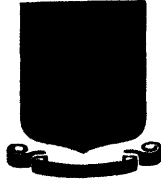


**SCHOOL OF PUBLIC HEALTH
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA**



**THE DETERMINANTS OF OCCUPATIONAL INJURIES
AMONG WORKERS AT GAMBIA PORTS AUTHORITY IN
BANJUL, THE GAMBIA**

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**THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY
OF GHANA, LEGON IN PARTIAL FULFILMENT OF THE
REQUIREMENT FOR THE AWARD OF MASTER OF
SCIENCE IN OCCUPATIONAL HYGIENE**

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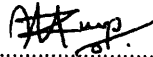
DECLARATION

I, Lamin Sanyang hereby declare that this dissertation is my own independent work and has not been submitted to any institution by any person for the award of degree. I have made references to works done by other people, which I have duly and sincerely acknowledged.



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DATE 12/10/2017

DEDICATION

This Research work is dedicated to my entire family, especially to my Mum and Dad, for their continuous support and prayers.

ACKNOWLEDGEMENT

My greatest acknowledgement goes to God Almighty for His guidance, protection and mercies which took me through even the greatest of my challenges.

My special thanks goes to the Management of The Gambia Port Authority for sponsoring the entire course of my study.

I am further greatly indebted in appreciation to Dr. Mawuli Dzodzomenyo for his tireless and invaluable sacrifices offered to ensure the excellent outcome of this work. His mentoring, criticisms and continuous guidance were crucial to my exclusive achievement.

Am also grateful to the Dean and all teaching and non-teaching staff of School of Public Health.

ABSTRACT

Background: Port related work is known to be one of the most dangerous occupations that contribute to increasing occupational injuries in the world. Numerous work-related injuries occur at different levels in the workplace but as a result of lack of thorough standards, or unfamiliarity with the existing guidelines, people are not normally aware of such events and their actual or potential consequences on human health. In The Gambia as in any other developing country, not much attention is paid to occupational health and safety and adequate data has been absent for safety policies and measurement of impact.

Objective: To explore the level of knowledge on occupational injuries among workers at Gambia Ports Authority, and also assess the safety standards and protocols used by the Gambia Ports Authority to prevent the occurrence of occupational injuries, among port workers.

Method: The study was a descriptive cross-sectional study and used both qualitative and quantitative methods of generating data. Questionnaire comprising both open and close-ended questions was used to collect relevant data and demographic information of the respondents. Purposive sampling method was used in selecting the ten (10) departments and simple random sampling used in selecting three hundred and twenty-eight (328) respondents, from whom information was gathered. An in-depth interview was conducted among key people at the head of management in different departments, with the aid of an interview guide.

Data analysis: Data was coded and entered into SPSS version 20 for analysis. Frequency tables are displayed for demographic variables and in-depth interviews transcribed into

main themes and sub-themes. The information on the prevalence and trend of occupational injury was gathered from clinic records.

Results: Majority (84%) of the respondents had adequate knowledge on occupational injury and injury prevention, and most of them (87%) used PPE during work. However, the result suggest that as compared to workers who were married, those who were not married were more likely to have knowledge on occupational injury . With regards to the source of information on occupational injury, those who relied on their colleagues for information (OR 2.42, 95%CI: 1:15-5.08), were two times more likely to experience occupational injury). On the other hand, those who had information from health education (OR 2.08, 95%CI: 0.98-4.43) and other sources (OR 2.04, 95%CI: 0.49-8.3) were both two times less likely to experience occupational injury. Main factors that determined occupational injury included sex, source of information on occupational injury, and knowledge on the effects of injury.

Information gathered from the interviewees had confirmed the availability of policies and safety standards, continuous training for workers, injury compensation and medical insurance for all full-time employees of Gambia Ports Authority.

The study however, recommended the management of Gambia port to, institute proper work schedule and job shifting policies, adopt more modern technologies and education of workers' on the use of first aid during emergencies.

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LIST OF ACRONYMS

Acronyms	Meanings
FGDs	Focus Group Discussions
GDP	Gross Domestic Product
GPA	Gambia Ports Authority
ILO	International Labor Organization
KII	Key Informant Interview
MRC	Medical Research Council
MSDs	Musculoskeletal Disorders
OCB	Organizational Citizenship Behavior
OR	Odds Ratio
PI	Principal Investigator
PPE	Personal Protective Equipment
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.0 Background

Globally, increasing population and industrialization has resulted in increased occupational injuries which is a major public health challenge (Nagai et al., 2007). Increasing industrialization is an indication of increasing numbers of population being exposed to workplace physical, chemical, biological, and psychological stressors (Annan, Addai, & Tulashie, 2015). Occupational injuries are said to have accounted for more than 300,000 deaths and causing high cases of disability among workers worldwide each year (Driscoll, Concha-barrientos, & Nelson, 2005). A study that assessed the burden of low back pain revealed that 37% of low back pain globally was attributed to occupations (Punnett, Pru, Fingerhut, Leigh, & Tak, 2005). The study further showed that work related low back pain have caused an estimated 818,000 disability adjusted life years, yearly (Punnett et al., 2005). Numerous work-related injuries, illnesses, and process losses occur at different workplaces but as a result of lack of thorough standards, or unfamiliarity with the existing guidelines, people are not normally aware of such events and their actual or potential consequences (Annan et al., 2015). Giving attention to this area is expected to demonstrate the organization's efforts and commitment to caring for its staff (Armstrong & Banks, 2015).

Gambia Ports Authority is the only shipping and maritime industry within the West African's smallest nation, The Gambia. There are many hazards present in this industry that has the potential to cause occupational injuries to workers. Accident investigation reports attribute the majority of marine accidents to human and organizational factors

(Arslan, Emek, Turan, & Wolff, 2016). Similarly, rough weather, inadequate awareness of safety, lack of use of personal protection devices, and inexperience were associated with many other fatal injuries directly related to work (Hansen & Hansen, 1996). Published reports have cited that fatal occupational accidents were also largely caused by the recurrence of similar types of accidents, such as asphyxiation in holes, falls down or inside holes, and falls overboard (Roberts & Marlow, 2005b). Recently, there has been increasing number of injuries among workers at Gambia Ports Authority but lack of data makes it difficult to gauge the actual state of affair. Notwithstanding, perils at harbors have been attributed to natural causes, to insufficiencies that are linked to the performance of equipment, overloading, the non-respect for navigation rules, professional inadequacies (Satia, Gallene, & Houehou, 1994), and fatigue (Strauch, 2015).

Maritime regulations have evolved over time in response to historical experience, mainly because of serious ship accidents (Woo, Wang, & Tae, 2016). Responsibility for maritime issues is delegated to International Maritime Organization (IMO) and International Labor Organization (ILO) provided that IMO is the agency responsible for shipping, environment and security, and ILO for the laws governing maritime personnel (Aps, Fetissov, Goerlandt, Helferich, & Kopti, 2015). Even though the government of The Gambia, has agreed to accept the International Labor Policies, yet there are few laws and policies to protect the safety of workers at workplace, in the country. Apart from the Labor Act of 1990 and the constitution which allows workers to organize (Culp, et al, 2006), Gambia Ports Authority have developed a health and safety policy in 2012. However the implementation and reinforcement of this policy remains a challenge. Currently, the maritime industry is starting to implement proactive approaches and has tried to avoid

reoccurrences by implementing an appropriate safety culture (Arslan et al., 2016). The importance of health and safety issues is increasing in port workers' training as port work is one of the most dangerous jobs in the industry sector (Hinkka, Eckhardt, Permala, & Mantsinen, 2016).

Barriers to the use of personal protective Equipment (PPE) were associated to, an individual's perception to hazards and risks, lack of enforcement and reinforcement and lack of comfort,(Lombardi, Verma, Brennan, & Perry, 2009). The younger an employee, less experience, and the lack of training for this age group becomes a barrier. Therefore, to involve the end users (workers) in any decision to protecting their health and safety, particularly in the planning process to purchase personal protective equipment will improve its usage. In addition, to reduce accidents associated with human error actions, and enhance safety of navigation in the marine ports, it is necessary to increase understanding of human factors aspects of navigational operation (Badrus, Kobayashi, Wakabayashi, & Maimun, 2015).

Ports have significant economic impact for several countries (Hinkka et al., 2016). There are few natural resources in The Gambia and therefore, Gambia Ports Authority serves as the backbone for Gambia's economy. In addition to having few natural resources, The Gambia is a small and developing country with huge economic burden and this makes it important to have policies and regulations that will reduce workplace injuries in all sectors of the government including parastatals. This will help to lessen the cost on medical bills, lost working hours and injury compensations.

1.1 Problem Statement

Port related work is known to be a dangerous occupation with a high risk of fatal accidents and port workers have been identified as a group with a high mortality in general (Hansen & Jensen, 1998). Global statistics presented by the International Labor Organization (ILO) indicate that approximately 2.2 million deaths occur yearly, as a result of work related accidents or illnesses (Karen, 2009), and about 5.8 million deaths occurred in 1998 globally, resulting from injury (World Health Organization, 1999). Even though safety indicators as a measure of performance are already in place for many types of operations in many countries (Seyr & Muskulus, 2016), measurement is conditional upon an evidence-base, information which consists of data, information, models, expert knowledge and assumptions (Goerlandt & Montewka, 2015).

The Gambia Ports is one of the most productive shipping and maritime industry within the sub region. Over the years, workers in this industry have been exposed to many hazards leading to injuries such as eye injuries, lacerations, musculoskeletal disorders (MSDs) such as low back pain, chemical burns, fire burns and bruises, (Gambia Ports Authority Clinic, Accident Report Register 2015,). These injuries can have adverse effect on both the organization and the workers in many ways. An examination of the casualty data between 1975 and 1995 shows that serious accidents have occurred in high-density ports in several countries, including The Gambian ports (Badrus et al., 2015). This has led to economic losses such as huge financial burden on medical expenses like treatment and evacuation of victims for overseas treatment in some cases, lost work hours, replacement of worker where a permanent disability may have occurred and payment of injury compensations to workers.

In The Gambia as in any other developing country, not much attention is paid to occupational health and safety and adequate data has been absent for measurement of impact. Up to now, the pressure and stress that port workers experience on board have not been investigated sufficiently and in particular, there is a lack of current scientific studies of the work and life experiences of port officials (Oldenburg, Jensen, Oldenburg, & Jensen, 2012).

Due to the lack of data in developing countries, it is difficult to have the regional overall statistics on occupational injuries. As for, The Gambia, there is no research done that has dealt with measuring the prevalence and impact of occupational injuries among port authorities. There is therefore a lack of information for policy formulation in reducing occupational injuries among port workers. Despite all the interventions made by the management of Gambia Ports Authority in preventing the occurrence of, occupational injuries, there is still an increasing number of cases and the year 2014 alone, recorded (3,737) cases of work related injuries among workers,(GPA Clinic Register, 2014).

The current research sought to explore the factors influencing these injuries among workers at Gambia Ports Authority in Banjul, The Gambia.

1.2 Conceptual Frame Work

Figure 1.3 depicts the conceptual frame work prepared for this study in the following manner;

Knowledge of Workers

Knowledge level of a worker has an impact on occupational injuries. Furthermore, level of education may improve on injury prevention. However, training and retraining of workers in general, can improve their knowledge level in the recognition of work place hazards and preventive measures to mitigate consequences.

This knowledge may be acquired during their course of education in schools, training and retraining provided by their employer or may come across such information from colleagues and other sources, such as newsletters and television channels.

On the other hand, those with low level of education are more likely to suffer occupational injuries because of their inability to measure the outcome of occupational injuries on the organization and to identify hazardous situations that are likely to cause injury. This will thus, increase the incidence of injuries among workers.

Organizational Factors

Organizational factors can influence the occurrences of occupational injuries either negatively or positively. Giving the job to experienced individuals who are knowledgeable, especially in areas that are accident prone, will reduced occupational injuries. This may however not be enough control mechanism but making it a pre-condition for employment may pay dividend. Inexperience worker in a high risk areas are more likely to suffer occupational injuries.

Health and safety policies and guidelines at work place can be helpful in reducing or diverting the trend of injuries at work. The lack of policies in relations to injury prevention at work may lead to high incidence of injury occurrence. Rigorous supervision and enforcement of rules and regulations at work can yield a positive outcome in the reduction

of occupational injuries at work. Where this mechanism is not put in place, then more cases of work place injuries will no doubt be on the increased.

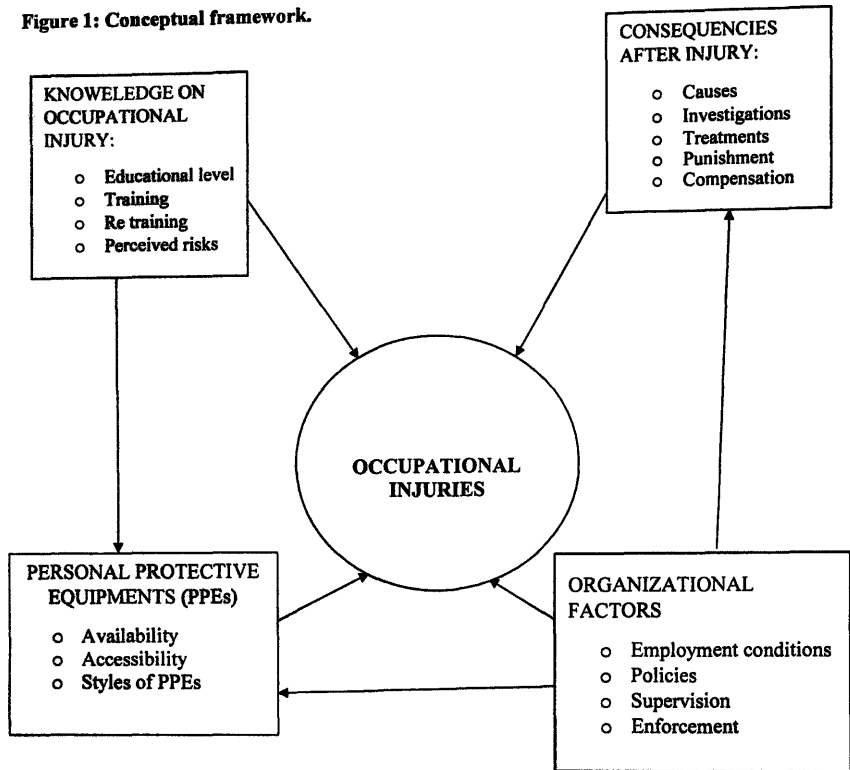
Personal Protective Equipment (PPEs)

The availability, accessibility and use of appropriate types of personal protective equipment's will reduce injuries among workers. When an organization provides the workers with adequate and appropriate type of PPEs and provide close monitoring and regular supervision for its use. This, will reduce the incidence of occupational injuries among workers.

Consequences after Injuries

If the consequences after injuries such as causes, treatment and compensation are not properly investigated and controlled, they can be a contributing factor in their increase. Some accidents may be caused by deliberate actions from some workers as they may be expecting compensations or free medical treatments especially when there is no proper accident investigations and possible punishment when the cause of the injury is deliberate. Where there is thorough accident investigation in to the cause and possible punishment for the culprits then, injuries due to deliberate or intentional actions will be minimize, leading to low incidence of occupational injuries.

Figure 1: Conceptual framework.



Source: Author's concept based on literature, 2016

1.3 Justification

Occupational injuries have been well studied over the years, but only limited research is available on factors that influence the occurrence among port workers. This research was initiated for the reason that there is little or no data on the level of knowledge and factors influencing Occupational injuries among workers at Gambia Ports Authority, in The Gambia. To fill this gap in literature, assessment of factors contributing to and mechanisms in place in the prevention of occupational injury among workers at Gambia port authority. Most policies are designed to tackle occupational injuries in general but the level of knowledge and factors contributing to occupational injuries are not well studied. Support systems and policies also fail to include other populations around the ports, hence the need for this study. Data gathered from this study has added to existing knowledge and will also help develop policies to protect workers and guide Gambia ports management for appropriate resource allocation for injury prevention or reduction and all other financial expenses related to injured workers. The Gambian port workers are therefore the direct beneficiaries of this research, since appropriate recommendations were made to facilitate policy. The researcher, the maritime industry, the Gambia national health service providers and other health-related NGOs (such as UNICEF and WHO), are all beneficiaries of this research.

1.4 Research Questions

1) What is the knowledge level of workers at Gambia Ports Authority on occupational injury and injury prevention?

2) What are the factors that contribute to occupational injuries among workers at Gambia Ports Authority?

3) What are the organizational and management mechanisms in place for workers who sustained injuries during work?

1.5 Objectives

1.5.1 General Objective

To explore the determinants of occupational injuries among workers, at Gambia Ports Authority.

1.5.2 Specific Objectives

1) To assess the knowledge level of workers, at Gambia Ports Authority and their practice, on occupational injury and injury prevention.

2) To assess the factors that contributed to occupational injuries among workers at Gambia Ports Authority.

3) To assess the organizational and management mechanisms in place for injury prevention during work.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Definition of Occupational Injury

Further definition for injury according to WHO, “An injury is a bodily lesion at the organic level resulting from acute exposure to energy (which can be mechanical, thermal, electrical, chemical or radiant) interacting with the body in amounts or rates that exceed the threshold of physiological tolerance”(World Health Organization, 1999). According to International Labor Organization (ILO) convention 121,(Laurie, 1998) Occupational injury is defined as all injuries that results from accidents before, during and after work causing death or diseases.

2.2 Classification of occupational injury

According to (ILO) classification, occupational injuries are classified in to two broad areas, fatal and non-fatal injuries. Fatal injuries are defined as any injuries that lead to death within six months or one year excluding the day of the accident. Non-Fatal injuries are defined as any injuries that do not cause death but may keep workers absent from work for up to 3 days or more (ILO).

According to (WHO), injuries are sometimes classified in to two broad terms and these are, intentional and unintentional. Intentional injuries are those that include manslaughter, suicides, and war. Unintentional injuries are those that includes traffic, fire related, falls, drowning and poisonings(World Health Organization, 1999).This classification is stated, in relation to the days the injured worker is absent from work that begins the next day of

the injury up to one year. The specific types of employment and fatal events that are reported vary from state to state (Stout & Bgs, 1991). Earlier literature have also stated maritime accidents, occupational disasters, off-duty accidents and homicide, as categories of occupational injuries among port workers (Roberts & Marlow, 2005b). In preliminary data, Mileski, Wang, & Iv, (2014) evaluated various types of accidents and categorized them into collisions, equipment failure, explosion, fire flooding, grounding, breakaway, capsizes and sinking. Others have included engineering related and human related (Huang, Zhang, & Ayyub, 2016). Due to the seriousness of its consequences and relatively frequent occurrence, these types of accidents have attracted a lot of attention in the academia, industry, and also among maritime authorities (Mazaheri, Montewka, & Kujala, 2016).

It is now pretty clear that the issue of industrial failures in the establishments should not only be limited to the administration for discussion. It is recognized that individuals, their organizations, groups and cultures are all vital instruments that should be involved in the design, construction and monitoring of technological systems for further prevention of industrial accidents and occupational injuries (Vredenburg, 2002). In addition to robust pre-disaster planning, authorities take into account the varying characteristics of different types of disasters (Zhang, Setunge, & Elmpt, 2014).

According to a study, only 10% of workplace accidents are as a result of working tools and the working environment. The rest are due to human factor which are mostly injuries that appears to be caused by risky acts of the employees (Vredenburg, 2002). Therefore, it is important to pay more attention to the reduction of risk behavior of workers in order to make a positive impact in the reduction of injuries at work than paying attention, only in improving working environment and equipment's. However, findings of a study conducted

in Finland tend to differ from the above results. The study clearly stated that administrative factors such as very demanding work timetables, the need to save time due to high work demand and the lack of attention had a superior effect on industrial accidents and injuries than human factors (Salminen et al., 2016).

A study that was conducted among nurses found out that, organizational cultures are the main factors for stress and strain among nurses. Which lead to occupational injuries and absenteeism, that was previously linked to, defiance, emotional and physical status of nurses (Hemingway & Smith, 1999). It has been found out that, organizational factors such as the demand to save time, busy schedule and lack of care by most organizations is the leading cause of increase workplace accidents which eventually results to increase occupational injuries (Salminen et al., 2016). However, different studies have disagreement with regards to which factor influences occupational injuries (Salminen et al., 2016).

These findings above have made big companies to be more proactive in preventing workplace injuries than small ones. Occupational accidents and injury observation are found to be more effective in reducing the occurrence of incidences and have tackled many difficult issues in occupational health and safety (Baker, Honchar, & Fine, 1989). Therefore, when an organization have active hazard or risk assessment system in place that observes events and put in control measures to mitigate consequences, this will immensely contribute in the reduction of the number of injuries in their record. Further prevention would benefit international collaboration in seeking to identify the direct and indirect causes, and common causal patterns, of the different types of traumatic work related death (Roberts & Marlow, 2005a). Over the years, several models were developed, all focusing

on why occupational accidents and injuries occur and what should be done to minimize their occurrence (Gray, 2016).

2.3 Factors Contributing to Occupational Injuries

2.3.1 Knowledge and Occupational injuries

Knowledge plays an important role in the development of communities. Different authors conclude that it is personal; it originates and resides in people, as a result of their own experience (Córdova, Durán, & Galindo, 2016). Many study findings have demonstrated that increase knowledge of employees decrease the incidence of occupational injury. However, there is no substantial body of knowledge showing what type of injury, the probability of injury, or the severity of injury that occurs with any duration of exposure to whole-body vibration with a port environment. Some study findings shows that knowledge and practice does not always match. A study among healthcare workers in a surgical unit have identified high level of knowledge but that does not reflect on the behavior of workers in the prevention of Hepatitis B infection (Abdel, Khamis, Jacoub, Suleiman, & Fahal, 2014). The knowledge of workers needs to be boost by protocols, continuous training and supervision. Other assessment also included criteria on the knowledge of workers in using personal protective equipment and workplace's risks related to incidents (Hinkka et al., 2016).

A similar study result agrees that knowledge has a positive impact on the behavior of an individual (Wang, Fennie, He, Burgess, & Williams, 2003). However, other literature have indicated that knowledge of the factors influencing other disorders (for example, neurological and musculoskeletal) is less substantial (Griffin, 2004). Additionally there is

widespread concern that managers ashore do not have at-sea experience, and thus lack the knowledge to make key safety decisions which will affect port officials (Bhattacharya, 2015). Provision of information and knowledge helps those exposed to dangers within the port working area and allows them to appropriate protective measures to be implemented in the local settings (Willey, 2012). There is also a need for port officials to have sufficient practical knowledge in boat steering, communication and assistance to persons during an injury (Satia et al., 1994). Further to this, true sustainability of knowledge comes from utilization of knowledge of authorities and local labour (Zhang et al., 2014). Knowledge about the existing safety culture in a maritime organization such as in shipping companies or on board ships can enable the formulation of effective interventions to maintain and improve safety culture and safety in the port organization (Ek, Runefors, & Borell, 2014). To avoid human entrap in such atmospheres, workers should have proper knowledge about the sources of the hazardous gases in the process and adequate precaution is to be taken by wearing breathing apparatus and other safety gears (Sivaprakash & Karthikeyan, 2014).

2.3.2 Personal protective equipment and Occupational injuries.

International unions have instituted specific directives, allowing Member States to adopt more protective measures, including lower exposure actions like the use of protective gears and lower exposure limit values (Griffin, 2004). The strict rules for the use and provision of appropriate type of personal protective equipment to workers will reduced the occurrence of occupational injuries in the work place (Zasa, Schiavi, Polo, & Pogliacomì, 2016). Low usage of eye protection among mechanics in Cape Coast metropolis in Ghana was recognized as a result of the prevalence of eye injuries among them (Abu et al., 2016). Therefore, use of personal protective equipment in preventing occupational injuries, is

crucial. In the developing countries, the use of appropriate type of eye protection have prevented approximately 90% of eye injuries (Abu et al., 2016). At Gambia ports authority, workers are provided with personal protective equipment however, the issue of reinforcement and strict rules is questionable. Earlier studies that assessed the development of damage control training scenarios have also suggested the use of personal protective equipment to prevent additional support request and reinforcement (Park, Shin, Chung, & Jung, 2016).

Occupational accidents and injuries have dropped sharply in the industrialized countries as a result of strict occupational health and safety regulations, which is lacking in the developing countries (Karen, 2009). This therefore implies that the availability of personal protective equipment (PPEs) alone is not enough for injury prevention but it must be the right type, regular supervision and reinforcement for its usage. Barriers to the usage of personal protective equipment are due to, one's perception to hazards and risks, age, comfort and also the lack of training, enforcement and reinforcement (Lombardi et al., 2009). Contrary, qualitative research collected comments that officials reported during research, which, in general, was that the company provides the necessary Personal Protective Equipment (PPE) at work and safety shoes, training, reinforcement measures, masks, gloves, ear protectors, helmets and tools general (Kaminski^a, Vieira, & Vieira, 2015), suggesting that failure to use PPE could be as a result of workers own personal decisions.

Long working hours and overtime works were linked to increase risk of occupational injuries among port workers. Not because of the time workers spend on the work that increases their risk of injuries but because, the time they spend in a risky and hazardous

environment makes them vulnerable to injuries (Dembe, Erickson, Delbos, & Banks, 2016). This therefore, recommends job redesign and health protection strategies for employees that are involved in overtime work and long working hours.

The working environment and the type of work a person do are found to be the contributing factors to occupational injury workers. A study conducted among warehouse workers have identified the lack of enough space and difficult positions that workers are subject to, has significantly contributes to low back pain among them (Denis, St-vincent, Imbeau, & Trudeau, 2006). The redesign of work stations which is an ergonomic concern is identified by several studies to have reduced musculoskeletal disorders such as low back pain.

The used of personal protective equipment is considered by health and safety to be the last option to protect workers, where hazards cannot be completely eliminate. This concept is in agreement with the study finding that was conducted among US soldiers who were involved in Iraqi war. In this study, it was found out that some veterans were injured in some body parts that could not be protected by PPE and some did not used it because of its inconvenience during the operations (Greer, Miklos-Essenber, & Harrison-Weaver, 2006)

2.3.3 Organizations and Occupational injuries

The shipping and ports industry is one of the highly-regulated industries which imply that most stakeholders' concerns on the environment, safety, and employees' well-being have been adequately addressed (Fai & Ming, 2016). However, ship accidents continue to occur, despite ongoing prevention efforts (Woo et al., 2016). In recent years, port authorities have made investments to prevent accidents and improve the conditions of workers, conducting campaigns and training to all new employees and recycling annually to former employees

(Kaminski^a et al., 2015). In assessing factors that contribute to occupational injuries, the causes are the contributing factors, their presence in the accident is observed, and the causality is related to the mechanism that the causes are interconnected and cause the accident at the end (Mazaheri, Montewka, Nisula, & Kujala, 2015). The rate of occupation related injuries are increasing in many industries, particularly in the developing countries. A study have shown that almost 17 workers in United States (US) died and up to 16,000 are injured as a result of occupation injuries (Vredenburg, 2002). In another article, the author have found out that the expenditure to completely eliminate hazards from work place is less expensive than providing trainings and buying safety equipment for workers(Martin, 2001). It is found in this article that, the safety standards most organizations are adhering to are the ones provided by occupational health and safety administration (OSHA) and they failed to do their own risk assessment within and that's why many injuries still continue to occur in the industries.

Several models have been developed, all gears towards occupational accident and injury prevention (Hovden, Albrechtsen, & Herrera, 2010). All these new developments have some cost on the industries in modifying the way of life of workers and the introduction of new technologies. It is abundantly cleared that, there are different views as to what are the causes of injuries among workers. In this study the researchers agrees that, causes of injuries among workers were linked to their occupations and to avoid threats, the focus should be on operational settings(Chau et al., 2004). The port crew are said to be permanently exposed to environmental factors, for example, temperature, humidity, noise level, and vibration, which are hidden contributing factors to occupation injury (Oldenburg et al., 2012). It was observed that the threat for any individual worker depends on the age, body size, lack of exercise and medical problems like loss of hearing and sleeplessness.

Other factors mentioned included rough weather, insufficient awareness of safety, lack of use of personal protective devise as well as inexperience are regarded as the main causes of occupational injury (Oldenburg et al., 2012).

Occupational injuries have different predisposing factors and therefore, different approaches should be employed to minimize their occurrence. Others argued that, workplace inspection alone can reduce injuries whilst some believe that enforcement will do better. In this study finding, the authors have concluded that both the inspection and enforcement models must be apply to yield the desire effect (John T . Scholz and Wayne B . Gray, 2016). This shows the dire need to apply vigorous inspection of workers to comply with the regulations during operations and those found wanting must face the punishment.

According to (WHO) conference on occupational health and safety in Italy, workers are about half of the world's population. They contributes immensely to the socioeconomic development of the society, therefore protection of their health and safety is paramount(WHO Collaborating Centres for Occupational Health, 2006).

This workforce is exposed to hazardous working environment which exposes them to injuries and diseases. The resulting factor is globalization which brings along changes in the employment system and changing working system. This poses a challenge to the health and safety of workers coupled with feeble regulation particularly in the developing countries (WHO Collaborating Centres for Occupational Health, 2006).

It is estimated that in the year 2000, about 22 million years of healthy life was lost due to work related factors, among workers who were exposed. This caused about 775000 deaths globally. Out of this figure males encountered about 647000 and females 128000(Concha-

barrientos et al., 2001). Work related injuries and diseases places a substantial liability on the employers either through medical treatment or injury benefit(Sears, Bowman, Blonar, & Hogg-Johnson, 2016). The growing nature of occupational injuries needs new evidence and strategies to reduce their burden both on the employer and employees. In the workers compensation scheme, it is evident that the employers have the liability to pay compensations to workers and all medical bill. This is done without considering who is on the wrong side of the story. The lost hours and all other expenditures during the course of medical care are bound by the employers(Ruser, The, Journal, Winter, & Ruser, 2016).

Several studies agree that there is lack of data in most developing countries in general and particularly in the organizations. In this study, it was found out that the starting point for the prevention of occupational injuries and diseases is the availability of data(Technical, 2009). Without data, countries and companies may not appreciate the importance of occupational health and safety and therefore, injury and disease burden will continue to rise at the workplaces.

The cost of medical care for organizations and injury compensations claims by workers has brought about many difficulties for both the employees and employers(Sears et al., 2016). It has been found out that some workers may not report their injuries for the fear of victimization by the injury reporting system.

Work related injuries according to many study findings are more among foreign workers than citizens in most countries. However, a study among foreign workers and Australian citizen shows a different result. In that, about 75% of Australian born workers had work related injuries as compare to foreign workers(Reid, Peters, Felipe, Lenguerrand, & Harding, 2016). This figure is high and therefore shows the need for more improvement of

occupational health and safety regulations in every industry, particularly those in the high risk areas

2.3.4 Workers and Occupational injuries.

The outcome of an injury to a worker can have negative social consequences on his or her family such as, low performance of the children in schools due to low earning of the parent as a result of occupational injury and it could equally affect the spouse to perform home duty, related to the psychological status of the injured worker (A. Dembe, 2016).

Studies have identified construction industries as the most high risk area for occupational injuries and accidents(Liao & Chiang, 2016). Majority of accidents and injuries in the construction industry are linked to the inattentiveness of workers, who normally tend to focus on the task they are performing rather than their immediate surroundings. However, a study conducted in South Africa have linked globalization to increasing industrial injuries and poor health and safety for workers in the developing countries (Loewenson, 2001). The transfer of out dated know-hows and machineries, great danger work environment, with little or no standard laws in place were the main factors (Loewenson, 2001). It was emphasized that the benefit of business should not only focus on satisfying the business but the health and safety of workers should be equally consider. Environmental factors such as noise, ship motion and vibration are known to affect the wellbeing of seafarers, and indeed seemed to do so in our study (Hystad & Eid, 2016).

Every type of occupation has posed different form of diseases and injuries to workers. A study conducted among workers in a power plant have shown that, workers in different sections of the power plant were exposed to various kinds of injuries(Kumar, Shrivastava,

Jain, & Patel, 2015). The kind of occupational disease or injury depends on the workers level of exposure and to what kind of hazard he or she is exposed to. It is obvious that each of the injuries related to occupation has an adverse impact on the economy of the organization and the worker; therefore preventive measures should be put in place to avert the occurrence.

The most frequent health risk factor among health care professionals globally is needle prick injury. It is approximated by world health organization (WHO) that about 3 million healthcare worker suffers needle prick injuries globally. A study in Ghana has demonstrated that, about 28.9% of nurses have suffered sharps injury within a year. This figure is more than one quarter of nurses' population in that unit(Lori, McCullagh, Krueger, & Oteng, 2015). Indeed, only few of these injured nurses could explain what they need to do in case of sharp injury. There is the need for educating these nurses on post exposure care in order to reduce the risk of infectious diseases among nurses.

Epidemiological studies have confirmed the relationship between musculoskeletal disorders and occupation. Workers in the European Union have greatly suffered from neck and upper limb pain which is related to the types of job they performed(Buckle & Devereux, 2002). The need for solution to prevent or reduce this occupational health menace is key. The change must involve educating the workers in task performance processes and re organization of the workplaces tasks.

However, there are lot of challenges for the epidemiological evidence for musculoskeletal disorders, such as low back pain and upper limbs as work related injury than other unknown factors. A study that combined both epidemiological evidence and laboratory findings of pathomechanisms (the ways in which human body functions) related to work stressors is

more convincing(Punnett & Wegman, 2004). The application of laboratory evidence in combination with the literature from epidemiology studies has finally closed the debate over the issue.

Debate on musculoskeletal disorders (MSDs) is not limit to, how to diagnose it or its relationship to work. In a study that looks at the interventions to reduce work related musculoskeletal disorders have demonstrated that, engineering and administrative control have positive some outcome(Silverstein & Clark, 2004). However, combination of measures have yield more positive impacts in reducing (MSDs). Therefore, it is more important and more beneficial for organizations to use combined measures than focusing on just few strategies. Studies have demonstrated that lack of attention at work results to accidents and injuries. The result of a study finding attest to that, mindfulness creates a good working relationship(Good et al., 2015). It helps in judgment and evaluation process of the worker and reduces incidences of accidents and injuries at work.

Organizational citizenship behavior (OCB) is a model that has, a positive impact on the employee and the organization (Koopman, Lanaj, & Scott, 2016). When employees feel, they belong to an organization (ownership) they tend to behavior positively and perform to the best of their ability. However, this relationship between worker and the work can have both positive and negative outcome. The worker may end up using personal resources in to the organization, which is a negative behavior.

There is great importance for the well-being of employees when the family needs are satisfied. Being a parent has a lot of demands for employees and once those family expectations are not met, it has negative consequences on both the work and the worker(Ryu, 2015). The role of family in the employees' life, is a stress of its own. This is

more evident especially where certain responsibilities are not affordable. All these have negative impact on the performance and output of employees. This therefore shows the need to improving both the working environment and the family environment simultaneously. This is the way to enhance productivity as a whole.

In UK, study among members of parliament have agrees that, psychological health have a negative on their performance(Weinberg, 2015). This finding came to an agreement with the result that family environment is key in improving work performance for employees. Once a worker is not mentally healthy, the output will be low and the possibility of occupational accidents and injuries are high.

Several literatures agree that stress has a negative impact on productivity and lead to work related injuries. A study result demonstrated that individual stress at work is related to the work environment(Sur & Ng, 2014). However, every employee is face with job stress but people's perception to stress differed. Job stress model identified the need for management to look up for those work stressors and address them quickly. Each individual worker have a different personality and react to situations differently. Job stress is linked to increase occupational injuries.

In conclusion, several published reports have shown the relationship between worker and working environment. The two are interdependent, and failure to satisfy one component will have a negative on the other. The resulting outcome always predisposes to increase occupational accidents, injuries and low productivity in the organizations.

CHAPTER THREE

3.0. METHODOLOGY

3.1. Background of the study area

The study was conducted at Gambia Ports Authority located in the southern part of Banjul, the capital city of The Gambia. It was established in the year 1972, and is now acknowledged as one of the nonviolent and well-organized ports in West Africa. The Gambia Ports Authority is positioned at the latitude 13 degrees 27' North and Longitude 16 degrees 34' West and situated on the bay of River Gambia, 26 maritime miles away from the Atlantic Ocean, which is one of the world's busiest sea transport lane. It contributes to about 90% of Gambia's economy.

On average, over thousands of containers are found on the premises of the ports and almost every other day three to five (3-5) cargos anchor at the ports for both loading and discharging. The number of employees in this industry numbered about two thousand (2000) people. This figure does not include Dockworkers and stevedores, who add up to 350(Gambia Ports Registry 2016).

The study site is a heavily industrialized area with well-developed and modern facilities for handling various types of cargo and using latest equipment, machineries and techniques. In addition, the staff of GPA, have been provided with various kinds of personal protective equipment's (PPE) over the years. The types of PPE available to the staff of Gambia Ports Authority are, Boots, Helmets, Gloves, Reflectors, Jackets, Dust masks and Googles. Gambia Ports Authority consists of different departments, including health & safety. It harbors containers, both emptied and loaded and many of these containers are on a transit to Mali and other destinations.

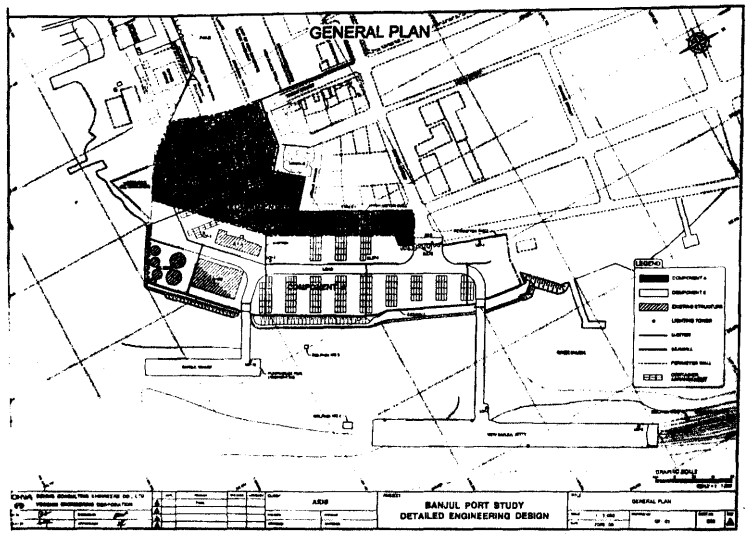


Figure 2: Map of Gambia Ports Authority.

3.2 Study design

This was a descriptive cross sectional study. The study has employed both qualitative and quantitative methods of data collection. It was conducted among workers in Gambia Ports Authority, over the month of May/June 2017.

3.3. Study Population

The study population included those who are currently working in Gambia Ports Authority either on full time, part time or contract workers. Study participants were selected from ten

(10) out of fifteen (15) departments in Gambia Ports Authority. The departments selected for the study were, Administration, Traffic, Estate, Mechanical, Harbours, Shipyard, Stores, Health & Safety, Dockworkers and Security.

3.4. Sample size

The sample size of this study was calculated based on a study conducted among trauma patients in Qatar hospital which have shown injury prevalence of 30.7%(Al-thani et al., 2015).The number of employees at GPA is about 2000,and this included both the male and female populations (GPA Administration,2016). Based on the sample calculation presented below, a sample size of 343 study subjects selected for this study were estimated using the formula;

Formula: $(z_{\alpha/2})^2 \times p(1-p) / \alpha^2$

$(1.96)^2 \times 0.307 \times 0.693 =$

$3.8416 \times 0.307 \times 0.693 / 0.0025 = 326.9$

$= 327$

Adjusted: 5% for errors and non-responses

$5/100 \times 327 = 16.3$ $327 + 16 = 343$

Therefore, the sample size was 343.

3.5 Sampling Procedure

Ten (10) out of the fifteen (15) departments in the Gambia port were purposively selected for the study based on the following criteria: All the departments located in the low risk area and those situated outside main (GPA) premises were not included in this study.

The total sample of respondents were selected from the chosen departments that were, Safety, Mechanical, Administration, Harbours, Traffic, Shipyard, Security, Estate, Health and Safety and Dockworkers, using simple random sampling method. Once a respondent was considered eligible, a register was used to select a respondent and he/she was invited orally to participate in the study. Any selected respondent who was not suitable, were replaced with the next available but eligible respondent. Key informants (K.I) were identified and interviewed, using a question guide. This included the people working in the management section related to injury prevention, management and compensation.

3.6 Inclusion criteria

Only adults who are 18 years and above were selected. Selected respondents all came from the above mentioned departments and they have consent to participate in this study. They have all been working in The Gambia ports authority for not less than one (1) year, prior to the commencement of this study. Both sexes i.e. Male and Female were included in this study.

3.7 Exclusion criteria

All subjects not willing to participate in the study were excluded. All departments that are located in low risk area were excluded. All departments outside of Gambia ports authority premises were excluded. Those workers who were either on study leave annual leave, maternity leave and sick leave were not sampled. All employees under the age of 18 years were excluded in this study as well.

3.8 Study variables

Dependent variables: Any occupational injury including. Physical injury, biological (Bio hazards), fire and explosive injury, thermal injuries, electrical injury, injury from hazardous materials and environmental injuries.

Independent variables: Workers' knowledge level on occupational injury and injury prevention, and the factors contributing to occupational injuries example, demographic characteristics of respondents. Knowledge level was measured using three main questions. The respondents were first asked to define occupational injury by selecting from a list of correct answers with one wrong definition. Secondly, respondents were asked to state the effects of occupational injury by selecting from a list of five options with one wrong answer. The third question measured their knowledge on measures that can be taken to avoid occupational injury. Respondents selected from a list of six answers with one wrong answer. Responses for the three main questions were then computed. Respondents who were able to select six correct answers and above, were categorized as having adequate knowledge on occupational injury, while those who select correct answers below six were categorized as having inadequate knowledge on occupational injury based on the answers provided and classified as adequate or inadequate knowledge.

3.9 Data Collection Tools

3.9.1 Questionnaire Administration

After consenting, a 44 point questionnaire comprising open and close ended questions, was administered to collect socio-demographic data and other relevant information from among selected respondents. The questionnaires were self-administered.

3.9.2 Key Informant Interview (K.I.I)

A total of three (3) key informant interviews were conducted. The average duration of the interviews was 40 minutes. Selected senior officers working at the management level were interviewed using an interview guide. This guide enquired about organization and management mechanisms available to prevent workplace injury. Those interviewed were the people involved in the implementation of safety policies and welfare of workers, who may fall sick or injured, including medical care and compensation. The people interviewed are, the manager health and safety department, manager dockworkers and stevedore and assistant manager Gambia Ports Authority Clinic respectively.

3.10 Data collection procedure

Prior to collecting data, the Principal Investigator led the research team and conducted a meeting with the Managing Director of Gambia Ports Authority, did a formal introduction, and informed him about the reason and procedures of the study. In addition, the workers were also informed through the management of Gambia Ports Authority, about the purpose, procedures and the timeline of data collection was explained. Questionnaires were employed that provided the quantitative data. Qualitative data collection was done by interviewing senior staffs at the management positions. Review of existing protocols and guidelines on injury prevention and management was made, that gave further relevant information.

3.11 Data Processing and Analysis

Data was processed using SPSS version 20. All errors were corrected before the data was entered. Descriptive analyses of all variables are presented in percentages and frequencies.

Tables are displayed for visualization. Chi-square test was done to test the association between dependent and independent variable such as background characteristics of respondent's and occupational injury, knowledge level of workers and occupational injury, and those factors contributing to occupational injuries and knowledge level of respondents. Multiple logistic regressions was done, for controlling potential confounders, and to find out the strength and direction of these associations.

3.12 Quality Control

The following measures were used to ensure quality of data. After collecting the data, it was also checked for completeness, possible errors and omissions, and the required steps were taken before analysis was done. Furthermore, all the data collected were entered in to the computer system and were checked by a competent person to ensure that they are completed, prior to analysis.

Research assistants were recruited and trained prior to the conduct of this research work. The training included detailed explanation of the questionnaire, ethical issues involved and informed consent of the study participants. Questions in the questionnaire were thoroughly explained to the research assistants to prevent interviewer bias. They were also trained to conform to the ethical guidelines of the study

3.13 Record protection

All data were protected against inappropriate use or exposure and accidental loss in order to protect the confidentiality of subject's information. Data was locked on a laptop and pass-worded, and was only accessed by the PI. Study questionnaires and other forms (hard copy) were kept and will later be destroyed after a considerable number of years.

3.14 Ethical consideration/issues

Ethical clearance was obtained from The Gambia Government/Medical Research Council (MRC) Joint Ethical Review Committee. Permission was also be sought from Gambia Ports Authority Board through the Managing Director, where the study was conducted. The objectives of the study, the procedures involved and any possible risk or benefits associated with the study were carefully explained to workers before they are recruited. All those individuals who have satisfied the inclusion criteria and were eligible for this study have consent and agreed verbally before a questionnaire was administered.

They were informed that their participation to this study was voluntary and that they have the right to withdraw at any point in the study and may also refuse to answer any question that they may feel is intimidating. They were further informed that all responses and records will be kept confidential. The forms will also be kept in a locker and an electronic version of the data be saved in a laptop with a password. The key and the password can be accessed by only the principal investigator.

CHAPTER FOUR

4.0. PRESENTATION OF RESULTS

4.1. Introduction

This presents results on the quantitative arm of the research. The study assessed the background characteristics of respondents, the knowledge of workers at the Gambia ports, and the factors that are facilitating the occurrence of occupation injuries at the Gambia Ports Authority, The Gambia

Table 1: Background characteristics of respondents (N=328)

Attribute	Frequency	Percent
Age group (in years)		
21-30	68	20.7
31-40	110	33.5
41-50	93	28.4
51-60	57	17.4
Marital status		
Married	205	62.5
Not Married	106	32.3
Divorced	17	5.2
Level of education		
Primary	25	7.6
Junior High	32	9.8
Senior High	95	29.0
Voc/Technical	33	10.1
Tertiary	143	43.6
Language of respondent		
Mandinka	102	31.1
Wollof	77	23.5
Fula	36	11.0
Manjako	15	4.6
Sarahule	14	4.3
Jola	84	25.6
Religious denomination		
Christian	22	6.7
Muslim	306	93.3
Type of employment		
Full Time	302	92.1
Part Time	26	7.9
Gender		
Male	311	94.8
Female	17	5.2

4.2. Background characteristics of respondents

A total of 328 respondents participated in the study and the response rate was 96%. Overall, 34% were within the age range of 31 to 40, 28% were within ages 41 to 50 and 21% were between ages 21 to 30. More than half (63%) of the respondents were married, 32% were not married and only 5% were divorced. Close to half (44%) of the respondents had attained tertiary education, 29% were graduates of senior high education and 10% had finished junior high education. Again, 31% were the Mandinka speaking origin, 25% were from Jola tribe and 24% were of Wollof. The results also indicated that almost all respondents (93%) were Muslims and most (92%) were full time employees of the Gambia Ports Authority. Close to all (95%) workers were male.

Table 2: Workers' knowledge and information source on injury prevention

Attribute	Frequency	Percent
Ever heard of occupational injury		
Yes	297	90.5
No	31	9.5
Definition of occupational injury		
Health safety at work	18	5.5
Injury occurred at work place	240	73.2
Injury related to the job	55	16.8
Disease contracted outside work	15	4.6
Effects of occupational hazards		
Nose/throat-irritation/cough	133	40.5
Eye irritation/itching	24	7.3
Bruises/cuts/injury	117	35.7
Back/waist pain	37	11.3
Negligence	17	5.2
Knowledge on measures to avoid injury		
Safety Signs	45	13.7
Use of Personal Protective Equipment	123	37.5
safety precaution measures	40	12.2
Training employees on safety precautionary measures	76	23.2
work place inspection to enforce adherence to safety signs	25	7.6
Hospitalization/treatment of injury	19	5.8
Level of knowledge on occupational injury		
Adequate knowledge	277	84.4
Inadequate knowledge	51	15.6
Source of information on occupational injuries		
During training	196	59.9
Colleagues	49	14.9
Health education	44	13.4
Other sources	10	3.0
Not applicable	29	8.8
Why occupational injuries occur		
negligence/ carelessness/ ignorance	123	37.5
Accident	89	27.1
Lack of safety precaution	113	34.5
Don't know	3	0.9
Ever had occupational injury		
Yes	126	38.4
No	202	61.6

4.3. Workers' knowledge and information source on injury prevention

The study also assessed respondents' knowledge and source of information on occupational injury. In total, 91% of the respondents have ever heard of occupational injury and seven in every ten (73%) of the respondents had defined occupational injury as injury occurring at work. Most (59.9%) of the respondents had knowledge on occupational injury as a result of safety training. Similarly, most (38%) of the workers were of the view that occupational injury occurs as a result of negligence/carelessness or ignorance, and 35% thinks its occurrence is due to lack of safety precautions. In addition, 41% of the workers at Gambia Ports Authority had knowledge on the effects of occupational injuries being nose/throat irritation, and 36% thinks it is bruises and cuts. Prevalence of occupational injury at the Gambia Ports Authority was 38%.

Table 3: Workers' practices on injury prevention

Attribute	Frequency	Percent
Action to take during an injury		
Seek for healthcare	193	58.8
First Aid treatment	135	41.2
Knowledge on prevention of injury		
Adherence to Safety Regulations	228	69.5
control usage of chemicals	25	7.6
sensitization on safety regulations	42	12.8
improve working condition	33	10.1
Knowledge on personal protective equipment		
Boot	63	19.2
Helmet	145	44.2
Goggles	15	4.6
Overall	10	3.0
Face mask	32	9.8
Gloves	63	19.2
Necessity to always protect yourself while working		
Yes	288	87.8
No	40	12.2
Sitting/working for long hours lead to an injury		
Yes	251	76.5
No	77	23.5
Manual/physical packaging of goods lead to an injury		
Yes	282	86.0
No	46	14.0
Reasons for wearing personal protective equipment		
Protect and prevent injuries	266	81.1
Avoid bruises	23	7.0
minimize exposure to hazards	39	11.9

4.4. Workers' practice on injury prevention

On assessing respondents' practices on injury prevention and emergency actions to take during an injury, more than half (59%) thinks seeking for healthcare was the best option while 41% said first aid treatment is best. A little over half (70%) of the respondents were aware that adherence to safety regulations could prevent occupational injuries. Similarly, respondents were also assessed on their knowledge on avoiding injury. 38% thinks the use of personal protective equipment can help avoid occupational injuries, and 23% said training. The study also assessed workers knowledge on what personal protective equipment was. 44% mentioned helmet, and 19% mentioned boot. Eight in every ten (88%) were aware that it is necessary to wear protective while working, 77% knows that sitting or working for long hours could lead to injury while 86% said work involving manual and physical packaging of goods can also result into injury. Majority (81%) of the respondents were also aware that wearing personal protective equipment can prevent injuries.

Table 4: Factors contributing to occupational injuries

Attribute	Frequency	Percent
Respondent's area of work		
Manager/engineer	34	10.4
Manufacturer/Maintainer	36	11.0
Producer	28	8.5
Laborer/packaging	64	19.5
Others	166	50.6
Use personal protective equipment		
Yes	284	86.6
No	44	13.4
Work involve physical exertion		
Yes	204	62.2
No	124	37.8
Hours of work a day		
Less than eight hours	134	40.9
More than eight hours	194	59.1
Work behavior associated with injury		
Working in bad postures	106	32.3
Emptying dust filters	20	6.1
Not using PPE	164	50.0
Scattering work tools	38	11.6
Work involve manual operation of equipment/packaging		
Yes	153	46.6
No	175	53.4
Exposed to sharp objects, hazardous chemicals		
Yes	127	38.7
No	201	61.3
Safety protocols available for workers		
Yes	254	77.4
No	74	22.6
Ensure strict adherence to safety guidelines		
Yes	219	66.8
No	109	33.2
On-site health corner available to handle minor injuries		
Yes	285	86.9
No	43	13.1
Have periodic health check-ups and screening		
Yes	155	47.3
No	173	52.7

4.5. Factors contributing to occupational injuries

Another aspect of importance to this study was the factors that may be contributing to the occurrence of occupational injury at the Gambia Ports Authority. Half (50%) of the workers at the ports were working in departments like shipping and packaging. Only 10% were top managers/engineers. Majority (87%) of the workers used personal protective equipment while working, 62% said their work involved physical exertion, and more than half (59%) of them work for more than eight hours a day. Half (50%) of the workers think the refusal to use personal protective equipment was the main reason associated with the occurrence of occupational injuries while 32% thinks is working in bad posture. A little below half (47%) said their work involved manual operation of equipment and packaging and 39 confirmed they were exposed to sharp objects and other hazardous chemicals. Most (77%) of the respondents confirmed the availability of safety protocols for workers, 67% thinks these protocols are being enforced and adhered to, and 89% said an on-site health corner was available to handle minor injuries. Only 47% confirmed ever having a health checkup and screening.

Table 5: Associations between background characteristics and Knowledge on occupational injury (Bi-variate analysis)

Attribute	Knowledge on occupational injury		P value
	Yes (%)	No (%)	
Age group (in years)			
21-30	24(35.3)	44(64.7)	0.48
31-40	47(42.7)	63(57.3)	
41-50	31(33.3)	62(66.7)	
51-60	24(42.1)	33(57.9)	
Marital status			
Married	84(41.0)	121(59.0)	0.002
Not Married	30(28.3)	76(71.7)	
Divorced	12(70.6)	5(29.4)	
Level of education			
Primary	6(24.0)	19(76.0)	0.14
Junior High	16(50.0)	16(50.0)	
Senior High	43(45.3)	52(54.7)	
Voc/Technical	11(33.3)	22(66.7)	
Tertiary	50(35.0)	93(65.0)	
Language of respondent			
Mandinka	47(46.1)	55(53.9)	0.46
Wollof	28(36.4)	49(63.6)	
Fula	14(38.9)	22(61.1)	
Manjako	6(40.0)	9(60.0)	
Sarahule	4(28.6)	10(71.4)	
Jola	27(32.1)	57(67.9)	
Religious denomination			
Christian	12(54.5)	10(45.5)	0.11
Muslim	114(37.3)	192(62.7)	
Type of employment			
Full Time	118(39.1)	184(60.9)	0.40
Part Time	8(30.8)	18(69.2)	
Sex			
Male	112(36.0)	199(64.0)	0.001
Female	14(82.4)	3(17.6)	

4.6. Associations between background characteristics and occupational injury (Bivariate analysis)

A test of associations was also conducted using chi-square test on all the background characteristics of respondents. However, only the respondent's marital status ($P < 0.002$) and their sex ($P < 0.001$) were significantly related to their knowledge on occupational injury.

Table 6: Associations between workers' knowledge and information source on injury prevention and occupational injury (Bi-variate analysis)

Attribute	Knowledge on occupational injury		P value
	Yes (%)	No (%)	
Ever heard of occupational injury			
Yes	119(40.1)	178(59.9)	0.09
No	7(22.6)	24(77.4)	
Definition of occupational injury			
Health safety at work	6(33.3)	12(66.7)	0.24
Occurred injury at work place	100(41.7)	140(58.3)	
Injury related to the job	16(29.1)	39(70.9)	
Disease contracted outside work	4(26.7)	11(73.3)	
Effects of occupational hazards			
Nose/throat-irritation/cough	58(43.6)	75(56.4)	0.005
Eye irritation/itching	15(62.5)	9(37.5)	
Bruises/cuts/injury	37(31.6)	80(68.4)	
Back/waist pain	14(37.8)	23(62.2)	
Negligence	2(11.8)	15(88.2)	
Knowledge on measures to avoid injury			
Safety Signs	18(40.0)	27(60.0)	0.06
Use of Personal Protective Equipment	44(35.8)	79(64.2)	
safety precaution measures	12(30.0)	28(70.0)	
Training employees on safety precautionary measures	32(42.1)	44(57.9)	
Enforce adherence to safety signs	7(28.0)	18(72.0)	
Hospitalization/treatment	13(68.4)	6(31.6)	
Source of information on occupational injuries			
During training	43(46.2)	50(53.8)	0.02
Colleagues	13(26.5)	36(73.5)	
Health education	13(29.5)	31(70.5)	
Other sources	3(30.0)	7(70.0)	
Not applicable	6(20.7)	23(79.3)	
Why occupational injuries occur			
negligence/ carelessness/ ignorance	38(30.9)	85(69.1)	0.08
Accident	42(47.2)	47(52.8)	
Lack of safety precaution	44(38.9)	69(61.1)	
Don't know	2(66.7)	1(33.3)	

4.7. Associations between workers' knowledge and source of information on injury prevention and occupational injury (Bi-variate analysis)

In assessing the relation between respondents' knowledge and source of information on the occurrence of occupational injuries, respondents ever hearing occupational injury ($P<0.09$), their ability to define occupational injury ($P<0.24$), and why they think occupational injury occurs ($P<0.08$) were all not significant. In addition, respondents knowledge on how injuries are prevented ($P<0.21$), their knowledge on measures to avoid injury ($P<0.06$), respondents knowledge that sitting and working for long hours can lead to injury ($P<0.52$), their knowledge that manual/physical packaging of goods leads to injury ($P<0.38$) and their ability to give reasons why personal protective equipment should be used ($P<0.08$) were also not significant. On the other hand, respondents' sources of information on occupational injury ($P<0.02$), and their knowledge on the effects of occupational injury ($P<0.01$), were both significantly associated with occupational injuries.

Table7: Associations between workers' practice on injury prevention and occupational injury (Bi-variate analysis)

Attribute	Knowledge on occupational injury		P value
	Yes (%)	No (%)	
Action to take during an injury			
Seek for healthcare	83(43.0)	110(57.0)	0.04
First Aid treatment	43(31.9)	92(68.1)	
Knowledge on prevention of injury			
Adherence to Safety Regulations	86(37.7)	142(62.3)	0.21
control usage of chemicals	11(44.0)	14(56.0)	
sensitization on safety regulations	12(28.6)	30(71.4)	
improve working condition	17(51.5)	16(48.5)	
Knowledge on personal protective equipment			
Boot	15(23.8)	48(76.2)	0.001
Helmet	50(34.5)	95(65.5)	
Goggles	9(60.0)	6(40.0)	
Overall	8(80.0)	2(20.0)	
Face mask	8(25.0)	24(75.0)	
Gloves	36(57.1)	27(42.9)	
Necessity to always protect yourself while working			
Yes	102(35.4)	186(64.6)	0.08
No	24(60.0)	16(40.0)	
Sitting/working for long hours lead to an injury			
Yes	94(37.5)	157(62.5)	0.52
No	32(41.6)	45(58.4)	
Manual/physical packaging of goods lead to an injury			
Yes	111(39.4)	171(60.6)	0.38
No	15(32.6)	31(67.4)	
Reasons for wearing personal protective equipment			
Protect and prevent injuries	110(41.4)	156(58.6)	0.08
Avoid bruises	6(26.1)	17(73.9)	
minimize exposure to hazards	10(25.6)	29(74.4)	

4.8. Associations between workers' practice on injury prevention and occupational injury (Bi-variate analysis)

From the assessment of the relation between workers' practice on injury prevention and occupational injury, respondents' knowledge on the action to take during an injury ($P < 0.04$) and respondents' ability to mention some personal protective equipment ($P < 0.01$), all had a significant association with occupational injuries.

Table 8: Associations between factors contributing to occupational injuries and knowledge on occupational injury (Bi-variate analysis)

Attribute	Knowledge on Occupational injury		P value
	Yes (%)	No (%)	
Respondent's area of work			
Manager/engineer	14(41.2)	20(58.8)	0.001
Manufacturer/Maintainer	22(61.1)	14(38.9)	
Producer	12(42.9)	16(57.1)	
Laborer/packaging	38(59.4)	26(40.6)	
Others	40(24.1)	126(75.9)	
Use personal protective equipment			
Yes	109(38.4)	175(61.6)	0.97
No	17(38.6)	27(61.4)	
Work involve physical exertion			
Yes	78(38.2)	126(61.8)	0.93
No	48(38.7)	76(61.3)	
Hours of work per day			
Less than eight hours	54(40.3)	80(59.7)	0.56
More than eight hours	72(37.1)	122(62.9)	
Work behavior associated with injury			
Working in bad postures	56(52.8)	50(47.2)	0.001
Emptying dust filters	2(10.0)	18(90.0)	
Not using PPE	55(33.5)	109(66.5)	
Scattering work tools	13(34.2)	25(65.8)	
Work involve manual operation of equipment/packaging			
Yes	66(43.1)	87(56.9)	0.10
No	60(34.3)	115(65.7)	
Exposed to sharp objects, hazardous chemicals			
Yes	46(36.2)	81(63.8)	0.52
No	80(39.8)	121(60.2)	
Safety protocols available for workers			
Yes	93(36.6)	161(63.4)	0.21
No	33(44.6)	41(55.4)	
Ensure strict adherence to safety guidelines			
Yes	86(39.3)	133(60.7)	0.65
No	40(36.7)	69(63.3)	
On-site health corner available to handle minor injuries			
Yes	123(43.2)	162(56.8)	0.001
No	3(7.0)	40(93.0)	
Have periodic health check-ups and screening			
Yes	80(51.6)	75(48.4)	0.001
No	46(26.6)	127(73.4)	

4.9. Associations between factors contributing to occupational injuries and Knowledge on occupational injury (Bi-variate analysis)

The study results also indicated that respondents, area of work ($P<0.01$), their work behavior that is associated with injury ($P<0.01$), the presence of an on-site health corner to handle minor injuries ($P<0.01$) and periodic health checkups and screening ($P<0.01$), were all significant to their knowledge on occupational injury.

Table 9: Determinants of Knowledge on occupational injury (multiple logistic regressions)

Attribute	AOR	(95% CI)	CI
Marital status			
Married	Ref.		
Not Married	1.759	1.060	2.917
Divorced	.289	.098	.852
Sex			
Male	Ref.		
Female	.121	.034	.429
Source of information on occupational injuries			
During training	Ref.		
Colleagues	2.417	1.150	5.081
Health education	2.081	.979	4.426
Other sources	2.036	.499	8.314
Not applicable	3.345	1.258	8.899
Effects of occupational hazards			
Nose/throat-irritation/cough	Ref.		
Eye irritation/itching	.464	.190	1.135
Bruises/cuts/injury	1.672	.995	2.809
Back/waist pain	1.270	.602	2.683
Negligence	5.800	1.275	26.378
Action to take during an injury			
Seek for healthcare	Ref.		
First Aid treatment	1.614	1.018	2.559
Knowledge on personal protective equipment			
Boot	Ref.		
Helmet	.594	.30	1.164
Goggles	.208	.064	.681
Overall	.078	.015	.409
Face mask	.938	.349	2.518
Gloves	.234	.109	.504
Respondent's area of work			
Manager/engineer	Ref.		
Manufacturer/Maintainer	.445	.171	1.160
Producer	.933	.339	2.571
Laborer/packaging	.479	.206	1.116
Others	2.205	1.021	4.763
Work behavior associated with injury			
Working in bad postures	Ref.		
Emptying dust filters	10.080	2.227	45.621
Not using PPE	2.220	1.346	3.661
Scattering work tools	2.154	.996	4.657
On-site health corner available to handle minor injuries			
Yes	Ref.		
No	10.123	3.060	33.492
Have periodic health check-ups and screening			
Yes	Ref.		
No	2.945	1.856	4.672

4.10. Determinants of knowledge on occupational injury

A multivariate logistic model was also built considering all variables that were significant at the chi-square test. The model took into consideration a significance level of $p < 0.05$. The model was to establish the strength as well as the direction of the significance and to control for confounders as well. The results suggest that as compared to workers who were married, those who were not married were more likely to have knowledge on occupational injury (OR 1.76, 95%CI: 1.06 – 2.92). On the issue of source of information on occupational injury, those who relied on their working colleagues (OR 2.42, 95%CI: 1.15-5.08), were more likely to experience the outcome (knowledge on occupational injury). Those who had information from health education (OR 2.08, 95%CI: 0.98-4.43) and other sources (OR 2.04, 95%CI: 0.49-8.3) were both two times more likely to have knowledge on occupational injury. Again, workers' knowledge on the use of first aid during an injury also significantly determined their knowledge on occupational injury (OR 1.6, 95%CI: 1.02-2.56).

As compared to respondents who had knowledge that working in a bad posture is associated with injury, those who said emptying dust filters (OR 10.08, 95%CI: 2.23-45.62), not using PPE (OR 2.22, 95%CI: 1.35-3.66) and those who were of the view that scattering work tools can result in injury (OR 2.15, 95%CI: 0.99-4.66), were all more likely to have knowledge on occupational injury, but scattering of work tools was not a significant determinant of knowledge on occupational injury. On the issue of health, workers who said there was no on-site health corner to treat minor injuries were ten times more likely to have knowledge on occupational injury (OR 10.12, 95%CI: 3.06-33.49) as compared to those who confirmed the presence of a health corner at the Gambia Ports Authority. Similarly,

those who never had a health check-up or screening were almost three times more likely to have knowledge on occupational injury (OR 2.95, 95%CI: 1.86-4.67).

4.11. Organizational and management mechanisms for injury prevention and compensation

All three participants had completed tertiary education and were heads of the various clinical and safety departments of the Gambia Ports Authority, The Gambia. Four key themes were identified with respect to management policies and injury prevention mechanisms. These include: safety protocols and standards, mechanisms for diagnosing and treating injuries, compensation policy for injury, and organizational health and medical insurance policy

4.11.1. Safety protocols and standards

The study results indicated a common trend that was observed in all departments of the Gambia Ports Authority. Clear policies and safety standards were available and implemented throughout working hours and at all sectors of the ports. Interviewees confirmed the strict adherence to safety standards by all workers to be a universal practice with periodic compulsory safety training as the most important component of the safety mechanism. Prompt injury reporting, diagnoses and clinical management was also unanimous practice to maintain safety standards. Again, compulsory provision and use of personal protective equipment was particularly emphasized by all interviewees as methods of reducing occupational injuries.

“What we have in place, key among them is training. Workers need to be trained so that they can avoid injuries. The safety policies we have here are very clear and easy to understand, they are observed by everyone”. (Manager Health and Safety).

4.11.2. Mechanisms for diagnosing and treating injuries

The second theme related to the perception that prompt health attention during or after injury leads to ultimate health. While the prevention of injury is of relevance to safety policy, more emphasis is even placed on injury diagnoses and treatment. Management at the Gambia Ports Authority had adopted the practice of giving prompt medical attention to workers during injury and also placed importance on diagnoses before treatment as a health and safety policy. Interviewees confirmed diagnoses are done using symptoms presented by the injured worker and depending on the level of severity; workers are referred to the GPA clinic for medical attention. One thing that ensures the effectiveness of this policy was its consistency and effective implementation in all departments, as mentioned by interviewees.

“Our policy is guided by diagnosing injury by symptoms of the disease or injury. That is the symptoms that the person shows” (Assistant Manager Clinic).

4.11.3 Compensation policy for injury

In every organization, conditions of service are an important part of the organization's success. While injury prevention and treatment were guided by policies that were strictly implemented, compensations were also made available for workers who were accidentally injured during work. Heads of the health departments were of the view that this policy ensures that workers are protected from severe and permanent disability as a result of work. Injured workers were also transferred to other departments for reassignment on lesser duties. However, the policy was guided by conditions. Management policies that are guided by conditions ensure that organizations like the Gambia Ports Authority does not over compensate injured workers or run at economic losses. That notwithstanding, interviewees

confirmed that the compensation policy ensure immerse work output and provides a cover for health insurance.

“Normally they (injured workers) are compensated provided they have health report and this policy is very effective. The policy protects Gambia Ports from financial losses”.
(Manager Health and Safety)

4.11.4. Organizational health and medical insurance policy

Health managers at the Gambia Ports Authority also ensured a health insurance policy that covers most workers, leading to reducing injuries and promoting organizational output. The Port has an in-house health insurance for all workers and takes care of workers during injury. The insurance also cover task shifting, periodic health screening of all workers and screening of new employees before commencement of duty. One important factor indicated by interviewees as a determinant of occupational injury was the health screening, which they said reduces occupational diseases and promotes positive health seeking behavior among workers at the Gambia Port Authority.

“There is medical insurance for the staff. It is important to know the physical/health status of new employee/s before they start work. When new workers are screened, diseases are prevented and it also instills a positive health behavior on workers. The health insurance policy is really good” (Manager Stevedore and Dockworkers).

CHAPTER FIVE

5.0. DISCUSSION

5.1 Introduction

In this chapter, the findings of the study are discussed and references made to similar studies carried out in other environments. The discussion focuses on the, background characteristics of respondents, knowledge on injury prevention and occupational injury, factors contributing to occupational injury and also the limitation of the study.

5.1. Background characteristics of respondents

A number of researchers studied knowledge on occupational injury in different parts of developing countries, especially occupational injury among Port workers. Furthermore, the sex of a respondent was noted as a significant determinant of his/her knowledge on occupational injury. In previous studies, while respondent's age was cited as a determinant of occupational injury (Hansen, Nielsen, & Frydenberg, 2002 ; Talley 2009 ; Hystad & Eid, 2016), this study failed to establish a relationship between respondent's age and their knowledge on occupational injury. Similarly, while this study found majority of the respondents to be between 31 to 40 years, Olaniyan & Hystad, (2016) had indicated a predominant age range between 30 to 39 years. This could result from the fact that these two studies were done in different study areas. Other evidence has suggested the influence of a port worker's educational attainment on his or her knowledge on occupational injury and emphasized the relevance of port education among workers (Loh & Thai, 2014). These findings are inconsistent with findings of this study. In addition, insufficient OHS education has been one of the challenges in implementing OHS practices (Annan, Addai,

& Tulashie, 2015), but other researchers argued that occupational safety does not only depend on formal education but a combination of factors (Nagai et al., 2007). Variations on educational influence could be as a result of different educational programs, national policies on OHS education and personal efforts to gain knowledge. Evidently, long duration of stay on work site had been associated with injuries, especially among Port workers who stay on Port for close to seven months, compelling countries to reduce port working time to 12 weeks (Oldenburg, Jensen, Oldenburg, & Jensen, 2012). Similar results were also found in this study, where the type of employment determined one's knowledge level on occupational injury.

5.2. Knowledge on injury prevention and occupational injury

Evidence from this study showed that knowledge on occupational injury among workers at the Gambia Ports Authority was almost universal (84%) and this might have resulted in the low prevalence (38%) of occupational injury at the Ports. While the high level of knowledge of respondents in this study did not necessarily predict their experience of occupational injury, counter findings by Griffin, (2004) had indicated that with workers' having knowledge on occupational hazards, increasing risk could be an important determinant of their injury experience. Considering the fact that majority of the respondents at the Gambia Ports Authority had attained tertiary level education (44%), this could explain the low level of occupational injury. In addition, if occupational safety education is an intensive practice at the Port, this could also be a contributing factor. Increasing knowledge among port workers on best methods of avoiding injury could increase the successful and holistic experience at Ports (Zhang, Setunge, & Elmpt, 2014).

In the case of this study, evidence points to the fact that respondent's source of information on occupational injury was a determining factor of their knowledge on occupational injury. It is also noted from findings of Swick & Estreicher (2014), that workers who received information from the environmental protection agency were less likely to have knowledge on occupational injury. This is possible, considering that occupational health education was an ongoing practice and was mostly done by the health and clinical department staff of the Ports. In studies by Sivaprakash & Karthikeyan, (2014), respondents' knowledge on reasons (carelessness) for the occurrence of occupational injury was related to their experience of injury and 54% had indicated various reasons for the prevalence of injury. However, new evidence from this current study indicates contrary findings and stated 81% as a prevalence of workers who had knowledge on why injuries occur at the Gambia Ports. The high knowledge is also an indication of current health education efforts being put in place by the Gambia ports. It is obvious that knowledge on the effects of occupational injury lead to changes in organizational behavior. Both this study and findings of previous studies (Swick et al., 2014) found that respondent's knowledge on the effects of injury significantly predicted their experience of occupational injuries. On the other hand, knowledge on adverse effects of not using recommended precautionary measures at ports during work, only determined a significantly low level of their experience of injury (Hystad & Eid, 2016). Results are reflecting this way for possible reasons of different working environment and different exposure levels. As a result of respondent's knowledge on the right action to take when an emergency occurs, occupational injury at the Gambia Ports Authority was low. Contrary to this, studies done elsewhere among Port workers found that limited knowledge on emergency safety measure resulted in incorrect actions by port workers, leading to increase injury (Yi, Marais, & Shu-guang, 2014). It was agreed that

special attention be paid to critical areas where high density shipping injuries occur (Waerebeek, 2005). Again, the presence of a health clinic at the Gambia Ports Authority is a contributory factor to increasing workers knowledge. On the issue of wearing personal protective equipment, respondents knowledge on the importance of such protective gear had led to the prevention of additional support requests and limited injury occurrence (Park, Shin, Chung, & Jung, 2016). This finding agrees with findings of this study, where respondent's knowledge on the importance of PPE significantly predicted their level of knowledge on occupational injury.

5.3. Factors contributing to occupational injuries at Gambia Ports Authority, The Gambia

Similarities can also be observed in finding by Roberts & Marlow, (2005) and the findings of this study. In both studies, results suggest that one's area of work was a significant factor in contributing to their knowledge on occupational injury, and further indicated that port workers at the engineering departments were more likely to have high level of knowledge on occupational injury as compared to their counterparts. In line with this, harbor engineering has become a vital reason for frequent grave accidents, considering that much technical duties are carried out by this working category (Zhi-qiang & Ya-mei, 2016). Conversely, responses from a similar population in India indicate that knowledge level can be considered independent of the type of employer and area of work (Bhattacharya, 2015).

While this study reported that the use of personal protective equipment was a determinant of knowledge on occupational injury, similar studies also stated that workers' use of necessary Personal Protective Equipment (PPE) at work including safety shoes, masks, gloves, ear protectors, helmets and tools in general, is an indication of their knowledge on

occupational injury (Kaminski^a, Vieira, & Vieira, 2015). The continuous commitment to providing PPE for works in addition to enforcing safety standards at the working environment can lead to the use of PPE for injury prevention. Whole-body vibration, bad posture, and other factors likely combine in a complex manner to cause morbidity (Griffin, 2004 ; Beek, 2012). Findings from this study also indicate that one factor exposing port workers to injury was static work posture. This could be explained by the fact that 47% of work at the Gambia Ports Authority involved manual operation of equipment and packaging, work positions that result in motionless duty performance. On the issue of health and clinical services, majority (87%) of the workers confirmed the presence of a health post at the Ports which handles minor injuries. The availability of the on-site health center greatly determined the knowledge on injuries at the Gambia Ports Authority. In a similar population, only 52% had considered the presence of an on-site health post to be a significant determinant of knowledge on occupational injury. This possibility may exist because India is a well-developed country as compared to The Gambia, and most workers will prefer seeking specialist care outside the Port clinic.

5.4. Organizational and management mechanism for injury prevention and compensation

The interviewees have all confirmed the availability of clear policies and safety standards, which are adhered to by all workers, and also the provision of personal protective equipment and continuous safety training as the most important part of safety mechanism

Furthermore, interviewees are with the view that Gambia ports management have provided an onsite clinic to facilitate prompt diagnosis and treatment which is very relevant to injury prevention and safety standard. In addition, the head of health and safety have also confirmed the availability of injury compensation and health insurance for all full time employees of Gambia Ports Authority. However, all these are guided by policies, for instance for an employee to benefit from injury compensation, the injured worker must obtain a medical board report from a recognized hospital and must fulfilled all the requirements with respect to compensation policy.

5.5. Limitations of the study

One major limitation of the study is that, it used quantitative methods in assessing workers and so their views on management contribution to injury were not included.

This notwithstanding, the limitations could not have significantly influenced the outcomes and main conclusions of the study. However, further examination of these findings is recommended by future studies.

CHAPTER SIX

6.0. CONCLUSIONS AND RECOMMENDATION

This chapter is the concluding chapter of the research. It summarizes the study findings and contains recommendations for consideration by policy makers and other researchers. Both sections are structured according to the objectives of the study.

6.1. Conclusions

Knowledge on occupational injury and injury prevention was near universal among Gambia Ports Workers and this resulted in a low prevalence of occupational injuries. Majority (84%) of the respondents had adequate knowledge and only 38% injury prevalence has been recorded at the time of this study. However, the knowledge of respondents on what action to take during an injury (41%) was low. Workers were also well informed about the importance of using PPE and majority of them (87%) were using PPE during work. Half (50%) of workers think the refusal to use personal protective equipment was the main reason associated with the occurrence of occupational injury while (32%) have the belief that is working in a bad posture. Factors that directly contributed to the occurrence of occupational injury were respondent's sex, source of information on occupational injury and knowledge on the use of PPE.

Management mechanism for injury prevention and compensation at Gambia Ports Authority was adequate, as stated by interviewees. However, there is need for additional education and training of workers to further reduce the prevalence of occupational injuries..

6.2. Recommendations

Recommendations for Policy Makers

1. Considering that majority of workers (92%) at the ports are full time workers, it is important for management to institute proper work schedules and job shifting policies to further reduce occupational injuries below the current prevalence.
2. It is also important for stakeholders and port management to adopt modern technologies that reduce the rate of manual operations at the ports, given that 62% of workers confirmed their work involved physical exertion.
3. The number of workers who had knowledge on the use of first aid during injury was low (41%). Though the availability of an on-site health corner predicted the prevalence of occupational injury, education on the use of first aid during emergencies could be a helpful measure in further reducing injury occurrence.
4. Considering the impact of ergonomic hazards on the prevalence of injury, more policies, education and organizational restructuring will help reduce their effect. As a significant number of workers (24%) still lack knowledge that sitting and working for long hours leads to injury and some also thinks it is not necessary for protection during work.

Recommendations for Future Research

- 1. In view that the study used quantitative methods for the worker and qualitative methods for the safety departments and management, the researcher will recommend that future researchers look at the use of the two methods in a reversal format. This will help policy makers to better understand the needs and views of ordinary port workers at the Gambia Port Authority.**
- 2. The study was only limited assessing injury among workers at the Gambia Ports Authority, future research could target dwellers around the Ports, considering that they could also be exposed to hazards as a result operations by the Port.**
- 3. Again, variables that were used in assessing the situation at the ports were limited to achieve specific information from respondents. It will be good for future research to include more variables that gives a holistic description of the situation.**

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APPENDICES

APPENDIX 1: Consent

Freedom to participate/Voluntary withdrawal

Your consent to participate in this study is voluntary, you can choose not to answer any particular question or all the questions. You are free to withdraw from this study at any point in time. However, you are I would encourage you to fully participate in this study as your opinions are very important for me to understand why you and your colleagues do encounter so many injuries during work and will help me to improve on preventing them.

Privacy and Confidentiality

Please be assured that whatever information you provide will be treated with confidentiality and will be used for research purpose only. Your personal details such as, names and surname or address, will not be used in this report but the responses and information you have provided will be used for the design of the prevention program. Data will be aggregated and analyzed to ensure anonymity.

Compensation for Participants

Compensation will be provide to those participating in the Focus Group Discussion, at the time of data collection. Each participant for the Focus group discussion will be given twenty-five (25) Gambian dalasi, not as payment for participating in this study. Since majority of the participants may not be at work on the schedule date for the discussion, so the amount will be used as a transport refund.

Declaration of conflict of interest

I, Lamin Sanyang (Principal Investigator) have declared that, to the best of my knowledge there is no associated or potential conflict of interest that may arise as my involvement with this study

Contact Persons

For any question regarding to this research, you may contact the following persons:

Dr. Mawuli Dzodzomenyo (+233 20 837 6845), Prof Julius Fobil, (+233 24 346 2541) all of the department of Biological, Environmental Health Sciences, School of Public Health, University of Ghana, Lagon. Or Lamin Sanyang (+233 54 017 5202).

Before taking Consent

Would you like to ask any question about this research? Yes No

(If yes, please indicate, please indicate your question below

.....
.....
.....

Statement of Consent

I have declared that, the purpose, procedures and benefits of this study have been read/ or explained to me and I have responded to the question(s) to the best of my knowledge and at my free will. I do hereby give my consent to participate in this study.

Signature/Thumbprint of the participant..... Date:
...../...../.....

Where a participant cannot read the form themselves, then a witness must sign in the space provided below.....

It was in my present that, the purpose, procedures and benefits were presented to the participant. The participant has consented to participate in this study before the questions were answered.

Name.....
Date...../...../.....

Signature/Thumbprint.....

Interviewer's Statement

I the undersigned name have explained all the questions to the respondent, in a language that he/she understood and the respondent have agreed to participate in the study.

Signature of the interviewer.....
Date...../...../.....

APPENDIX II:

INTERVIEW GUIDE FOR MANAGEMENT

SECTION D: Treatment and Management of injuries during work

(Interview guide for management)

Key question 1: What are some of the safety protocols your department has put in place to ensure safe and early treatment of injuries?

Key question 2: How are work-related injury cases diagnosed and how should they be diagnosed?

Key question 3: What are the decision outcomes of management on workers who are already affected and are unable to continue working? (Benefits for affected staff)

Ancillary questions: How effective is your policy on compensation for injured workers? What health insurance packages are available for affected workers? How is task shifting and job-reassigning an important measure to limit the re-occurrence of occupational injuries?

Key question 4: What are the benefits of intermittent medical screening and surveillance on occupational injuries?

Ancillary questions: Is it possible to improve symptoms of injuries through pharmacological treatment in affected workers with persistent exposure? Is pre-placement screening for specific sensitization to work-related allergens useful for the identification of those at higher risk of developing work-related injuries? Is pre-placement screening for a

risk factor of occupational sensitization, such as atopy (a hereditary tendency to react to certain allergens), useful for the identification of those at higher risk of developing work-related injury? What is the impact of medical surveillance on the disease burden (prevalence) of work-related injuries?

Key question 5: What is the impact of controlling work-related exposure to prevent occupational injuries?

Ancillary questions: What are the consequences of persistent exposure to the causal agent? How effective is complete avoidance of exposure to occupational injuries? How effective is the reduction of exposure through personal protective equipment? How effective is the reduction of exposure through engineering controls or relocation of affected workers?

Key question 6: If you were to make recommendations to improve the safety and health of workers, what will they be?

APPENDIX III: DATA COLLECTION TOOLS

SECTION 1: TO BE COMPLETED BY INTERVIEWER [for office use]

SECTION 1: TO BE COMPLETED BY INTERVIEWER [for office use]		
Q001	Questionnaire Number	<input type="text"/> <input type="text"/> <input type="text"/>
Q002	Date of interview	...../...../..... dd/mm/yyyy
Q003	Name of Interviewer	.....

SECTION A: SOCIO-DEMOGRAPHIC INFORMATION ON RESPONDENT

NO.	QUESTIONS AND FILTERS	CODING CATEGORY	
Q1	How old are you? (Age in completed years)	<input type="text"/> <input type="text"/>	
Q2	What is your current marital Status?	Married	1
		Not Married	2
		Divorced	3
		Other (specify).....	4
Q3	What is the highest level of education completed?	Primary	1
		Junior High	2
		Senior High	3
		Voc/Technical	4
		Tertiary	5
		Other (specify)	6

Q4	What is your mother tongue?	English	1
		Mandinka	2
		Wollof	3
		Fulla	4
		Manjako	5
		Sarahule	6
		Jola	7
Q5	What is your religious denomination?	Christian	1
		Muslim	2
		Traditional	3
		Others.....	4
Q6	What is your type of employment?	Full time	1
		Part time	2
		Other (specify).....	3

Knowledge level of workers on occupational injuries

Q7	Have you ever heard of occupational injury?	Yes	1
		No	2
Q8	In your opinion, which of these directly defines occupational injury? Select all that apply	1. Health safety at work 2. Occurred injury at work place.	

		3. Occupational injury related to the job. 4. Disease contracted outside work	
Q9	What is your source of information on occupational injuries?	During training Colleagues Health education Other sources (specify)....	1 2 3 4
Q10	In your opinion, why do occupational injuries occur?	..... ..... ..... .....
Q11	Have you ever experienced an injury at work?	Yes No	1 2
Q12	What are some of the effects of occupational hazards? Select all that apply	Nose/throat-irritation/cough Eye irritation/itching Bruises/cuts/injury Back/waist pain Negligence	1 2 3 4 5
Q13		..... .....

	<p>What action do you think someone should take during an injury?</p>	<p>.....</p>
<p>Q14</p>	<p>How can occupational injury be prevented?</p>	<p>.....</p>
<p>Q15</p>	<p>What specific measures can be put in-place to avoid injury? Select all that apply</p>	<p>1. Safety Signs 2. Use of Personal Protective Equipment. 3. Safety precaution measures 4. Training employees on safety precautionary measures. 5. Work place inspection to enforce adherence to safety signs. 6. Hospitalization.</p>
<p>Q16</p>	<p>Mention three personal protective equipment that can prevent occupational injury?</p>	<p>.....</p>

Q17	Which injuries can be prevented by using personal protective gears/equipment?	..... ..... .....
Q18	Apart from using personal protective equipment, in which other way can injuries be prevented?	..... ..... .....
Q19	Do you feel the necessity to always protect yourself while working?	Yes	1
		No	2
Q20	Can sitting/working for long hours lead to an injury?	Yes	1
		No	2
Q21	Can manual/physical packaging of goods lead to an injury?	Yes	1
		No	2
Q22	For what reason should someone wear personal protective clothing?	..... ..... ..... .....
Q23	Is it necessary to separate hazardous/harmful chemicals/goods from other goods at the port?	Yes	1
		No	2
Q24	Mention three danger signs you can identify	..... ..... ..... .....

Factors that contributes to knowledge on occupational injuries

Q25	What is your area of work?	Manager/Engineer Manufacturer/Maintainer Producer Laborer/packaging Others (specify).....	1 2 3 4 5
Q26	Do you use of Personal Protective Equipment?	Yes No	1 2
Q27	What form of Personal Protective Equipment do you use?	Hand gloves Coat overalls Eye goggles Helmets Face masks Boots Earplugs/muffs Respirators	1 2 3 4 5 6 7 8
Q28	Single most important PPE you feel that is important	Hand gloves Coat overalls Eye goggles Helmets Boots Earplugs/muffs Face masks	1 2 3 4 5 6

		Respirators	7
Q29	Frequency of Personal Protective Equipment use	Always	1
		Sometimes	2
		Rarely	3
Q30	Reasons why PPE are not always used	Forget to use	1
		Can't afford it	2
		Inconvenient	3
		Not a necessity	4
Q31	Does your work involve physical exertion?	Yes	1
		No	2
Q32	On average, how many hours do you work a day?	Less than eight hours	1
		More than eight hours	2
Q33	What work behavior or action do you feel is associated with the effects encountered	Working in bad postures	1
		Emptying dust filter bags	2
		Not using PPE	3
		Scattering work tools	4
		Compressed	5
		Others.....	6
		.....	7
Q34	What is your sailing period length?	Less than a week	1
		1-2 weeks	2
		3-4 weeks	3
		5-6 weeks	4

		6 weeks and above	5
Q35	Do you experience breathing/respiratory challenges?	Yes No	1 2
Q36	Does your work involve manual operation of equipment/packaging?	Yes No	1 2
Q37	Do you easily get struck by falling object?	Yes No	1 2
Q38	Are you exposed to sharp objects, hazardous chemicals or explosives?	Yes No	1 2
Q39	Do you have a management safety protocol for workers?	Yes No	1 2
Q40	Do management ensure strict adherence to safety guidelines?	Yes No	1 2
Q41	What immediate treatment measures are in place during an injury?	..... .....
Q42	Do you have an on-site health corner available to handle minor injuries?	Yes No	1 2
Q43	Do you officially have periodic industrial health check-ups and screening?	Yes No	1 2
Q44	What other measures are lacking that can contribute to ensuring your health and safety?	..... ..... .....

