

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**KUMASI-GHANA**

**COLLEGE OF HEALTH SCIENCES**

**SCHOOL OF PUBLIC HEALTH**

**DEPARTMENT OF POPULATION, FAMILY AND REPRODUCTIVE HEALTH**

**OCCUPATIONAL INJURIES AMONG HEALTHCARE WORKERS IN  
SUNTRESO DISTRICT HOSPITAL IN THE ASHANTI REGION,  
GHANA**

**BY**

**DR. HELENA SERWAA APPIAGYEI**

**JUNE, 2019**

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**KUMASI, GHANA**

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**BY**

**HELENA SERWAA APPIAGYEI (Doctor of Medicine)**

**A THESIS SUBMITTED TO THE DEPARTMENT OF POPULATION, FAMILY  
AND REPRODUCTIVE HEALTH, SCHOOL OF PUBLIC HEALTH, COLLEGE OF  
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FOR  
THE DEGREE OF MASTER OF PUBLIC HEALTH IN POPULATION AND  
REPRODUCTIVE HEALTH**

**JUNE, 2019**

# KNUST



## DECLARATION

I hereby do declare that except for references to other people's work which have been duly acknowledged, this piece of work is my own composition and neither in the whole nor in part has this work been presented for the award of a degree in this university or elsewhere.

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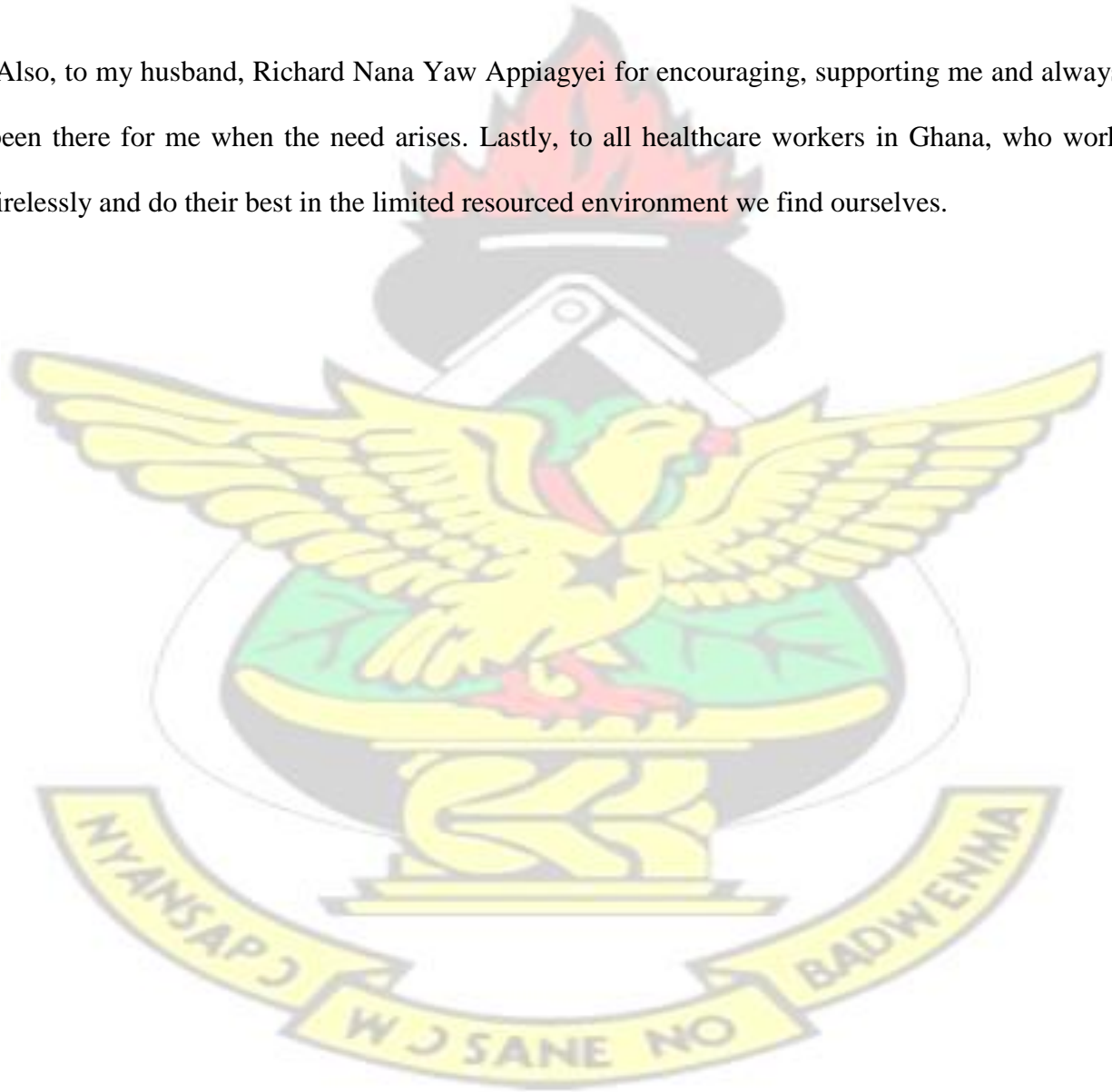
(HEAD OF DEPARTMENT)

## DEDICATION

I dedicate this work to first and foremost to God Almighty, for given me life and sustaining me throughout the course.

Secondly, to my late father, Mr. Adolf Yaw Appiagyei, who sacrificed a lot to make me who I am today by teaching me how to be studious, ambitious, determined and never to give up in life no matter the circumstance.

Also, to my husband, Richard Nana Yaw Appiagyei for encouraging, supporting me and always been there for me when the need arises. Lastly, to all healthcare workers in Ghana, who work tirelessly and do their best in the limited resourced environment we find ourselves.





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## **ABSTRACT**

Occupational health is defined as the highest degree of physical, mental and social wellbeing of workers in all occupations. Healthcare workers are exposed to various blood pathogens such as Hepatitis B and C virus, HIV and other occupational injuries such as violence from patients and patients relatives, biological and chemical hazards, others experience psychological trauma like fear, anxiety of infection and post exposure of body fluids. The lack of credible data hampers efforts to improve workplace safety especially in developing countries including Ghana, for these reasons occupational injuries are not recognised as public health priority.

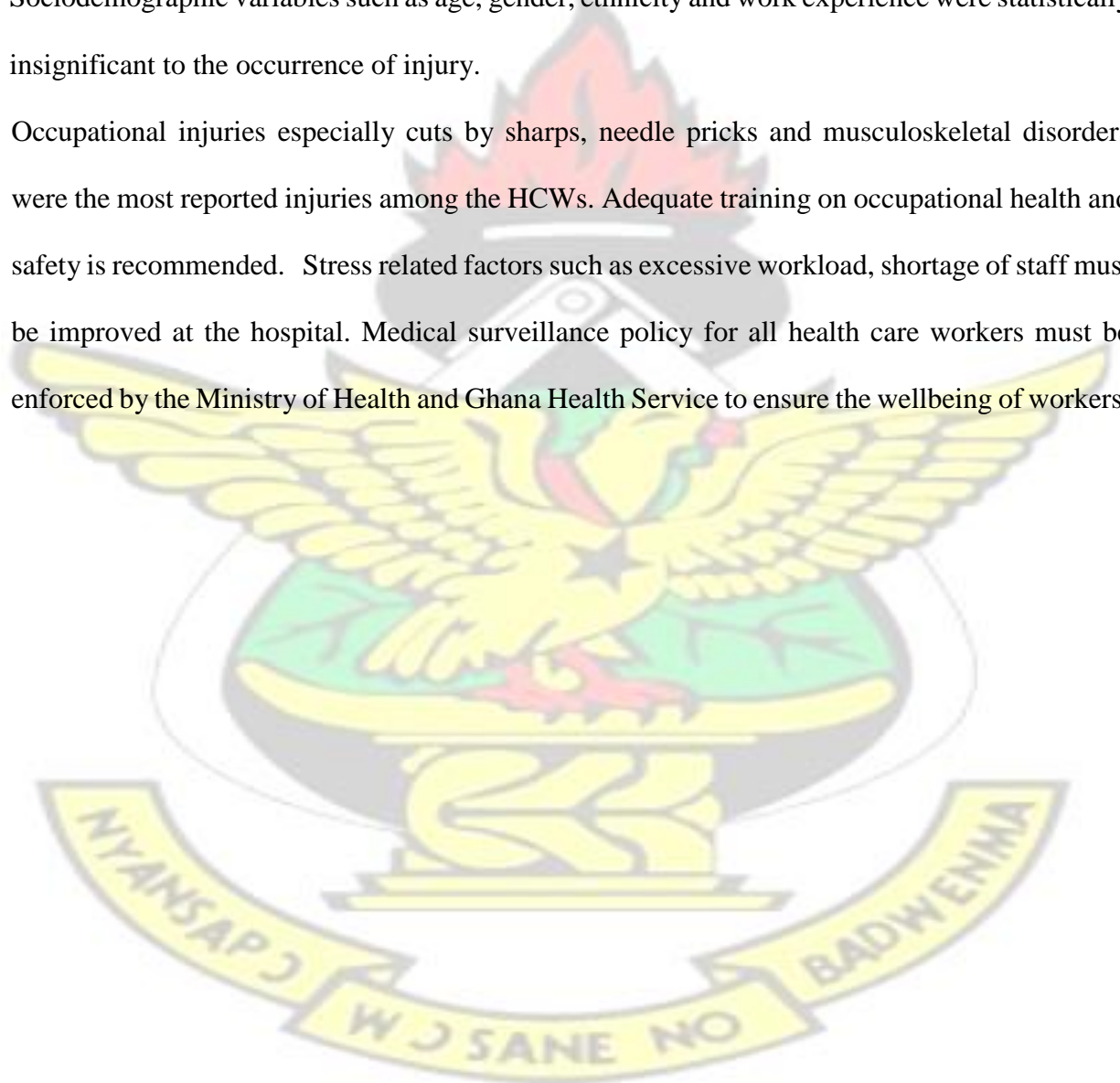
The main objective was to assess the prevalence rate of the most common occupational injuries and the group of healthcare workers at risk. To examine the awareness and knowledge of occupational health and safety measures.

The study was a hospital-based with a cross-sectional design study which used a simple random sampling technique. Quantitative method through a well-structured questionnaire with both opened and closed questions was administered. Participation of respondents was voluntary. The study was conducted within 3month duration. It consisted of 246 respondents which represented about 75% of the HCWS at the facility. Data was entered and analysed by Stata. Binary logistic regression and chi square for categorical variables was done and alpha was set at 0.05.

The prevalence rate of occupational injury was 29.7% among the respondents of 12months prior to the study with the commonest injury been cuts from sharps, followed by needle prick injuries and musculoskeletal disorders. , married workers were 62 percent less [AOR = 0.62; 95% CI. =

0.30-3.62] likely to suffer from injury compared to workers who are single. The risk to injury was 3.8 times higher for nurses [AOR = 3.80; 95% CI = 0.87-1.98] compared to laboratory assistants [AOR = 1.98 95% CI. = 0.41-9.40], physicians [AOR = 1.82; 95% CI. = 0.50-5.62] and nonclinical staff. Also working on shift termed as stressful exposes a worker to injury at 2.23 times [AOR = 2.23; 95% CI. = 1.22-5.23] compared to those who do not. Sociodemographic variables such as age, gender, ethnicity and work experience were statistically insignificant to the occurrence of injury.

Occupational injuries especially cuts by sharps, needle pricks and musculoskeletal disorders were the most reported injuries among the HCWs. Adequate training on occupational health and safety is recommended. Stress related factors such as excessive workload, shortage of staff must be improved at the hospital. Medical surveillance policy for all health care workers must be enforced by the Ministry of Health and Ghana Health Service to ensure the wellbeing of workers.



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## LIST OF ABBREVIATIONS

ILO	International labour organisation
CDC	Centers for Disease Control and prevention
MoH	Ministry of Health
OSHA	Occupational Safety and Health Authority
NIOSH	National Institute of Occupational Safety and Health
WHO	World Health Organization
HWs	Hospital Workers
HCWs	Health Care Workers
WRIs	Work Related Injuries
IPC	Infection Prevention Control
PPE	Personal Protective Equipment
HIV	Human Immunodeficiency Virus
HBV	Hepatitis B Virus
HCV	Hepatitis C virus
GHS	Ghana Health Service
SOCSSO	Social Security Organisation
PPE	Personal Protective Equipment

## DEFINITION OF TERMS

**OCCUPATIONAL HAZARD** is defined as the “potential risk to the health of a person emerging from an unhealthy environment” which is a significant public health issue.

**OCCUPATIONAL INJURY** is any personal injury, disease or death resulting from an occupational accident; an occupational injury is therefore distinct from an occupational disease, which is a disease contracted as a result of an exposure over a period of time to risk factors arising from work activity (ILO ,1998).



## **CHAPTER ONE**

### **1.0 INTRODUCTION**

#### **1.1 Background Information**

Globally, healthcare workers constitute 12% of the world populace. Currently, over 59 million people are engaged as healthcare workers worldwide (WHO, 2018). The healthcare industry is one of the biggest employing force of this generation.

Occupational injury is any personal harm, damage to any part of the body or disease or death which results from an external source such as occupational accidents, an occupational injury is therefore distinct from occupational disease, which is a disease contracted as a result of an exposure over a period of time to risk factors arising from work activity (ILO, 1998).

The main objective of occupational health and safety stated by the WHO is to promote and maintain the highest degree of physical, mental and social wellbeing of workers in all occupations and the good adaptation of work to man and of each man is to his job (WHO, 1995). There are 270 million occupational accidents and 160 million occupational diseases each year, as estimated by ILO (2005). Protecting the safety of health care workers at the workplace is necessary in order to have well-trained and health professionals. Ignoring or overlooking the safe measures of the workplace causes healthcare workers attrition in many countries especially developing Countries (WHO, 2016). As Kofi Annan (Former UN secretary general) says, "having a safety and a good working environment is not only a basic human right but also a sound economic policy." Policy makers, health administrators believe that healthcare workers are immune to injuries or diseases which make them ignore or not adhered to the universal precaution procedures. This perception contributes to healthcare workers not seeking, implementing and adhering to universal precaution measures.



The Ghana Annual Report (2000) of the Labour Department gave a total of 8,692 work-related accidents reported to the Department for Compensation claims which has doubled since 1999 statistics figure which stood at 4,088. Although occupational hazards are mostly underreported due to poor record keeping and inadequate research into occupational health and safety, few research that has been done shows a high prevalence of occupational diseases and injuries in subSaharan Africa and Asia with developing countries lacking the necessary expertise and resources to manage it (Ahasan & Partanen 2001). The under reporting of injuries at the workplaces of developing countries contributes to poor data statistics and analysis of specific occupational injuries of health facilities.

There are varieties of risk factors of occupational injuries such as blood pathogens from body fluids from patients, needle stick pricks, sharp cuts, slips, trips, violence from patients and relatives at the hospital. These hazards or injuries are classified into biological hazards (been exposed to body fluids of patients) these hazards make healthcare workers prone to infectious diseases such as TB, hepatitis, HIV/AIDS, SARS, Ebola. Chemical hazards such as glutaraldehyde, ethylene oxide. Physical hazards such as noise, slips, trips, falls. Ergonomic hazards such as heavy lifting. Psychosocial hazards such as shift work, stress. Finally, fire and explosion hazards. The use of oxygen, alcohols and sanitizing gels (WHO, 2006).

Needle stick or sharp injuries has been found to be the most frequent injury among HCWs. most in various studies both local and internationally (Manyele et al. 2008, Qrji et al., 2002,). The hepatitis B, C and HIV are the most common blood borne infections among healthcare workers (Gorman et al., 2013a) acquired by healthcare workers through needle stick and sharp injuries. In 2003 ,it was predicted by WHO that almost 16,000 HCV infections, 66,000 HBV infections, and 1,000 HIV infections happen annually worldwide in healthcare workers from needle stick injuries



(NSIs) (Gorman et al 2013b).WHO statistics states that global burden of disease from sharps injuries to healthcare workers was shown to be 37% of the hepatitis B among health care workers was the result of occupational exposure ,while less than 10% of the HIV among health workers is the result of an exposure at work ,needle stick injuries, the cause of 95% of the HIV occupational seroconversions are avoidable with practical, low cost procedures.( WHO, 2018).

Poor knowledge and bad attitude to occupational health is associated with high occurrence of occupational injuries which contribute to low productivity of workers, absenteeism, high economic loss and high prevalence rate of occupational infectious and non-infectious diseases.

The main objective of this study to investigate the types of occupational injuries and their associated risk factors to determine the prevalence of injuries, assess the safety measures of the health facility and to recommend solutions to improve the working environment of healthcare workers.

There is a necessity to reflect on policies, training of healthcare workers on occupational health and safety by the policy makers, hospital administrators and government which will encourage good health care delivery and health promotion strategies.

## **1.2 Problem Statement**

There has been a neglect of occupational health and safety for a very long time especially in the developing countries such as Ghana. Many governments, organizations, policy makers, managers and administrators do not show any commitment and lacks interest investing in this sector. The health sector has been one of the organizations that needs to adhere to occupational health and safety principles and measures to promote safety at work. SOCSO, (2008) states that public hospitals are listed as one of the top ten places with the highest accident rates compared to other

public service sectors. Healthcare workers face daily risk of occupational injuries which affect their quality of lives and work output.

During a focus group discussion among healthcare workers ,the root causes and core problems were as follows ; poor implementations of guidelines and policies of workers' health and safety; lack of effective supervision, monitoring and orientation of newly employed workers or in case of new devices usage , unlabeled waste containers ,Improper disposal of sharps objects ;poor adherence to standard operating procedures, ineffective communication between care providers and client, inadequate sharp storage facilities, lack of periodic health and safety risk assessment, lack of surveillance of work occupational injuries, Inadequate and outmoded equipment's at the facilities, lack of regular training on occupational health and safety and lastly shortage of occupational health and safety personnel.

Globally, there is a burden of infectious disease which health workers contribute to the increase rate of risks due to the daily exposure to blood pathogens through needle stick injuries, cuts, sharps and body fluids of patients' .This increase their susceptibility to infectious diseases like HEPATITIS B & C, HIV and others. In Germany, about 500,000 needle stick injuries occur annually among healthcare workers (HCWS).

The risk of transmission from a positive source for Hepatitis B&C is between 3% and 10% and the average risk of transmission of HIV is 0.3%(Barry, 2000 ).This rate calls for remedies to reduce the risk of transmission.

2.5% of HIV cases, 40% of both HBV and HCV cases globally are the result of occupational exposure among HCWs as reported by WHO (Hutin et al., 2001; WHO, 2002). In Sub-Saharan Africa, Sharps injuries among HCWs constitute 30% of new cases of HBV and 2.5 % of annual infections of HIV as stated by WHO (WHO, 2002).

HCWs suffer from psychological and emotional distress after a needle stick injury (Lee et al. 2005) which affects their mental wellbeing at work. Needle or sharps injuries are often avoidable and not properly documented. (UK Department of Health, 2004).

In Ghana, the doctor –population ratio was 1:8953 in 2015, one nurse to population ratio is 1:739 in 2015(GSGDA 2014-2017). With Greater Accra Region having densely populated health workers for instance doctor to patient ratio is 1:3,186 with the Northern Region with 1: 30,601. (GSGDA2014-2017) These statistics indicates losing one healthcare worker affects health care delivery and the consequences are immensely due to the crisis or inadequacy of healthcare workers in the country.

Transportation of patients from one department to other department, lifting of objects and instruments, positions of delivering services, post-surgical patients are risk factors for musculoskeletal disorders. There is underreporting of occupational injuries in the various working sectors, the health sector is no exception. In the health sectors, there is limited information or records of injuries which makes it difficult in the statistical analysis of injuries.

### **1.3 Study Rationale**

The study will address the types of occupational injuries in the healthcare sector and its associated determinants .Information on the frequency, types and safety measures at the hospital will be investigated.

High morbidity of infectious diseases such as HIV, Hep B, Hep C, has being a global concern, healthcare workers are daily exposed to risks such as needle stick injuries, cuts and body fluids that make them prone in acquiring these infectious diseases. A reduction in these work related injuries will contribute to a reduction in morbidity and mortality of infectious diseases.

The findings from the study will inform the management of the hospital, health directorate, Ghana health service, ministry of health and lastly the occupational safety and health authority to know the level of knowledge of occupational health and safety including types of injuries at the hospital, frequency of in-service training, workshop and seminars on occupational health and safety attended by healthcare workers within the year.

It will also inform them on the extent of work related injuries and means to ensure effective monitoring and supervision of injuries and accidents at the workplace.

### **1.5 Research Questions**

1. What are the levels of awareness and knowledge of occupational health and safety measures?
2. Are the healthcare workers satisfied with the safety measures of the health facility?
3. How frequent are training, workshop and seminars on occupational health and safety?
4. What is the frequency and prevalence rates of occupational injury among healthcare workers?

### **1.6 General Objective**

To investigate prevalence rate, the causes and types of occupational injuries and assess safety issues in Suntressso district hospital.

### **1.7 Specific Objectives**

1. To assess the occupational health and safety training available to the health care workers.
2. To examine the mechanism of injury and exposures prevalent at the facility



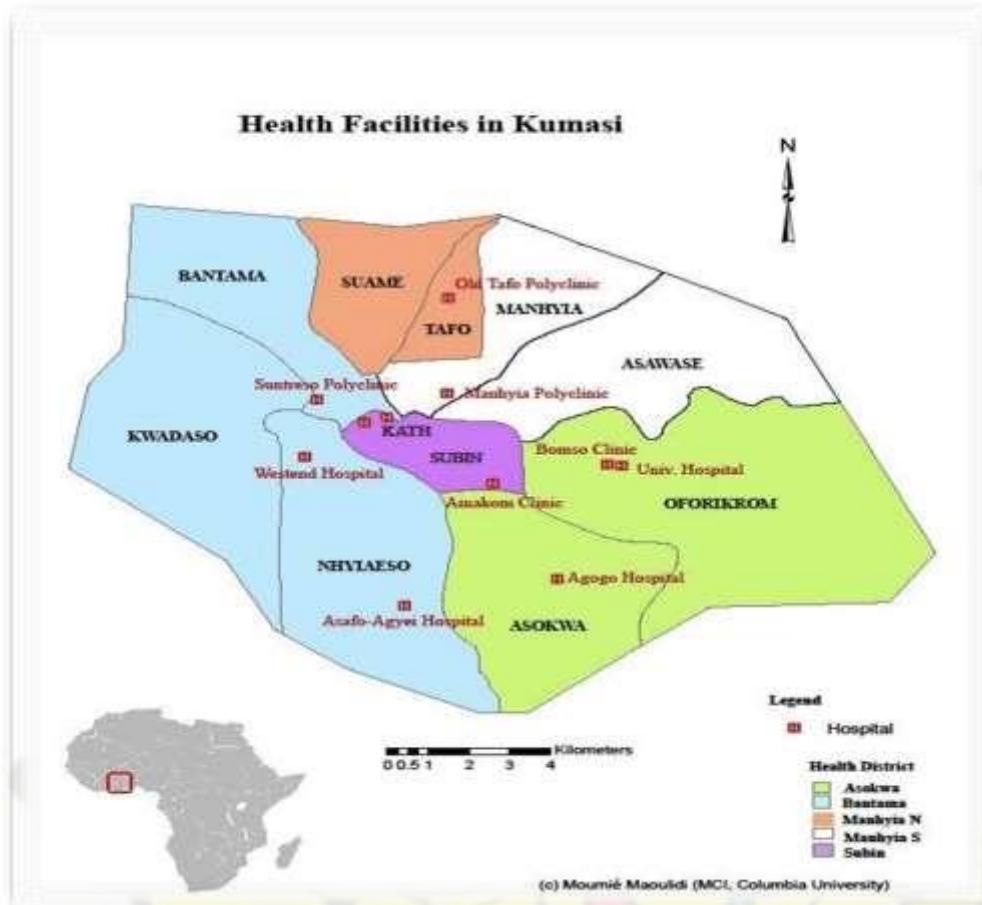
3. To investigate the current safety measures and its implementation at the facility

4. To examine the factors predicting injuries among health care workers

### **1.8 Profile of the Study Area**

Ashanti Region is one of the densely populated region and 3<sup>rd</sup> largest in Ghana. It has a population of 4,780,380.(Ghana statistical service , 2012) .There are 21 districts with 114 sub districts .The region has a landside of 24,390sq.km which forms about 10.2% of the land area of Ghana . There are about 170 government hospitals , 71 mission hospitals, 281 private health facilities whiles the Quasi-government comprises of eight (8) with one tertiary hospital which is Komfo Anokye Teaching Hospital. Kumasi has 38% of health facilities in Ghana (service availability mapping survey). The health districts in Kumasi are Asokwa, Subin, Bantama, Manhyia North and Manhyia South. Bantama Sub-metro is situated at West of Kumasi and is bounded by Atwima Kwanwoma and Atwima Nwabiagya to the North West and South West respectively and to the East by Asokwa, Manhyia and Subin.





**Figure 1: Health Facilities in Kumasi**

### 1.81 Population

Bantama sub metro – forms the second largest amongst the five (5) sub – metros in Kumasi metropolis. It consist of three constituencies namely, Nhyiaeso, Bantama and Kwadaso.

Bantama Sub – metro has 81 communities, 26 Electoral areas; currently the sub - metropolis has 28 demarcated zones with 78 outreach points. One functional CHPS Compound –Takyiman donated by community. The total population is 550,233 with a growth rate of 2.7% in 2016. The sub-metro has a total of 43 health facilities and 28 CHPs zones .The total number of facilities in

DHIMS2 are 38 facilities. The doctor –population ratio in 2016 was 1:14109, nurse –population ratio in 2016 was 448. Suntreso is part of the health district of Bantama sub –metro.

### **1.82 Brief Profile of Suntreso Government Hospital (As At Dec 2017)**

The Suntreso Government Hospital was constructed and started off as Suntreso Urban Health Centre in 1963, on November 22nd, by Mr. L. R. Abavana. However, the first patient was seen on the 27<sup>th</sup> January, 1964. The maternity unit was added in 1973. It was given a Polyclinic Status in 1985. In 1998 a specialist clinic for Sexually Transmitted Infections (STI) was added to the range of services. In the year 2000 the facility again was given a District Hospital status within the Bantama sub metro. Under the auspices of the millennium cities initiative and the Israeli consul (Mashav) in 2009 another specialist clinic mother and baby unit was added. A dermatology specialist consultation service was added in 2015. The facility has no mortuary. The hospital has (90) ninety bed in a whole: MBU consists of (16) beds and (10) cots, female ward has (15) fifteen beds while the males has (16) sixteen, emergency ward has (3) three beds children's ward (6) six beds, (11) cots, obstetrics and gynaecology department has (19) nineteen consists, female surgical (13) Thirteen beds, (2) two beds at the theater recovery.

### **1.83 Departments**

The following are the departments found in the hospital: Internal medicine, Surgery, Paediatric, Obstetrics and Gynaecology, Eye, ENT, Dental, Public health, Diagnostics, Theatre /Anaesthesia, Administration

### **1.84 Services Available**

General OPD, Inpatient Care, Disease Surveillance, CT (PMTCT), Pharmacy, Pediatrics care (MBU), Obstetrics / Gynecology, Surgery, Dermatology, Eye care, Dental Care, ENT, STI/ HIV care, Ultrasound, Laboratory services, X-ray, Family planning, Herbal Medicine Psychiatry, General Administration.

### **1.85 Human Resource**

There are six specialists, 9 medical officers, 2 medical officers at the dental department three public health nurses, fifty two community health nurses, 36 enrolled nurses, 5 biomedical scientist, 36 enrolled nurses, 5 pharmacist, 5 laboratory technicians, 70 midwives, 110 general nurses, 1 optometrist. The total number of outpatients in 2017 was 78142, the total number of inpatients in 2017 was 9204.

### **1.9 Scope of Study**

This study was a hospital based which was conducted in Suntreso district hospital located in the Bantama Sub –metro district for a 3month period from June to August 2018. The main aim was to examine the various types of occupational injuries in the health sector which put healthcare workers at risk in their daily work activities and also determine the safety measures at the hospital. The respondents were 246 healthcare workers who were at risk of the types of occupational injuries (physical, biological, chemical, ergonomic and work related violence been investigated. Exclusion of the study were all staffs at the administrative department, radiology department (the long term effect of the radiation could not be assessed), security personnel's and other healthcare workers who were less at risks of the injuries. A well-structured questionnaire with both open ended and closed questions were used for data collection. This study is important because if

healthcare workers are safe and healthy, they will be more productive in their work and save more lives, absenteeism, economic loss, injuries and infection would be reduced.

### **1.10 Organization of Report**

The study has been organized into six (6) chapters.

Chapter one (1) presents the background information of occupational health and safety , problem statement, rationale of the study, the hypothesis, research questions, general objectives and profile of the study area.

Chapter two (2) comprises of literature review of various research studies in journals, books and other resources of the topic.

Chapter three (3) deals with the research methods and design, data collection techniques and tools, study population, study variables, sampling, pretesting, data handling, data analysis, ethical consideration, limitations of the study and the assumptions.

Chapter four (4) involves the results of key study variables of the study.

Chapter five (5) includes association of the findings of the study to other various research papers results.

Chapter six (6) take account of the key findings of the study and the recommendations to interested parties and stakeholders.

## **CHAPTER TWO**

### **2.0 LITERATURE REVIEW**



## **2.1 Occupational Health and Safety**

The right to safety and health at work is enshrined in the United Nations Universal Declaration of Human Rights, 1948, which states: Everyone has the right to work, to free choice of employment, to just and favourable conditions of work (Alli, 2008a).

According to the WHO, all workers have the right to healthy and safe work and to a work environment that enables them to live a socially and economically productive life (WHO, 1994). Occupational safety and health (OSH) is generally defined as the science of the anticipation, recognition, evaluation and control of hazards arising in or from the workplace that could impair the health and well-being of workers, taking into account the possible impact on the surrounding communities and the general environment.(Alli, 2008b).

Occupational health is “the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations – total health of all at work (ILO, WHO). Occupational health aim is : the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention amongst workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the workers in an occupational environment adapted to their physiological and psychological capabilities; and, to summarize: the adaptation of work to man and of each man to his job (WHO, 1995).

## **2.2 Types of Occupational Injuries**

Occupational injuries are classified into fatal and non-fatal depending on the severity, type and effect on the healthcare worker. Many agents can cause these injuries, these are:



- A. Physical agents
- B. Chemical agents
- C. Biological agents
- D. Mechanical agents
- E. Psychosocial stress

### **2.2.1 Physical Hazard Injuries**

Physical Hazards is defined as "A factor within the environment that can harm the body without necessarily touching it. Examples are vibration, noise and slips which happens when a person's foot loses traction with the ground surface while trips occur when a person unexpectedly catches their foot on an object or surface. Falls may result from a slip or trip but many occur during falls from low heights or into a hole, ditch or body of water ([www.worksafe.vic.gov.au](http://www.worksafe.vic.gov.au)).

Heat - Heat hyperpyrexia, heat exhaustion, heat syncope, and heat cramps, burns, prickly heat

Cold - Frost bite, light – Occupational Cataract, Atmospheric-pressure-Caisson disease, air embolism, explosion.

Noise: Noisy equipment found in the laundry can cause occupational deafness among the workers.

Radiation – causes diseases like Cancer, Leukemia, aplastic anemia, Pancytopenia

Electricity - Electrical hazards including electric shock, electrocutions fires, and explosions.

### **2.2.2 Chemical Hazards**

Hazardous chemicals in the workplace are defined as substances, mixtures and materials that can be classified according to their health and physicochemical risks and dangers. Health hazards include skin irritants, carcinogens or respiratory sensitizers that have an adverse effect on a worker's health as a result of direct contact with or exposure to the chemical, usually through

inhalation, skin contact or ingestion. Physicochemical hazards generally result from a substance's physical and chemical properties, as is the case with flammable, corrosive, oxidising or explosive substances. The routes of entry are inhalation, ingestion and skin absorption.

Chemical agents can be classified into: Metals (lead, arsenic, and mercury), Aromatic Hydrocarbons (phenol, benzene), aliphatic hydrocarbons (methyl alcohol), gases (nitrites, methane). In the hospital setting, chemical hazards such as latex is mostly found in gloves, flexible tubing, and mercury also from accidental spills when there is a breakage of thermometers, sphygmomanometers, during sterilization and centrifugation thermometers for maintenance

### **2.2.3. Biological Agents**

Biological hazards are organic substances that pose a threat to the health of humans and other living organisms. Biological hazards include pathogenic micro-organisms, viruses, toxins (from biological sources), spores, fungi and bio-active substances. Biological hazards also involves biological vectors or transmitters of disease. Globally, it is projected that around 320 000 workers die each year from transmissible diseases caused by work-related exposures to biological hazards (Driscoll et al. 2005; OSHA 2007).

Bacteria- causes tetanus, tuberculosis, anthrax, brucellosis. Legionnaire diseases: caused by inhalation of airborne droplets containing the legionella bacteria, pneumonia-type symptom.

Virus – Hepatitis B and C, HIV, AIDs, Protozoa&Parasitic-Malaria. Fungi –tinea infections, Coccidiomycosi, Psittacosis, etc.

### **2.2.4 Ergonomics-Adjustment of Man and Machine**

An ergonomic hazard is a physical factor within the environment that harms the musculoskeletal system. Ergonomic hazards include themes such as repetitive movement, manual handling, workplace or task design, uncomfortable workstation height and poor body positioning. Ergonomics is the study of how a workplace, the equipment used there and the work environment itself can best be designed for comfort, efficiency, safety and productivity

### **2.2.5 Psychosocial Stress**

**Psychosocial stress** is experienced as a result of our social interaction with others and developing a sense of identity. It also offers opportunities for people to improve and practice their skills, to form social relationships, and find their self-worth. These are situations in which work can have adverse consequences for health and wellbeing. Risks to psychological health at work may result from organisational or personal factors, with the major factors being poor design of work place, poor communicational skills and interpersonal relationships, occupational violence and fatigue. Risks to psychological health due to work should be viewed in the same way as other health and safety risks and a commitment to prevention of work-related stress must be involved in an organisation's health and safety policies.

#### **2.3.5.1 Work-Related Mental Stress**

Work-related mental stress has been described as the adverse reaction experienced by workers when workplace demands and responsibilities are greater than the worker can comfortably manage or are beyond the workers' capabilities (Leka et al. 2003). It can affect each worker differently and originate from different sources. High levels of Job demand and low levels of job resources increase the risk of mental stress, and may include job demands( Role overload ,Role ambiguity ,Role conflict, Cognitive demand, Emotional demand, Group task conflict, Group relationship

conflict) and job resources (Job control, supervisor support ,Co-worker support, praise and recognition, Procedural justice, Change consultations).

### **2.3 State of Occupational Health and Safety Policy in Ghana**

Ghana till now has not instigated national policy on OHS. A draft of occupational services policy cooperatively written by the Ministries of Manpower Youth & Employment, Health and Lands, Forestry & Mines in the year 2000 is yet to be implemented. Lack of comprehensive OHS policy, insufficient funding, poor organisation, lack of occupational health and safety professionals, inadequate awareness, training and education are reasons for poor occupational health and safety at the workplaces, (Muchiri, 2003).

### **2.4 Legal Context of the Policy of Ghana Health Sector OHS**

Section 24(1) of the 1992 Constitution states that “Every person has the right to work under safe and healthy conditions....” This essential human right has been endorsed by the Labour Act, 2003 (Act 651).

### **2.5 Medical Surveillance**

Medical surveillance is defined as systematic assessment of employees exposed to occupational hazards. It is a strategic programme of systematic medical examinations planned to aid the early detection of disease or ill health related to particular types of work. It is mandatory for all staffs. The kind and rates of examinations done depends on the nature of work of individuals and other factors such as age and sex. Surveillance plan must describe the types and frequency of examinations to be done by each institution by taking into consideration the various categories of



workers. There are four periods to be considered: pre-placement, periodic, post sickness absence and exit. The examination includes these steps:

- Medical history form completion
- Physical examination
- Special Tests/laboratory investigations
- Final assessment

The objective of these medical assessments is to guarantee that workers are fit for their prospective job at the health facility .An employee's consent is necessary before any medical monitoring is done, results of any surveillance of workers remains confidential and kept .The four (4) key areas of medical monitoring:

## **2.6 Pre-placement (Pre-employment) Examination**

This medical assessment is to make sure that the employee is apt to assume the profession without causing harm to him and co-workers. The pre-employment medical examination of workers shows the initial health status while the successive examinations will be used to assess the obvious health effects of the work environment.

### **Periodic Examination**

This examination is done occasionally to detect the risk groups among the staff which can be of an enormous significance to prevention. The types of examinations will be assigned for each risk groups depending on the characteristics of the group members.

### **Post Sickness Absence Examination**

This examination is conducted after employee absence due to a medical condition for a period of time to ensure he is fit for his job which in effect helps in rehabilitation process

### **Exit Medical Examination**

This is the provision of data when workers are exiting from the workplace. This is beneficial to those who will need continuous medical assistance for their conditions to provide data on employees at the point of exit from a particular occupation or workplace. (GHS, OHS policy, 2010).

## **2.7 Prevention of Communicable Diseases**

The Ghana health service has put up these measures in preventing infectious diseases among healthcare workers facilities:

**Immunization Strategy:** The GHS will institute a complete occupational immunization programme for its workers who handle patients. The appropriate immunizations against these infectious diseases must be made available for all staff and potential staff periodically to reduce the transmission rate. These are: Hepatitis B, Tetanus, Yellow Fever & Cerebro-Spinal Meningitis and other diseases where occupationally relevant. There must be a record keeping and recall for boosters of the immunization programme (GHS, OHS policy, 2010).

### **2.7.1 HIV/AIDS and Hepatitis**

HCWs who have been infected with the HIV, Hepatitis B or Hepatitis C must receive counselling and the necessary screening. All the information are described in appropriate policies e.g. HIV/AIDS workplace policy and other guidance relating to provisions for care and compensation for ill or injured staff and staff welfare in use by sub-sectors, institutions and facilities. Exposure to Hepatitis or HIV/AIDS exposures in the work places through needle stick injuries or other factors

as a result of contact from biological products, the occurrence has to be reported as soon as possible. Post-exposure prophylaxis must be provided (GHS, OHS policy, 2010).

### **2.7.2 Protection of Employees from Harassment Abuse**

In the event that an employee suffers from or is threatened with physical, sexual, or psychological abuse from a client/patient or his/her representative, the employee should report immediately to his/her supervisor who is to make sure an investigation of the matter starts with the appropriate action taken. (GHS, OHS policy, 2010).

## **2.8 Research Studies on Occupational Injuries**

### **2.8.1 Biological Injuries**

A study by Askarian and Ghavanni concluded that non-immune people have a risk percentage of viral transmission by infected people through an injury of a sharp instrument has been assessed to be 6–30% for hepatitis B virus, 5–10% for hepatitis C virus, and 0.3% for HIV (Askarian, & Ghavanini, 2002). WHO reports that annually, about 2 million of the 35 million of health-care workers experienced percutaneous exposure to infectious diseases. It also discovered that, globally, 37.6% of Hepatitis B, 39% of Hepatitis C and 4.4% of HIV/AIDS in HCW are due to needle stick injuries (WHO, 2002). A study by Prüss-Üstün and colleagues determined the global liability of disease by sharps among healthcare workers shows significant variability proportions of injuries by regions (0.2%–2.5%), as did the usual number of injuries per health-care worker (0.2–4.7 sharps injuries per year). The annual proportions of health-care workers exposed to blood borne pathogens was 2.6% for HCV, 5.9% for HBV and 0.5% for HIV, corresponding to about 16 000 HCV infections and 66 000 HBV infections in health-care workers worldwide. According to the model, 200–5000 HIV infections would also be caused (with an expected value of 1000 HIV infections). In developing countries, 40%–65% of HBV and HCV infections in health-care workers were as a



result to percutaneous occupational exposure. In developed countries, contrary to developed countries, the attributable fraction for HCV was only 8%–27%, and that for HBV was less than 10%, due to immunization and PEP. The attributable fraction for HIV in the various countries was between 0.5%–11% (Prüss-Üstün *et al.*, 2003).

Transmission of blood borne pathogens Blood borne pathogens which include HIV, HBV and Hepatitis C Virus (HCV) are regularly acquired occupational diseases in developing countries (Abeje *et al.*, 2015; Beyera *et al.*, 2014; Gupta *et al.*, 2014. Lee discovered that most of occupational acquired bloods borne diseases by HCWs were due to needle stick injuries (2009) in the study of assessing occupational transmission of blood borne diseases to healthcare workers in developing countries: meeting the challenges. These conclusions were similar to a study by Orji and colleagues in Nigeria: Occupational health hazards among health care workers in an obstetrics and gynaecology unit of a Nigerian teaching hospital (Orji *et al.*, 2002). Another study in Uganda among healthcare workers in the public hospitals also showed that the biological hazards that occurs among healthcare workers were mostly sharp related injuries (21.5%), cuts and wounds (17.0%)( Ndejjo *et al.*, 2015). Congolese study also estimated an annual prevalence of occupational exposure to body fluids among health-care workers to be 44.9%, with an average of 1.38 exposures per health-care worker per year while a Burundian study found 67.6% among healthcare workers. A meta-analysis of 21 African countries also discovered a lifetime prevalence of body fluids exposure was 65.7% among healthcare workers which is very high (Auta *et al.*, 2017). Amini and fellows concluded on their study on Iranian healthcare workers with 67.8% of the participants (n = 211) had at least one NSI. The most reported NSIs was from the emergency department (33.5%). Most respondents reported that, needles used for injections was the leading cause of their injuries (71.1% of all NSIs). Among NSIs, those caused by insulin syringe needles (6.2%) were the second



leading cause. In this study, females were the most infected with the highest number who had NSIs. There was a statistically significant relationship between sex and the rate of NSIs ( $P < 0.05$ ) (Amini et al., 2015). A Malaysian studies done at two teaching hospitals concluded with the results of 52.9% prevalence of needle stick injury among healthcare workers (Ng et al., 2007).

A research done in a tertiary institution by Muralidhar and fellows to determine the prevalence of NSIs among healthcare workers discovered that the most contributing factors to NSI at the facility were blood withdrawal (55%), followed by suturing (20.3%) and vaccination (11.7%). The recapping of needles after use was still practiced among HCWs (66.3%). Some HCWs also reported that they bent the needles before disposal (11.4%). (Muralidhar et al., 2010a).

### **2.8.2 Slips, Trips, fall and Sprains**

In 2000, injuries from falls was recorded in South Africa the 20<sup>th</sup> leading cause of mortality with 10% morbidity (Seedart, 2009). Female workers are more prone to slip related falls than male workers in the health care sector according to study by Alamgir and Bell. (Alamgir et al., 2011; Bell et al., 2013). The injury rates from STFs were estimated at 38.2 per 100 000 population (Bell et al., 2010). Work-related or occupational slips, trips and falls (STFs) especially in the health sector can result in serious injuries, which can impact negatively on the health care personnel, resulting in pain, lost days of work, diminished productivity, and inability to care for patients (Bell et al., 2010; Bell et al., 2013; Miller et al., 2013; Yeoh, Lockhart, & Wu, 2013).

Hence, the rates of these injuries are said to steadily increase after middle age (Reubenstein & Josephson, 2002). A study in Botswana to determine incidence of occupational slips, trips and falls amongst health care workers in Limpopo Province of South Africa discovered that out of the 686 cases of occupational injuries reported to the Compensation Commissioner for the years

reviewed, there were 139 cases related to STFs, resulting in a prevalence of 20.3%. (Mogale et al., 2014). Lower extremities such as knees, ankles and feet are the most cited injured body parts after an STF event (Andersen et al., 2012).

### **2.8.3 Musculoskeletal Disorders**

A cross sectional study in Turkey done at four large hospitals with about 120 nursing staff from 6 departments (surgery, medical, obstetrics and gynaecology, psychiatry, pediatric and neurology) to determine the prevalence and distribution of symptoms of musculoskeletal disorders. The study revealed 90% of all nurses reported at least one musculoskeletal complaint, 60% reported at least two, and 36% reported three complaints in the past 6 months with the most prevalent disorder been low back pain of 69% of reported cases with the least with neck pains of 46% ,shoulder pain disorders been 54%.(Tezel,2005a). Azizpour et al argues that the highest prevalence's of LBP were 59.5% in wards nurses, 50.3% in operating room technicians, and 39.4% in aid nurses while Tezel makes a contrast of the highest prevalent of musculoskeletal disorders, especially low back pain is found among surgical and obstetric departments nurses and not ward nurses. Musculoskeletal disorders are frequent among females and older age more prone to it than the younger ones. (Tezel, 2009b; Azizpour et al; 2017, karahan et al; 2017)

According to karahan et al , the causes of the musculoskeletal disorders among the healthcare workers were as follows: age, female gender, smoking, occupation, perceived work stress and heavy lifting were statistically significant risk-factors. Awosan et al supported the factors by adding overweight , obesity and with highest risk factor of healthcare workers standing for longer hours during work being 57.2% ,followed by awkward postures of 22.2% , lastly lifting of heavy objects 20.6% of reported cases (Awosan et al., 2017).

#### **2.8.4 Workplace Violence**

A study done in a Nigerian tertiary hospital among the healthcare workers in assessing the prevalence and types of workplace violence revealed that: 88.1% of the participants have had experienced workplace violence with more than half of 54.4% of all violent incidents happening in the wards. Verbal abuse (85.4%) was the most experienced, while sexual harassment was the least with 4.5%. Approximately one quarter (25.1%) of all the participants had been physically assaulted in the preceding year. Patients and their relations were the main culprits of physical assault and threats. The main workplace bullies were the senior colleagues.(Ogbonnaya et al., 2012). This study findings can also be supported with a study done in the Caribbean's, Barbados at some health facilities determining the prevalence of workplace violence and its gender predisposition. Out of 102 subjects, there was 72% response rate with 63% of nursing and physician staff at the polyclinics reported at least one episode of violence in the past year. Most of respondents were exposed to verbal abuse (60%) and 19% reported being exposed to bullying.

Seven percent of the staff reported incidents of sexual harassment, 3% physical violence and another 3% reported racial harassment. Females, especially among the nurses were more prone to workplace violence than the males (Abed et al., 2016).

#### **2.8.5 Psychosocial Stress**

A study done in the Republic of Srpska to determine the prevalence of stress and burnout syndrome among physicians of healthcare facilities found out a high degree of emotional exhaustion of 27.2% of respondents, while high depersonalization was 23.8% and a low level of personal accomplishment was highest with 39.7%. The physicians aged over 45 years had a significantly ( $p = 0.030$ ) higher level of emotional exhaustion than their younger colleagues (Stanetic et al., 2016).

The main reasons healthcare workers state for burnout syndrome and stress in a Iranian study of



physicians under the ministry of Health were patient's pressure or violence, unorganized patient flow, less cooperative colleague doctors, fewer support services at the PHCCs, more paperwork, and less cooperative colleagues. Addressing these issues could lead to a decrease in physician's burnout and these factors apply to all departments in the healthcare sector (Bawakid et al., 2017).

### **2.8.6 Safety Measures**

A study done in Uganda, in 8 major hospitals in the city of Kampala in assessing the occupational hazards among healthcare workers and mitigation measures in the year 2015 illustrated these results: the most important control measures available at the health facilities were provision of separate areas and waste disposal containers was (92.0%) and safety tools and equipment (90.0%). More than half (53.5%) of the health facilities ensured provision of personal protective equipment. HIV screening examination was done by 97% of the HCWs, while 91.0% had received BCG vaccination. In view of the hand washing practices, most health workers washed their hands before and after every procedure (79.5%) and after handling stained materials (68.5%). 46% of healthcare workers washed hands when they were obviously unclean while about 53.5% did so after visiting the washrooms. (Ndejjo et al., 2015). A cross-sectional study was done to assess safety breaches and type of ill health posed by conditions of work and the working environment in Ghana, specifically seven (7) government hospitals and health centers in the Greater Accra and Eastern regions discovered these results: out of a total of one hundred and eighty-nine (189) respondents, only 6% of health workers considered health and safety measures in place at the time of the survey adequate; 48% of the 4 Respondents considered the measures to be poor and an additional 33% said they required improvement. Some of the reasons illustrated by the healthcare



workers are : perceived poor health and safety performance including insufficient facilities and absence of safety equipment (18.5%), absence of Health and Safety Policy (14.3%), health care personnel's incurring healthcare cost by themselves (6.9%) and the inadequacy awareness of safety issues was 5-8% (GHS,OHS .,2010).

### **2.8.7 Post Exposure Prophylaxis and Vaccination**

It was disturbing to note that only 40 per cent of the HCWs knew about the availability of PEP services in the hospital and 75 per cent of exposed nursing students did not seek PEP (Muralidhar\_et al .,2010b).This confirms a study findings that was done in Kenya among healthcare workers to assess the safety measures ,the results were :the incidence of NSIs was 0.97 per healthcare worker per year. Twenty-one percent had had an HIV test in the last year.

After one year there was a significant drop in the number of NSIs (OR: 0.4; CI: 0.3– 0.6;  $p<0.001$ ) and a significant increase in the number of HCWs accessing HIV testing (OR: 1.55; CI: 1.2–2.1;  $p=0.003$ ). In comparison to uptake of hepatitis B vaccination (88% of those requiring vaccine) the uptake of PEP was low -4% of those who had NSIs (Taegtmeyer et al., 2008).

## **CHAPTER THREE**

### **3.0 METHODOLOGY**

#### **3.1 Study Design**

The study was a cross-sectional design done in a hospital which assessed the safety measures and the prevalence of occupational injuries HCWs in a public district hospital in the Ashanti Region. Recruitment process started from June to August 2018. A quantitative approach was used to develop a well -structured questionnaire that had five (5) parts that included demographic characteristics, types of occupational injuries state of working conditions, universal precautions and its implementations for the past 12 months.

#### **3.2 Data Collection and Tools**

Respondents of the study were interviewed by using smart phones on the ODK (open data kit). Platform with well-structured administered questionnaire with open and closed ended questions. The five (5) parts of the questionnaire consisted of demographic characteristics such as age, marital status, ethnicity, gender, and type of profession, level of education, frequency, and severity of occupational injuries twelve months preceding the research study will be collected. The second part consisted of questions on exposure to chemical, biological and physical injuries while the third part also has questions on stress level of respondents. The fourth part had questions on musculoskeletal disorders and ergonomics with last part consisting of the safety measures at the facility.

#### **3.3 Study Population**

The study composed of all healthcare workers from Suntreso Government hospital in Kumasi

Metropolis.

### **3.4 Study Variables**

#### **3.4.1 Dependent Variable**

The dependent variable of this study is occupational injury that occurs among healthcare workers while performing his/her duty. We considered respondents who have suffered work related injury if they self-reported or have had one or more injury during twelve months period before the study.

#### **3.4.2 Independent Variables**

Relative to the outcome or dependent, we required study participants to provide information on; Age, sex, gender and ethnicity of respondents, Type of Job categories of respondents, Compliance with safety measures, Work experience in healthcare industry, Type of injury suffered, Time of shift injury occurred, Hours worked per day, Level of education, Workers occupational health and safety trainings status, Vaccination status, Periodic health/safety assessment/route causes analysis in their respective work units, Availability of guidelines on infection prevention and control.

### **3.5 Sampling Size**

A sampling size of 250 healthcare workers from the selected groups of different categories of profession. This was obtained by using the Kish and losle formula (1965)  $n = \frac{Z^2 P (1-P)}{d^2}$  where n= sample size, Z= 95% confidence interval, p=proportion, d=margin of error.

An assumption that the true value will fall within 95% confidence interval with type one error of 5%, and Z score of 1.96. We assumed a prevalence of occupational injuries of 15% at a tolerable error of 5%

$$n = (\text{sample size}) = \frac{1.96^2 \cdot 0.15(1-0.15)}{0.05^2}$$

$$0.05^2$$

$$= \frac{1.96^2 \cdot 0.015(0.88)}{0.05^2} = 3.84 \times 0.1275 / 0.0025 = 195$$

$$0.05^2$$

The maximum sample size of respondents was 195 healthcare workers. 15% of non-respondents

Total 195 +55=250

### **3.5.1 Sampling Strategy**

Suntreso Government Hospital was selected to be the study site because is one of the biggest district hospitals in the country and the only district hospital in Bantama sub –metro district with almost all clinical departments at the facility. The sampling technique was simple random sampling according to the occupational group into doctors, nurses, laboratory technicians and pharmacy staff, health informants and public health workers who balloted and selected yes as an option were interviewed. The participants eligible for the study were healthcare workers who performed medical and surgical procedures, interacted directly with patients in their day to day activities. Personnel at the management and administration unit, stores and procurement unit, registry were excluded from the study.

### **3.6 Pre-Testing**

Training on the objectives of the study and content of the questionnaires was done for two research assistants, and on the contents of the data collection tool. The questionnaires were pre tested at a different hospital, precisely HopeXchange medical center, comments and contributions was considered for the final presentation of the questionnaires. The questionnaires was very clear with simple English Language that was easy to understand. Two research assistants were available for clarification of issues arising from participants.



### **3.7 Data Handling**

Control of data quality was through review of data collected in the field (data collection).

Research team identified all incomplete and missing information and corrected them accordingly.

The data was secured only with the principal investigator and supervisor.

### **3.8 Data Analysis**

Data collected from data instrument were coded and analysed by Stata. The results were presented in the form of descriptive and inferential statistics displayed in graphs and on tables.

Descriptive statistics : frequencies, percentages, mean and standard deviation were calculated.

Inferential statistics: univariate, multivariate logistics regression, reporting odds ratio-significant level were set at 0.03 and 0.05.

### **3.9 Ethical Statement**

Institutional ethical clearances was requested from the committee on human research publication and ethics , KNUST and KATH , the Ghana Health Service, School of Public Health, KNUST , the medical superintendent of Suntressso government hospital, the medical officer in charge of research projects at the facility before the commencement of the study. The participant's rights and interests were protected as follows;

- a. Study subjects were made to understand that their participation was not by compulsion but voluntary and that they can pull out from the study at any time or decline to answer any question without any penalty.

- b. The research objectives and all data collection activities was made clear and simple to study subjects.
- c. A written informed consent form was received all from respondents.
- d. Privacy and confidentiality of data was guaranteed. Study subjects were anonymous, no names were required, and therefore no information can be linked to any identity. Data was kept with only the principal investigator and supervisor.

### **3.9 Study Limitations**

This study had several limitations that was considered when collecting data and interpreting the final results; The frequency , prevalence rate of occupational injuries and their associated risk factors subjected to reporting bias since information given by study participants themselves instead of injury records review . The sample size of the job categories differed due to unequal total number of professions at the hospital, this created selection bias which resulted in large intervals of their estimated association with an injury. In this study, the reporting of injury by HCWs for the past twelve months were affected by recall bias because some of the HCWs could not easily remember the incidence encountered in such a long period of time. In this context future studies may determine increased incident of injuries if they restrict study of injuries within past six months or three months.

Due to time limitation of the HCW and their work schedule, focus group discussions, key informants and observation of work process couldn't be done which could have given the true picture of the occupational health assessment. Cause and effect were not recognized since it was a cross sectional study. The results couldn't be generalized due to data been collected at one district hospital, due to time it could have been extended to other district hospitals in the ten regions.

### **3.10 Assumptions**

The following assumptions were made:

1. Sample size was a true representative of the study population
- 2.

Respondents responses reflected the true situation of the hospital

3. Respondents showed objectivity in their answers.

4. Instruments used were precise and reliable in collecting data.

## **CHAPTER FOUR**

### **4.0 RESULTS**

#### **4.1 Introduction**

This chapter presents detailed results and findings generated from data gathered from health care workers in Suntreso Government hospital in line with the study objectives. The results are organized into sections following the specific objectives; examine the frequency of occupational health training, nature and causes of injuries and the workers at risk of these injuries. The study further examined the current safety practices and its implementation at the hospital. Also, various types of occupational injuries that occurs at the facility were explored.

The findings were presented in the order of socio-demographic characteristics of the study sample, prevalence of injuries and exposure at the facility, body injury locations, knowledge on occupational health and safety training of the workers, injury treatment and management, health and safety practices at the facility. The risk factors to these injuries were explored through a logistics regression. All results were presented using tables, charts and diagrams.

## 4.2 Background characteristics of the study sample

Table 4.1 give details of the characteristics of the study sample examined. A response rate of 98.40 % was achieved. The workers were between the ages of 19 to 59 years averaging at  $27.76 \pm 6.7$  years. However most of the workers were in the age range of 25-34 years (52.03%), with the least being 35 years and above (13.01%). Majority of the workers studied were females (73.98%) and most of them were married (62.20%) respectively. Nurses dominated the group of professionals interviewed (77.96), while laboratory scientist were the least group (5.71%).

Christianity (93.90%) and Akan (85.77%) dominated the group as the majority of religious and ethnic distribution of the workers.

The educational qualifications ranged from diploma level up to postgraduate level, with most of the workers being first degree holders (56.15%), while a little over one percent were postgraduate degree holders (1.23%). About thirty-four percent of the workers had worked for less than a year, while a little over forty percent (40.17%) had worked in the range of 1-5 years, however, the average years of working experience among the workers was  $6.1 \pm 5.26$ . There were others who had worked for 6-10 years (14.53%) and over eleven years (11.11%) respectively.



**Table 4.1 Socio-demographic characteristics of the study sample**

Variable	Frequency	Percentage
<b>Age</b>		
Less than 24years	86	34.96
25-34years	128	52.03
35 year and above	32	13.01
Mean age (SD)	27.76 (6.7)	
<b>Gender</b>		
Male	64	26.02
Female	182	73.98
<b>Marital status</b>		
Single	93	37.80
Married	153	62.20
<b>Profession</b>		
Physician	23	9.39
Laboratory scientist	14	5.71
Nurse	191	77.96
Other Non-clinical staff (health informants, laundry ,public health workers)	17	6.94
<b>Religion</b>		
Christian	931	93.90
Muslim	15	6.10
<b>Ethnicity</b>		
Akan	211	85.77
Other ethnic groups	35	14.23
<b>Educational level</b>		
Diploma	104	42.62
First degree	137	56.15
Postgraduate	3	1.23
<b>Working experience</b>		
Less than a year	80	34.18
1-5years	94	40.17
6-10years	34	14.53
11 years and above	26	11.11
Mean years of experience	6.1±5.26	

*Source: Field Data, 2018*

### **4.3 Mechanisms of Injury and exposures prevalence at the facility**

The table 4.2 and figure 4.1 & 4.2 shows the frequencies of the various injury causes among the workers. The overall injury prevalence among the health care workers was seventy-two injuries representing twenty-nine percent (29.7%) in the past 12 months prior to the study. Eighteen percent of the workers indicated that had experience needle prick throughout their years of working at their various profession, however, thirty-five percent had experienced it within the past year in the facility prior to this study. Thirty-four and twenty-four percent of the workers had also experience injuries resulting from cuts and violence, threats and physical injury at the workplace. Injuries resulting from hit by objects, slips and falls on same level ground were reported by twenty-five and eight percent respectively. A little over a percentage (1.63%) also reported falls from height. Nurses dominated in the frequency of the causes of injuries among all the other professions sampled for the study. The non-clinical staffs recorded the least representation of needle pricks for their entire career (4.44%) and the past twelve months (3.45%), cuts (3.53%), physical violence and threats (3.33%) as the main cause of injury among them. Also slips, trips or fall on same level was the least reported cause among the laboratory scientist (5.00%), whereas the hit by object was reported as the less frequent cause for physicians, laboratory scientist and non-clinical staff together (6.45%) as presented in table 4.2.

Majority of the workers reported to be frequently exposed to substances such as blood (75.00%). Urine (9.00%), sweat (8.00%) and saliva (8.00%) of patients were also reported to be the substance they come into contact with in their everyday activities (figure 4.1). Majority of the workers also reported to be exposed to toxic substances (94.00%), while the rest also reported their contacts with carcinogenic substances as presented in figure 4.2

# KNUST

4(6.45)

**Table 4.2 Prevalence of injury causes among healthcare workers at the facility**

Variables	Physician (%)	Nurse (%)	Laboratory (%)	Non-Clinical staff (%)	Total (%)
<b>Overall Injury experience in last 12 months</b>					
No	16 (69.57)	136 (71.20)	7 (50.00)	14 (82.35)	174 (70.73)
Yes	7 (30.43)	55 (28.80)	7 (50.00)	3 (17.65)	72 (29.27)
Needle prick since you started work at the hospital	4 (8.89)	33 (73.33)	6 (13.33)	2 (4.44)	45 (18.29)
Needle prick for the last 12months	7(8.05)	68(77.85)	9(10.34)	3(3.45)	87(35.37)
Injury from sharp objects (Cut)	5(5.88)	72(84.71)	5(5.88)	3(3.53)	85(34.55)
violence, threat or physical injury at workplace	7(11.67)	48(80.00)	3(5.00)	2(3.33)	60(24.39)
Hit by object	50(80.65)		4(6.45)	4(6.45)	62(25.20)
Slip, trip or fall on same level	4(20.00)	13(65.00)	1(5.00)	2(10.00)	20(8.13)

Fall from heights

1(25.00)

2(50.00)

-

1(25.00)

4(1.63)

*Source: Field Data, 2018*





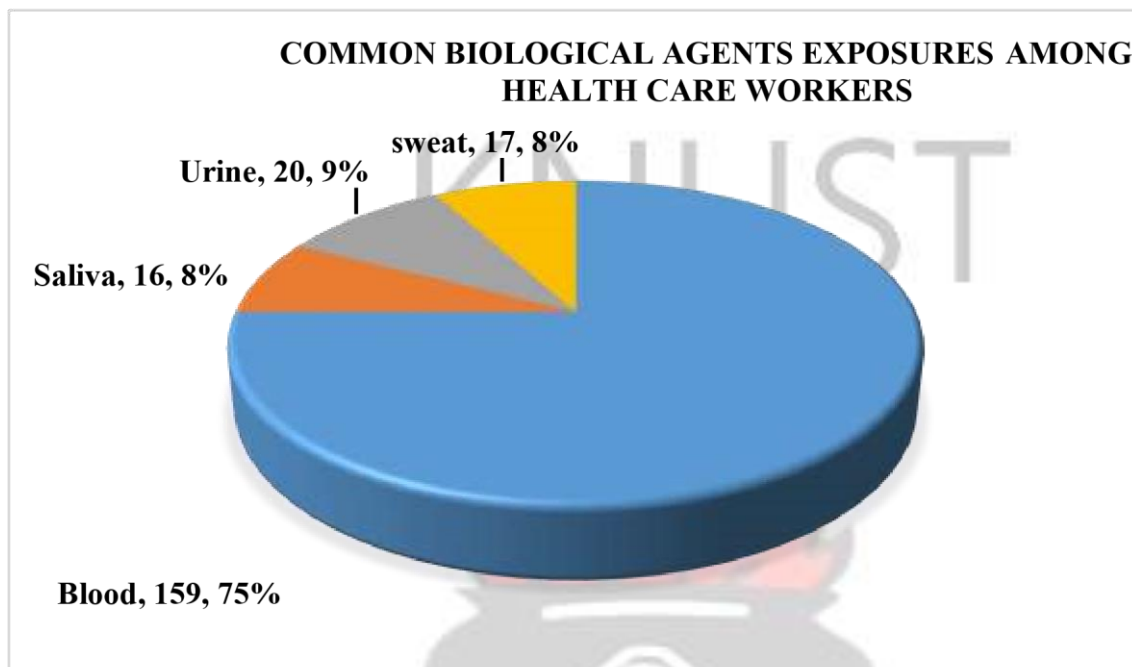


Figure 4.1: Exposure to Biological waste

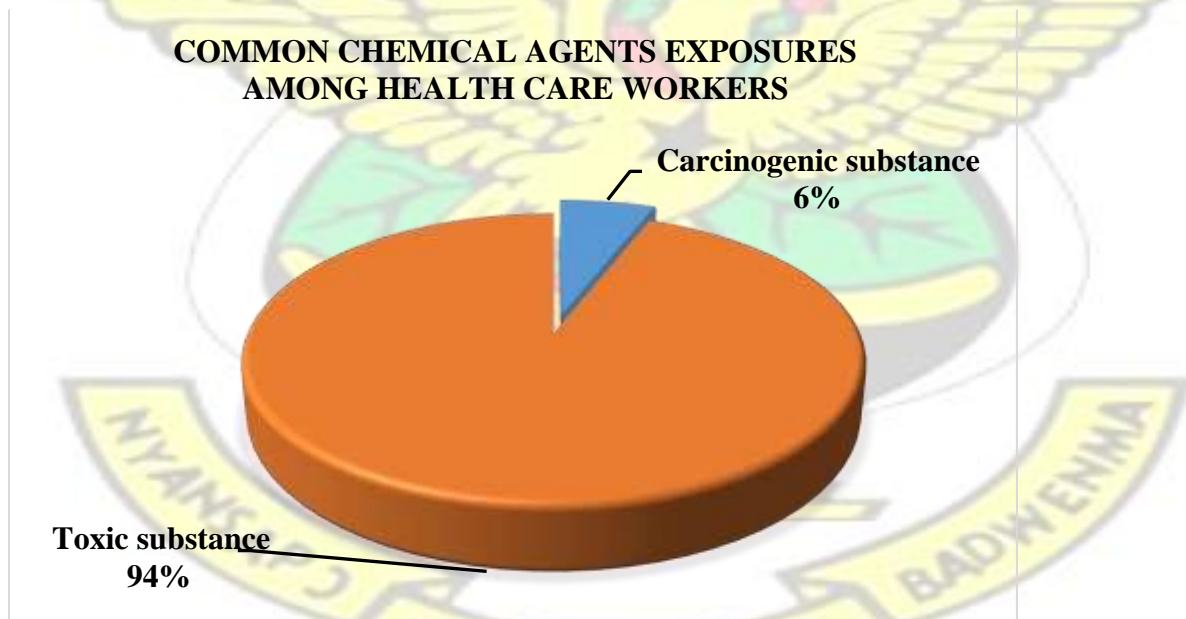
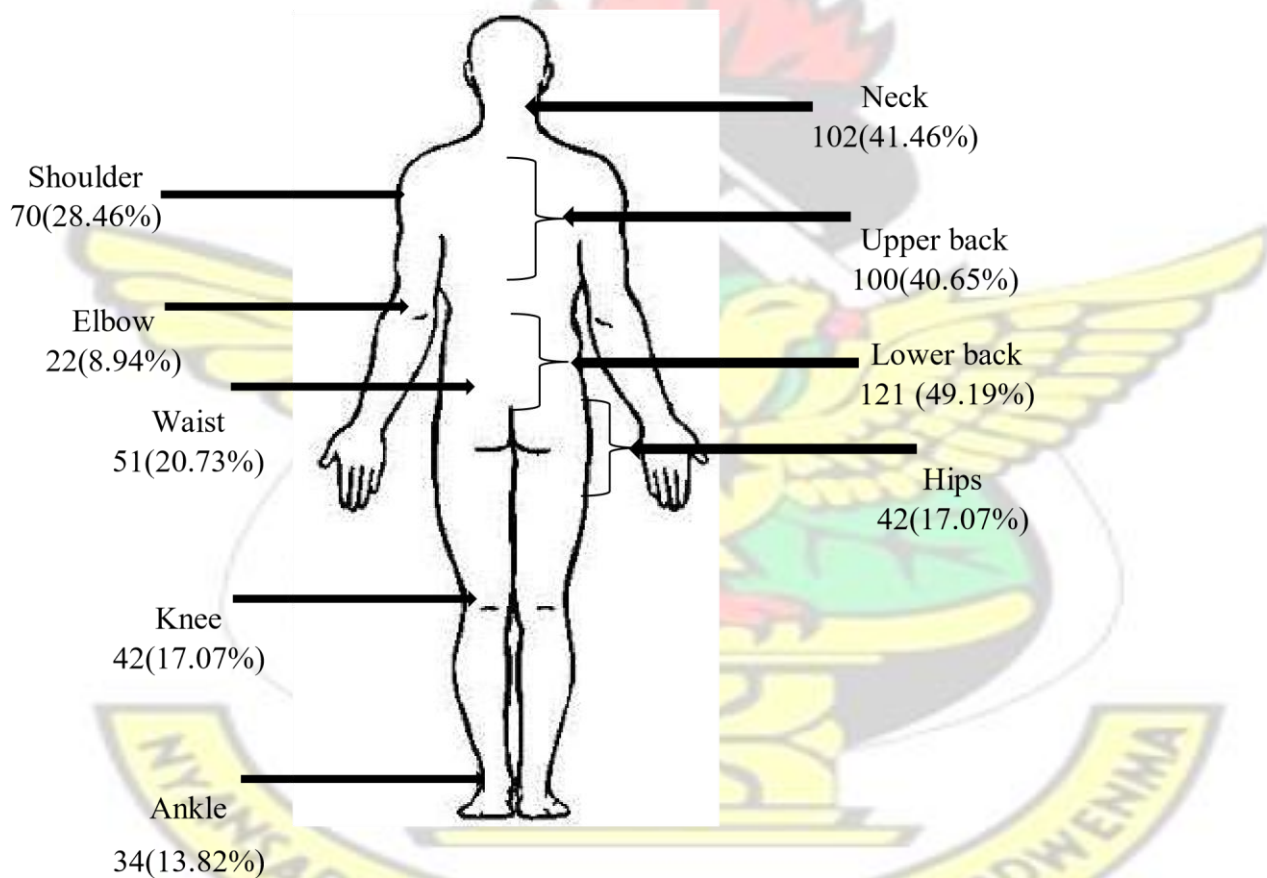


Figure 4.2: Exposure to chemicals and Biological waste The diagram 4.1 below shows the body location of workers that which is usually affected by these injuries. These injuries were distributed among the various body location of the workers.

41% (102) reported neck pains, while the rest were; shoulder 70 (28.46%), upper back 100 (40.65%), elbow 22(8.94%). The rest of the body parts were the lower back 121 (49.19%), waist 51(20.73%), hips and knee 42(17.07%) and ankle 34(13.82%) were reported to be the common body location usually affected.

Diagram 4.1 Common body injury location of the study sample



#### 4.4 Occupational health and safety training available to the health care workers

The occupational health and safety training available to the workers is presented in table 4.3 below.

Majority of the workers were aware of subject occupational safety (95.93%), over eightyfive

percent of this majority got to know about it through workshops and trainings (85.59%), while the rest were through electronic media (2.12%) and printed media (12.29%). A little over five percent of the workers knew the officer in-charge of post exposure prophylaxis (5.28%). Most of the workers (62.20%) had received training on occupational health and safety with majority receiving 1-2 times (88.89%) of such training and about eleven percent had also received the training for more than three times. Similarly, sixty percent of the workers had also been trained on the use of fire extinguisher.

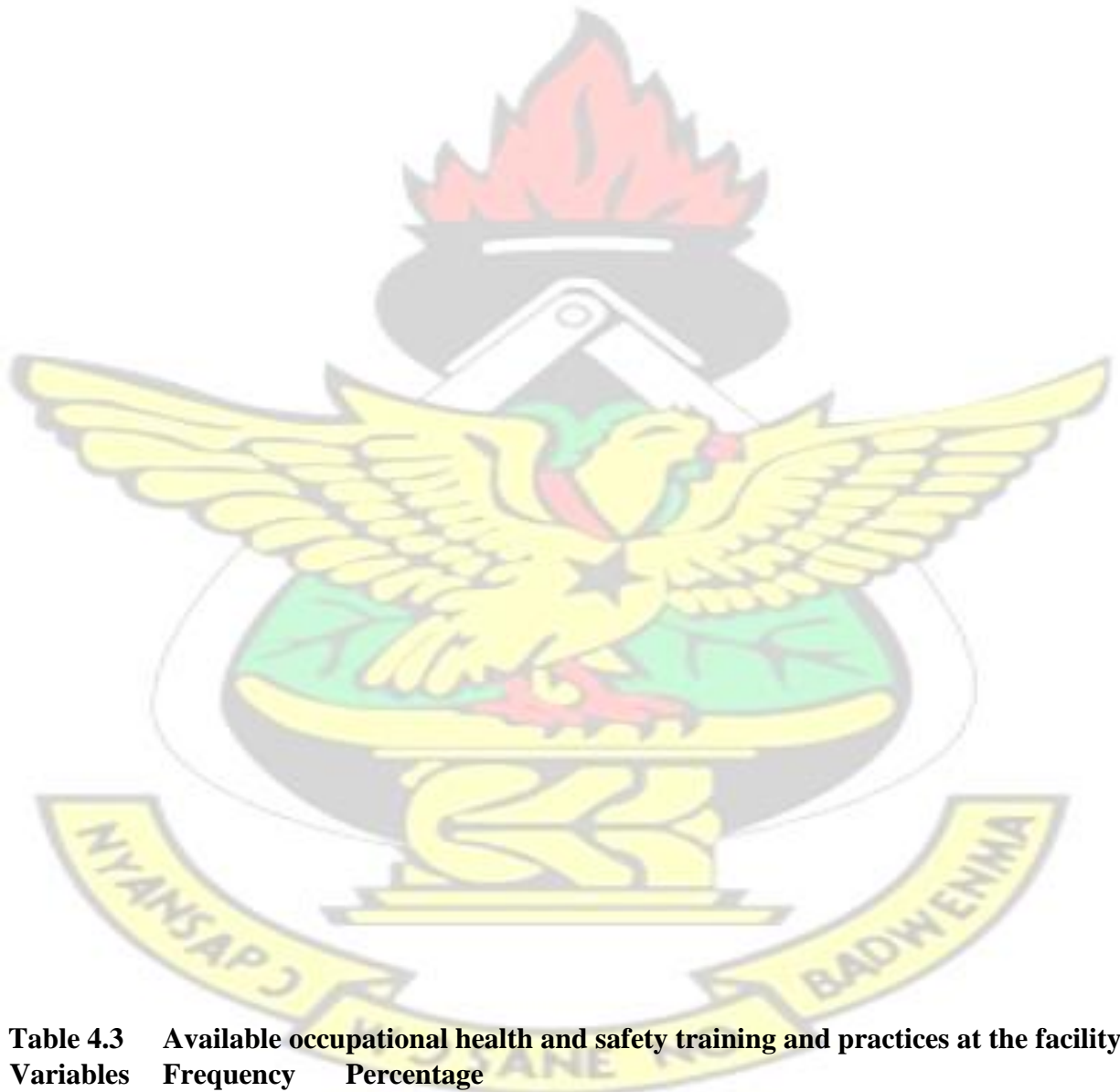
On the organizational practices, twenty-six percent of the workers knew there were occupational health and safety unit in the facility. Also, sixty percent of the workers reported that occupational injuries records of workers are recorded in the various units at the facility. Majority of the workers had their Hepatitis B status checked (84.15%) and vaccinated 78.46% respectively. Also, seventy-three percent also have their HIV status checked (73.98%).

Seventy-five percent of the workers indicated that they have safety protocols displayed in their various units, also almost all the workers reported that they are provided with the required personal protective equipment's at the workplace. The facility had fire extinguishers place at strategic position which eighty-nine percent confirmed it. Also, eighty-eight and ninety-two percent of the workers had access to restrooms and washroom solely for their use respectively, while thirty-seven percent also had access to drinking water at work.

At the individual level, ninety-one percent of the workers indicated that they adhere to infection control techniques and also eighty-six percent also dispose sharps properly using the approved container. The usual universal precaution often practice at the facility were mostly hand washing (86.18%) and wearing of mask (13.82%) respectively. Almost all the workers believed occupational health was necessary at the workplace (98.78%), and eighty-five percent of them use

personal protective equipment in discharging their duties. On the other hand, fifty-eight percent of the workers were actually satisfied with their jobs (table 4.3)

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**Table 4.3 Available occupational health and safety training and practices at the facility**

<b>Variables</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Awareness of occupational safety</b>		
No	10	4.07
Yes	236	95.93



<b>Source of knowledge</b>		
Printed media	5	2.12
electronic media (tv, radio, internet)	29	12.29
Workshop and training	202	85.59
<b>Knowledge of officer in-charge: post exposure prophylaxis</b>		
No	233	94.72
Yes	13	5.28
<b>Trained on occupational health and safety</b>		
No	93	37.80
Yes	153	62.20
<b>Number of training received in year</b>		
1-2 times	136	88.89
More than 3 times	17	11.11
<b>Received training on extinguishing fire during outbreak</b>		
No	26	10.57
Yes	220	89.43
<b>Organizational practices</b>		
<b>Do you have occupational health and safety unit</b>		
No	181	73.58
Yes	65	26.42
<b>Records for injuries at each unit</b>		
No	98	39.84
Yes	148	60.16
<b>Hepatitis B check</b>		
No	39	15.85
Yes	207	84.15
<b>Hepatitis B vaccination</b>		
No	53	21.54
Yes	193	78.46
<b>HIV status check</b>		
No	64	26.02
Yes	182	73.98
<b>Safety protocol displayed</b>		
No	60	24.39
Yes	186	75.61

**Table 4.3 Available occupational health and safety training and practices at the facility (cont')**

<b>Does facility provide personal protective equipment (PPE)</b>		
No	14	5.69
Yes	211	94.31
<b>Existing fire extinguisher</b>		
No	26	10.57
Yes	220	89.43
<b>Available restroom for staff</b>		
No	29	11.79
Yes	217	88.21
<b>Available washroom for staff</b>		
No	19	7.72
Yes	227	92.28
<b>Access to drinking water at work</b>		
No	153	62.20
Yes	93	37.80
<b>INDIVIDUAL PRACTICES</b>		
<b>Adherence to infection control techniques</b>		
No	20	8.13
Yes	226	91.87
<b>Do you Properly dispose sharps</b>		
No	33	13.41
Yes	213	86.59
<b>Universal precaution often practices</b>		
Hand washing	212	86.18
Wearing of mask	34	13.82
<b>Do you use personal protective equipment (PPE)</b>		
No	35	14.23
Yes	211	85.77
<b>Satisfied with Job</b>		
No	102	41.46
Yes	144	58.54
<b>Believe occupational health is necessary</b>		
No	3	1.22
Yes	243	98.78

Source: Field Data, 2018

#### 4.5 Injury outcome and treatment among health care workers at Suntresso Government Hospital

The study further examined the causes of the various injuries recorded in the last twelve months and how they are managed as shown in table 4.5. Majority of the injuries were caused by sharp objects (77.78%), while others were also caused contact with harmful substance (9.73%), falls in the course of working (8.33%) and hit by heavy objects (4.17%) respectively. Most of the injuries were reported to the appropriate quarters (55.56%) and were treated and discharged same day (59.72%) respectively. A little over forty-eight percent (48.61%) took days off due to the injury and also 6.94 % of the workers thought of changing their profession, while about eight percent (8.33%) were contemplating over changing it. Twenty percent of the injured workers had difficulty in access care (20.83%). The following issues were cited by the workers as the main difficulties they encounter when injured. Absence of injury protocol and post-exposure medication or treatment. (40.00%) and the absence of an occupational health therapist (20.00%) as presented in table 4.5.

**Table 4.4 Injury outcome and treatment among healthcare workers at the facility**

<u>Variables</u>	<u>Frequency</u>	<u>Percentage</u>
<b>Cause of the injury</b>		
Contact with harmful substance	7	9.72
Cuts from sharp object	56	77.78
Fall in the course of work	6	8.33
Harm by heavy object	3	4.17
Total	72	100
<b>Was the injury reported</b>		
No	32	44.44
Yes Total	40	55.56
	72	100
<b>Injury management outcome</b>		
No treatment	28	38.89

Treated and discharge same day	43	59.72
Hospitalized 1-3days	1	1.39
<b>Off days as a result of injury</b>		
No	37	51.39
Yes	35	48.61
<b>Thought of changing profession due to injury</b>		
No	61	84.72
Yes	5	6.94
May be	6	8.33
<b>Difficulty in seeking care</b>		
No	57	79.17
Yes	15	20.83
<b>Main difficulty usually faced</b>		
Absence of injury protocol	6	40.00
Absence of occupational health therapist	3	20
Absence of post-exposure medication/remedy	6	40.00

**Source:** Field Data, 2018

#### 4.6 Factors predicting injury occurrences at Suntresso Government Hospital

The table below shows the risk factors that are believed to influence injuries among health care workers.

The study revealed that seventy-three percent of the workers had stressful shifts (73.17%), which are usually caused by excessive workload (48.89%), inadequate staff (35.56%) and long working hours (15.56%). The working hours ranged between one to twelve, however, most of them worked between 7-8 hours in a day (54.47%), while a little over five percent (5.69%) worked above 9 hours. Majority of the workers indicated that there were no fixed breaks (92.28%) and also work on shift system (94.31%) with the afternoon shift being the most undesired one affecting their social lives (46.75%).



Majority of the workers activities involved moving heavy objects including patients (84.96%), also most of the workers reported that their work involved prolonged standing (57.96%), while the rest were prolonged sitting (25.71%), frequent bending (11.43%) and repetitive movement (4.90%) as presented in table 4.5

**Table 4.5 Primary risk factors of occupational injuries among the health care workers**

<b><u>Variables</u></b>	<b><u>Frequency</u></b>	<b><u>Percentage</u></b>
<b>Stressful shift</b>		
No	66	26.83
Yes	180	73.17
<b>Cause of your stress</b>		
Excessive workload	88	48.89
Inadequate staff	64	35.56
Long working hours	28	15.56
<b>Working hours</b>		
1-6 hours	98	39.84
7-8 hours	134	54.47
Above 9 hours	14	5.69
<b>Fixed breaks</b>		
No	227	92.28
Yes	19	7.72
<b>Nature of work schedule</b>		
Fixed working hours	14	5.69
Run shifts	246	94.31
<b>Shifts affecting social life</b>		
Morning	46	18.70
Afternoon	115	46.75
Night	85	34.55
<b>Moving heavy objects including patients</b>		
No	37	15.04
Yes	209	84.96
<b>Nature of job activity</b>		
Long sitting	63	25.71
prolong standing	142	57.96
Frequent bending	28	11.43
Repetitive movement	12	4.90

**Source:** Field Data, 2018

#### **4.7 Identifying factors predicting injuries among health care workers at Suntreso Government hospital**

The study examined the various factors that predicts the occurrence of injury among the health workers. Marital status, religious affiliation, type of profession, shifts that are stressful and causes of the stress had significant relationship with the occurrence of these injuries as presented in table 4.6. The crude odds ratio from the logistics regression analysis suggest a decrease risk for married workers. They were 62% less likely [OR = 0.62; 95% CI. = 0.35-1.86] to experience injury compared to single workers, Muslim workers were 2.98 times [OR = 2.98; 95% CI. = 1.03-8.56] likely to suffer from injury compared to their Christian counterparts. The likelihood of injury among workers was high among nurses [OR = 4.66; 95% CI. = 0.91-2.30] compared to the other professions; physicians, laboratory scientist and all the non-clinical staff. The group of workers who reported of having a stressful shift were 2.56 times [OR = 2.56; 95% CI. = 1.25-5.25] likely to experience work related injury compared to those who do not think so. Also, those who reported that stress was caused by long working hours had a lower likelihood of injury [OR = 0.27; 95% CI. = 0.30-3.62] compare to the workers who believed excessive load and inadequate staff could cause the injury.

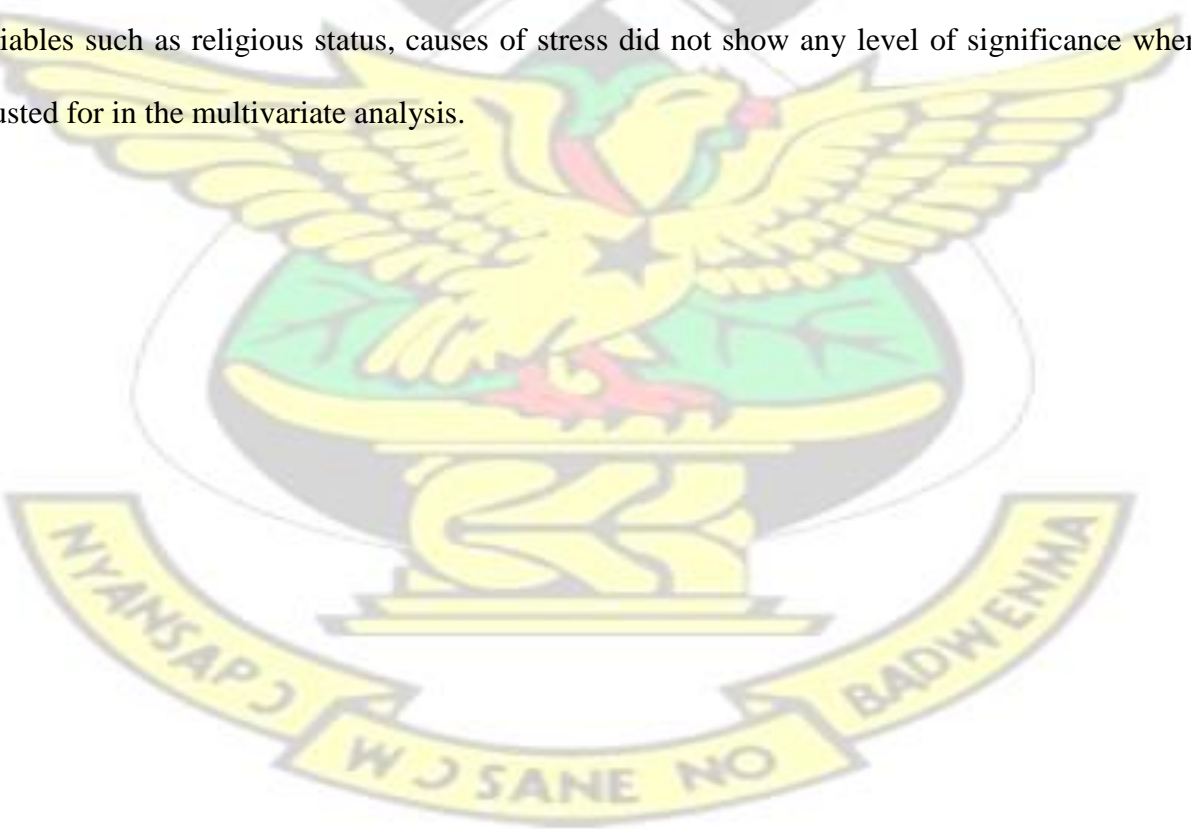
Other socio-demographic variables such as age, gender, ethnicity and work experience were not statistically significant, but indicated some form of influence in the likelihood of injury at various degrees.

Similarly, other work-related factors such as number of working hours, nature of work schedules, break system, training on occupational health and safety, moving of objects including patients, display of safety protocol and disposal of sharps, adherence to infection control techniques, use of

personal protective equipment. Job satisfaction and the believe that occupational health is necessary were not significant variables in the univariate analysis.

The multivariate Poisson regression was further performed indicated that type of profession, marital status and working in stressful shifts truly predicts the occurrence of the injuries at the hospital. After taken care of other covariates, married workers were 60% percent less [AOR = 0.27; 95% CI. = 0.30-3.62] likely to suffer from injury compared to workers who are single. The risk to injury was 3.8 times higher for nurse [AOR = 3.80; 95% CI = 0.87-1.98] compared to laboratory assistants [AOR = 1.98 95% CI. = 0.41-9.40], physicians [AOR = 1.82; 95% CI. = 0.50-5.62] and non-clinical staff. Also working on shift termed as stressful exposes a worker to injury at 2.23 times [AOR = 2.23; 95% CI. = 1.22-5.23] compared to those who do not.

Variables such as religious status, causes of stress did not show any level of significance when adjusted for in the multivariate analysis.



**Table 4.6 Univariate and Multivariate analysis of predictive factors of occupational injuries among health workers**

Variables	Univariate logistics regression		Multivariate logistics regression	
	Crude Odd ratio (OR; 95% C.I)	P-value	Adjusted Odd ratio (AOR; 95% CI)	P-value
<b>Age</b>				
35 year and above ref	1			
25-34years	1.51(0.62-3.65)	0.35		
Less than 24years	0.96(0.37-2.47)	0.94		-
<b>Gender</b>				
Male (ref)	1			
Female	0.97(0.52-1.81)	0.93		-
<b>** Marital status</b>				
Single (ref)	1		1	
Married	0.62(0.35-1.08)	<b>0.009</b>	0.60(0.32-1.06)	<b>0.02*</b>
<b>Religion</b>				
Christian	1			
Muslim	2.98(1.03-8.56)	<b>0.04*</b>	2.22(0.75-6.55)	0.14
<b>Ethnicity</b>				
Akan	1			
Other ethnic groups	1.52(0.72-3.21)	0.27		-
<b>**Profession</b>				
Other Non-clinical staff (ref) (public health workers, health informants)	1		1	
Physician	1.88(0.52-6.82)	0.33	1.82(0.50-5.62)	0.31
Laboratory scientist	2.04(0.44-9.43)	0.36	1.98(0.41-9.40)	0.33
Nurse	4.66(0.91-2.30)	<b>0.006</b>	3.80(0.87-1.98)	<b>0.02</b>

variables adjusted for: marital status; occupation; partner meaningfully employed; nature of residence; *Source:*  
Field Data, 2018



**Table 4.6 Univariate and Multivariate analysis of predictive factors of occupational injuries among health workers (cont')**

Variables	Univariate logistics regression		Multivariate logistics regression	
	<u>Crude Odd ratio (OR; 95% C.I)</u>	<u>P-value</u>	<u>Adjusted Odd ratio (AOR; 95% CI)</u>	<u>P-value</u>
<b>Working experience</b>				
Less than a year	1			
1-5years	0.51(0.33-0.79)	0.06		-
6-10years	1.93(0.87-4.29)	0.10		-
11 years and above	0.35(0.11-1.10)	0.07		-
<b>Working hours</b>				
Above 9hours	1			
7-8hours	1.02(0.30-3.46)	0.96		-
1-6hours	1.05(0.30-3.62)	0.93		-

\*\*variables adjusted for: marital status; occupation; partner meaningfully employed; nature of residence;

*Source: Field Data, 2018*

**Table 4.6 Univariate and Multivariate analysis of predictive factors of occupational injuries among health workers Con't.**

	<b>Univariate logistics regression</b>		<b>Multivariate logistics regression</b>	
	<b>Crude Odd ratio (OR; 95% C.I)</b>	<b>P-value</b>	<b>Adjusted Odd ratio (AOR; 95% CI)</b>	<b>P-value</b>
<b>Stressful shift</b>				
No	1			
Yes	2.56(1.25-5.25)	<b>0.01*</b>	2.23(1.22-5.23)	<b>0.03</b>
<b>Cause of your stress</b>				
Inadequate staff	1			
Excessive workload	1.00(0.51-1.94)	1.00	0.97 (0.88-0.92)	0.95
Long working hours	0.27(0.08-0.89)	<b>0.03*</b>	0.28 (0.50-1.91)	0.06
<b>Working hours</b>				
Above 9hours	1			
7-8hours	1.02(0.30-3.46)	0.96		-
1-6hours	1.05(0.30-3.62)	0.93		-
<b>Fixed breaks</b>				
No	1			
Yes	0.85(0.29-2.46)	0.76		-
<b>Nature of work schedule</b>				
Fixed working hours	1			
Run shifts	2.5(0.56-11.88)	0.22		-
<b>Shifts affecting social life</b>				
Morning	1			
Afternoon	1.50(0.69-3.30)	0.30		-
Night	1.25(0.54-2.85)	0.59		-
<b>Moving heavy objects including patients</b>				
No	1			
Yes	1.93(0.80-4.46)	0.34		-

\*\*variables adjusted for: marital status; occupation; partner meaningfully employed; nature of residence; *Source:* Field Data, 2018

**Table 4.6 Univariate and Multivariate analysis of predictive factors of occupational injuries among health workers Con't.**

	Univariate logistics regression		Multivariate logistics regression	
	<u>Crude Odd ratio (OR; 95% C.I)</u>	<u>P-value</u>	<u>Adjusted Odd ratio (AOR; 95% CI)</u>	<u>P-value</u>
<b>Trained on occupational health and safety</b>				
No	1			
Yes	1.20(0.68-2.13)	0.52	-	-
<b>Safety protocol displayed</b>				
No	1			
Yes	1.06(0.55-2.02)	0.85		

\*\*variables adjusted for: marital status; occupation; partner meaningfully employed; nature of residence; *Source: Field Data, 2018*

**Table 4.6 Univariate and Multivariate analysis of predictive factors of occupational injuries among health workers Con't.**

	Univariate logistics regression		Multivariate logistics regression	
	<u>Crude Odd ratio (OR; 95% C.I)</u>	<u>P-value</u>	<u>Adjusted Odd ratio (AOR; 95% CI)</u>	<u>P-value</u>
<b>Nature of work</b>				
Long sitting	1			
Long standing	1.05(0.54-2.02)	0.88		
Frequent bending	1.38(0.53-3.57)	0.49		
Repetitive movement	0.22(0.02-1.89)	0.17		
<b>Safety protocol displayed</b>				
No	1			
Yes	1.06(0.55-2.02)	0.85		
<b>Do you Properly dispose sharps</b>				

No	1	
Yes	2.02(0.79-5.12)	0.13
<b>Adherence to infection control techniques</b>		
No	1	
Yes	2.49(0.70-8.77)	0.15
<b>Do you use personal protective equipment (PPE)</b>		
No	1	
Yes	1.78(0.73-4.28)	0.19
<b>Satisfied with Job</b>		
No	1	
Yes	1.16(0.66-2.03)	0.59
<b>Believe occupational health is necessary</b>		
No	1	
Yes	0.82(0.07-9.25)	0.86

\*\*variables adjusted for: marital status; occupation; partner meaningfully employed; nature of residence; *Source:*  
*Field Data, 2018*



## **CHAPTER FIVE**

### **5.0 DISCUSSION**

#### **5.1 Introduction**

This chapter presents a detailed discussion of the results generated from the data obtained for the study. The study investigated occupational injuries among Health care workers (HCW) in Suntresso Government Hospital. All the discussions are based on the objectives of this study. The study estimated the total injury prevalence of 29.27% representing seventy-two injury episodes, which is mostly caused by cuts from sharp objects, hits by objects, violence, threat or physical injury and needle pricks. Among the noted factors influencing these injuries were marital status, profession type and being in a shift considered as stressful.

#### **5.2 Background characteristics of the study sample**

The response rate of 98.40% was achieved in this study, comparable to other similar study conducted in Kumasi (Amponsah-Tawiah & Anuka 2018). A higher response rate like this enables findings to be a true reflection of the study population as 75% of all the healthcare workers were represented in the study. The age distribution of the worker was between the ages of 19 to 59 years averaging at 27years. Majority of the workers were females and married. This proportion is similar to a report by Prüss-Üstün et.al. (2005), they reported that males among health care and social workers are generally low. Similarly, Orji et al. (2002) also reported a higher percentage of females in their study of occupational hazards among health workers in Nigeria. This could be explained by the professional distribution in our health facilities which is mostly dominated by nurses, who are usually female. The age range of workers in this study is similar to findings reported by Amponsah-Tawiah and Adu (2016), where majority of the health workers in Accra were between

21-39 years. The religious distribution in the region is dominated by Christians, followed by Muslim; therefore it is not out of place to record such a trend in this study, since it reflects the reality on the ground (GSS, 2010). The professional distribution of the health care workers was dominated by nurse and also the most of the workers had worked between 1-5 years in the clinic. These proportions are reported in similar studies Amponsah-Tawiah and Adu (2016). Most of the health workers were first degree holders, this is probably because most of the health care qualification in Ghana are obtained at the degree level, aside few programs like nursing and midwifery that one can have their qualification from the training colleges.

### **5.3 Causes of Injury and exposures prevalence at the facility**

The study revealed that needle pricks constituted a greater portion of the causes of injury among the health care workers followed by injuries resulting from cuts of sharp objects and strike by heavy objects. The workers also reported violence, threat or physical injuries, and slips as the main causes of injuries at the workplace. Several other studies have also reported needle prick to be the main cause of injuries among health care workers in other African settings including Uganda (Ndejjo et al. 2015; Prüss-Üstün et al. 2005). This confirms our finding of a relatively high prevalence of needle prick recorded as the major cause of occupational injury among workers in Suntresso Hospital. Slips, trips, falls and treats and physical violence have also been reported separately by Ndejjo et al. (2015) and Orji et al. (2002) to be the additional causes of injury just as it was revealed in this study finding. For instance, injuries resulting from other causes such as falls, strips and trips have been reported to be one of the most frequent cause of occupational morbidity and also forms about 20 percent prevalence of the causes of injury among health workers in Botswana (Mogale et al., 2014) (Seedart ,2009).

The nursing profession represented the group which recorded highest frequency among all the main causes of injuries. Because the nature of their role in the clinic involves to a lot of movement and walking, coupled with the administration of drugs and injection, they are easily exposed more to the possible hazards and accidents related to these activities. This explains why nurses were the dominate group among other professions in reporting the main causes of occupational injuries. In addition, because the nurses are usually the first people to contacts at the facilities they are encountered with all sort of things before it gets to other staff. It is therefore not surprising that they are the group who faces attacks from agitated patients and their relatives more often. Similarly, Orji et al. (2002), also reported in Nigeria that nurses experience most of their occupational injuries from needle pricks, whereas physical assaults or violence and threats were seen to be high among doctors. But in this study, assaults were also high among nurses compared to the rest of the professions.

Blood was reported to be the most common biological agent are exposed to by a third of the workers in the course doing their work. Other agents like urine, saliva and sweat were also reported to be among the common exposures they meet in their daily routine. Ndejjo et al. (2015) in their study of occupational hazards among health workers in Kampala reported that biological hazards (agents) contributed a total of thirty-nine percent of all the hazards that a worker is exposed to in the course of working. Contact with blood and other blood borne pathogens have been reported to be one of the common exposures in the hospital (Ndejjo et al. 2015; Orji et al. 2002). Because of the direct involvement of most of the professional sampled in this with the patients, they are easily exposed to some of these bodily fluids. For instance, in handling an emergency, the worker may have body contact with the patient, thereby exposing them to these biological agents. Among the other chemical agents which the workers were exposed to, ninetyfour percent of them were classified as toxic substance while the remaining six percent were also classified as carcinogenic.



This implies that constant exposure of the workers to these toxic substances could harm the worker badly and have long term effect on their health. Findings from this study confirms a global report which estimate a higher number of health workers of over 320,000 who are exposed to work-related biological hazards each year (Driscoll et al. 2005; OSHA 2007). Carcinogenic substances are also known causal agents of various cancers and constant exposure to these chemicals could reduce a worker's quality of life. The findings from this study revealed that six percent of the workers were exposed to carcinogenic substance, while the majority were exposed to other toxic substance like mercury from broken thermometer and sphygmomanometers among others. The study further examined the various body regions of workers that are usually affected in the injurious situation. Lower back (waist), neck and upper back pains were the most reported musculoskeletal injuries among the workers. However, there were some cases of pains associated to the shoulders, knee, wrist, elbow, ankle and hips as reported by the workers. The prevalence was high for lower back probably because of the long standing, sitting and repetitive bending reported by the workers respectively as presented in table 4.6. Similar trend was also reported by Daraiseh et al. (2010) in their study of prevalence of lower back pain in nurses. Awkward working postures prolong and monotonous work activities among HCW have been cited to be strong predictors of musculoskeletal injuries among several studies (Harkness et al. 2004; Macfarlane et al. 1997; Kehinde J et al. 2017). The frequent use of these body parts could put some form of pressure on them; this possibly explains why these body parts were reported to be suffering from musculoskeletal injuries.

#### **5.4 Occupational health and safety training available to the health care workers**

Majority of the workers knew something about occupational health and safety because they have been to workshops and trainings, where the topic was discussed. There were others who



encountered the subject through personal reading on the internet and printed media. Among the workers who knew about occupational health and safety issues, sixty percent had actually received training on the subject and majority of these workers had receive such training between one and two times in their lifetime. The study further revealed that sixty percent had also been trained on the use of fire extinguisher. Access to knowledge on health safety and issues was relatively high among the group of health workers studied and was similar to that of another study conducted in Ethiopian, where more than half of the workers had heard about occupational safety, head of it through trainings and actually received training on it (Mathewos et al. 2013).

Training is known to alter an individual's usual behavior, improves knowledge, attitude and practice over time, therefore the possible explanation of low injury prevalence could be due to that. For instance, Asa Auta et al.2017 reported in their systematic review that, untrained workers on occupational exposure prevention procedures were twice likely to be injured compared to the trained workers.

The study further examined the basic practices and observation of the key element of occupational safety in the facility. Seventy-three percent of the workers were unaware of the existence of safety department or unit in the hospital, however a relatively substantial number responded positive that all injuries occurring in the hospital are documented. Majority of the workers also attested that they are always provided personal protective equipment needed and also have safety protocol notices around operational areas. There was access to portable drinking water, restroom and washroom for the workers at the various departments. It is obvious that the twenty-six percent of the workers who are not aware of the safety unity at the facility may not relate the provision of this safety requirement to the unit. This indicated that the work of the occupational health and safety division is not visible enough for the workers to appreciate even though they have relatively met the institutional conformance to occupational and safety practices of Hospitals as recommended in the 2003 labour Act 651 (GHS, OHS Policy, 2010).

Majority of the workers studied

On the individual practices and behavior on occupational safety, the study revealed that adherence to infection control measures and proper disposal of sharps was practice by 91% and 86% percent respectively. The major universal precaution usually practice was hand washing and also those who believe that occupational health is necessary was high. The relatively high adherence to the safety practices and compliance among the workers in this study could be explained by motivation drawn by the workers from the facility's efforts on provision of all the safety requirement. For instance, Gershon et al. (1995) concluded in their study conducted that individual compliance to safety rules were strongly correlated with an organizational determination to promote safety practices at the workplace.

### **5.5 Injury outcome and treatment among health care workers at Suntreso Government Hospital**

The treatment outcome in the event of injury is usually affected by multiples of factors, including the nature of injury, severity, support system available among others. Findings from our study revealed that, the major causes of occupational injuries in Suntreso hospital included is cuts from sharps objects, contact with harmful substances, falls in the course of working and harm by heavy objects. However, injuries from sharp objects dominated among the causes just as it has been reported in most of the studies investigating occupational injuries among health workers globally (Orji et al. 2002; Ongete & Duffey 2018; Prüss-Üstün et al. 2005).

About forty-percent of the injured workers did not officially report to the authorities in charge, however, almost six percent sought for treatment and were discharged same day. There were also a group who did not seek treatment at all, and also a little of fifty percent of the injured workers did not take days off as result of the injury, this could be mean that these injuries were not severe

requiring longer period for one to recover from. A substantial number of injured workers (79.17%) expressed difficulty in accessing the health care required during their injured moment. These workers cited reasons like difficulty of access to injury reporting protocol (40.00%), absence of post-exposure medications (40.00%) and absence of an occupational therapist as the main hindrance to care. Even though access to care was reported to be a problem among the workers, less than seven percent thought of changing profession after recovering from the injury, while eight percent were in contemplation.

### **5.6 Factors predicting injury occurrences at Suntreso Government Hospital**

Both lifestyle and job-related characteristics are known to play an important role in determining workplace safety in several industries and the health sector is not excluded. Therefore, if such factors are not properly regulated, they could contribute to severe occupational injuries. For instance, a worker's attitude towards workplace norms and exposure to uncondusive environment been reported to influence incidence of occupational injury according to Cui et al. (2015) and Khosravi et al. (2014).

Job related factors such as working under stressful environment, working overtime, for long hours without flexible breaks and shifts are known to influence individual's susceptibility to injury.

Working for longer duration, without enough rest affects the worker's ability to avoid possible mistakes, because once the human mind is exhausted the possibility of making a mistake which can caused his health is very likely. Majority of the workers (73.17%) in the facility reported to be having stressful shifts which is mostly caused by excessive workload and inadequate staff to help manage the situation. Similarly, Orji et al. (2002) in their study of occupational health hazards among health workers in Nigeria reported stress to be the leading cause of injury. This implies that



once the worker is exhausted, there is a possibility of committing errors that may affect their health. Almost all the workers (94.31%) in the facility worked on shift system, with a flexible break system. However the afternoon and night shift were reported by forty-six and thirty-four percent of the workers as affecting the social lives. Most workers attending afternoon and evening shift are likely to miss other personal daily activities and socializing with their families and friends outside their workplaces. This is because the afternoon shift workers close in the evening and may go home exhausted missing the chance to spend time with other people at home. Similarly, the possibility of spending a comfortable evening and sound sleep in the luxury of your home is out of the case for night shift workers. The nature of job activities is also known to have some level of influence on the rate of injury among worker as indicated in the works of Harkness et al. (2004) and (McBeth et al. 2003). Majority of the workers reported their job involved moving of heavy objects (84.96%) and the nature of their job mostly requiring prolong standing, prolong sitting frequent bending and repetitive movement in descending order.

### **5.7 Factors predicting injuries among health care workers at Suntreso Government hospital**

The univariate analysis identified marital status, religious affiliation, type of profession, shifts that are stressful and causes of the stress as the significant variables associated with the occurrence of occupational injuries. Working in certain health professions increases one's

susceptibility to injury than others. Being a clinical staff makes a worker more prone to injury compare to other professions. This is because clinical staff in the facility are exposed to both biological agents and toxic substances in the course of carrying out their duty, which can further lead to other forms of injuries. Nurses in Suntreso hospital were four folds likely to be exposed



injuries compared to other professions. The likelihood of injury is reduced with profession like Laboratory Scientist and Physician respectively. This is probably due to the rate of contact the nurse usually have with patients and other their related waste from them. Similarly, previous studies have indicated that other health workers have a reduce risk of injury compared to nurses (Ndejjo et al. 2015). Religious status was also revealed to influence the occurrence of injury; Muslim workers were two folds likely to be injured compared to their Christian counterparts.

After adjusting for other covariates in the multivariate analysis, type of profession and stressful shifts were found to be independent factors that predicts injury occurrence among the health workers, while marital status was seen as protective factor for the risk of injury. Meanwhile other factor such as religion of the worker was not significant.

The study revealed that work-related stress contributed significantly to the occurrence of injury. Those who reported to be stressed were twice likely to be injured compared to those who are not. Stressed out worker is likely to lose concentration and make mistakes in the course of discharging his duty which can harm others or himself. Stress has been recorded to be one of the common non biological contributors of injury in several occupational setting. Therefore, our study finding is not a deviation from other earlier studies (Orji et al. 2002; Croft et al. 2006; Ndejjo et al. 2015). Marital status was revealed to be protective in this study. Workers who were married had a sixty percent reduced risk of injury compared to those who are single.

Consequently, the type of profession one engages in proves to be associated with the occurrence of injuries. Nurses were at a risk of three times likelihood of being injured compared to other profession. This could be as a result of the nature of job activities which involves frequent handling of needles, sharps and other objects that can easily inflict a physical wound on them. Needle prick and cuts from sharps formed the highest injury type recorded in this study and it was among the nursing profession. This could therefore explain why their risk of injury was three-fold higher than

other professions. Similarly, other studies have also reported nurses to be the professionals who suffer most from needle sticks injuries, which one of the frequent cause of accidents in most clinical settings (Ndejjo et al. 2015).

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## **CHAPTER SIX**

### **6.0 CONCLUSION AND RECOMMENDATION**

#### **6.1 Introduction**

This chapter concludes on the results and findings that evolved from this study and they are presented in accordance with the study objectives. Additionally, recommendations and suggested areas for further studies were made based on the findings to all stakeholder concerned for their next line of action in the Suntreso Government Hospital in Kumasi.

#### **6.2 Conclusion**

##### **6.2.1 Occupational health and safety training available to the health care workers**

The study revealed that almost all the staff at the facility were aware of the issue of occupational safety, however, 153 workers representing sixty-two percent had actually received a training on occupational health. Eighty-eight percent of this group that had received the training between one and two times in a lifetime, while the remaining had received the training on more than three occasions. These figures point to the need of additional trainings to cover a larger percentage of the workers.

##### **6.2.2 Current safety measures and its implementation at the facility**

Twenty-six percent of the workers were aware of the existence of health and safety department at the facility. However most of the injuries (60.16%) happening in the facility were put on records. Majority of the workers had their hepatitis B and HIV status checked, while seventy-eight percent had been vaccinated against the hepatitis B virus. The facility ensured the safety protocols were displayed and workers were provided personal protective equipment (PPE) as it was confirmed by

seventy-five and ninety-four percent of the workers respectively. The provision of washrooms, restroom and fire extinguishers were also confirmed by majority of the workers.

### **6.2.3 The nature and causes of injuries among health care workers**

The overall injury prevalence of seventy-two representing twenty-nine percent (29.7%) was recorded in the past 12 months prior to the study. Eighteen percent of the worker had experience needled pricks in their entire life, while a higher rate of 35% was recorded for the past twelve months. Other injuries such as cut from sharp objects, violence, threat or physical injury and hit from objects were also recorded in descending order.

Majority of the injuries (77.78%) recorded in this study was caused by cuts from sharp objects, while the least ones were caused heavy objects (4.17%).

### **6.2.4 Risk factors predicting injuries among health care workers at Suntreso Government hospital**

The factors identified as predicting injuries among the HCWs after adjusting for co-variables included type of profession, stressful nature of work and marital status. These factors were found to have various degree of influence on a worker's risk of injury. Nurses were three times likely to be injured compared to other professions such as laboratory scientist, physicians and non-clinical staff. Similarly, workers who see their job as stressful were two times likely to experience injury compared to their other counterparts. Finally, marital status was a protective variable, that is being married indicated a reduce risk of injury among the worker.



## **6.3 RECOMMENDATION**

### **Health Facility**

1. Sharp tools management training should be mandatory for all staff .A review on policy and procedures of WHO guidelines on the use of safety –engineered syringes for intramuscular, intradermal and subcutaneous injections in healthcare settings 2016.
2. The administrative and management team of the facility must encourage and improve on inservice training, workshops on occupational health and safety.
3. Training tailored according to workers needs and educational background, injury prevention, use of PPE, standardized operating procedures.
4. The management and administrative team must invest in training workers professionally or employ occupational health and safety therapists
5. A unit of occupational health and safety must be created to operate at the facility.
6. Medical surveillance of healthcare workers must be enforced and improved for early detection, treatment of infections and diseases as a result of exposure to occupational hazards.

### **National**

7. Stakeholders such as government, policy makers, managers, administrators must be engaged on the relevance of reducing occupational injuries and ensuring the provision of logistics at facilities.
8. Policy on occupational health and safety must be enforced in all health facilities in Ghana.

9. More training centers and occupational courses must be established in the various tertiary institutions .Also more people must be trained as occupational health and safety therapists, PEP officers and educators throughout all health facilities.



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## APPENDIX 1

### QUESTIONNAIRE

The questionnaire is a confidential assessment tool to collect data to determine the prevalence rate of occupational injuries among health care workers at the hospital and to assess the safety measures of the facility for workers. I would be counting on your support, thank you.

Please answer by using the tick brackets { }

## SOCIO-DEMOGRAPHIC FACTORS

1. Age? (In years)

2. Sex

Male { }

Female { }

3. Type of profession?

Nurses { }

Doctors { }

Laboratory scientists { }

other (specify) { }

Christian { }

Muslim { }

Traditionalist { } Other

5. Ethnicity?

Akan { }

Ewe { }

Northerner { }

Other; please specify.....

6. Educational level?

SHS { }

Diploma { }

Graduate { }

Postgraduate { }

other (specify).....

7. Marital status?

a. Single { }

b. Married { }

c. others.....

8. Number of years of work?

a. <1yr { }

b. 1-5yrs { }

c. 6-10yrs { }

d. 10-20yrs { }

e. >20 { }

### Knowledge about injuries and its severity threshold Hint;

- ✓ Occupational injuries were defined as case of injuries, traumas, poisonings, occurring in the workplace while performing work-related tasks out of the work environment.
- ✓ Injury is any harm or damage to any part of the body by external source such as sharps, needles pricks, cuts, slips, unprotected exposure to body fluids, chemicals, hit by objects, and violence from patient.

9. Are you aware of occupational injuries? Yes { }

No { }

10. Where did you get information about occupational injuries from?

a. graphics

b. television

c. radio

d. workshops

e. others

11. Have you been injured at work (for the past year)? Yes { }

No { }



If yes, what type and what caused it

- a. Falling down while pushing or pulling a wheelchair or bed { }      b. Falling down while walking { }  
c. Hit by any hard or sharp object { }      d. Contact with harmful chemicals { }

12. If yes, did you report it for medical attention? Yes { }      No { }

13. What was the result of the injury?

- a. Treated and discharged the same day { }      b. Hospitalized for 1-3 days { }  
c. hospitalised more than 3 days { }      d. No treatment { }

14. Did you take a day or more days off as a result of your injury?

Days { }      Weeks { }      Months { }

15. Have you returned to work?

Yes { }      No { }

16. During your treatment, did it occur to you to change your medical profession?

Yes { }      No { }      Maybe { }

17. Has it been difficult seeking for treatment for an injury at the workplace?

Yes { }      No { }

18. Can you tell me the main difficulties you have experienced in trying to get medical treatment or services?

- a. Absence of protocols of occupational injuries { }      b. Absence of resource personnel or occupational injuries unit or healthcare worker { }  
c. Absence of postexposure medication { }      d. Other:

### **EXPOSURE TO CHEMICALS, BIOLOGICAL AND PHYSICAL INJURY.**

1. Have you been exposed to any of these biological fluids of patients? Please tick the one you have been exposed to:

- a. Nasal secretions { }      b. Blood { }      c. Urine { }      d. Saliva { }  
e. Sputum { }  
f. Peritoneal fluid { }      g. Semen { }      h. Vomitus { }      i. Vaginal secretions { }  
j. Sweat { }      k. Cerebrospinal fluid { }      l. Pleural fluid { }

2. Please tick the chemical substance you been exposed to?

Carcinogenic substance { } Toxic substance { } Other:

3. Have you had a needle prick for the past one year till now? Yes { } No { }

4. Have you had a needle prick since you started work at the hospital?

Yes { } No { }

5. Have you had any injury from sharp objects for the past year?

Yes { } No { }

6. Have you experience any violence, threat or physical injury from a client or patient's relative?

Yes { } No { }

7. Have you been injured by any object at the work place for the past year?

Yes { } No { }

8. Have you had any slip or trip at the workplace for the past year?

Yes { } No { }

9. Have you fall from heights at the workplace for the past year? Yes { } No { }

## EXPOSURE TO STRESS

1. Is your work shift stressful?

Yes { } No { }

2. If yes, which of the following causes the stress?

Excessive workload { }

Inadequate staff { }

Long working hours { }

Other, please specify.....

3. How many hours do you work a day?

Your answer

4. Do you have fixed breaks during working hours?

Yes { } No { }

5. How is your work schedule?

Fixed working hours { } Run shifts { } Work on call { }

6. Which shift affects your social and private life?

Morning { }      Afternoon { }      Night { } **EXPOSURE TO MUSCULOSKELETAL DISORDERS AND ERGONOMICS**

Please answer by using the tick brackets [ ]

Please note that this part of the questionnaire should be answered, even if you have never had trouble in any parts of your body.

Have you at any time during the last 12 months had trouble (such as ache, pain, discomfort, numbness) in:	Have you had trouble during the last 7 days:
1 Neck	2 Neck
No Yes	No Yes
1[ ] 2[ ]	1[ ] 2[ ]
3 Shoulders	4 Shoulders
No Yes	No Yes
1[ ] 2[ ]	1[ ] 2[ ]
5 Elbows	6 Elbows
No Yes	No Yes
1[ ] 2[ ]	1[ ] 2[ ]
7 Wrists/hands	8 Wrists/hands
No Yes	No Yes
1[ ] 2[ ]	1[ ] 2[ ]
9 No Upper back	10 Upper back
Yes	No Yes
1[ ] 2[ ]	1[ ] 2[ ]

11	Lower back or waist	12	Lower back
No	Yes	No	Yes
1[ ]	2[ ]	1[ ]	2[ ]
13	One or both hips/thighs/buttocks	14	Hips/thighs/buttocks
No	Yes	No	Yes
1[ ]	2[ ]	1[ ]	2[ ]
15	One or both knees	16	Knees
No	Yes	No	Yes
1[ ]	2[ ]	1[ ]	2[ ]
17	One or both ankles/feet	18	Ankles/feet
No	Yes	No	Yes
1[ ]	2[ ]	1[ ]	2[ ]

8. Have you ever moved objects or patients as part of your duty? Yes { } No { }

9. In performing your duties, does the required posture result in you having pains in any part of your body? Yes { } No { }

10. During your work, tick any of the inconveniences you have experienced?

A. sitting for a longer duration { }

B. standing for a longer duration { }

C. bending down { }

D. reaching heights { }

E. repetitive movements { }

Other

MEASUREMENT OF RISKS AND SAFETY MEASURES AT THE FACILITY



1. Is there any log book for recording injuries at your department?  
Yes { } No { }
2. Have you had training on occupational health and safety since you started work? Yes  
{ } No { }
3. If yes, how many times within a year?.....
4. Is there a special unit for occupational health and safety?  
Yes { } No { }
5. Have you checked your Hepatitis B status since you started work? Yes { } No { }
6. Have you been vaccinated for hepatitis B?  
Yes { } No { }
7. Who paid for the vaccination of the hepatitis B?  
Short answer
8. Have you checked your HIV status since you started work?  
Yes { } No { }
9. Do you have a post exposure protocol posted at the various units of the hospital? Yes  
{ } No { }
10. Do you know a coordinator in charge of the post –exposure prophylaxis?  
Yes { } No { }
11. Have u had any experience with post exposure prophylaxis?  
Yes { } No { }
12. Do you follow infection control techniques? Yes { } No { }
- 12b. Do you always dispose all sharps in a puncture –resistant sharp containers?  
Yes { } No { }
13. Which of these universal precautions do you often practice in the facility?  
a).hand washing b. wearing of gloves c. nose masking other
14. Do you always use personal protective equipment's? Yes { } No { }
15. Does the facility provide resources for personal protection equipment's and infection control? (Gloves, goggles, gowns). Yes { } No { }
16. Do you have fire extinguishers at the various departments of the hospital? Yes { }  
No { }

17. Have you been trained on how to use fire extinguishers during fire outbreak? Yes { } No { }
18. Do you have rest rooms for staffs? Yes { } No { }
19. Do you have staff washrooms? Yes { } No { }
20. Do you have access to drinking water during working hours? Yes { } No { }
21. Are you satisfied about the safety management of the hospital? Yes { } No { }
22. If no, what are your suggestions to improve it?

Short answers

23. In your opinion which injury is the most serious and threatening to the performance of your duties? .....

24. Do you think occupational health is necessary?

a. If yes, why

b. If no, why

Severity of injuries	Mild	No day loss at work
	Moderate	Treated and discharged absent from work 1-3 days
	Severe	Admitted more than 3 days Absent from work for more than 3 days

## APPENDICE 2



KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY  
COLLEGE OF HEALTH SCIENCES



SCHOOL OF MEDICAL SCIENCES / KOMFO ANOKYE TEACHING HOSPITAL  
**COMMITTEE ON HUMAN RESEARCH, PUBLICATION AND ETHICS**

Ref: CHRPE/AP/378/18

27<sup>th</sup> June, 2018.

Dr. Mrs. Helena Serwa Appiagyei  
School of Public Health  
KNUST – KUMASI.

Dear Madam,

**LETTER OF APPROVAL**

**Protocol Title:** *"Investigations of Occupational Injuries among Healthcare Workers at a Public Hospital in the Ashanti Region, Ghana."*

**Proposed Site:** *All Clinical and Housekeeping Departments, Suntreso Government Hospital.*

**Sponsor:** *Principal Investigator.*

Your submission to the Committee on Human Research, Publications and Ethics on the above-named protocol refers.

The Committee reviewed the following documents:

- A notification letter of 9<sup>th</sup> March, 2018 from the School of Public Health, KNUST seeking permission to conduct the study at the Suntreso Government Hospital (study site) and was approved.
- A Completed CHRPE Application Form.
- Participant Information Leaflet and Consent Form.
- Research Protocol.
- Questionnaire.

The Committee has considered the ethical merit of your submission and approved the protocol. The approval is for a fixed period of one year, beginning 27<sup>th</sup> June, 2018 to 26<sup>th</sup> June, 2019 renewable thereafter. The Committee may however, suspend or withdraw ethical approval at any time if your study is found to contravene the approved protocol.

Data gathered for the study should be used for the approved purposes only. Permission should be sought from the Committee if any amendment to the protocol or use, other than submitted, is made of your research data.

The Committee should be notified of the actual start date of the project and would expect a report on your study, annually or at the close of the project, whichever one comes first. It should also be informed of any publication arising from the study.

Yours faithfully,

Osomfo Prof. Sir J. W. Acheampong MD, FWACP  
**Chairman**