SCHOOL OF PUBLIC HEALTH
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA

ASSESSMENT OF OCCUPATIONAL HEALTH AND SAFETY STATUS OF CENTRAL TONGU DISTRICT HOSPITAL, ADIDOME.

BY

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Declaration

I, Isaac Kwabla Agbenyezi, declare that apart from other people's investigations, which have been duly acknowledged, this dissertation is the result of my own original research undertaken under supervision, and that this dissertation, either in whole or in part has not been presented for the award of any degree in any institution.

…….…...…….	**……**
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Dr. Judith Stephens	**Date**
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Dedication

This dissertation is dedicated to the glory of God Almighty and to my ever-supportive, Agbenyezi and Hormeku families of Yegbekope and Dorveme respectively, in the Keta Municipality of the Volta Region.

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To God be the glory, I am so grateful to Him. I am sincerely grateful to my supervisor, Dr. Judith Stephens for her constructive guidance. I also appreciate the inspirations I received from Prof. Julius Fobil (HOD, BEOHS), Dr. John Arko-Mensah (M.Sc. Occupational Health Programme Co-Ordinator) and Ms. Jane Oppong (Administrative Assistant-BEOHS) throughout my study.

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Abstract

Background: Healthcare workers are exposed to myriads of occupational health and safety hazards in the course of work. These hazards arise from many sources and include; biological agents, chemical agents, ergonomic, physical and psychosocial factors in the health facilities. The impact of poor occupational health and safety is felt not just by affected healthcare workers, but also by the patients receiving care in their facilities.

The main determinants of occupational health and safety studied include; safety management, safety training, hazards and controls. This study assessed the state of occupational health and safety in the Central Tongu District Hospital by assessing the level of knowledge of safety management, safety training, hazards and controls in the hospital.

Method: Descriptive cross-sectional study was conducted among 155 healthcare workers who were purposively and randomly sampled. The functional and operational management systems for this study were the Occupational Health and Safety Policy and Guidelines for the health sector MOH/GHS, (2010) and the safety and health management system: a roadmap for hospitals OSHA, (2013) respectively. Data were analyzed with STATA version 15; descriptive statistics, chi-square and logistic regression were computed.

Analyses: Results indicated that the level of knowledge of safety management is medium, proportion of healthcare workers who had training in OHS was 61% (95/155, $p<0.001$), the exposure to hazards ranged from, chemical hazards 58% (90/155, $p<0.001$) to Biological hazards 91% (141/155, $p=0.055$). The use of controls also ranged from, hand hygiene 27% (42/155, $p=0.002$) to PPE use 86% (134/155, $p=0.001$).

Conclusion: The study underscored the need for management to improve upon its safety leadership and commitment roles and to step up efforts to enhance safety training in the hospital in compliance with the MOH/GHS (2010) OHS policy. It finally emphasized the hazard-prone nature of the hospital and the controls in use in the hospital. The state of OHS was assessed to be medium.

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List of abbreviations

BCG:	Baciile Calmette Guerin
BEOHS:	Biological, Environmental and Occupational Health Sciences
CHPS:	Community Health Planning Services
CI:	Confidence Interval
CTD:	Central Tongu District
CTDA:	Central Tongu District Assembly
CTDH:	Central Tongu District Hospital
DCE:	District Chief Executive
DDHS:	District Directors of Health Services
DHD:	District Health Directorate
ERC:	Ethical Review Committee
EU-OSHA:	European Union – Occupational Safety and Health Administration
HAZCOM:	Hazard Communication
HCW:	Healthcare Worker
HIV/AIDS:	Human Immuno-Deficiency Virus / Acquired Immuno-Deficiency Syndrome
HOD:	Head of Department
HSA:	Health and Safety Authorities
HSE:	Health and Safety Executives
MOH/GHS:	Ministry of Health / Ghana Health Service
OHS:	Occupational Health and Safety
OPD:	Out-Patients' Department
OSHA:	Occupational Safety and Health Administration
PPE:	Personal Protective Equipment
PPE:	Personal Protective Equipment
US:	United States

CHAPTER ONE

INTRODUCTION

1.1 Background

Occupational health and safety (OHS) cover essentially the health, safety and welfare of workers in the workplace. Exposure to infectious and chemical agents, manual handling of patients and materials, slips, trips, falls, and occupational violence are common hazards in hospitals hence the need for OHS. The fact that the impact of poor OHS affects the worker and patients being treated makes OHS of healthcare workers more critical (HSA, 2010).

"Occupational health should aim at: 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 worker in an occupational environment adapted to his physiological and psychological capabilities; and, to summarize: the adaptation of work to man and of each man to his job" (International Commission on Occupational Health, 2012).

Employers or representatives have the responsibility of ensuring that the working environment is safe and healthy for workers, by putting measures in place to prevent and protect workers from the risk of imminent hazards in the work (Alli, 2008).

The global Healthcare Workforce is about 35million people, representing 12% of the working population (Goniewicz et al., 2012). Healthcare workers (HCWs) face several hazards in their workplaces, which are mainly the health facilities and communities

(Ndejjo et al., 2015). The main hazards HCWs are exposed to can be categorized as infection, accident, radiation, exposure to noxious chemicals, drug addiction and psychological problems; and assault (Gestal, 1987).

Occupational injuries and illnesses can increase your hospital's workers' compensation insurance costs, disrupt staffing and workflow, lead to the early exit of experienced staff, and damage workplace morale. There is also growing recognition that the systemic issues that lead to hospital worker injuries and illnesses can compromise patient safety as well (Asumeng et al., 2015).

The prevalence of hazards in the health facilities and the consequences thereof, make it necessary to carry out this study to assess the state of OHS of the Central Tongu District Hospital, Adidome for appropriate measures to be put in place to improve upon the wellbeing of healthcare workers.

1.2 Problem statement

United States hospitals recorded 253,700 work-related injuries and illnesses in 2011, which computes to a rate of 6.8 work-related injuries and illnesses for every 100 full-time employees (OSHA, 2013). Sub-Saharan Africa experience 21 fatality rate per 100,000 workers, 16,000 accident rate, 54,000 workers die each year and 42million work-related accidents take place each year. The real cost of these incidents at the enterprise, national and global levels is high (Alli, 2008). In Ghana, many injuries, illnesses, property damages and process losses occur at various work environments including health facilities but they are underreported or misclassified as a result of lack of comprehensive standards and or ignorance of the existing guidelines and lack of

awareness of most workers of such incidents and their real or probable consequences (Asumeng et al., 2015).

The healthcare workers' general task involves daily contact with patients, permanent contact with diseases and the dead, the use of specific techniques or procedures and chemicals which exposes them to several occupational diseases and injuries (Hryhorczuk et al., 2004).

Health care workers are known to be at a higher risk of infection from blood-borne pathogens than the general population (MOH/GHS, 2010). The most important resource in the delivery of care to patients is the health worker. Employers are required to take all steps as far as reasonably practicable to create safe and healthy working environment, for the healthcare worker, as required by Article 24 of the 1992 Constitution of the Republic of Ghana and section 118 of the Labour Act (Act 651) 2003, (MOH/GHS, 2010). This study assessed the state of occupational health and safety in the Central Tongu District Hospital, Adidome, in line with the requirements of the OHS policy of the MOH/GHS and other international safety standards.

1.3 Justification

The findings of this study closely described the OHS status of health facilities in the Central Tongu District. This is necessary to inform decisions on measures to put in place to promote the implementation of the Ghana Health Service OHS policy and continuous improvement in OHS in the health sector, for the welfare of the healthcare workers. The findings are important to the Ministry of Health/Ghana Health Service regarding taking steps to support the implementation of the OHS laws and standards in

the health sector. The findings of this study also contribute to the knowledge base of academia.

1.4 Research questions

1. What is the level of knowledge of OHS management in the departments of the Central Tongu District hospital?
2. What proportion of the healthcare workers has been trained in occupational health and safety?
3. What is the rate of exposure to OHS hazards in the departments of the Central Tongu District Hospital?
4. What methods of hazard control measures are used in the departments of the Central Tongu District hospital?

1.5 General objectives

To determine the state of occupational health and safety in the Central Tongu District Hospital, Adidome.

1.6 Specific objectives

1. To assess the level of knowledge of OHS management in the departments of the Central Tongu District Hospital.
2. To determine the proportion of healthcare workers who have been trained in OHS in the departments of the Central Tongu District Hospital.
3. To determine the prevalence of occupational health hazards in the departments of the Central Tongu District Hospital.
4. To assess the methods used for the control of hazards in the departments of the Central Tongu District Hospital.

1.7 Conceptual framework

This framework explains the interactions between the dependent variable; OHS status and the independent variables; OHS management, OHS training, hazards and control measures in the hospital. Occupational Health and Safety training ensure that those in management are well-informed about the importance of OHS to the achievement of set objectives of the hospital. This influence management safety decisions, commitment, leadership and involvement in safety issues, which influence essentially, the state of OHS in the hospital. Safety training promotes informed staff who are alert about issues of safety at work. This also influences the state of OHS in the hospital. Occupational health and safety training again sharpen the skills of workers in identifying hazards relating to every activity/task involved in their work. The ability of the health care workers to identify hazards associated with their duties make the healthcare worker so sensitive to them. Relatedly, safety training informs the workforce and enable them to promptly use available control measures to prevent or reduce the harm associated with the hazard. This also influences the state of OHS in the hospital (Figure 1.1).

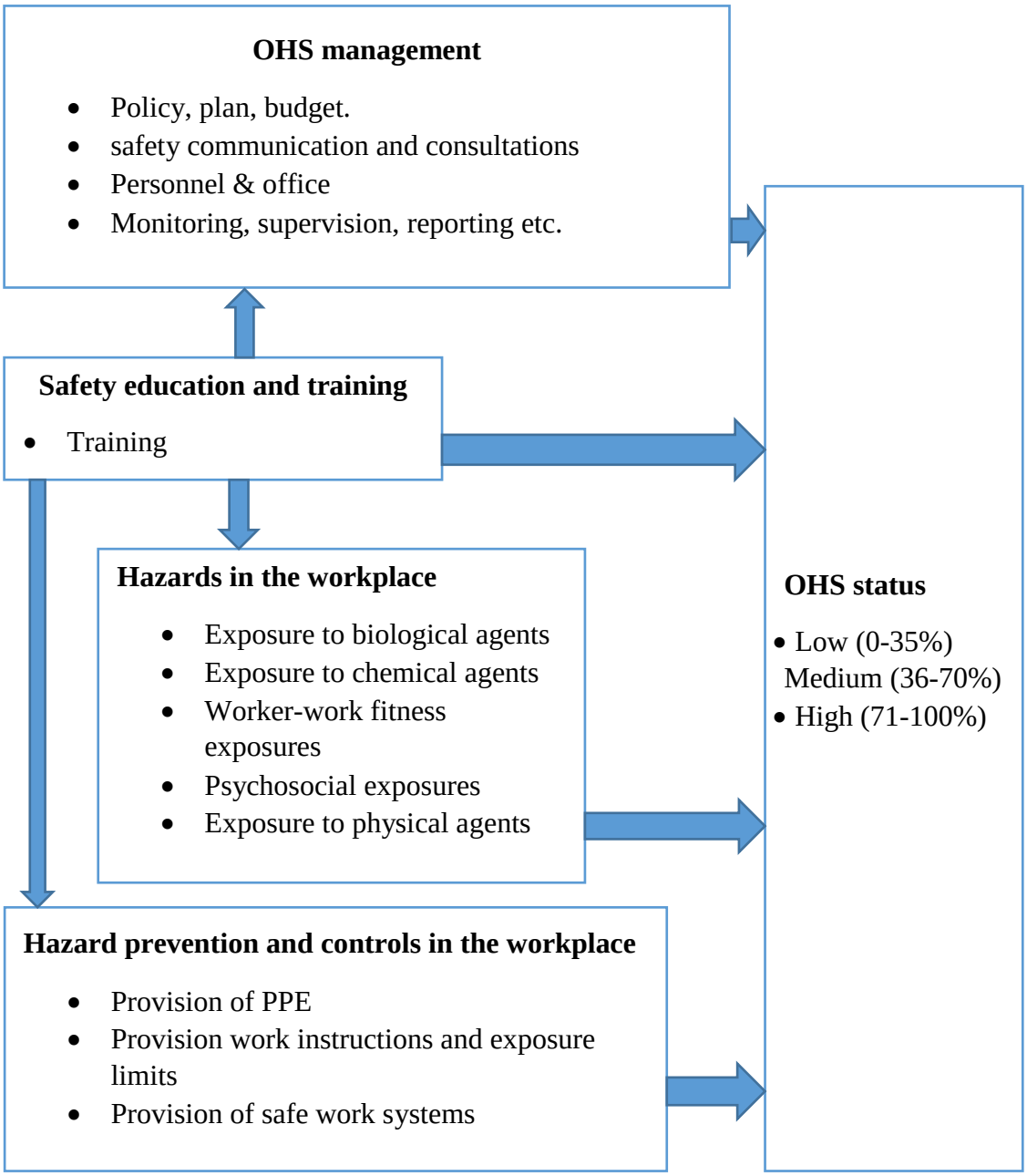


Figure 1.1: Conceptual framework for assessing OHS status of the Central Tongu District Hospital, Adidome

CHAPTER TWO

LITERATURE REVIEW

2.1 Occupational health and safety management

It is the legal and moral duty of employers to ensure the protection of workers' health and safety which can be achieved with management leadership in safety and health. Management can prevent safety and health risk by showing effective and strong leadership, involving workers and their constructive engagement, ongoing assessment and review (EU-OSHA, 2012).

Top management shall define and authorize the organization's OHS policy and ensure that the policy is appropriate to the nature and scale of its risks. This includes a commitment to prevention of injuries and ill health and continual improvement of OHS management and performance, commitment to comply with applicable legal requirements, documentation, implementation and maintenance, communication and periodic reviews (NQA, 2009). There is the need for a qualified personnel for OHS in hospitals to promote OHS practices in the healthcare facility (Manyele et al., 2008).

Senior management explicit commitment to providing safe and healthy workplace for employees is necessary for improving the safety and wellbeing of workers. This is exhibited through visible management leadership in promoting adherence to safety requirements in the workplace, involvement of workers in regular workplace hazard assessment, review of safety standards and enforcement of compliance with hazard control measures (Asumeng et al., 2015).

Employers are expected to establish, implement and maintain effective workplace violence prevention plan that is in use at all times in every unit, service, and operation.

This plan should include provisions on obtaining help from facility security or law enforcement agencies, the configuration of facility spaces so that employee access to doors and alarm systems are not impeded and train employees on the plan and its implementation (Butera, 2016).

Consultation for the promotion of occupational health and safety in health facilities covers areas of; developing policies, developing procedures and action plans for identifying, assessing, and controlling hazards; reviewing accident statistics; solving of OHS problems; discussions on major occupational health and safety issues; and procedures and methods for sharing relevant health and safety information which relates to work (MOH/GHS, 2010). Also, MOH/GHS, (2010) recommended a wide dissemination of OHS policy and the provision of copies to all staff at post including new staff who join the service. In addition, MOH/GHS, (2010) mentioned that every facility or institution in the Ghana Health service is required to have an OHS plan that shall spell out the procedures for hazard identification, evaluation and control by staff in the health facilities.

Employees are also expected to carry out their work in a safe manner and to keep themselves fit for work and meet established standard for job performance and conduct. Employees are required to avoid the use of alcohol and or hard drugs that puts their lives and that of other workers at risk (MOH/GHS, 2010). Workers have the duty of care for their personal safety and the safety of any other person who might be affected by the workers' actions and inactions. Workers therefore have the right to stop any work that presents imminent danger to safety and health. Workers are also required to work together with employer and management to promote occupational health and safety in the workplace (Alli, 2008).

2.2 Training in occupational health and safety

The employer needs to have the knowledge and experience of the work activities and potential hazards in order to prepare a safety statement for their workplaces (HSA, 2010). Training as a necessary tool that increases worker knowledge of job hazards, and effect safer work practices and other positive actions in a wide array of worksites (Okafoagu et al., 2017).

Door-to-door, Posters, Internet, Radio, Journals and Guidelines, Seminar/Workshop, Leaflets, Supervisor, Meeting, Training, Newsletters and Television as sources of information of OHS of health workers which inform their knowledge (Manyele et al, 2008). Safety education and training on all universal precautions, safety tools, equipment (for instance, appendix 6), and machinery, training on how to wash hands, personal set of personal protective equipment, separate areas and containers to dispose of medical waste are relevant to OHS promotion in the workplace (Ndejjo et al., 2015).

Managers of all facilities are required to develop a list of priorities that shall include specialist training in occupational health as well as occupational health services for their staff. Managers are also required to make budgetary allocations towards staff training, setting up of health and safety committees and acquisition of the necessary tools for a well-organized implementation of OHS services on a continuous basis (MOH/GHS, 2010). Occupational safety and health training is a technical aspect of workers activities and responsibilities and should be a fundamental element in the OHS policy and should be held for workers and worker representatives (Alli, 2008).

Induction training is required to be conducted for new staff within two (2) weeks of engagement and should include workplace standards information, risks and hazards, controls, use of PPE, the system of reporting accidents and what to do in an emergency.

There should also be training for staff with designated roles and responsibilities; including Safety Coordinators and Representatives, Health and Safety Committee members, Emergency Wardens and First-Aiders (MOH/GHS, 2010).

Safety climate in the hospital includes management participation in safety programmes, high status and rank for safety officers, strong safety training and safety communications programmes, orderly plant operations, good housekeeping and an emphasis on recognition for safe performance rather than reliance on punishment and enforcement (Grosch et al., 2000). It is necessary that employers and workers initiate positive action to conduct training and information programmes aimed at preventing potential occupational hazards, and controlling and protecting against existing risks in the working environment (Alli, 2008).

Staff who handle healthcare waste should be trained to deal with injuries and exposures in the area of immediate first-aid measures, reporting incidents immediately to a designated responsible person, retention, if possible, of the item involved in the incident; details of its source for identification of possible infection, recording of the incident, investigation of the incident, and identification and implementation of remedial action to prevent similar incidents in the future (Caselli, 2010).

Training is among the most essential tasks performed by employers to promote workplace safety. Training builds the ability of workers to know how to do their jobs and how to protect lives whiles working. It is, therefore, the responsibility of managers and supervisors to ensure that the workforce is given the needed training for their daily work activities. Information on the safety and health aspects of the work and ways to

prevent or minimize exposure to hazards are the relevant areas necessary for this training (Alli, 2008).

2.3 Hazards, prevention and controls

The use of "one system" of identification, assessment and control of hazards should be applied uniformly in the MOH/GHS facilities within the service to avoid all confusions in the management of occupational hazards and risks (MOH/GHS, 2010).

BCG vaccination, hepatitis A vaccination, hepatitis B vaccination, provision of post-exposure prophylaxis, receipt of post-exposure prophylaxis, receipt of HIV screening examination, hand washing; after handling soiled materials, when hands are evidently dirty, before and after meals, after using the toilet, after removing gloves, before and after every procedure, before and after handling each patient, after handling biological samples, before and after handling hazardous materials are control measures in the health facilities against hazards (Ndejjo et al., 2015).

Strong cooperation between the heads of the health units, the nurses and all other workers, including the cleaning personnel, is a means to attain "zero accident" conditions in all hospital units (Caillard, 1993). The biological hazards healthcare workers are exposed to in the discharge of their duties include sharps-related injuries, infection from patients, cuts and wounds, airborne diseases, direct contact with the contaminated specimen and bloodborne pathogens (Osungbemiro et al., 2016).

Hospitals, laboratories, emergency response, nursing homes and outdoor occupations expose workers to biological hazards which arise from exposure to blood and other body fluids, fungi/mold, bacteria and viruses, plants, insect bites, animals and bird droppings (Asumeng et al., 2015).

Biological hazards are most common in the operating theatres, acute medicine, intensive care units, emergency and ambulance services, dialysis, laboratories, geriatrics, especially where there is exposure to blood and blood products, potentially hazardous devices and instruments, or handling of aggressive patients, pathology, anatomy and forensic medicine, blood and plasma donor banks and centres (Directorate-General for Employment Social Affars and Inclusion, 2011).

Heat, noise, vibration, lasers, x-ray and other forms of radiation, violent patients, visitors, residents, staff or clients, disinfectants, antiseptics, lab chemicals, detergents, cleaners and anaesthetic gases, some drugs, lifting and transferring patients, residents and clients, repetitive movement, postures, physical, emotional and mental abuse and high workload as hazards in the healthcare workplace (Public Services Health & Safety Association, 2013).

Physical hazards that healthcare workers are exposed to include radiation (electromagnetic fields, microwaves, radio waves), high exposure to ultraviolet rays, temperature extremes, constant loud noise, poor lighting, poor ventilation, faulty electrical wiring and bare electrical cables (Asumeng et al., 2015).

Psychosocial hazards are also present in the hospital environments and stress is best known as a psychosocial hazard. These hazards are associated with rotating shift work, heavy workload, lack of autonomy/control, and poor supervision and have been linked to worker ill health and an increased risk of workplace injuries (Grosch et al., 2000).

Psychosocial hazards at workplaces arise from workload demands, workplace violence, intensity and or pace of work, lack of respect for employees, work flexibility, individual

control or say about issues at work, social supports, sexual harassment and bullying which results in stress or strain among the workers (Asumeng et al., 2015).

The protective clothing used for healthcare waste management process depends on the risk associated with the health-care waste. It is necessary to use helmets, with or without visors, face masks, eye protectors (safety goggles), overalls (coveralls), industrial aprons, leg protectors and/or industrial boots, disposable gloves (medical staff) or heavy-duty gloves (waste workers) in the hospital (Caselli, 2010).

Once a hazard is identified and the risk determined, measures to control the harm should be considered in terms of the possibility of eliminating the hazard or reducing risk to reduce the chances of harm. It is necessary to try less risky controls, try to limit access to the hazard, package work to lessen exposure or use PPE. Controls, however, should not introduce new hazards (MOH/GHS, 2010).

Hospitals that use cytotoxic products, should have specific guidelines on their safe handling and established protection for the healthcare workers at risk. These guidelines should include rules on waste handling procedures, separate collection of waste in leak-proof bags or containers, labelling for identification (Appendix 7), return of outdated drugs to suppliers, safe storage separately from other healthcare waste, disposal of contaminated material, treatment of spillages and treatment of infectious waste contaminated with cytotoxic products (Caselli, 2010).

Ergonomic hazards in workplaces results from improperly adjusted workstations, frequent lifting, awkward posture, repetitive actions, frequent excessive force exertion and vibrations. Sources of chemical hazards in workplaces also include; paints, acids, solvents-especially if chemicals containers are not labelled or not labelled

appropriately, vapours, fumes from welding or solvents, gases like acetylene, propane, carbon monoxide, flammable materials like gasoline, solvents and explosive chemicals and pesticides (Asumeng et al., 2015).

Most common hazards that exist in hospitals include, exposures to infectious and chemical agents, lifting and repetitive tasks, slips, trips, and falls, occupational violence and risks associated with the poor design of the workspace. These can lead to infections such as hepatitis, musculoskeletal injuries, stress and serious injuries such as fractures from exposure to occupational violence, acute traumatic injury and even death (HSA, 2010).

Engineering controls to hazards comprises of proper design and maintenance of facilities that aims at minimizing hazard exposures in the work environment. Administrative controls also comprise of policies and procedures that establish expectations of safety performance, codes of practice, staff placement, required orientation, education and training, work schedules, occupational programmes and good communication of safety expectations and requirements (Asumeng et al., 2015). Gloves, mask or respirators and goggle or face shield are personal protection equipment often used in conjunction with engineering and administrative controls to provide protection for workers (Asumeng et al., 2015).

CHAPTER THREE

METHODOLOGY

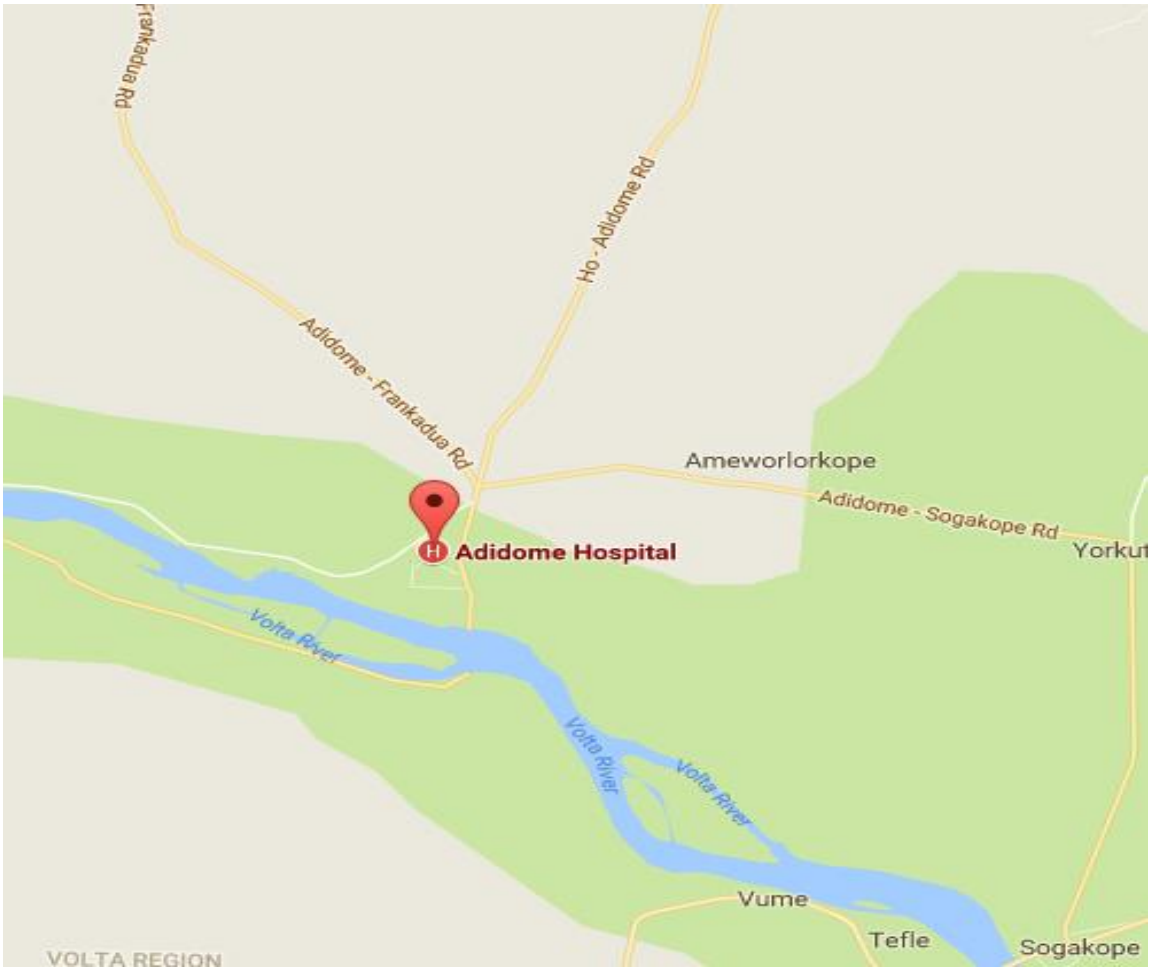
3.1 Study design

This was a descriptive cross-sectional study and involved the use of a structured questionnaire to collect data from management and staff of the Central Tongu District Hospital, who were purposively and randomly sampled respectively. The data were coded, entered into STATA version 15 and analyzed quantitatively. The functional management system for this study was the Occupational Health and Safety Policy and Guidelines for the health sector (MOH/GHS, 2010). The study also adopted the safety and health management system: a roadmap for hospitals (OSHA, 2013).

3.2 Study location

The Central Tongu District was carved out of the former North Tongu District Assembly in 2012 by Legislative Instrument (L.I.) 2077. It shares boundaries with South Tongu at the South, Dangme West and North Tongu Districts at the West, Akatsi North District at the East and Adaklu-Anyigbe District at the North. The District's total land area with is 1460km², which is about 7.1 of the total land area of the Volta Region. The projected population of the district from the 2010 census is 69714 people.

There are four Area Councils in the district; Adidome, Mafi-Kumase, Kpedzeglo and Bakpa. There are two island communities; Siamekome, Afadiwoekome, other hard-to-reach communities include Mafi-dugame, Mafi-Kebenu, Kpogadzi, Wudukpo, Kpewu-Afiadenyigba, Gafatsikope, Atiglinyikope. The Central Tongu District has thirteen (13) healthcare facilities; one (1) hospital, three (3) Health Centres, seven (7) Community Health Planning Services (CHPS) zones and two (2) private Clinics. The Central Tongu District hospital was established in 1957 (Figure 3.1).



Source: Google map, 2017

Figure 3.1: Map of Central Tongu District showing the location of Central Tongu District Hospital

3.3 Variables:
Dependent: OHS status

Independent: factors that are capable of influencing the state of OHS practices, systems and structures in the Central Tongu District (CTD) hospital.

OHS management, covering safety policy, plan, budget, incident reporting and response, OHS office and officer, safety committee with minutes of meetings, monitoring, supervision and reporting.

OHS Education and training - OHS training

OHS Hazards, prevention and Controls, covering, biological, chemical, ergonomic, physical and psychosocial hazards and elimination, substitution, engineering and administrative control and use of personal protective equipment (PPE).

3.4 Target population

Ghana Health Service staff working in the Central Tongu District Hospital. This include; Physicians, Nurses and Midwives, Lab technicians, Radiologists, Pharmacists and Dispensing Assistants, Biostatisticians, Ward Assistants, Health Assistants Orderlies, Cleaners, Laundry workers, Janitorial and Mortuary staff. The total population of the health care workforce in the Central Tongu District Hospital was 239 workers.

3.4.1 Eligibility criteria

The healthcare worker in the CTD hospital, who accepts to participate in the study by giving a verbal and or written consent. He/she should be in active service and work in the District Hospital.

3.4.2 Exclusion criteria

This defines all persons who are health care workers in the hospital but cannot participate in the study. It includes healthcare workers who are not permanent staff but are working in the CTD Hospital (for instance, students on practical attachment, national service personnel etc.). Healthcare workers, working in the CTD hospital who refuse to participate in the study are also excluded.

3.5 Sampling

3.5.1 Sample size determination and sample size

The average prevalence of occupational health and safety practices among health workers in Lower Manya Krobo District is 40% (Akagbo et al., 2017). This study adopted this prevalence with a confidence level of 95% and Z^2 score of 1.96

According to (Polonia, 2013) sample size for proportions is $n = \frac{Z^2pq}{d^2}$

Where n = Sample size

P= prevalence

q=1-p

d=confidence level

$$n = \frac{1.96^2 \times 0.4 \times 0.6}{0.05^2}$$

$$\boldsymbol{n = \frac{0.921984}{0.0025}}$$

369

The sample size of 369people is more than 5% of the population of the healthcare workers. This requires correction captured in Israel, (1992) as follows;

$$\boldsymbol{n = 1 + \frac{\frac{n}{(n-1)}}{N}}, \text{where N = population}$$

$\boldsymbol{n = 1 + \frac{\frac{369}{(369-1)}}{238}}$、

=145+10

=155

A sample size of 155 healthcare workers was selected to participate in the study.

3.5.2 Sampling method

Purposive sampling was used to select all management staff who met the inclusion criteria. That is five (5) core management staff and twelve (12) heads of department, totaling 17 respondents. Top administration staff and all heads of departments constitute the management of the hospital. The purposive sampling method was deemed appropriate because MOH/GHS, (2010) stated clearly that management is responsible for the health and safety of employees in institutions and health facilities at all levels of the health delivery system.

Departmental staff lists were obtained from the administration and the proportion of sample needed from each department was determined. Random number generator was used. Names of staff on the staff list by the numbers generated were selected with the help of the heads of departments to constitute the sample. In sum, 155 sample was derived.

3.6 Data collection tools

A questionnaire was developed covering all the variables under study in line with the OSHA, (2013) hospital assessment tool (Appendix 2). The questionnaire was administered to the participants.

3.7 Data collection procedure

The heads of the departments identified the staff selected in the sampling process and administered the questionnaire and the written informed consent forms to them. This approach was adopted due to the busy work schedule of the participants. The Principal Investigator and the Research Assistants moved from department to department to retrieve the questionnaire that were answered by the respondents.

3.8 Quality control

In order to ensure the quality of the research, training was organized for the Research Assistants who supported during data collection. The Principal Investigator also actively participated in the data collection and closely monitored the data collection process to ensure that data was collected rightly. The questionnaire was pretested with healthcare workers in the CTD hospital, who satisfied the inclusion criteria but were not included in the sample. This was necessary to ensure that the questions were, to a large extent, understood correctly. The questionnaire was corrected after the pretest. Double data entering was done to ensure accuracy.

3.9 Data processing and analysis

A codebook was developed for the data collected and was used to enter the data into excel spreadsheet and later imported to STATA version 15 software for analysis. The fifteen (15) questions on the management were coded into low (1-5), medium (6-10) and high (11-15). Percentages were calculated, chi-square and regression tests were conducted to determine the necessary levels of associations, in order to achieve the study objectives.

3.10 Ethical consideration

Ethical clearance was obtained from the Ghana Health Service Ethical Review Committee; approval number GHS-ERC: 027/01/18 (Appendix 8). Permission was obtained from the Volta Regional Director of Health Services, the Central Tongu District Chief Executive, District Director of Health Services and the Hospital management. Research participants gave informed verbal and written consents (refer to appendix 1). The identity and information of participants were not disclosed to anyone

(i.e. confidentiality was assured). Names of participants were not written on the questionnaire. Participants' privacy was also respected.

3.11 Limitations of the study

This assessment was conducted only in the Central Tongu District Hospital, in the Central Tongu District and this could hinder the generalization of the findings to other health facilities in the district or nation. There were limited studies carried out in this area of study locally, making it difficult to have local benchmarks.

CHAPTER FOUR

RESULTS

4.1 Socio-demographic characteristics of respondents

The socio-demographic characteristics of respondents are shown in Table 4.1. Forty-one percent (63/155) of the respondents were male and 59.35% (92/155) were female. Forty-one percent (63/155) of them were within 21-30 years age category, 35.48% (55/155) falls in 31-40 years age category, 9.03% (14/155) were within 41-50 years age category and 14.84% (23/155) were within 51-60 years age category. Sixty-nine percent (107/155) of the respondents had worked in the Central Tongu District Hospital between 1-5 years whilst 4.52% (7/155) worked in the hospital between 31-35 years. Seventy-three percent (114/155) of the respondents had tertiary education, 21.29% (33/155) had Senior High School education whilst 2.58% (4/155) each had Junior High School and Middle School educations.

The respondents were from the Nursing, Community Health, Laboratory, Pharmacy, Administration, Orderlies, Emergency Ambulance Technician and Artisan grades (Appendix 3). The respondents were working in twelve (12) departments in the hospital (Appendix 3). Thirty-five percent (54/155) of the respondents were single, 63.87% (99/155) were married and 1.29% (2/155) were divorced (Table 4.1). Ninety-one percent (141/155) of the respondents occupied no management position whilst 9% (14/155) occupied management positions (i.e. head of departments, Nursing Manager, Accountant, Administrator and Internal Auditor) (Appendix 4).

Table 4.1: Socio-democratic characteristics of respondents

Variable	Frequency (N)	Percent (%)
Sex		
Male	63	40.65
Female	92	59.35
Total	**155**	**100**
Age category		
21-30 years	63	40.65
31-40 years	55	35.48
41-50 years	14	9.03
51-60 years	23	14.84
Total	**155**	**100**
Marital Status		
Single	54	34.84
Married	99	63.87
Divorced	2	1.29
Total	**155**	**100**
Duration worked in CTD Hospital		
1-5 years	107	69.03
6-10 years	19	12.26
11-15 years	5	3.23
16-20 years	3	1.94
21-25 years	3	1.94
26-30 years	11	7.10
31-35 years	7	4.52
Total	**155**	**100**
Education Background		
Junior High School	4	2.58
Middle School Leaving Cert.	4	2.58
Senior High School	33	21.29
Tertiary	114	73.55
Total	**155**	**100**
Religion		
Traditionalist	2	1.29
Christian	151	97.42
Muslim	2	1.29
Total	**155**	**100**

4.2 Level of knowledge of occupational health and safety management among respondents by departments

The affirmative responses to fifteen (15) critical questions on level of knowledge of OHS management, which were on OHS policy, plan, budget, employee involvement in safety programmes, safety office, safety committee, safety representatives in departments, safety inspections, incident reporting and investigation systems, safety monitoring and evaluation, pre-employment, scheduled periodic and exit medical examinations, were coded into 1-5=low, 6-10=medium and 11-15=high. From figure 4.1, responses from Maternity (18/18), Female ward (10/10), Male ward (12/12) and Children's ward (12/12) indicate 100% medium level of knowledge of OHS management. Administration 72.73% (16/22), Theatre (11/12), Out-patients department (17/22), Accident and emergency (9/10), Public Health Unit (11/13), Pharmacy (5/7), Laboratory (6/7) and Maintenance (9/10) indicated that there were medium levels of knowledge of health and safety management in these respective departments. In sum, responses of 4.52% (7/155) of the study participants indicated that there was a low level of knowledge of OHS management in the hospital. Also, 87.74% (136/155) of the responses indicated that there was a medium level of knowledge of OHS management, whilst 7.74% (12/155) of the responses pointed to high level of knowledge of OHS management in the hospital. There was no significant difference in the level of knowledge of OHS management in the departments ($p=0.336$).

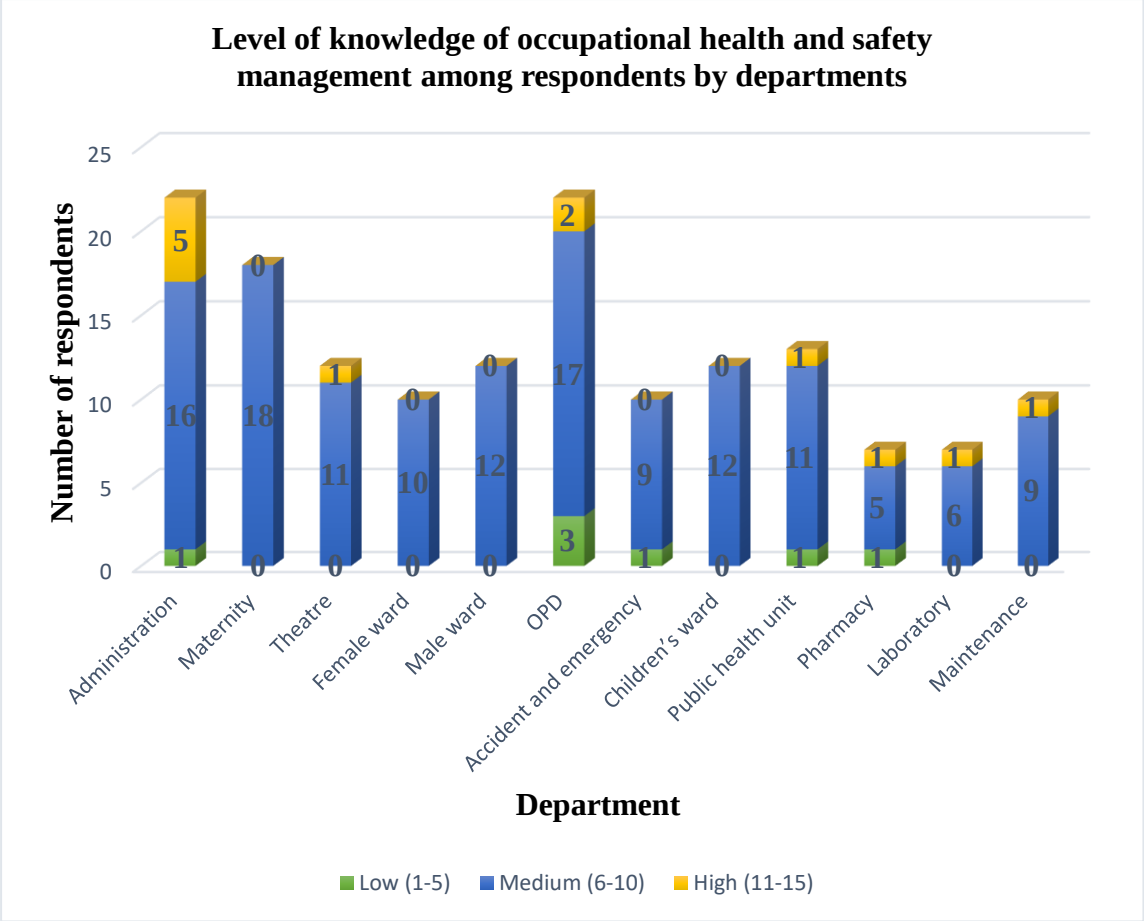


Figure 4.1: Level of knowledge of occupational health and safety management among respondents by departments

4.3 Proportion of healthcare workers who had OHS training

Responses from Male ward 100% (12/12), Administration 91% (20/22), Maternity 77% (14/18), Pharmacy 71% (5/7), Laboratory 71% (5/7), OPD 64% (14/22) and maintenance 60% (6/10) showed respondents that had OHS training. Again, responses from Theatre 42% (5/12), Accident and emergency 40% (4/10), Public health unit 31% (4/13), Female ward 30% (3/10) and Children's ward 25% (3/12) indicated different proportions of respondents that had OHS training in the departments. In sum, 61% (95/155) of the respondents had safety training and 38.71% (60/155) had no OHS training in the departments (Figure 4.2). There was a significant difference between training and the departments ($p<0.01$)

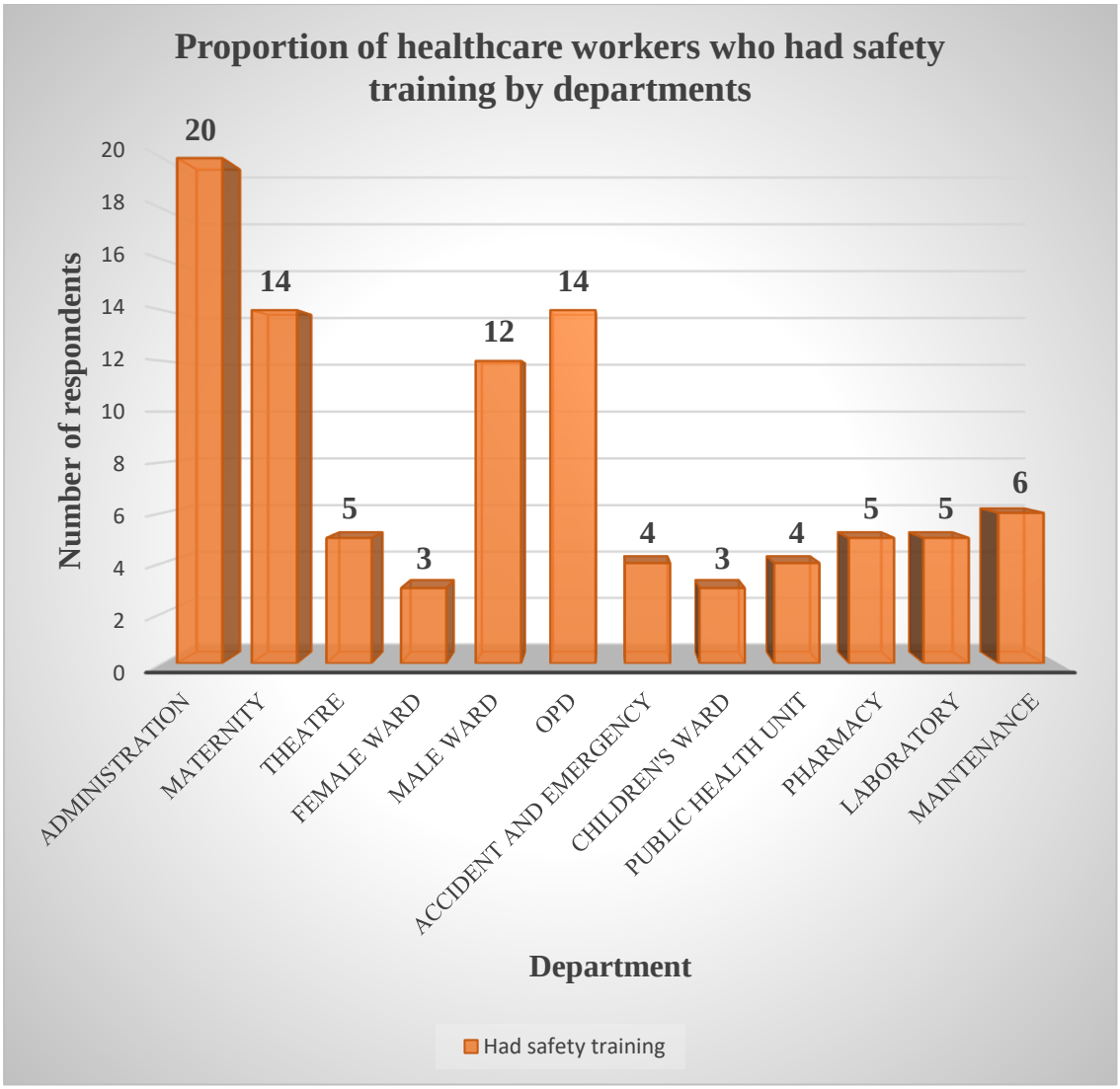


Figure 4. 2: Proportion of respondents who had safety training by departments

4.4 Source of training for staff who had safety training in the departments

Out of the 61% (95/155) who had training in OHS in the hospital (Figure 4.2); 18% (17/95) had the training at training school, 52% (49/95) had their training at the Central Tongu District hospital, 23% (22/95) had it at their former workplaces and 7.4% (7/95) had their safety training at workshops organized by MOH/GHS/DHD (Figure 4.3).

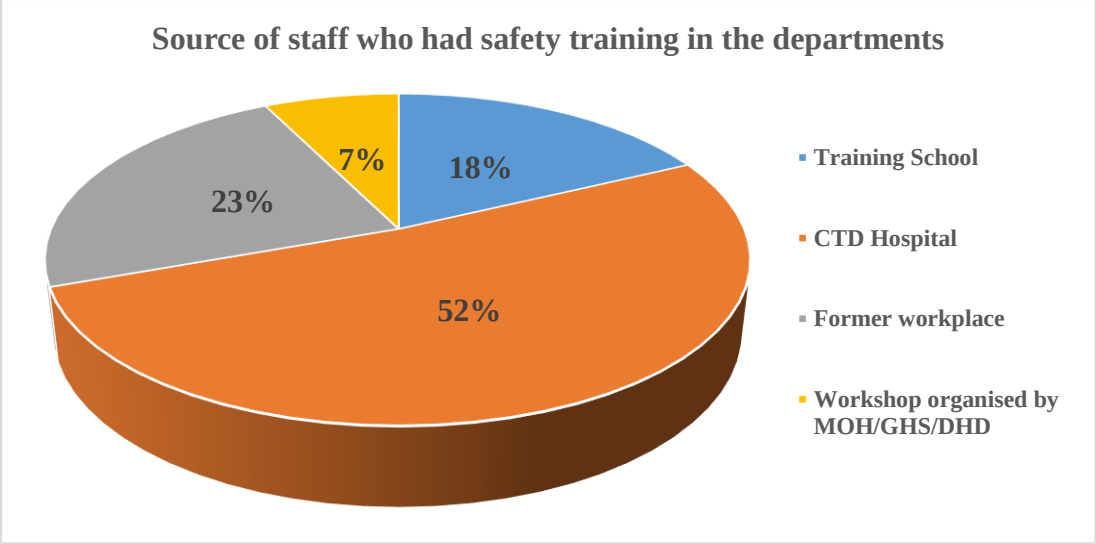


Figure 4.3: Sources of training for staff who had Safety training in the departments

4.5 Association between OHS training and socio-demographic characteristics

Analysis for any possible association between OHS training and the demographic characteristics of the respondents shows the following; sex p=0.423, age p=0.051, education background p=0.237 and duration worked in the Central Tongu District Hospital p=0.945 and department p<0.01. This shows that apart from departments, no statistically significant association had been shown to exist between OHS training and socio-demographic characteristics of the respondents (Table 4.2).

Table 4.2: Test for the association between safety training and demographic characteristics

Characteristic	Chi-square	p-value
Sex	0.6423	0.423
Age	7.7862	0.051
Education background	4.2379	0.237
Duration worked in the CTDH	2.2528	0.945
Department	45.9919	<0.01*

Significant level < 0.05

4.6 Rate of exposure to occupational hazards in the departments

4.6.1: Biological hazards

Table 4.3 shows reported occupational hazards by respondents in the various departments. Maternity (18/18), Female ward (10/10), Male ward (12/12), Accident and emergency (10/10), Pharmacy (7/7), Laboratory (7/7) and Maintenance (10/10) indicated the highest (100%) exposure to biological hazards. Public health unit (12/13) Children's ward (11/12) Theatre (10/12) and Administration 18/22) showed declining exposures whilst responses from the Out-patients department (16/22) indicated the lowest exposure. In general, 91% (141/155) respondents indicated that they were exposed to bio-hazards. There was no significant difference between the biological hazards and the departments ($p=0.055$).

4.6.2: Chemical hazards

Table 4.3 shows responses from the Laboratory (7/7), Male ward (11/12), Maternity (16/18) and Pharmacy (6/7) indicating, 100%, 91.67%, 88.89% and 85.71% exposures respectively. Administration (8/22), Accident and emergency (3/10) and OPD (6/22) recorded the lowest exposures of 36.36%, 30% and 27.27% respectively. In sum, 58% (90/155) of the respondents indicated that they were exposed to chemical hazards. There was a significant difference between exposure to chemical hazards and the departments ($p<0.01$).

Table 4.4 showed the strength of association between exposure to chemical hazards and the departments in the hospital. Maternity had 14 times more the odds of exposure to chemical hazards compared to administration (CI 2.5387-77.200). Male ward showed 19times more the odds of exposure to chemical hazards compared to administration

(CI 2.083-177.89). Finally, the Pharmacy showed 11times more the odds of exposure to chemical hazards compared to administration (CI 1.065-103.5007).

4.6.3: Physical hazards

Responses from the Maternity (18/18), Female ward (10/10), Male ward (12/12), Accident and emergency (10/10), Children's ward (12/12), Public health unit (13/13), Laboratory (7/7), and Maintenance (10/10) departments indicated 100% exposure to different physical hazards whilst responses from the Administration(15/22), Theatre (10/12), OPD (16/22) and Pharmacy (5/7) showed 68.18%, 83.33%, 72.73% and 71.43% exposure to physical hazards respectively. In total, 89% (138/155) of the respondents mentioned that they were exposed to physical hazards. P=0.002 was indicative of a significant difference between exposure to physical hazards and the departments (Table 4.3).

4.6.4 Ergonomic hazards

From table 4.3, responses from Maternity, Female, Male, Accident and emergency, Children's ward, indicated 100% exposure. Responses from Administration (19/22), Out-patients Department (18/22), and Maintenance (8/10) pointed to 86.36%, 81.82% and 80% ergonomic hazard exposures respectively. Least reported exposures were from Laboratory (2/7) and Pharmacy (1/7) indicating 28.57% and 14.29% respectively. In total, 83% (128/155) responses stated ergonomic hazards exposures. There was a significant difference in the exposure to ergonomic hazard in the departments ($p<0.001$).

Table 4.5 shows the results of the test for the strength of association between ergonomic hazards and departments. The test indicated that Pharmacy had 0.026times more the

odds of exposure to ergonomic hazards compared to Administration (CI 0.0023-1.9331). Similarly, Laboratory had 0.063times more the odds of exposure to ergonomic hazards compared to Administration (CI 0.0082 - 0.4870). No statistically significant association was found between the ergonomic hazards and the other departments.

4.6.5 Psychosocial hazards

Table 4.3 shows responses from female ward 100% (10/10), Male ward 92% (11/12), Accident and emergency 90% (9/10), Maternity 89% (16/18), Laboratory 86%, Children's ward 83% (10/12) indicating varied proportions of exposure to various forms of psychosocial hazards. The responses from the Pharmacy 42.86% (3/7) and Administration 40.91% (9/22) showed the lowest exposure 43% and 41% respectively. On the whole, 69% (107/155) responses indicated psychosocial hazards exposure. A significant difference was found between the psychosocial hazards in the departments (p=0.002).

Table 4.6 showed analysis for the strength of the association between psychosocial hazards and departments. Maternity was shown to have 12times more the odds of exposure to psychosocial hazards compared to Administration (CI 2.116-63.149). Similarly, Male ward had 16times more the odds of exposure to psychosocial hazards compared to Administration (CI 1.732-145.878). Again, Accident and emergency had 13times more the odds of exposure to psychosocial hazards, compared to Administration (CI 1.393-121.462). Children's ward had 7times more the odds of exposure to psychosocial hazards compared to Administration (CI 1.268-41.158). No statistically significant association was found between psychosocial hazards and the other departments.

Table 4.3: Rate of exposure to occupational health and safety hazards in the departments

Hazards	Biological (p=0.055)	Chemical (p<0.01*)	Physical (p=0.002*)	Ergonomic (p<0.01*)	Psychosocial (p=0.002*)
Department					
	Yes (%)	**Yes (%)**	**Yes (%)**	**Yes (%)**	**Yes (%)**
Administration	82 (18/22)	36 (8/22)	68 (15/22)	86 (19/22)	41(9/22)
Maternity	100 (18/18)	89 (16/18)	100 (18/18)	100 (18/18)	89 (16/18)
Theatre	83 (10/12)	58 (7/12)	83 (10/12)	75 (9/12)	50 (6/12)
Female Ward	100 (10/10)	60 (6/10)	100 (10/10)	100 (10/10)	100 (10/10)
Male ward	100 (12/12)	92 (11/12)	100 (12/12)	100 (12/12)	92 (11/12)
OPD	73 (16/22)	27 (6/22)	73 (16/22)	82 (18/22)	59 (13/22)
Accident & emergency	100 (10/10)	30 (3/10)	100 (10/10)	100 (10/10)	90 (9/10)
Children's ward	92 (11/12)	50 (6/12)	100 (12/12)	100 (12/12)	83 (10/12)
Public health unit	92 (12/13)	54 (7/13)	100 (13/13)	69 (9/13)	69 (9/13)
Pharmacy	100 (7/7)	86 (6/7)	71 (5/7)	14 (1/7)	43 (3/7)
Laboratory	100 (7/7)	100 (7/7)	100 (7/7)	29 (2/7)	86 (6/7)
Maintenance	100 (10/10)	70 (7/10)	100 (10/10)	80 (8/10)	50 (5/10)
Total	91(141/155)	58 (90/155)	89 (138/155)	83 (128/155)	69 (107/155)

* represent P-values. Significance level <0.05

Table 4.4: Test for the strength of association between chemical hazard and departments

Department	Odds Ratio	p-value	95% Confidence Interval
Maternity	14	0.002*	2.5387 – 77.200
Male ward	19	0.009*	2.083 – 177.89
Pharmacy	11	0.044*	1.065 – 103.5007

Reference department = Administration. Significance level <0.05

Table 4.5: Test for the strength of association between ergonomic hazard and departments

Department	Odds Ratio	p-value	95% Confidence Interval
Pharmacy	0.026	0.004*	0.0023-1.9331
Laboratory	0.063	0.008*	0.0082-0.4870

Reference department = Administration. Significance level <0.05

Table 4.6: Test for the strength of association between psychosocial hazard and departments

Department	Odds Ratio	p-value	95% Confidence Interval
Maternity	12	0.005*	2.116-63.149
Male ward	16	0.014*	1.732-145.878
Accident and emergency	13	0.024*	1.393-121.462
Children's ward	7	0.026*	1.268-41.158

Reference department = Administration. Significance level <0.05

4.7 Methods used for control of hazards in the departments

Responses from the departments showed that four main controls were used in the Central Tongu District Hospital. These are hand hygiene, use of personal protective equipment (PPE), hazard communication and housekeeping & tool/equipment maintenance.

4.7.1: Hand hygiene

Table 4.7 showed responses from Maternity 61% (11/18), Public Health Unit 38% (5/13), Children's ward 50% (6/12), Accident and emergency 40% (4/10), Theatre and Male ward 33% (4/12) and Laboratory 29% (2/7) use of hand hygiene control. The

lowest use of hand hygiene control was shown by responses from the Maintenance 20% (2/10), Female ward 10% (1/10), Administration 9% (2/22), OPD 5% (1/22) and Pharmacy 0% (0/7). In total, 27% (42/155) responses mentioned the use of hand hygiene as a hazard control measure. There was a significant difference in the use of hand hygiene in the departments (p=0.002). One of the hand hygiene equipment installed in the departments is attached (Appendix 5).

Table 4.8 shows the result of the test for the strength of the association between hand hygiene and departments. It was established that Maternity had 16times more the odds of using hand hygiene control compared to administration (CI 2.771-89.097). Similarly, Children's ward was found to have 10times more the odds of using hand hygiene compared to Administration (CI 1.585-63.104). There was no statistically significant association between hand hygiene and the other departments.

4.7.2: Personal protective equipment

Table 4.7 shows that responses from Female ward (10/10), Accident and emergency (10/10), Children's ward (12/12), Public Health Unit (13/13), Pharmacy (7/7) and Laboratory (7/7) indicated 100% use of personal protective equipment control. Responses from Theatre and Male ward 92% (11/12), Maternity 89% (16/18), OPD 82% (18/22) and Maintenance 70% (7/10) indicated reducing percentages of the use of PPE in the departments. Responses from Administration indicated the least PPE use of 55% (12/22). In total, 86% (134/155) responses indicated the use of PPE as a control measure. There was a significant statistical difference in the use of PPE in the departments (p=0.001).

Test for the strength of association between PPE use and departments showed that only Maternity has 7times more the odds of using PPE compared to Administration (1.227-36.234). No significant association was found between PPE use and the other departments (Table 4.9).

4.7.3: Hazard Communication (HAZCOM)

Table 4.7 shows responses from Accident and emergency (6/10), Male ward (7/12) and Laboratory (3/7) indicating 60%, 58% and 43% use of hazard communication control respectively. Theatre and Children's ward indicated 42% (5/12) whilst maintenance (3/10), Laboratory (2/7), Maternity (5/18), OPD (6/22), Public Health Unit (2/13), Administration (3/22) and Female ward (1/10) showed 30%, 29% 42%, 28%, 27%, 15%, 14% and 10% use of HAZCOM respectively. On the whole, 31% (48/155) of the responses mentioned the use of HAZCOM as a control measure. There was no significant difference in the use of HAZCOM in the departments (p=0.115).

4.7.4: Housekeeping and maintenance of tools/equipment

Table 4.7 shows responses from Accident and emergency (9/10), Female ward and Maintenance (8/10), Administration (16/22), OPD (15/22) and Maternity (12/18) pointing to 90%, 80%, 73%, 68% and 67% use of this control respectively. Responses from the Male ward 58.33% (7/12), Children's ward 50% (6/12) and Public Health Unit 46.15% (6/13) showed reducing percentages of the use of housekeeping and tools/equipment maintenance control. The departments with the least use of housekeeping, tools/equipment maintenance control were Theatre 25% (3/12), Pharmacy 14.29% (1/7) and Laboratory 0% (0/7). In sum, 59% (91/155) of the responses declared the use of housekeeping and tool/equipment maintenance as a

control measure. There was a significant difference in the use of housekeeping and tools/equipment maintenance by the departments ($p<0.01$).

Table 4.10 shows the results of the test for the strength of association between housekeeping & tools/equipment maintenance and departments. Theatre had 0.13times more the odds of using this control compared to Administration (CI 0.250-0.625). Pharmacy also had 0.062times more odds of using this control compared to administration (CI 0.006-0.633). No statistically significant association between housekeeping & tools/equipment maintenance and the other departments was detected.

Table 4.7: Reported methods used for control of hazards in the departments

Control / Department	Hand hygiene (%) (p=0.002*)	PPE (%) (p=0.001*)	Hazard Com. (%) (p=0.115)	Housekeeping & tools/equipt. Maint. (%) (p<0.01*)
Administration	9 (2/22)	55 (12/22)	14 (3/22)	73 (16/22)
Maternity	61 (11/18)	89 (16/18)	28 (5/18)	67 (12/18)
Theatre	33 (4/12)	92 (11/12)	42 (5/12)	25 (3/12)
Female ward	10 (1/10)	100 (10/10)	10 (1/10)	80 (8/10)
Male ward	33 (4/12)	92 (11/12)	58 (7/12)	58 (7/12)
OPD	5 (1/22)	82 (18/22)	27 (6/22)	68 (15/22)
Accident & emergency	40 (4/10)	100 (10/10)	60 (6/10)	90 (9/10)
Children's ward	50 (6/12)	100 (12/12)	42 (5/12)	50 (6/12)
Public health unit	38 (5/13)	100 (13/13)	15 (2/13)	46 (6/13)
Pharmacy	0 (0/7)	100 (7/7)	29 (2/7)	14 (1/7)
Laboratory	29 (2/7)	100 (7/7)	43 (3/7)	0 (0/7)
Maintenance	20 (2/10)	70 (7/10)	30 (3/10)	80 (8/10)
Total	**27 (42/155)**	**86 (134/155)**	**31 (48/155)**	**59 (91/155)**

*represent p-values. Significance level <0.05

Table 4.8: Test for the strength of the association between hand hygiene and departments

Department	Odds Ratio	P-value	95% CI
Maternity	16	0.002	2.771-89.096
Children's ward	10	0.014	1.585-63.104
Public Health Unit	6	0.050	0.999-39.101
Accident and emergency	7	0.054	0.971-45.802
Theatre	5	0.094	0.759-32.940

Reference department = Administration. Significance level <0.05

Table 4.9: Test for the strength of association between PPE and departments

Department	Odds Ratio	p-value	95% Confidence Interval
Maternity	7	0.028*	1.227-36.234
Theatre	9	0.050	1.003-83.785
Male ward	9	0.050	1.003-83.785
OPD	4	0.059	0.953-14.767
Maintenance	2	0.413	0.396-9.554

Reference department = Administration. Significance level <0.05

Table 4.10: Test for the strength of association between housekeeping and tools/equipment maintenance and departments

Department	Odds Ratio	p-value	95% Confidence Interval
Theatre	0.13	0.011*	0.250-0.625
Pharmacy	0.062	0.019*	0.006-0.633
Public health unit	0.321	0.122	0.076-1.355
Children's ward	0.038	0.191	0.086-1.630
Accident and emergency	3.376	0.293	0.349-32.648

Reference department = Administration. Significance level <0.05

CHAPTER FIVE

DISCUSSION

5.1 Level of knowledge of occupational health and safety management among respondents by departments

The responses of 5% (7/155) indicated a low level of knowledge of safety management, 88% (136/155) indicated medium level and 8% (12/155) indicated a high level of knowledge of safety management among respondents. This shows that adequate measures are not in place to guarantee the highest level of safety of the healthcare worker in the hospital. This finding is contrary to the requirement by the MOH/GHS, (2010) that management is responsible for the health and safety of employees in health facilities at all levels of the health delivery system. The current state of management of safety in the hospital also disagrees with OSHA, (2013) which requires management to demonstrate a commitment to improved safety and health, communicate this commitment, document safety and health performance, make safety and health a top priority, establish goals and objectives, provide adequate resources and support. The finding of medium level of knowledge of safety management is also contrary to MOH/GHS, (2010) which recommended a wide dissemination of OHS management information to all staff at post including new staff who join the service.

5.2 Proportion of health workers who had training in occupational health and safety

It was found that 61% (95/155) of the staff of the Central Tongu District Hospital had training in OHS. The finding of this study was an improvement over the findings of Akagbo et al., (2017) who held that 48% of HCWs had training in OHS.

The finding agreed with MOH/GHS, (2010) OHS policy which requires all facility managers to include OHS training in the priority training areas for all healthcare workers. It also corroborated the position of Alli, (2008) that workers need adequate training regarding occupational health and safety, and further that training helps workers to know how to do their jobs, protect their lives and that of other workers. Again, the finding agreed with Okafoagu et al., (2017) who mentioned that training is a necessary tool that increases worker knowledge of job hazards, and effect safer work practices and other positive actions in a wide array of worksites. The 61% was lower than the findings of Ndejjo et al., (2015), who found that OHS training among healthcare workers was 72% in a similar study.

On the other hand, the absence of training for 38.71% (60/155) of the staff of the hospital is contrary to the MOH/GHS, (2010) policy which requires that an induction training in OHS is organized for staff within two (2) weeks of their engagement in any health facility. The policy also recommended a series of in-service training in OHS after the induction training. The respondents had worked for a minimum of one (1) year in the Central Tongu District Hospital and could have had at least a safety induction.

5.3 Rate of exposure to hazards in the Departments

The finding of 91% (141/155) biological hazard exposure was higher than 52% finding by Osungbemiro et al., (2016) in a similar study. This finding is again higher than that of Akagbo et al., (2017), who placed biological hazard exposure among healthcare workers at 53%. Ndejjo et al., (2015) also placed exposure of healthcare workers to biological hazards at 37%, far below the finding of this study. The finding of exposure to ergonomic hazards 83% (128/155) is also higher than the 78% finding of the MOH/GHS, (2010), in a study conducted before the policy formulation. Again, the

finding of 91% (141/155) exposure to biological hazards agreed with Asumeng et al., (2015) who identified exposure to blood and other body fluids, fungi/mold, bacteria and viruses, plants, insect bites, animals and bird droppings most of which respondents mentioned as biological hazards they were exposed to.

The finding of exposure to physical hazard of 89% (138/155) agreed with Public Services Health & Safety Association, (2013) who identified heat, noise, vibration, lasers, x-ray and other forms of radiation, as hazards in the healthcare setting. Also the finding of 89% (138/155) physical hazard exposure concords with Asumeng et al., (2015) who identified radiation (electromagnetic fields, microwaves, radio waves), high exposure to ultraviolet rays, temperature extremes, constant loud noise, poor lighting, poor ventilation, faulty electrical wiring and bare electrical cables as hazards workers are exposed to. These hazards were among the physical hazards mentioned by the respondents as hazards in their departments which cumulated to the 89%.

Psychosocial hazard exposure finding of 69% (107/155) agreed with Public Services Health & Safety Association, (2013) who mentioned violent patients, visitors, residents, staff or clients, physical, emotional and mental abuse and high workload as hazards in the healthcare work environment.

In addition, the finding of chemical exposure 58% (90/155) agreed with Public Services Health & Safety Association, (2013), who identified disinfectants, antiseptics, laboratory chemicals, detergents, cleaners, anaesthetic gases and some drugs as occupational hazards in the healthcare facilities. The 58% (90/155) again concords with Asumeng et al., (2015) who mentioned paints, acids, solvents, vapours, fumes from welding or solvents, gases like acetylene, propane, carbon monoxide, flammable

materials like gasoline, solvents, explosive and pesticides as chemical hazards workers are exposed to in workplaces. Most of these hazards were listed by workers as hazards present in their departments.

Lifting and transferring patients, residents and clients, repetitive movement, postures mentioned by Public Services Health & Safety Association, (2013) also agreed with ergonomic hazard exposure of 83% (128/155) found by this study. Similarly, the finding of 83% ergonomic hazards exposure is compatible with Asumeng et al., (2015) who identified improperly adjusted workstations, frequent lifting, awkward posture, repetitive actions, frequent excessive force exertion and vibrations, which were identified by the respondents to be associated with their daily activities.

The finding of 69% psychosocial hazard exposure is congruent with Grosch et al., (2000) who posits that rotating shift work, heavy workload, lack of autonomy/control, and poor supervision are linked to worker ill-health and an increased risk of workplace injuries. This finding also agreed with Asumeng et al., (2015) who outlined workload demands, workplace violence, intensity and or pace of work, lack of respect for employees, work flexibility, individual control or say, about issues at work, social supports, and sexual harassment and bullying which results in stress or strain among the workers as psychosocial hazards workers are exposed to at workplaces.

5.4 Reported methods used for control of hazards in the departments

Twenty-seven percent (42/155) of the healthcare workers indicated that hand hygiene was used as a control measure to hazards at p= 0.002, 86% (134/155) identified the use of PPE as a control measure p<0.001, hazard communication 31% (48/155) p=0.115 and housekeeping & tools/equipment maintenance (59%) p=0.001, all in relation to

departments, were reflective of the MOH/GHS (2010) policy requirement of taking steps to eliminate the hazards or at worse reduce likely harm in order to protect the healthcare worker.

Twenty-seven percent (42/155) use of hand hygiene as a control measure was less than the findings of (Ndejjo et al., 2015), which puts the use of handwashing at 62% in a similar study. In addition, the finding of 31% use of hazard communication as a control, is lower than 63% finding of Ndejjo et al., (2015) in their study. This finding of 27% (42/155) is also congruent with Asumeng et al., (2015), who identified good communication of safety expectations and requirements as administrative initiatives for the control of workplace hazards.

Again, the finding of the use of housekeeping and tools/equipment maintenance at 59% was also lower than the finding of Ndejjo et al., (2015), which puts same at 92%. The 28% finding of use of hand hygiene as hazards control was also lower than the findings of Akagbo et al., (2017) who puts hand hygiene as a control in a similar study at 55%. On the contrary, the finding of use of PPE (86%) is higher than that of Ndejjo et al., (2015) who placed the same at 54%. In additions, the 86% PPE use in the hospital is consistent with Asumeng et al., (2015) who identified gloves, nose mask or respirators and goggle or face shield as personal protection equipment often used in conjunction with engineering and administrative controls to provide protection for workers. All of which were among the PPE respondents indicated that they use to control exposure to hazards in their departments.

In effect, it was clear that management initiated actions to promote healthcare workers' safety. Safety training programmes were organized and there were safety hazards and

controls in the hospital as well. These were found to be inadequate in providing the safety the healthcare workers need, at least, as required by the MOH/GHS (2010) occupational health and safety policy.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The responses show a medium level of knowledge of occupational health and safety management among the staff. The finding of 61% of staff having had an occupational health and safety training also falls within the medium region (36%-70%). It is also clear that healthcare workers in the hospital are highly exposed to all the categories of hazards described. Some controls were identified but these were inadequate compared to the hazards healthcare workers were exposed to. The status of occupational health and safety of healthcare workers in the Central Tongu District hospital was found to be medium 36-70%. The OHS of healthcare workers can only be 36-70% guaranteed.

6.2 Recommendations

The suggestions below are hereby made for the consideration of management for improvement upon the current state of OHS in the hospital.

- Hospital management needs to play its safety leadership and commitment roles as contained in the MOH/GHS (2010) policy.
- Management should take steps to improve upon OHS training as required by MOH/GHS (2010) OHS policy.
- Periodic risk assessments should be conducted in the hospital so that all hazards can be appropriately quantified, adequately controlled and monitored.

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APPENDICES

1. Informed consent form

Project title: Assessment of occupational health and safety status of Central Tongu District Hospital, Adidome, Volta Region.

I……. have been invited to participate in the study of assessment of occupational health and safety status of Central Tongu District Hospital, Adidome, Volta Region. I have been informed of the purpose of the study. I have also been informed that as part of the data collection process for the study, I will be providing answers to some questions.

Risks and Benefits

I was informed that I may feel uncomfortable with some of the questions, as a result of a recall of certain traumatic hazard exposure experiences among others. I was informed that provision is made for counseling services for any psychological risk that may arise from the recall of past traumatic hazard exposure experiences.

I have been told that outcome of this study will be made available to the management of the CTD Hospital for appropriate actions to be taken to correct gaps that may be detected and or improve upon existing systems to promote the safety of the healthcare workers in the hospital.

Confidentiality:

I was also informed that the information generated from this study is restricted to the principal investigator and that a code will be assigned to my name and the code used afterward. I was further informed that the findings of this study may be reported at meetings, seminars or published in medical journals but my name will not be used in the reports but codes.

Right to refuse or withdraw:

I have been informed of my rights to refuse to take part in or withdraw from this study, without losing any entitlement as a healthcare worker in the CTD hospital.

Contact information:

Finally, I was informed of the opportunity to ask any questions I may have now or later or later contact, Isaac K. Agbenyezi on 0242941634, Dr. Judith K. Stephens of the

Department of Biological, Environmental and Occupational Health Sciences, School of Public Health on (0244285224) and Hannah Frimpong of the Ghana Health Service Ethical Review Committee on (0507041225).

I have read the above information/ it has been read and well translated to me in my local language in the presence of a witness. I have had the opportunity to ask questions and all the questions that I asked, were answered to my satisfaction. I consent voluntarily to participate in this study and am fully aware of my rights as a participant.

Sign:……..……

Date:……..……..

Department:…….…….

2: Questionnaire

My name is Isaac K. Agbenyezi, M.Sc. Occupational Hygiene student from the Department of Biological, Environmental and Occupational Health Sciences, School of Public Health, College of Health Sciences, University of Ghana, Legon.

I am conducting a study **to assess the occupational health and safety status of the Central Tongu District Hospital, Adidome**. This study is purely an academic exercise. Your responses would not be disclosed to anyone.

This questionnaire is designed to collect data on;

1. Socio-demographic characteristics (9 questions)
2. Level of knowledge of OHS management (21questions)
3. Safety education and training (9 questions)
4. Hazards identification, prevention and control (11 questions)

No.	Question	Response
Section A: Socio-demographic data		
1.	Sex	☐ Male ☐ Female
2.	Age (at last birth date) (in years)	
3.	Grade/Rank	
4.	Name of department	
5.	Marital Status	☐ Single ☐ Married ☐ Divorced ☐ Others specify……
6.	Management position (if any)	
7.	Number of years worked in CTDH (State completely e.g. 2yrs 1month)	…….. …….
8.	Educational background (select highest obtained or both tertiary; where applicable)	☐ None ☐ Non-formal ☐ Primary ☐ Secondary ☐ Tertiary (professional) ☐ Tertiary (academic)
9.	Religion	☐ Traditionalist ☐ Christian ☐ Muslim ☐ Others (specify)……...

Section B Occupational health and safety management		
BI: For staff who are members of management only		
10.	Does the hospital have an occupational health and safety policy?	☐ Yes ☐ No
11.	Does the hospital have an occupational health and safety plan?	☐ Yes ☐ No
12.	Does the hospital have an occupational health and safety budget?	☐ Yes ☐ No
13.	Is there an incident record book or record system in the hospital?	☐ Yes ☐ No
14.	Is the general staff involved in safety programmes implementations?	☐ Yes ☐ No ☐ Others specify ……
15.	Which officer is responsible for occupational health and safety in the hospital?	……. ……. …….
16.	Is there an occupational health and safety office in the hospital?	☐ Yes ☐ No
17.	Which officer is responsible for occupational health and safety in your department?	…….. …….. ……..
18.	Is there an incident record book or record system in your department?	☐ Yes ☐ No
	BII: For all staff including staff who are members of management	
19	Is the general staff involved in developing the worker health and safety policy, plan, budget and reporting systems?	☐ Yes ☐ No
20.	Does the hospital have an occupational health and safety committee/team?	☐ Yes ☐ No
21.	List the members of the Occupational health and safety committee/team (if question 20 is yes)	…… …… ……

22.	What roles does the committee/team play in your department?	…… ……
23.	Is there a procedure for reporting incidents in your department?	☐ Yes ☐ No
24.	State the procedure in sequence as practiced in your department (if 23 is yes)	…… …… ……
25.	Is occupational health and safety inspection conducted in your department?	☐ Yes ☐ No
26.	Who is/are responsible for this inspection?	…… ……
27.	How does the head(s) of your department respond to incidents	☐ Sanction the person involved ☐ Keep a record of the event ☐ Investigate the incident and sanction the person whose action or inaction caused it. ☐ Take action to prevent future occurrence ☐ Others specify……
28.	Are new recruits and staff on transfer to your department made to go through pre-entry medical exam?	☐ Yes ☐ No
29.	Does your department has scheduled periodic medical exam for staff?	☐ Yes ☐ No
30.	Are staff due for pension or voluntary retirement or transferred made to undergo exit medical examination?	☐ Yes ☐ No
Section C: Occupational health and safety education and training		
31.	Have you had any training in OHS	☐ Yes ☐ No
32.	If yes in (31) where did you receive the training?	☐ Training school ☐ CTD hospital ☐ At my former workplace ☐ Others specify……..
33.	Is training in OHS part of the priority training areas for staff?	☐ Yes ☐ Not aware ☐ No

34.	What time(s) is/are OHS training carried out in your department?	☐ When you change task ☐ When a new product is introduced ☐ As and when the need arises ☐ Others specify…….
35.	Have you been trained on safety precautions concerning your job?	☐ Yes ☐ No
36.	Have you been trained on the use of safety tools and equipment or machinery e.g. Fire extinguishers, smoke detectors	☐ Yes ☐ No
37.	Have you been trained in the use of separate containers for storage of healthcare wastes?	☐ Yes ☐ No
38.	Whose responsibility is it to conduct OHS training for staff in the hospital?	☐ Management ☐ Staff ☐ District Assembly ☐ NGOs ☐ Others specify…….
39.	What is/are the sources of health and safety information for staff in the hospital?	☐ Training ☐ SMS/Whatsapp ☐ Meetings ☐ Head of Dept. ☐ Posters/newsletters ☐ Others specify……..
Section D: OHS Hazards Identification, Prevention and Controls		
40.	How do you identify conditions that are likely to be harmful to you in your department?	☐ Inspection ☐ Investigation of incidents ☐ Asking other staff ☐ Not aware ☐ Others specify……
41.	What conditions in your workplace are likely to be harmful to you in the discharge of your duties in your department? (refer to hazard list attached)	…… …… …… ……
42.	Has management informed you about the conditions that can cause harm to you in your department?	☐ Yes ☐ No

43	What measures are put in place to stop the conditions identified in 41 from causing harm?	…… ……. …….
44	Does your department/hospital carry out annual review of written materials, such as safety logs, workers' complains, results of workplace inspections, incident investigation reports, and manufacturers' literature to help staff to identify hazards?	☐ Yes ☐ No ☐ Others specify……
45	Does your department carry out periodic inspections of the physical environment to identify conditions that pose or could pose a worker safety or health concern?	☐ Yes ☐ No ☐ Others specify……
46	Does your department identify hazards associated with emergencies and non-routine operations?	☐ Yes ☐ No ☐ Others specify ……..
47	Does your department investigate incidents to identify any hazards previously unrecognized or inadequately controlled?	☐ Yes ☐ No ☐ Others specify……...
48	Does your department have an updated hazard control plan in place?	☐ Yes ☐ No ☐ Others specify
49	Does your department promptly install controls when a hazard is identified?	☐ Yes ☐ No ☐ Others specify……
50	Does your department track the implementation of controls to completion?	☐ Yes ☐ No ☐ Others specify……..

3: Grade of the respondents

Grade	Frequency (N)	Percent (%)
Deputy Director of Nursing Services	1	0.65
Principal Nursing Officer	1	0.65
Senior Nursing Officer	2	1.25
Nursing Officer	11	7.10
Senior Staff Nurse	13	8.39
Staff Nurse	16	10.32
Senior Midwifery Officer	4	2.58
Senior Midwife	12	7.74
Senior Staff Enrolled Nurse	2	1.25
Senior Enrolled Nurse	12	7.74
Senior Community Health Nurse	2	1.25
Community Health nurse	3	1.94
Community Health Worker	5	3.23
Principal Health Assistant	11	7.10
Principal Estate Officer	2	1.25
Principal Driver	3	1.94
Principal Estate Officer	1	0.65
Senior Med. Lab Scientist	3	1.94
Principal Lab Technician	5	3.23
Senior Lab Technician	7	4.52
Principal Artisan	1	0.65
Orderly	1	0.65
Executive Officer	1	0.65
Internal Auditor	1	0.65
Principal Accountant	2	1.25
Accountant	2	1.25
Dispensary Assistant	9	5.81
Optician Technician	1	0.65
Assistant Chief Estate Officer	1	0.65
Deputy Chief Accountant	1	0.65
Emergency Ambulance Serv. Technician	2	1.25
Principal Store Officer	1	0.65
Head Labourer	1	0.65
Labourer/Cleaner	3	1.94
Mortuary Attendant	1	0.65
Assistant mortuary attendant	1	0.65
Principal Biostatistician Assistant	1	0.65
Radiographic Assistant	1	0.65
Record Assistant	6	3.81
Total	**155**	**100**

4: Departments and management positions of respondents

Department	**Frequency (N)**	**Percent (%)**
Administration	22	14.19
Maternity	18	11.61
Theatre	12	7.74
Female Ward	10	6.48
Male Ward	12	7.74
Out-patients Department	22	14.19
Accident and Emergency	10	6.45
Children Ward	12	7.74
Public Health Unit	13	8.39
Pharmacy	7	4.52
Laboratory	7	4.52
Maintenance	10	6.45
Total	**155**	**100**
Management Position	**Frequency (N)**	**Percent (%)**
No management position	141	90.97
Nursing manager	1	0.65
Administrator	1	0.65
Accountant	1	0.65
Internal auditor	1	0.65
Heads of departments	10	6.45
Total	**155**	**100**

5: Photograph of hand hygiene facility installed in the departments

6: Photograph of fire extinguisher installed in the departments

7: Photograph of waste storage in coded waste containers