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DETERMINANTS OF SHARP INJURIES AMONG CLINICAL CARE WORKERS IN THE KINTAMPO MUNICIPAL HOSPITAL, BRONG AHAFO REGION, GHANA

BY

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DECLARATION

Except for the specific references which were duly acknowledged, I hereby declare that this work is the result of my own effort under the supervision of Dr. Uri Serlom Markakpo, and it has not been submitted either in part or whole for any other degree elsewhere.

SIGNATURE…… DATE ……

HIPPOLYT KUUBETERSUUR

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SIGNATURE …… DATE ……..

DR. URI SERLOM MARKAKPO

(SUPERVISOR)

DEDICATION

I dedicate this dissertation to my beloved one Dr. Andra Esther Gyamfi and the entire Kuubetersuur family.

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Firstly, my utmost thanks and gratitude go to Almighty God for the strength, wisdom, protection and guidance given me for the successful completion of this piece of work.

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ABSTRACT

Background: Occupational injury is a global public health problem in terms of disability adjusted life years which contributed to 1.5% of all cases with estimated economic loss of 5% - 10% gross national domestic productivity. The International Labour Organization (ILO) estimated that about 2.3 million workers die each year from unintentional work-related accidents and diseases. Healthcare workers are more likely to experience work-related injuries than are workers in most other occupations. Sharp injury (SIs) occurs when sharp instruments such as needle penetrates the skin. If the sharp instrument is contaminated with infectious blood and body fluids, there is the potential for transmission of infections. Globally, more than 35 million healthcare workers (HCWs) suffer from occupational injuries due to sharp objects such as needle sticks every year. Even though efforts have been made to reduce the incidence of sharp injuries, the problem still persist. This study therefore aimed to find out determinants of sharp injuries among clinical care workers at the Kintampo Municipal Hospital in the Brong Ahafo Region of Ghana.

Methods: A cross-sectional study was conducted among clinical care workers between May and June 2017. The study population was divided into seven strata (i.e. seven units) proportionately. Simple random sampling method was used to select respondents from the various units. The units were serially numbered where the first unit was numbered U/001, the second unit numbered U/002 until the sample size for the cluster was exhausted. A total sample size of 152 healthcare workers was studied. Structured questionnaires were administered to study participants to obtain their demographic characteristics and associated risk factors for sharp injuries. Data was edited, coded and statistically analysed using Stata version 14.1. Basic descriptive statistics was run

(frequencies, percentages, and proportions) and association between variables was analysed using appropriate test statistics.

Results: Out of 152 clinical care workers who met the inclusion criteria, all agreed to participate and fully completed the study. The modal age was 20-29years. About (86.84%) of the respondents indicated that lack of workplace supervision can contribute to sharp injuries (SIs), (87.50%) said lack of health safety and training can contribute to SIs, (57.89%) of the respondents indicated that alcohol consumption can lead to SIs, (80.26%) showed that job stress can contribute to SIs, (57.89%) of the respondents indicated that sleeping difficulties can lead to SIs and finally, (89.47%) of the respondents stated that failure to use PPE can contribute to SIs.

Conclusion: The incidence of SIs among clinical care workers in the Kintampo Municipal Hospital was relatively high as 15.13% of respondents reported of SIs. Alcohol consumption, job stress, lack of workplace supervision, lack of health safety and training, sleeping difficulties and lack of use of PPE were the reasons given by respondents to contribute to SIs. Appropriate interventions such as regular workplace supervision, life style modifications and regular use of PPE are required for the control and prevention of risk factors contributing to SIs.

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LIST OF ACRNYMS

AIDS	Acquired Immunodeficiency Syndrome
BBPs	Blood Borne Pathogens
CDC	Centre for Disease Control
CHCWs	Clinical Health Care Workers
CI	Confidence Interval
GHS	Ghana Healthcare Service
HBV	Hepatitis B virus
HCV	Hepatitis C virus
HCWs	Healthcare Workers
HIV	Human Immunodeficiency Virus
IV	Intravenous
KMH	Kintampo Municipal Hospital
MSIs	Musculoskeletal Injuries
NSSIs	Needle-Stick and Sharp Injuries
OR	Odd Ratio
PPE	Personal Protective Equipment
SIs	Sharp Injuries
SSA	Sub-Sahara Africa
UPs	Universal Precautions
WMSIs	Work-Related Musculoskeletal Injuries

DEFINITION OF TERMS

Cigarette Smoking: Inhalation of the smoke generated by burning of cigarettes regularly.

Health and Safety Information Officer: A worker who has acquired any kind of knowledge in-one-year period through any kind of media about health and safety of factory workers.

Health and Safety Training: Trainings given to a worker about health and safety to workers.

Healthcare Workers: People whose job is to protect and improve the health of members of their communities.

Job Stress: A worker who scores above or equal to 90th percentile on questions on job stress will be considered to have a problem with job stress and below the 90th percentile will be considered not to have job stress.

Occupational Injury: Any physical trauma sustained by a worker while performing his or her job.

Personal Protective Equipment (PPE): Any worker-specialized clothing or equipment worn by employees for protection against health and safety hazards at the time of work or job assignments.

Sleeping Disturbance or Problem: Is any sleep related problem shown by a worker while carrying out his or her job assignments.

Work Place Supervision: Is the regular check performed by health and safety responsible bodies in the department and working rooms of various establishments to ensure that work-related activities are progressing as planned.

Working Department: One of the units or sections of an occupational set-up where job related activities are carried out.

CHAPTER ONE

1.0. INTRODUCTION

1.1. Background

The World Health Organization (WHO) in 2007 sanctioned the Universal Plan of Action on Workers' Health between 2008 and 2017 to offer a political platform for the formation of policy guidelines, infrastructure, technologies and group of people working together for the attainment of a fundamental state that safeguards all working environment globally. The Global Plan of Action considers every aspect of workers' health, considering basic or fundamental deterrence of work-related exposures, security and advancement of health at work, work environments and improving the response to the health status of clinical care workers. In most situations there is an association between occupational health and public health (Bekele et al., 2015a).

While there are about twenty blood-related disease-causing microorganisms which can be passed on from one person to the other through deliberate needle and/or sharp injuries, the potentially deadly health conditions include Human Immunodeficiency Virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV). Even though there are reported cases of increased blood-related disease-causing microorganisms in most developing countries, records of morbidity resulting from job-related exposure in these Sub-Sahara countries are limited. About 70% of the global individuals suffering from HIV dwells in Sub-Saharan African, however, only 4% of the global cases of job-related HIV infection are documented from this part of the world. Inadequate documentation of sharps injuries by employees is reported in different various studies. The extent of inadequate reporting of sharp injuries ranges from 22% to 99 % (Bekele et al., 2015a).

There could be several reasons why clinical care workers fail to document and appropriately report cases of sharp injuries. Mostly majority of clinical care workers presume that the hazards or the origin of the hazards are not risky; they may also be afraid of the conditions of the clients that they have accidentally been exposed to their samples, they may equally have worries concerning the sustainability of their profession or the enormous paperwork and time associated with outcome. Furthermore, clinical workers may not have adequate knowledge and training concerning appropriate documentation processes and or the reporting protocols themselves may not be enough (Bekele et al., 2015a). They may also be psychologically traumatized about the post exposure prophylaxis or treatment that they might be subjected to including the duration and the discomfort of taking routine treatment for "no apparent known disease or ailment."

A work-related hazard may be explained as any bodily trauma sustained by a worker while performing his or her work. Industrial workers mostly spend not less than eight hours every day during working days, which have a strong consequence on their wellbeing and safety to work and job-related exposures or hazards (Aderaw et al., 2011). These job-related hazards create a greater global health and developmental challenges which contribute to serious wellbeing, public, and financial burdens on employers and their workers (Aderaw et al., 2011). Globally, a projection was made in 2005 of 250 million work-related hazards and 5.4million deaths expected to occur annually due to hazards. More than 90% of these deaths occurred in low-and middle income nations where the most densely populated employees are located and less developed industries are also situated (Aderaw et al., 2011). This situation globally contributes to a loss of

approximately 4% of the GDP. Notwithstanding the enormous nature of the situation, very few thus 5 to 10% of the workers in developing countries is privileged to some form of job-related health and wellbeing amenities (Aderaw et al., 2011).

Occupational injury is a global public health problem that leads to loss of 18.6 DALYs per 1,000 persons in the working population and 5% – 10% of gross national domestic productivity (Habtu et al., 2014). Also the International Labour Organization (ILO) projected that about 2.3 million personnel are reported dead yearly in relation to accidental job-related hazards and ailments. Diseases associated with work were also predicted to be more than 270million among employees at work (Habtu et al., 2014). Workers belonging to all levels of financial categories experience serious hazards, however death cases resulting from injuries tend to be greater among unindustrialized nations in which there are insecure working surroundings, reduced attentiveness, incompetent employees, inadequate or no professional services, and psychosocial stress.

Clinical care workers have a higher probability of experiencing occupational hazards compared with employees working elsewhere. Throughout the United States, nursing and residential care services ranked 3rd among the top 10 industries with the highest rates of less injurious hazards and diseases in the place of work. Nurses have the greatest chances in relation to occupational injuries due to the physically challenging work and the setting in which employees carry out their professional duties.

Needle-stick and Sharp Injuries (NSSIs) occur when there is any form of unintentional damage to the skin causing a break in the continuity of the skin resulting from sharp instruments within a clinical workplace. Sharp injuries may be explained to be

unintentional damage to the skin resulting from sharp objects in the clinical care setting including hypodermic needles, needles for collecting or taking blood sample, intravenous (IV) catheter stylets, as well as needles used to connect parts of IV delivery system, surgical blades including broken glasses. It is estimated internationally that, over 35million clinical care professionals suffer from work-related needle sick and sharp injury (NSSI) annually (Bekele et al., 2015b).

On the other hand, NSSIs can also mean the act of exposing the body of healthcare professionals to blood or any other potentially dangerous materials through the use of hollow bore needles or sharp instruments, such as needles, lancets, scalpels, and infectious broken glasses, in the course of carrying out their jobs at their work places (El-hay, 2015). Needle stick and sharp injuries usually result in the transmission of infectious disease conditions from the patients to clinical care trainees (El-hay, 2015) and such deadly diseases include HIV, HBV and HCV through exposure with infected body fluids or blood. The probability of getting infected resulting from a single needle stick from a known-client with any blood-borne disease ranges from as low as 0.3% HIV, and 3% to 10% for hepatitis C to as high as 40% for hepatitis B (El-hay, 2015). Injuries from needle stick usually occur through the process of taking blood samples, giving injections into deep muscles or veins, or carrying out other activities which include the use of sharps instruments where the needle can dislodge and harm the trainee student (El-hay, 2015). In relation to damages sustained at workplaces, sutures and use of sharp instruments mostly contribute significantly to sharp injuries (Aderaw et al., 2011; El-hay, 2015). Among clinical care professionals, nurses and physicians appear particularly at chances of experiencing sharp injuries (Arabia et al, 2012). Factors that can contribute to the

incidence of sharp injuries may involve several causes including shape and type of sharp instrument, covering of needle after use, processing of samples, crash involving CCWs or sharps, during clean-up, handling needles in patients' line associated with work, processing of instruments or improper use of safe containers for sharp objects (Arabia et al., 2012). This enormous tally of lost hours due to preventable illnesses and injuries translate into a lot of lost hours during care of clients across the country each year. Studies have shown that on average, clinical care professionals within Africa experience 2-4 injuries from sharp objects annually. However, these hazards of needle from sharp instruments can be avoided using safer needle devices as well as adhering to the universal precautionary measures. The extent of the problem and factors associated with its occurrence is limited in the study area. Therefore, the research aims at assessing the determinants of sharp injuries among clinical care workers at the Kintampo Municipal Hospital in the Brong Ahafo of Ghana.

1.2. Problem Statement

Injuries caused by sharp objects are common clinical care hazards that occur in the work environment. A projected number of workers constituting 500,000, 100,000 and 600,000–800,000 needle sticks and other percutaneous injuries are documented yearly among Germany, United Kingdom and United States health care workers respectively (Kebede et al., 2012). Needle stick and sharp injuries were also recorded among health care professionals in African nations (Kebede et al., 2012). Furthermore, the risk and health implications are not often scrutinized hence little is done to safeguard health care workers from such exposures making them prone to sepsis, morbidity, disability and mortality. These hazards can negatively affect the quality of health care globally. Clinical

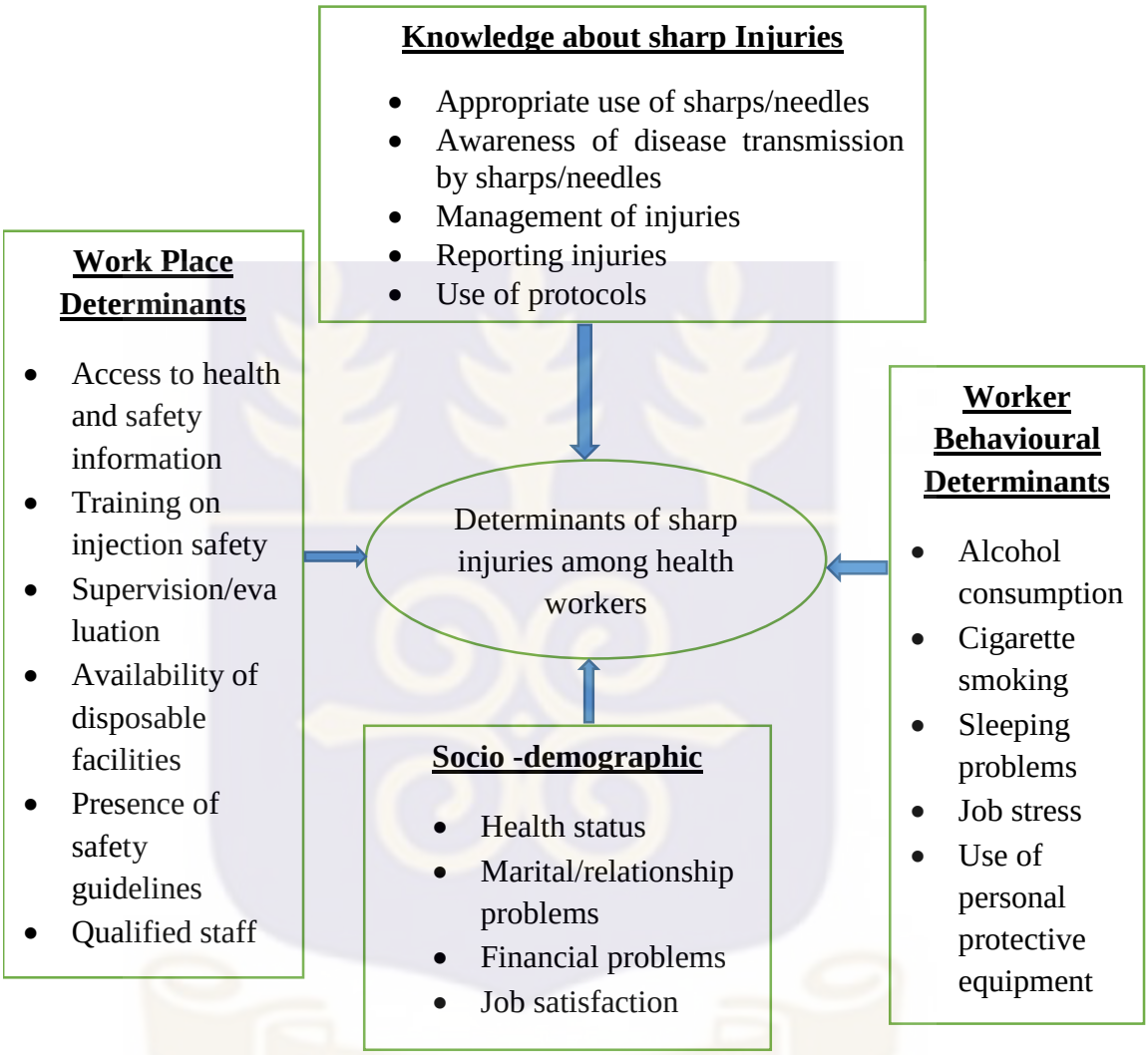
professionals are most likely to be exposed to over 27 job-related blood-borne disease-causing microorganisms (Voide et al., 2012). Injuries to HCWs mostly result from pricks or scratches from piercing objects or instruments. Injuries to HCWs may also include exposure to the nose, mouth, skin, or eye coming into contact with body fluids or blood from patients. Injuries from sharp objects result if penetrating or piercing objects like the needle pierces the skin. If the sharp object is infected with body fluids and blood, there is a higher probability of transferring blood-borne pathogens. Worldwide, over 35 million clinical care professionals have been reported to be suffering from job-related injuries from needle stick and sharp objects annually. It is also estimated that over 20 blood-related disease-causing microorganisms can be acquired through unintentional exposures, the most deadly of such pathogens are HIV, HBV and HCV. A study conducted involving 273 junior doctors at two London teaching hospitals revealed that 76% had reported of higher risk exposure to potentially infective materials during their care (Tesfay & Habtewold, 2014). It has also been found that there are a number of countries in which there are increased request for injections which are perceived to be more efficacious than other kinds of treatment. Even though the average clinical care workers in hospitals within the Brong Ahafo Region are exposed to work related sharps injuries, there is no baseline data for formulation and implementation of policy needed to prevent sharps injuries among clinical care professionals. Notwithstanding, it was also observed that since January 2016, ten (10) cases of sharp injuries were recorded in the Kintampo Municipal Hospital. Even though the figures could be higher, because it was also possible that some of the cases had not been recoded or documented. Under reporting or failure to report incidence of needle pricks or injuries involving clinical care professionals has been

a common practice in most countries in Sub-Saharan African in which Ghana is not an exceptional.

It is also estimated that between 80 and 90% of Ghanaian clients who visit clinical care centers receive average number of injections at each visit. Studies have indicated similar results in Indonesia as well as Uganda. The Kintampo Municipal Hospital is located on a major highway and frequently receives several road traffic accident cases. As a result of work pressure, the clinical care workers are most likely to be exposed to sharps injuries however, very few of such cases are reported.

Furthermore, there is no data on the factors contributing to the occurrence of sharp injuries among the clinical care workers of the KMH. To provide a reliable baseline data for formulation of policy for addressing these problems, therefore, this study aims at assessing the determinants of sharps injuries among clinical care workers of the KMH in the Brong Ahafo Region of Ghana.

1.3. Conceptual Framework



1. 4. Significance of the Study

This study aims to provide information regarding factors that contribute to sharp injuries among clinical care professionals in the Kintampo Municipal Hospital. This information would enable policy makers in the Ministry of Health (MoH), Ghana, and their

collaborating agencies make policy decisions towards designing worker friendly strategies that would help minimize, if not remove sharp injuries among clinical care workers. The results of this study would also provide the baseline for more vigorous research in the future regarding the gap determinants and personal or worker behaviour factors that contribute to occupational hazards among health care workers. Additionally, health care workers who report cases of sharp injuries at the work place could be diagnosed early enough and taken through appropriate counselling and testing for any blood-borne disease conditions that can be transmitted through sharp injuries. This would allow them receive early treatment and care that would improve their health to work and eventually increase productivity in their various communities, pursue academic goals and also support others in their homes since clinical care workers remain important in their society.

1.4.1. Objectives of the study

1.4.2. Main Objective

1. To determine factors that contribute to sharp injuries among clinical care workers in the Kintampo Municipal Hospital (KMH)

1.4.3. Specific Objectives

1. To determine the proportion of clinical care workers that experience sharp injuries in the KMH
2. To assess the level of knowledge of sharp injuries among clinical care workers of the KMH

1.4.4. Research Questions

1. What proportion of clinical care workers experience sharp injuries in the KMH?
2. What is the level of knowledge of clinical care workers about sharp injuries in the KMH?

CHAPTER TWO

2.0. LITERATURE REVIEW

2.1. Introduction

This section of the study seeks to evaluate existing materials which are related and relevant to determinants of needle stick and sharp injuries among clinical care professionals. It is an established fact that Ghanaian employees are employed in various occupations at various workplaces and are therefore exposed to diverse work environment conditions hence diverse exposures at different levels. Due to individual differences in human physiology and health resistance, different workers may be exposed to similar hazards however, each individual might react differently therefore leading to diverse levels of health implications.

Injuries from needle stick and sharp objects are common health problems that occur in the working environment. Research findings on needle stick injury indicate that it ranges from 21% to 95% among clinical care workers (Bekele et al., 2015a). These avoidable incidents expose clinical care professionals to more than twenty diverse blood-related disease-causing microorganisms, hence leading to about 1,000 infections per year (Bekele et al., 2015b). Needle stick and sharp injuries account for about 86% of all occupationally related infection transmissions among clinical care workers.

2.2. Proportion of Clinical care Workers Who Experience Sharp Injuries

Needle-stick and sharp injuries are unintentional skin piercing injuries resulting from hollow-bore needles such as hypodermic needles, blood-collection needles, intravenous catheter stylets, needles used to connect parts of intravenous delivery system, scalpels and broken glasses (El-hay, 2015). Clinical care professionals who come into contact

with patients' body fluids and blood may be exposed to life threatening disease-causing microorganisms which may result through injuries form sharp instruments or objects (Aderaw et al., 2011; El-hay, 2015). Needle stick and sharp injuries can contribute to the spread of infectious disease conditions to nursing trainees as well as other clinical care professionals (El-hay, 2015). Some of these infectious microorganisms include HIV, HBV and HCV which most often occur through contacts with infected blood and deep body fluids. The possibility of health care professionals suffer from a single needle stick injury with blood-borne infection is estimated to be as low as 0.3% for HIV, and 3% to 10% for HCV to as high as 40% HBV (El-hay, 2015; Janjua et al, 2010).

Needle stick and sharp injuries most frequently occur during certain invasive procedures including but not limited to; taking blood sample for laboratory investigations, giving an intramuscular or intravenous treatment, or carrying out other activities relating to sharp instruments such that the sharp instrument can deviate causing harm to the nursing trainee (Bekele et al., 2015a; Janjua et al., 2010). In relation to wounds caused by sharp objects, sutures and use of sharp equipment remain the most potential instruments that cause more harm (El-hay, 2015). It has also been established that there are some category of health professionals who may have a higher exposure to some risks compared to others (Aderaw, 2013). Medical, dental, nursing and midwifery workers are at higher risk for occupational exposure to blood-borne pathogens via sharp injuries (Aderaw et al., 2011). A research carried out among Malaysia health care professionals revealed that medical assistants recorded the greatest risk of needle stick and sharp injuries compared to nurses, doctors and clinical care professionals (Aderaw, 2013). However, various researchers have reported nurses to be the commonest category of clinical care professionals who

encounter more sharp injuries (Aderaw, 2013). Furthermore, a univariate statistical analysis showed no significant difference between exposure group and non-exposure group in terms of age, gender, education and marital status. Studies have shown that the prevalence of occupational exposures are generally highest among house officers, medical officers and nurses, and lowest among consultants and laboratory scientists; this disparities could be the fact that the consultants and the laboratory scientists are less likely to get cuts from sharp objects since they do not do more invasive procedures compared with the aforementioned category of clinical care workers. Out of the total number of study participants who had ever suffered work-related injury, 55(43.7%) were exposed more than once. Almost 31.7% of the injuries took place in the accident and emergency unit. Other injuries occurred in medical ward 17.5%, maternity ward 13.5%, surgical ward 9.5%, paediatrics 8.7%, operation theatre unit 8.7% and others such as laboratory unit, outpatient department, vaccination and TB clinic were responsible for 10.4% of injuries.

Lastly, Azadi et al (2011) reported that 68% of the nurses who encountered needle stick and sharp injuries in the previous year had job experience less than five years. There was a significant difference between years of work and needle stick and sharp injuries (P = 0.02). Overall, 37.3% of nurses (n = 42) aged between 25 – 30 years, and 46.8% of needle stick and sharp injuries had occurred in this group. Regarding procedures and activities that caused needle stick and sharp injuries, 31.4% of the injuries occurred while recapping of needle, followed by 25.5% occurred during intravenous line administration, and 13.7% occurred during blood collection from clients for laboratory investigations.

2.3. Socio-Demographic Factors that Contribute to Sharp Injuries among Clinical care Workers

A study conducted in Ethiopia indicated that in relation to socio-demographic determinants that contribute to sharp injuries at a work facility, variables such as age group, gender and work experience revealed statistically significant association with job-related injuries in the bivariate analysis. However, background characteristic variables like religion, ethnicity, marital status, educational level, employment condition, and monthly income of the study participants showed no significant relationship with work-related injuries. It was also revealed that only gender and years of workers showed an association in a multivariate model, whereas years of working experience showed no correlation. A study conducted among clinical nursing trainees indicated that, the distribution of the respondents in relation to their background characteristics indicated the following: with regards to age, it was recorded that the greatest proportion of the nursing trainees (60.6%) were found within the age bracket 20-21 years. Also concerning years of training, it was noticed that (54.5%) of the respondents were third year of Applied Medical Science students while (45.5%) belonged to year two and three of the Faculty of Health Science. In addition, it was also observed that the total study population (100%) did not have any training concerning needle stick and sharp injuries, (54.4 %) of student trainees never had any form of teaching concerning infection control measures, while over three quarters of the trainees did not obtain any needle prick and sharp injuries prior to the study.

2.4. Work Environment Determinants that Contribute to Sharp Injuries Among Clinical care Workers

Mostly, there are other important factors that contribute to needle stick and sharp injuries in a health care facility and these include: work overload, lack of patience while performing activities, exhaustion and a congested work background, again carrying out other functions including recapping of needles with both hands, failure to adhere to good techniques in taking samples from patients for laboratory investigations, disposal of sharps waste and washing of infected instruments (El-hay, 2015). Needle stick and sharp injuries mostly result in some menaces including: heamorrhage, minor abrasions, and minor visible skin injuries. Even though the main risk associated with sharp injuries is transmission of viral infections, injuries caused by scalpel blade require massive attention compared to needle stick injuries (El-hay, 2015; Janjua et al., 2010).

Furthermore, studies on the association of occupational injury with other factors such as alcohol intake, sleeping disorders, cigarette smoking, job satisfaction, flying objects in the work environment and mishandling of machinery have been conducted in other occupational sectors, but not in the clinical care environment. The foregoing therefore clearly shows that more studies should be conducted to ascertain the determinants that contribute to increase in the risk of sharp injuries among clinical care professionals. This is necessary to institute targeted measures for prevention of sharps injuries among clinical care professionals.

People working in various work places including industries are exposed to various occupational environmental challenges and consequently different agents at different levels of exposure. In as much as there are personal differences in human physiology and

health resistance, different individuals who are exposed to the same agent would have different reactions with its accompanying different magnitudes of health outcome. Hazards in comparable work environments also differ depending on the activities conducted at each particular workplace. Clinical care settings are workplaces in which clinical care services are rendered to clients and these include many settings, such as primary clinical care facilities; occupational health services, and hospitals. Clinical care settings have been identified as becoming among the most hazardous occupational settings due to the activities that are carried out there and the diverse hazards encountered in these environments. A research conducted using small and medium-scale factory employees in Ethiopia showed no significant statistical association between occupational injury and sex of the employers (Aderaw et al., 2011). Researchers from various places have shown that younger employees encounter higher job-related injuries at an alarming rate compared to older employees (Aderaw, 2013; Aderaw et al., 2011)). Several researches concerning occupational health and safety carried out among developing countries concluded that higher academic status regarding work place safety have been linked with reduced occupational traumas (Aderaw et al., 2011; Voide et al., 2012). Inadequate knowledge concerning environmental safety and occupational health has a strong impact in relation to incidence of needle stick and sharp injury among clinical care professionals. Majority of investigators indicate that occupational hazards can be associated with poor personal surroundings leading to higher incidence of job stress hence, exposing workers to higher risk of work place injuries (Aderaw et al., 2011). Regarding materials which cause injuries in the clinical care sector however, the greatest percentage recorded was syringe needles (69.8%), followed by suture needles (15.9%).

Injections are the major clinical health care activities conducted at the primary health care facilities in Pakistan, where about 13 injections per person are received yearly (Janjua et al., 2010). A greater proportion of such treatments are administered using old injection equipment (Janjua et al., 2010). Majority of the injection administrations and reuse of syringes commonly happen or take place at personal health facilities. The practice of using leftovers from ampoules and multidose vials remains popular among the people of Pakistan. The act of using already used syringe and multidose vials includes handling, trying to cover the used needle and disassembling of syringes from needles. This practice makes clinical care professionals more exposed to needle stick and sharp injuries (Bekele et al., 2015a; Janjua et al., 2010). Also independent factors that contributed to injuries by sharps objects were statistically analyzed using logistic regression analysis involving variables such as age, work experience in terms of years, distance from workplace as well as category of clinical care workers. The professional category of the respondents happened to be the only independent factor contributing to injuries resulting from sharp instruments. Consultants, older medical officers and laboratory scientists were significantly less likely to experience cuts from sharp injuries compared to newly qualified medical officers. Even though nurses were more likely to suffer injuries from sharp objects compared to newly qualified medical officers, the disparities were statistically insignificant. The foregoing suggests that although several studies have been conducted on environmental factors that influence the risk of injuries in other occupational settings, limited data are available on environmental determinants that are associated with risk of sharp injuries among clinical care professionals, and this highlights the need for further studies on this subject. Even though several studies have

been conducted elsewhere on work environmental determinants that influence the occurrences of sharp injuries, very few of such studies have been conducted in Ghana. The conduct of several of such studies in Ghana therefore, would provide the additional evidence based research findings necessary for targeted efforts to prevent needle stick and sharp injuries among clinical care professionals.

2. 5. Knowledge of Clinical care Workers about Sharp Injuries in a Health Facility

According to Khushdil et al., (2013) injuries from sharp objects are known to be the only life threatening work-related exposure that is very harmful to clinical care professionals. Needle stick and sharp injuries are common incidents which happen among clinical care providers. Such injuries increase the risk of infections associated with blood-related disease-causing microorganisms including HIV, HBV or HCV, which are serious threats to their wellbeing or even to their lives. Epidemiological data on needle stick and sharp injuries, including factors associated with workplace transmission of blood-related disease-causing microorganisms, are vital for identifying, implementing, and assessing treatment both at the local and national levels. More than 80% of needle stick and sharp injuries are avoidable with the use of correct precautionary measures (Zaidi et al., 2010), however, lack of knowledge regarding these precautionary measures may lead to incidence of sharp injuries among clinical care professionals. A study conducted by Cho et al., (2012) revealed that there are some determinants which promote the chances of needle stick injuries at the health care facilities, factors like recapping of needles after use, job stress, inadequate number of years of work experience, failure to use or improper use of needle-disposing or puncture proof sharp containers, as well as psychological instabilities. Likewise, Zafar et al (2008) indicated that the most common reasons for

needle stick and sharp injuries among clinical care providers are recapping and the unsafe collection and disposal of sharp wastes. However, lack of adequate training concerning the use and disposal of sharp instruments among clinical care workers could equally lead or contribute to incidence of sharp injuries among clinical care workers.

In most developing nations, there is increased request for injections which originates from the conviction that injections are more efficacious than other kinds of treatment in most health care settings. A study conducted in Ghana revealed that, about 80 to 90 percent of the patients who visited the clinical care centers received not less than one injection per visit. Furthermore, a univariate statistical analysis showed no significant difference between exposure group and non-exposure group in terms of age, gender, education and marital status. No association was found between history of training and exposure to blood-borne pathogens exposure. However, exposures to needle stick and sharp injuries were highest among house officers, medical officers and nurses, and lowest among consultants and laboratory scientists. Reasons assigned to fewer cases of sharp injuries among consultants and the laboratory scientists include the fact that they do less invasive activities compared to other category of clinical care professionals. From the total respondents who had ever experienced occupational injury, 55(43.7%) were exposed more than once and nearly one-third (31.7%) of the injuries occurred in the emergency unit. Other injuries occurred in the medical ward (17.5%), maternity ward (13.5%), surgical ward (9.5%), peadiatric ward (8.7%), operation theater unit (8.7%) and others such as laboratory unit, outpatient department, vaccination and TB clinic were responsible for (10.4%) of sharp injuries.

Lastly Azadi et al., (2011) reported that 68% of the nurses who encountered NSSIs in the past year had work experience less than five years. There was a significant difference between experience and NSSIs (P = 0.02). Overall, 37.3% of nurses (n = 42) aged between 25–30 years, and 46.8% of NSSIs had occurred in this group. Regarding procedures and activities that caused needle stick and sharp injuries, 31.4% of the injuries occurred while recapping used needles, followed by 25.5% during intravenous line administration, and 13.7% occurred during blood collection for laboratory investigations.

A study conducted in Pakistan also revealed that, at an average clinic, a HCW gives between 20–100 injections per day and 60% of the prescriptions contain at least one injection. Repeated use and handling of syringes and inappropriate sharp disposals are very common (Janjua et al. 2007a). Difference in the incidence or prevalence of sharp injuries across studies could be associated with frequency of injection use, injection apparatus manipulation for repeated use coupled with low knowledge level concerning risk of BBPs and universal precautions, especially in private settings. Thus, injection abuse and needle reuse may have contributed to an increased risk of percutaneous exposure among HCWs in Pakistan. Interventions targeting injection overuse and repeated use would also reduce the sharp exposure. The study revealed that years of work experience, risk perception and type of HCW were found to contribute to needle stick and sharp injury occurrence. Further findings in connection with injection providers (dispensers) only, years of work experience, knowledge score, and perceived severity of disease as well as lack of professional qualification were found to be associated with needle stick and sharp injuries. Increased knowledge scores related to BBPs transmission were associated with fewer sharp injuries. Knowledge score predicts use of universal

precautions including recapping, gloves and gown and vaccination for HBV (Janjua et al. 2007b). Increasing knowledge and raising awareness among the HCWs about the risks of needle stick and sharp injuries directly promote a better understanding of how the employees can protect themselves and the patients from BBPs by adopting universal precautions and safe practices. Studies from similar settings also suggest that better qualified HCWs, increased levels of knowledge about BBPs and adherence to the use of universal precautionary measures are associated with lower incidence of needle stick and sharp injuries, while poor or low levels of knowledge in relation to BBPs is found to contribute to greater needle stick and sharp injuries (Kotwal et al., 2004; Kermode et al., 2005b). Thus, having an in-depth knowledge about sharp injuries is an essential element in decreasing the incidence of needle stick and sharp injuries among HCWs. Lack of professional training or education was associated with a high risk of needle stick and sharp injuries among clinical care workers. A greater percentage of the employees in Pakistan does not have the requisite qualifications to practice as clinical care professionals, and administer injections. On the contrary, training alone does not promise safe injection practices. Some studies from tertiary care hospitals have reported higher rates of needle stick and sharp injuries among physicians or qualified HCWs (Zafar et al., 2008).

CHAPTER THREE

3.0. METHODOLOGY

3.1. Introduction

In this chapter, the various steps that were followed to achieve the objectives of the study have been described under their respective subheadings.

3.2. Study Design

The study design for this study was purposive cross-sectional study design. The data was collected on determinants of sharp injuries among clinical care workers of the Kintampo Municipal Hospital (KMH) within the Brong Ahafo Region of Ghana between May and June 2017.

3.3. Study Area

The research was conducted at the Kintampo Municipal Hospital within the Kintampo North Municipality of the Brong Ahafo Region. It is a moderately sized public hospital which is partly opened air complex and has a special interest in the study and treatment of infectious diseases apart from health care delivery. It has nine (9) units which are, the central administration, surgical unit, medical unit, operating theatre unit, pharmacy unit, accident and emergency unit, laboratory unit, x-ray unit and the obstetrics and gynaecology unit. The KMH has a total staff strength of 224, with 184 of them being directly involved in patient care, and comprise, medical officers, physician assistants, laboratory and dispensary technicians, nurses, midwives and ward assistants. In collaboration with the Kintampo Health Research Centre, the KMH conducts active research into various diseases, particularly, HIV/AIDS, tuberculosis and malaria. The Hospital is located on the Tamale-Techiman highway and on account of this, frequently

receives lots of road traffic accident cases which impose a heavy work load on the staff, particularly, those directly responsible for clinical care delivery. As a result of work pressure, the clinical care professional are often prone to hazards such as needle stick and sharp injuries. Despite incidence of sharp injuries however, very few of such cases are reported or documented.

The Kintampo North Municipal is one of the twenty seven municipalities/districts in the Brong Ahafo Region of Ghana. Kintampo is located between latitudes $8^0$45'N - $7^0$45'N and longitudes $1^0$20' - $2^0$1'E and shares borders or boundaries with five districts within the country. These districts are Central Gonja District to the north; Bole District to the west; East Gonja District to the North-East; Kintampo South District to the south; and Pru District to the South-East. The Municipal capital Kintampo, is about 130 km away by road from the regional capital Sunyani and lies east to the regional capital. The Kintampo Municipal has an estimated population of 111,965 comprising 56,498 (50.46%) females with a growth rate of 2.5% based on the Ghana Statistical Service 2010 Population and Housing Census (Kintampo North Municipal Health Directorate Report, 2016). The Municipality is divided into seven sub-districts, comprising one government hospital, four (4) health centers, thirteen (13) functional community-based health planning and services (CHPS) compounds. There are three (3) private clinics or hospitals and a maternity home in the Municipality. The Municipality also has the Municipal Health Directorate, a Health Research Centre known as the (Kintampo Health Research Centre) and a Health Training Institution (College of Health and Well-Being, Kintampo). The College trains all cadres of middle class health professionals from all over the country to augment health care delivery in Ghana.

3.4. Inclusion Criteria

All clinical care workers working in the selected units of the Municipal hospital, Kintampo, who are at risk of being exposed to sharp injuries due to their day to day professional activities and comprises medical officers, physician assistants, anaesthetists, nurses, midwives, laboratory technicians, enrolled nurses, and health assistants were recruited into the study.

3.5. Exclusion Criteria

Administrative and technical workers whose day to day work activities do not expose them to sharp injuries from the immediate work environment and include managers, secretaries, porters, finance, and security staff, were exempted from the study.

3.6. Sample Size Determination

The sample size was calculated using one single population proportion formula thus;

$n = Z_{1-a/2}^2 p(1-p)/d^2$, where,

n = sample size, $Z_{1-a/2}^2$ = confidence interval, p = estimated proportion and d = desired precision. It was computed based on 10% prevalence of needle stick and sharp injuries in the KMH, at 95% confidence interval, and 0.05 margin of error. This gave an approximation of 138 clinical care workers and a 10% allowance for non-responsive participants, making a total of 152 participants which was recruited into the study. Before the selection of the respondents, a list of the workers was obtained and grouped into specific working departments. Only participants who fulfilled the inclusion criteria participated in the study.

3.7. Sampling Method

A multi-stage sampling technique was used for the study. The clinical care workers in the facility were put into seven (7) clusters using the existing records of clinical care workers where each unit represented a cluster. This cluster of clinical care workers included: the medical officers, anaesthetists, nurses, midwives, clinical care assistants, physician assistants and the laboratory technicians. A simple random sampling technique was used to recruit the respondents for the study. The various categories of staff were numbered serially using their staff identification numbers. The lottery method of sample selection was then used in selecting the participants for the study. The units were numbered serially according to the number of departments available. The first unit in each department was numbered U/001 and the second department numbered U/002 until the sample size was exhausted. The emergency ward which is one of the busiest units in the hospital, however, was purposively selected because it was perceived to record the highest number of sharp injuries among the study population in the KMH.

3.8. Data Collection Tool

A structured questionnaire was used for the study since all the participants could read and write. The instrument was constructed in English language using close ended questions. The questions were constructed to reflect the variables under study. Questions covered thematic areas such as socio-demographic factors, worker behaviour, work environment factors that can contribute to sharp injuries among clinical care workers as well as respondents' level of knowledge regarding sharp injuries among clinical care workers.

3.9.0. Variables of the Study

The outcome variable for the study was sharp injuries among clinical care workers.

Other independent variables measured were the socio-demographic variables such as age of respondents, sex, educational status, marital status as well as location of the respondents. Also, the study measured the proportion of clinical care workers who experienced sharp injuries, length of time in service, worker behaviour determinants of sharp injuries, work environment determinants that influence sharp injuries and respondents' level of knowledge about sharp injuries.

3.9.1. Data Management and Analysis

The data collected was edited manually to correct any duplications and wrong entries. The edited data was then coded and statistically analyzed using Stata software version 14.1. Basic descriptive statistics was run and the results presented in Tables depicting frequencies, percentages, and proportions of respondents with sharp injuries. Basic test statistics and Chi-squared (X^2) test, Pearson's , Fisher's exact tests as well as simple logistic regression were used to further show associated factors contributing to sharp injuries among clinical care employees in the Kintampo Municipal hospital.

3.9.2. Ethical Consideration

Permission was sought from the Municipal Health Director of Health Services – Kintampo, the Medical Superintendent of the Municipal Hospital – Kintampo, the departmental heads as well as the officers' in-charge of the units in the facility where the study was conducted. Respondents' consent were sought before the commencement of the study. The questionnaire was given to respondents in an environment that was devoid of distraction and provided privacy. The objectives of the study were explained to the

participants and their informed consent sought. Participants who consented to participate in the study were made to sign the consent forms before they responded to the questions on the questionnaire.

Participants were also made to understand that participation in the study was voluntary and that they had the right to withdraw at any time during the course of the study. Confidentiality of data collected was ensured by using identifiers rather than names of participants. The study participants were assured that the data collected was for academic purposes only, hence, they should feel free and respond to the questions as honestly as possible. The study involved only the administration of questionnaire with no risk to the participants. Therefore, there was no compensation package to the participants. The administration of the questionnaire lasted for about 15 minutes.

3.9.3. Pretest of Questionnaires

Pretesting of questionnaires was carried out at the Jema District Hospital in the Kintampo South District. This was used to determine how feasible the questionnaires were and if possible address all sensitive questions raised. Errors detected were rectified and corrected or modified before the start of the study.

CHAPTER FOUR

4.0. RESULTS

4.1. Introduction

This section covers findings of the study. The results include data on main variables studied as well as background characteristics of the study participants.

4.2. Socio-Demographic Characteristics of Study Participants

Tables 4.1a and 4.1b summarize the socio-demographic characteristics of the study participants. As shown, 152 participants in all, were involved in the study, 77 (50.66%) of whom were of ages between 20 – 29 years old. Individuals of ages between 40 – 49 years old formed the minority, 8 (5.26%).

Also, the results show that slightly more than half (51.32%) of the total number of participants recruited were females, a majority, 115 (75.66%) of them were Christians with African Traditionalists representing the minority (1%).

In addition, approximately half the total number of participants were either married (46.05%) or single (47.37%) respectively.

Furthermore, the participants were of different ethnic origins, with the Mo (16.45%), Bono (21.05%) and the Dagaaba (11.84%) constituting the dominant groups. In addition, the participants live in localities of varying distances away from the workplace which are as classified as very far (38.16%), far (40.79%) and not far (21.05%). Finally, the results (Table 4.1b) showed that a majority (85.53%) of the participants had tertiary level of education, majority (61.18%) had worked at this hospital for 5 years at most, Nurses

formed the largest proportion (45.39%) with only one medical officer constituting the minority (0.66%) of the work force.

Table 4.1a: Socio-Demographic Characteristics of Respondents

Variable	Number of Respondents (f)	Percentage (%)
Age in Years		
20 – 29	77	50.66
30 – 39	58	38.16
40 – 49	8	5.26
50 and above	9	5.92
Sex		
Male	74	48.68
Female	78	51.32
Religion		
Christian	115	75.66
Muslim	33	21.71
African Tradition	1	0.66
None	3	1.97
Ethnicity		
Mo	25	16.45
Bono	32	21.05
Dagaaba	18	11.84
Others	77	50.66
Marital status		
Married	70	46.05
Single	72	47.37
Divorced	9	5.92
Others	1	0.66
Location from Work		
Very far	58	38.16
Far	62	40.79
Not far	32	21.05

Table 4.1b: Socio-Demographic Characteristics of Respondents

Variable	Number of Respondents (f)	Percentage (%)
Educational Status		
Secondary	22	14.47
Tertiary	130	85.53
Work Experience in Years		
5 years and below	93	61.18
6 years and above	59	38.82
Professional Categories		
Nurse	69	45.39
Physician Assistant	6	3.95
Midwife	21	13.82
Anesthetist	2	1.32
Medical Officer	1	0.66
Laboratory Technician	30	19.74
Healthcare Assistant	23	15.13

4.3. Determinants of Sharp Injuries of Respondents

The determinants of sharp injuries among respondents are summarized in Table 4.2 below. As shown, few of the respondents 18 (11.84%) did not have access to healthcare and safety information, few 20 (13.16%) did not get workplace supervision. Majority of the respondents 133 (87.50%) had health safety and training, most 144 (94.74%) of the respondents had disposable facilities available. A higher number 138 (90.79%) reported that there was the presence of safety guideline protocols, majority of the respondents 88 (57.89%) stated that alcohol consumption can contribute to sharp injuries. Furthermore, 81 (53.29%) of the respondents stated that cigarette smoking can lead to incidence of sharp injuries. Again, 88 (57.89%) of the respondents indicated that sleeping problems can contribute to incidence of sharp injuries, a higher number of the respondents 122 (80.26%) stated that job stress can lead to sharp injuries. Finally, majority of the respondents 136 (89.47%) indicated that use of PPE can reduce incidence of sharp injuries.

Table 4.2: Determinants of Sharp Injuries among Healthcare Workers

Variable	Number of respondents (f)	Percentage (%)
Healthcare and Safety Information Access		
Yes	134	88.16
No	18	11.84
Workplace supervision		
Yes	132	86.84
No	20	11.84
Health safety and training	133	87.50
Yes	19	12.50
No		
Availability of disposable facilities		
Yes	144	94.74
No	8	5.26
Presence of safety guidelines		
Yes	138	90.79
No	14	9.21
Alcohol consumption		
Yes	88	57.89
No	64	42.11
Cigarette smoking		
Yes	81	53.29
No	71	46.71
Sleeping problems		
Yes	88	57.89
No	64	42.11
Job stress		
Yes	122	80.26
No	30	19.74
Use of PPE		
Yes	136	89.47
No	16	10.53

4.3. Proportion of Clinical Care Workers with Sharp Injuries

Table 4.2.1 below shows findings from the study in relation to proportions of clinical care workers who had experienced sharp injuries at the KMH. As shown, 23 (15.13%) prevalence of sharp injuries was recorded among the participants with Nurses sustaining the highest proportion 8 (5.26%) of the injuries.

Table 4.2.1: Proportion of Respondents with Sharp Injuries

Variable	**No of respondents (f)**	**Prevalence of Sharp Injuries among Participants**	
		No n (%)	Yes n (%)
Professional Categories			
Nurse	69	61 (40.13)	8 (5.26)
Physician Assistant	6	6 (3.95)	0 (0.00)
Midwife	21	16 (10.53)	5 (3.29)
Anesthetist	2	2 (1.32)	0 (0.00)
Medical Officer	1	1 (0.66)	0 (0.00)
Laboratory Technician	23	18 (11.84)	5 (3.29)
Healthcare Assistant	30	25 (16.45)	5 (3.29)

The level of knowledge of participants are summarized in Table 4.2.2 below. Likert's scale was used to ascertain the level of knowledge of sharp injuries among the respondents of the study. The options ranging from 1 to 5 with the following interpretations "1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, and 5 = Strongly Agree". A score of less than 3, equal to 3 and above 3 represents a low level, an average level and a higher level of knowledge about sharp injuries among respondents respectively. The findings of the study indicated that majority, 30 (19.74%) of professional category with low level of knowledge regarding sharp injuries were health care assistants, while all the other professional categories obtained a score above 3 indicating their level of knowledge about sharp injuries was higher.

Table 4.2.2: Level of Knowledge about Sharp Injuries among Respondents

Professional Category	**Frequency(f)**	**Percentage (%)**
Nurse	69	45.39
Physician Assistant	6	3.95
Midwife	21	13.82
Anesthetist	2	1.32
Medical Officer	1	0.66
Clinical Laboratory Technician	23	15.13
Clinical care assistant	30	19.74
Total	**152**	**100**

4.4. Determinants of Sharp Injuries among Respondents

Tables 4.2.3a and 4.2.3b summarize the determinants of sharp injuries among respondents of the study. Results obtained from the Chi-squared, Pearson's and Fisher's exact test analyses in this study showed no association. The Fisher's exact test analyses regarding healthcare and safety information access, workplace supervision, health safety and training, working department, availability of disposable facilities, presence of safety guidelines as well as use of PPE did not show any relationship with sharp injuries among clinical care workers in the study area, (all the p values measured > 0.05) as shown in Table 4.2.3a and 4.2.3b. Again, Pearson's Chi-squared analyses for alcohol consumption, cigarette smoking, sleeping problems and job stress did not also show any association (all p values measured > 0.05), as shown in Table 4.2.3a and 4.2.3b.

Table 4.2.3a: Determinants of Sharp Injuries among Respondents

Variable	Respondents with Sharp Injuries (N) = 152		$\chi 2$ (*P-value*)
	No (%)	Yes (%)	
Healthcare and Safety			0.0375 (0.738)**
Information Access			
Yes	114(75.00)	20(13.16)	
No	15(9.87)	3(1.97)	
Workplace Supervision			0.0003 (1.000)**
Yes	112(73.68)	20(13.16)	
No	17(11.18)	3(1.97)	
Health Safety and			0.5928 (0.492)**
Training			
Yes	114(75.00)	19(12.50)	
No	15(9.87)	4(2.63)	
Working Department			9.0887 (0.225)**
Emergency	27(17.76)	3(1.97)	
Pediatric	13(8.55)	0.(0.00)	
Maternity	22(14.47)	9(5.92)	
Theatre	18(11.84)	4(2.63)	
General word	21(13.82)	2(1.32)	
Laboratory	25(16.45)	5(3.29)	
OPD	3(1.97)	0(0.00)	
Availability of			0.0455 (1.000)**
Disposable Facilities			
Yes	122(80.26)	22(14.47)	
No	7(4.61)	1(0.66)	

Note: PPE = Personal Protective Equipment; ** = Fisher's Exact Test

Table 4.2.3b: Determinants of Sharp Injuries among Respondents

Variable	Respondents with Sharp Injuries (N) = 152		$\chi 2$ (*P-value*)
	No (%)	Yes (%)	
Sleeping Problems			0.0086 (1.000)**
Yes			
No	117(76.97)	21(13.82)	
	12(7.89)	2(1.32)	
Alcohol Consumption			1.1271 (0.288)
Yes	77(50.66)	11(7.24)	
No	52(34.21)	12(7.89)	
Cigarette Smoking			2.1827 (0.140)
Yes	72(47.37)	9(5.92)	
No	57(37.50)	14(9.21)	
Presence of Safety			3.9145 (0.048)
Guidelines	79(51.97)	9(5.92)	
Yes	50(32.89)	14(9.21)	
No			
Job Stress			0.6898 (0.406)
Yes	105(69.08)	17(11.18)	
No	24(15.79)	6(3.95)	
Use of PPE			1.0984 (0.468)**
Yes	114(75.00)	22(14.47)	
No	15(9.87)	1(0.66)	

Note: PPE = Personal Protective Equipment; ** = Fisher's Exact Test

4.5. Knowledge about Sharp Injuries among Clinical Care Workers

Knowledge about sharp injuries has been associated with factors that contribute to sharp injuries among healthcare workers in other studies. On the contrary, results from the Fisher's exact test statistic in this study indicated no association. The Fisher's exact test analyses for appropriate use of sharps, awareness of diseases transmitted by sharps, management of injuries, reporting injuries and use of protocol (all p values measured > 0.05), (Table 4.2.4).

Table 4.2.4: Knowledge about Sharp Injuries among Clinical Care Workers

Variable	**Respondents with Sharp Injuries (N) = 152**		**$\chi 2$ (*P-value*)**
	No (%)	**Yes (%)**	
Appropriate use of sharps			1.9187 (0.281)**
Yes	128(84.21)	22(14.47)	
No	1(0.66)	1(0.66)	
Awareness of Diseases Transmitted by Sharps			
Yes	127(83.55)	22(14.47)	0.7895 (0.391)**
No	2(1.32)	1(0.66)	
Management of Injuries			1.0321 (0.286)**
Yes	124(81.26)	21(13.82)	
No	5(3.29)	2(1.32)	
Reporting Injuries			0.3745 (0.0.626)**
Yes	122(80.26)	21(13.82)	
No	7(4.61)	2(1.32)	
Use of Protocol			0.0041 (1.000)**
Yes	123(80.92)	22(14.47)	
No	6(3.95)	1(0.66)	

Note: ** = Fisher's Exact Test

4.6. Regression of Determinants about Sharp Injuries among Respondents

A simple logistic regression analysis for the determinants of sharp injuries among clinical care workers in this study shows that healthcare and safety information access (OR = 1.140, 95% CI: 0.302 – 4.299), workplace supervision (OR = 0.988, 95% CI: 0.265 – 0.854), working department (OR = 1.037, 95% CI: 0.812 – 1.324), availability of disposable facilities (OR = 0.792, 95% CI: 0.093 – 6.760), presence of safety guidelines (0.929, 95% CI: 0.194 – 4.452), alcohol consumption (OR = 1.615, 95% CI: 0.663 – 3.936), sleeping disturbance problems (OR = 2.456, 95% CI: 0.990 – 6.1001), job stress (OR = 2.456, 95% CI: 0.551 – 4.329 and use of PPE (OR = 0.345, 95% CI: 0.043 – 2.715) respectively have no association with sharp injuries as indicated in Table 4.2.5.

Table 4.2.5: Regression of Determinants about Sharp Injuries among Respondents

Variable	Odds Ratio	P - Value	95% CI
Healthcare and Safety Information Access	1.140	0.847	0.302 – 4.299
Workplace Supervision	0.988	0.986	0.265 – 0.854
Working Department	1.037	0.773	0.812 – 1.324
Availability of Disposable Facilities	0.792	0.831	0.093 – 6.760
Presence of Safety Guidelines	0.929	0.926	0.194 – 4.452
Alcohol Consumption	1.615	0.291	0.663 – 3.936
Sleeping Problems	2.456	0.053	0.990 – 6.1001
Job Stress	1.544	0.409	0.551 – 4.329
Use of PPE	0.345	0.315	0.043 – 2.715

Note: PPE = Personal Protective Equipment; CI = Confidence Interval

4.7. Regression of Workplace Variables on Knowledge of Respondents about Sharp Injuries

A simple logistic regression analysis on knowledge of respondents about sharp injuries revealed that appropriate use of sharp (OR = 5.818, 95% CI: 0.351 – 96.492), awareness of diseases transmitted by sharps (OR = 2. 886, 95% CI: 0.430 – 12.978), management of injuries (OR = 2.362, 95% CI: 0.430 – 12.978), reporting injuries (OR = 1.660, 95% CI: 0.323 – 8.542), and use of protocols (OR = 0.932, 95% CI: 0.107 – 8.121) respectively did not show any association (Table 4.2.6)

Table 4.2.6: Regression of Workplace Variables on Knowledge of Respondents about Sharp Injuries

Variable	Odds Ratio	P -Value	95% CI
Workplace supervision	5.818	0.219	0.351 – 96.492
Health safety and training	2. 886	0.395	0.251 – 33.207
Job stress	2.362	0.323	0.430 – 12.978
Sleeping problems	1.660	0.544	0.323 – 8.542
Use of protocols	0.932	0.949	0.107 – 8.121

CHAPTER FIVE

5.0. DISCUSSION

5.1. Introduction

The aim of the study described in this dissertation was to assess the determinants of sharp injuries in the Kintampo Municipal Hospital (KMH) of the Brong Ahafo Region of Ghana. Kintampo Municipal Hospital is located near a major highway characterized by a high incidence of road traffic accidents regularly. On account of the large numbers of accident cases that the hospital receives regularly, the clinical care staff are often exposed to high levels of work pressure which adversely affects their performance. Also as a result of work pressure, the clinical care staff are exposed to sharps injuries, however, very few of such cases were reported. Furthermore, there was limited data on the factors contributing to the occurrence of sharp injuries among clinical care workers of the KMH. To provide a reliable baseline data necessary for institution of measures for addressing these problems, therefore, this study was conducted to assess the determinants of sharps injuries among clinical care workers of the KMH in the Brong Ahafo Region, of Ghana.

Assessing the determinants of sharp injuries among health workers would provide a baseline data necessary for formulation of policy to prevent and/ or control sharp injuries among clinical care workers in the KMH. Also, conduct of this study would generate the critical information required to create awareness of hazards that are associated with the use of sharp instruments and the necessary precautionary measures that must be observed in order to minimize the adverse effects of such occupational hazards on their health, the burden on their families and the nation as a whole. Finally, assessment of determinants of

sharp injuries among clinical care workers in the KMH would augment scientific knowledge that is currently available on the subject area.

5.2. Socio-Demographic Characteristics of Study Participants

The study revealed that participants of ages between 20-29 years old constituted the highest proportion of the clinical care staff who were recruited into the study. Since, these results agree with findings of a similar study by El-hay, 2015, in Ethiopia, which indicated that majority of the clinical care staff were of ages between 20 and 30 years, it highlights the importance of the need to institute measures aimed at minimizing sharps injuries among healthcare staff. This is because staff in this age category constitutes the youth who are strong and energetic and do the lifting of patients who are incapacitated and cannot walk by themselves. Since sharps injuries in healthcare facilities lead to infection of clinical care staff with pathogens of dangerous diseases which if not diagnosed and treated promptly could lead to death (Aderaw et al., 2011), exposure of this age category of clinical staff could lead to deprivation of healthcare facilities of emergency care service staff.

5.3. Proportion of Clinical care Workers with Sharp Injuries

The results of this study show that 23(15.13%) of the 152 clinical care staff recruited into the study had sustained sharps' injuries in the course of work. Also, according to the results, the highest proportion of the 152 clinical care staff recruited into the study comprised nurses and therefore constituted the majority of those who had sustained sharp injuries. These observations are probably because, due to the nature of their job

specifications, nurses constitute the largest category of staff of any healthcare institution known. Since the sample size must have accurate representations of the various categories of individuals in the total sample population in their relative proportions, it was not surprising that they constituted the highest category of clinical staff recruited into the study.

In addition, the fact that more nurses (5.26%) than the other clinical care staff had sustained sharp injuries confirms the reports from other studies (Aderaw, 2013; Bekele et al., 2015b; Janjua et al., 2010; Voide et al., 2012) that nurses are at the highest risk of sharps injuries in the healthcare sector. In view of this, considering that nurses are the first point of call in the healthcare delivery system, this observation comes to intensify the fact that additional efforts are required to eliminate sharps injuries from the healthcare sector since death of any nurse could have a ripple effect on several hundreds of patients visiting the affected health facility.

5.4. Knowledge About Sharp Injuries Among Clinical Care Workers

According to Khushdil et al., (2013), sharps injuries are considered to be the single most serious occupational hazards threatening clinical care workers. Needle stick and sharp injuries are very common incidents/events among clinical care providers, such injuries increase the risk of infections with blood-borne pathogens (BBPs) like HIV, Hepatitis B Virus (HBV), or Hepatitis C Virus (HCV), which are serious threats to their wellbeing or even to their lives. Epidemiological data on needle stick and sharp injuries, including factors associated with occupational transmission of blood-borne pathogens, are essential

for targeting, implementing, and evaluating interventions at the local and national levels. More than 80% of needle stick injuries are avoidable with the use of correct precautionary measures (Zaidiet al., 2010), however, lack of knowledge of this may lead to occurrence of sharp injuries among clinical care workers.

Also, according to (Khraisat & Juni, 2014), factors that increase the risk of needle stick injuries among clinical care workers inside hospital facilities include recapping of needles after use, neglecting to use needle-disposing containers, job stress, lack of experience, and emotional distress, however, lack of adequate training could lead to such injuries among clinical care workers.

The findings of this study agrees with the findings of Zafar et al., (2009) which indicate that adequate and regular training of clinical care workers on health and safety practices contribute greatly to the reduction and prevention of SIs since such universal precautionary measure become a routine practice among health care providers.

In addition, a study conducted by Azadi et al., (2011) reported that 68% of the nurses who encountered SIs in the past year, was because they had less than five years of working experience (P = 0.02), as level of knowledge increases with number of years of experience.

Furthermore, a chi-squired test of significance indicated that there was statistical association between level of knowledge and training on safety precautionary measures on one hand, and the occurrence of sharps' injuries on the other hand, among the staff ($P < 0.05$). Therefore, the fact that knowledge and training among the staff did not transcend into prevention of injury, suggests that probably, they were not complying with known safety measures, or that there were other factors that contributed to the occurrence of injuries among the staff.

5.5. Determinants of Sharps Injuries among Clinical Staff

Work place and worker behavioural determinants have been shown to be associated with factors that contribute to sharp injuries among health care workers. According to Khushdil et al (2013), sharps injuries are considered to be the single most serious occupational hazards threatening clinical care workers. Needle stick and sharp injuries are very common to happen among clinical care providers, such injuries increase the risk of infections with blood-borne pathogens (BBPs) like HIV, Hepatitis B Virus (HBV), or Hepatitis C Virus (HCV), which are serious threats to their wellbeing or even to their lives.

Apart from training and knowledge of safety precautionary measures, other factors such as level of experience, length of time of work in the clinical sector, marital status, availability and use of safety protocols and manuals, use of personal protective equipment (PPE), lack of adequate sleep, job stress and alcohol consumption have been reported to influence sustenance of sharps' injuries among healthcare staff (Azadi et al.;

2011; Khraisat and Juni, 2014; Aderaw et al., 2011 and Janjua et al., 2007a and b). According to this present study, even though a majority of the staff indicated that they had access to and use of safety protocols and manuals (90.79%), PPE (89.44%), had job stress (80.26%), sleeping difficulties (57.89%), consume alcohol (57.89%), none of these factors were significantly associated with sharps injuries among staff as reported by earlier writers (Azadi et al.; 2011; Khraisat and Juni, 2014; Aderaw et al., 2011and Janjua et al., 2007a and b), and therefore could not be considered as determinants of sharps injuries among clinical care staff of Kintampo Municipal Hospital.

Finally, years of experience in the clinical care sector has been reported to influence sharps injury among health care staff (Azadi et al.; 2011; Janjua et al., 2007a and b). In respect of this, healthcare staff with less than five years of experience, were reported to be at high risk of sharps injury (Azadi et al.; 2011; Janjua et al., 2007a and b). In view of the foregoing, the fact that majority (61.18%) of the clinical care staff who participated in this study have worked in this establishment for less than five (5) years, suggests that lack of adequate experience could be a contributing factor in the sustenance of injury among the clinical care staff of KMH.

5.6. Limitation of the Study

Perhaps the most essential limitation of the study was the self-reported nature of the data that was collected. The study was a facility-based study and only relied on reports by the participants. This could lead to reporting bias because of the possibility of reporting

behaviours that were socially desirable. In addition, recall bias could occur especially regarding reports on sharp injuries involving clinical care providers in the KMH.

Also, limiting the study to only the clinical care staff could also bias the study since needle stick and sharp injuries could also occur among other categories of workers in the clinical care facility such as the orderlies, morgue attendance, waste handlers and the kitchen staff. The clinical care staff used for the study included the following: medical officers, physician assistants, anaesthetists, general nurses, midwives, laboratory technicians, enrolled nurses and clinical care assistants. This was due to the fact that their routine activities as clinical care providers expose them more to experiencing needle stick and sharp injuries unlike the non-clinical staff working in the same facility.

CHAPTER SIX

6.0. CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

This study has shown that 23(15.13%) of the clinical care staff of the Kintampo Municipal Hospital had sustained sharps injuries. Also, this study has shown that years of experience below 5 years of service in the clinical sector could be a determinant of sharps injury among clinical care staff of the Kintampo Municipal Hospital.

In addition, the study has shown that even though high proportions of clinical care staff had adequate training and knowledge on safety precautionary measures, use of personal protective equipment, had job related stress and sleep disturbances, used safety protocols and manuals, consumed alcohol, were married and attained tertiary level of education such factors were not determinants of sharp injuries among the clinical care staff of Kintampo Municipal Hospital.

Finally, the fact that most of the determinants of sharp injuries in the healthcare sector could not be associated with the occurrence of sharps injuries among the clinical care staff of the Kintampo Municipal Hospital, suggests that further studies are required to validate this observation.

6.2. Recommendations

To reduce this problem of sharp injuries among health care workers:

1. Regular provision of information by Ministry of Health, Regional Health Directorate and various Nongovernmental Organizations on sharp injuries and safety should be strengthened at all levels through different means to health care workers.
2. The occupational health and safety unit should give special attention to all clinical health care professionals especially the health care assistants.
3. Workers with low level of knowledge on health safety and training become more victims of sharps injuries. Therefore special training should be given to these clinical care staff to increase their knowledge concerning sharp injuries.
4. Finally, the fact that most of the determinants of sharps injuries in the healthcare sector were not associated with the occurrence of sharps injuries among the clinical care staff of the Kintampo Municipal Hospital, further studies are required to validate this observation.

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APPENDIX A

RESEARCH TOPIC: DETERMINANTS OF SHARP INJURIES AMONG HEALTH WORKERS IN THE MUNICIPAL HOSPITAL, KINTAMPO.

CONSENT FORM FOR PARTICIPATION IN THE STUDY

Unit Number……

Dear Participant,

You have been selected to participate in this study titled "Determinants of Sharp Injuries among Clinical care Workers in the Municipal Hospital, Kintampo, Ghana". This study is being conducted by Mr. Hippolyt Kuubetersuur, a student of the University of Ghana, School of Public Health in partial fulfillment for the award of a Masters of Public Health degree.

Your participation in this study is voluntary and you are allowed to withdraw in the course of the study even after you have agreed to participate without any penalty. **If you have any questions about the study you are free to ask the following persons: Mr. Hippolyt Kuubetersuur (principal investigator) on 0208790193/0243128427 or Dr. Uri Selorm Markakpo on 0261598742 (supervisor, School of Public Health, Legon).**

You will be asked questions about yourself, your knowledge regarding sharp injuries and factors that contribute to sharp injuries. The study does not pose any risk except some questions that may be private. The information you provide will be treated totally confidential and will not be disclosed to anyone except for academic purpose. No response you give will be specifically identified with you but will be combined with the general responses of the entire population.

PARTICIPANT STATEMENT AND SIGNATURE

I hereby certify that I willingly agree to fully participate in the study on the topic "Determinants of Sharp Injuries among Clinical care Workers in the Municipal Hospital Kintampo. All my questions have been addressed satisfactorily.

I understand that I can freely withdraw myself from the study if I so desire at any given time.

Signature of Participant……...

Date ……

INVESTIGATOR STATEMENT AND SIGNATURE

I certify that the participant has been given enough time to read and study about the topic under study. All questions and concerns raised by the participant have been addressed.

Signature ……..

Date ……

APPENDIX B

QUESTIONNAIRE ON DETERMINANTS OF SHARP INJURIES AMONG CLINICAL CARE WORKERS IN THE MUNICIPAL HOSPITAL, KINTAMPO IN THE BRONG AHAFO REGION- GHANA.

Instruction: Kindly check [√] in the spaces provided where applicable

S/N	ITEM/QUESTION	RESPONSE	[√]
	SECTION A: SOCIO- DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS		
1	Age of respondent	20 – 29 30 – 39 40 – 49 50 and above	[ ] [ ] [ ] [ ]
2	Sex of respondent	Male Female	[ ] [ ]
3	Religion of respondent	Christian Muslim African Tradition None	[ ] [ ] [ ] [ ]
4	Ethnic group	Mo Bono Dagaaba Others	[ ] [ ] [ ] [ ]
5	Marital status	Married Single	[ ] [ ]

		Divorced Widowed	[ ] [ ]
6	Location/distance of residence from work	Very far Far Not far	[ ] [ ] [ ]
7	Education status	Secondary education Tertiary/post-secondary education	[ ] [ ]
8	Employment condition	Employment contract Temporary contract	[ ] [ ]
9	Work experience in years	5 years and below 6 years and above	[ ] [ ]
10	Professional category	Nurse Physician Assistant Midwife Anesthetist Medical Officer Clinical Laboratory Technician Clinical care Assistance	[ ] [ ] [ ] [ ] [ ] [ ] [ ]

	SECTION B – PROPORTION OF RESPONDENTS WITH SHARP INJURIES		
1	Have you ever experienced any sharp injury at work before?	Yes No	[ ] [ ]
1	**Professional Category**	Nurse Physician Assistant Midwife Anesthetist Medical Officer Clinical Laboratory Technician Clinical care Assistance	[ ] [ ] [ ] [ ] [ ] [ ] [ ]
	SECTION C - WORK ENVIRONMENT DETERMINANTS		
1	Clinical care and safety information access	Yes No	[ ] [ ]
2	Work place supervision	Yes No	[ ] [ ]
3	Clinical care and safety training	Yes No	[ ] [ ]
4	Working department	Emergency unit	[ ]

		Pediatric ward	[ ]
		Maternity ward	[ ]
		Operation theatre unit	[ ]
		Medical ward	[ ]
		Surgical ward	[ ]
		Laboratory	[ ]
5	Availability of disposable facilities	Yes	[ ]
		No	[ ]
6	Presence of safety guidelines	Yes	[ ]
		No	[ ]
	SECTION D – KNOWLEDGE ON DETERMINANATS OF SIs		
1	Alcohol consumption can contribute to SIs	1	[ ]
		2	[ ]
		3	[ ]
		4	[ ]
		5	[ ]
2	Workplace supervision can reduce SIs	1	[ ]
		2	[ ]
		3	[ ]
		4	[ ]
		5	[ ]
3	Healthcare and safety	1	[ ]

	information access can reduce SIs	2 3 4 5	[ ] [ ] [ ] [ ]
4	Cigarette smoking can lead to SIs	1 2 3 4 5	[ ] [ ] [ ] [ ] [ ]
5	Sleeping problems can lead to SIs	1 2 3 4 5	[ ] [ ] [ ] [ ] [ ]
6	Job stress can cause SIs	1 2 3 4 5	[ ] [ ] [ ] [ ] [ ]
7	Failure to use of personal protective equipment can lead to SIs	1 2 3 4 5	[ ] [ ] [ ] [ ] [ ]
8	Presence of safety guidelines and manuals can reduce SIs	1 2 3 4 5	[ ] [ ] [ ] [ ] [ ]
9	Availability of disposable facilities can reduce SIs	1 2	[ ] [ ]

		3 4 5	[ ] [ ] [ ]