FFACTORS INFLUENCING ACCIDENT OCCURRENCE AMONG FOOD LABORATORY WORKERS IN MOMBASA COUNTY, KENYA

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Factors Influencing Accident Occurrence among Food Laboratory Workers in Mombasa County, Kenya

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University

Signature……Date……

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This thesis has been submitted for examination with our approval as the University supervisors

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DEDICATION

I dedicate this work to my parents, who encouraged me throughout the learning process. A special feeling of gratitude goes to my supervisors, for their tireless efforts in creating time to make this work better.

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ABBREVIATIONS

DOSHS- Directorate of Occupational Safety and Health Services

ILO - International Labor Organization

NACADA- National Authority for the Campaign against Alcohol and Drug Abuse

OSH Occupational Safety and Health

OSHA- Occupational Safety and Health Act.

UNODC- United Nations Office on Drugs and Crime

WHO - World Health Organization

ABSTRACT

Occupational accidents kill nearly one thousand people every day. There were over 313 million non-fatal occupational accidents in 2010, meaning that around the world work provokes injury for approximately 860,000 people every day. Kenya has put in place legislations to safeguard the safety and health of workers, but still the number of accidents at workplaces has continued to increase. According to the Directorate of Occupational Safety and Health Services (DOSHS) Annual Report, the Coast region was leading with the number of fatal accidents at 42 and non-fatal accidents at 842 for the year 2004. Literature from various parts of the world has identified numerous factors influencing these accident occurrences. Human error plays a big role in accident causation, behavioral factors such as factors attributed to the worker, e.g. improper attitude, lack of knowledge, lack of skills and inadequate physical and mental condition. Carelessness and reckless behavior, inattention or fatigue, inadequate or unsafe equipment and lack of adequate training increase the probability of accidents to occur. However, not much has been documented in Kenya, particularly in Mombasa County. This study therefore sought to investigate the factors influencing the occurrences of accidents in the food laboratories in Mombasa Country through establishing the influence, if any, of drug and substance use, working environment and trainings in OSH on laboratory safety practices and accident occurrence among the laboratory workers. Data collected was analyzed both qualitatively and quantitatively using the SPSS computer software and results were presented in tables as percentages and frequencies. Results indicated slip and falls as the main cause of accidents as was reported by 43% of respondents. The results also showed a strong inverse correlation between the work experience and accident occurrence. Knowledge on OSH and laboratory safety Practices, drug and substance use among the laboratory and working environment were the key factors affecting accident occurrence among food laboratory workers. The level of awareness on occupational safety and health was inadequate as 53.8% of the workers were not aware of the safety precautions. The study concluded that; inadequate training on occupational health and safety, drug use among Food laboratory workers and poor working environment were the key causes of accident occurrence in food laboratories. The study recommended an inclusion of training progamme for all food laboratory workers, development and implementation of alcohol and substance policy and screening of workers before accessing their station and inspection of work environment to be done regularly to ensure it is conducive for the workers.

CHAPTER ONE

INTRODUCTION

1.1 Background Information

Industrialization has brought about many problems which include industrial accidents and other occupational health related issues for the workers working in industries (Kumuda, 2012). Recently, there has been a rise in occupational accidents occupational diseases and disasters in industries, despite the existence of legislations at international and national levels (Abdallae t al., 2017).

Workplace accident also referred to as Occupational Accident can be defined as an unwanted, unplanned and uncontrolled event affecting people, the workplace and society (Noorul et al., 2012). As per the standards of Occupational Safety and Health Administration, an injury is work-related if something occurs at the work environment which either causes or contributes to the resulting condition or significantly aggravates a pre-existing condition. It is any wound or damage to the body resulting from an event in the work environment (OSHA, 2015).

According to Wachter and Yorio (2014), workplace accidents mostly occur as people engage in work and/ or as they transit to and from the workplace. Quite often it is thought that workplace accidents may involve several injuries and/or other harm in organizations. Harms (2001) reports that workplace injuries can occur in a variety of ways. According to him, they can be categorized into three categories:

a) Workplace accidents: the accidents occurring in the workplace
b) Workplace diseases: the harmful effects of work that is not due to an accident, such as over-exertion injuries, allergies or hearing complaints.
c) Commuting accidents: according to Wherry and Schor (2015), a commuting accident is one that occurs while commuting to and from work and in the course of work.

Globally, despite a lot of efforts being put in place to improve Occupational Safety and Health, an estimated 374 million nonfatal occupational injuries and 380,500 occupational fatalities occur each year (WSHI, 2017). According to ILO (2017), Occupational Accidents, affect about 70% of adult men and up to 60% of adult women throughout the world. Such Occupational accidents contribute to absenteeism, light duty assignments or other work restrictions, high turnover, and higher workers' compensation costs (ILO, 2012).

According to a report by GFP (2014) most of these occupational accidents occur in low- and middle-income countries in Asia and Africa region as shown in Table 1.1. These countries possess most of the world's working population, but additionally, as in other developing countries; the proportion of workers occupied in jobs like agriculture, mining, construction and fishing (ILO, 2018) is higher. Nevertheless, high-income countries also present a significant number of work-related fatalities, though fatal accidents represent a smaller portion of their death toll. This in part reflects the lower proportion of hazardous jobs in these countries at present, but also illustrates previous efforts made regarding occupational accident prevention.

Table 1.1: Global trend on occupational accidents for the year 2014

			Occupational injuries reported to ILO 2014		Global estimates of occupational accidents 2014				
							Non-fatal (at least four days absence)		
Region	Labour force	Total employment	Fatal	Non-fatal	Fatal	* Fatality Rate	Lower limit (0.14)	Upper limit (0.08)	Average
Africa	413,329,046	397,013,885	320	25,434	71,882	17.39	51,343,960	89,851,931	70,597,946
America	479,990,599	433,527,137	1,916	966,221	24,579	5.12	17,556,317	30,672,033	24,114,175
Asia	2,093,134,505	1,953,718,973	2,694	121,256	271,949	12.99	194,249,063	339,932,172	267,097,755
Europe	364,546,703	326,139,450	4,079	1,921,644	11,017	3.02	7,869,606	13,600,463	11,134,918
Oceania	19,486,718	18,118,018	188	98,980	1,074	5.51	767,040	1,316,209	1,041,625
Total	**3,370,487,570**	**3,128,517,463**	**9,197**	**3,133,535**	**380,500**	**11.29**	**271,785,986**	**475,372,807**	**373,986,418**

* Number of occupational accidents per 100,000 persons in the labour force

Source:Ministry of Social Affairs and Health Finland, 2017

According to Thobora (2016), Kenya's health and safety situation in some organizations is less satisfactory when compared to international firms. The Occupational Safety and Health Act, 2007 has been enacted in Kenya. The law states that it is the duty of employees to report any dangerous situation to the supervisor. In the event of any contravention in connection with or in relation to a workplace of the provision of this Act be quilt of an offence (GOK, 2007).

ILO (2005) reported occupational fatalities and injuries between the years 2000 and 2004 were as follows: in 2000-1528, 2001-1923, 2002-1332, 2003-1599 and 2004-1387. According to Mutemi (2005) however, even though the Government of Kenya has put in place legislations to safeguard the safety and health of workers, the number of accidents at workplaces has continued to increase. A report done by the government of Kenya through the Ministry of Labour and Social Protection (2018) confirms that there has been an increasing trend in number of accidents with an increase of 5% between years 2011/2012 and 2012/2013 and a 12 % increase between 2013/2014 and 2014/2015 as shown in table 1.2 below

Table 1.2: Analysis of reported Occupational Accidents to DOSHS

Years	Non-fatal	Fatal	% increase in accidents
2012	5,088	159	-
2013	5,306	175	5
2014	5,898	185	11
2015	6,482	314	12

Source: Ministry of Labour and Social Protection Audit Reports, 2018

Food laboratory is among the list of workplaces where incidents of both fatal and non-fatal occupational accidents occur. According to APLAC (2014), Food Laboratories are applicable mainly to the following areas of activity: Food Chemistry; Food Microbiology; Food Rheology and other Physical Testing; Food Toxicology; Functional Testing; Molecular Biology (including genetically modified organisms); Sensory Testing. However, so little research has been done on this area.

Muchemedzi and Charamba (2006) reports that accidents arise from a combination of factors which act simultaneously. Accidents are caused by the result of unsafe acts or practices (the human element that results from poor attitudes, physical conditions and lack of knowledge or skills to enable one to work safely). They are also caused by the result of unsafe conditions of equipment or materials.

Danson (2005) stated that workers in every occupation can be faced with a multitude of hazards in the workplace. Occupational Safety and Health addresses the broad range of workplace hazards from accident prevention to the more insidious hazards including toxic fumes, dust, noise, heat, stress, etc. Preventing work-related diseases and accidents must be the goal of Occupational Safety and Health programmes, rather than attempting to solve problems after they have already developed.

As Rhee *et al.* (2013) argues, it is very difficult to extract the causal factors from occupational accident phenomena However Ratnayaka *et al.* (2017) concluded that factors affecting industrial accidents were Awareness of health and safety practices, Utilization of personal protecting equipment, Safety and health performance, Safety culture and Work environment. Sklet S. (2006) however, stated that there are many factors associated with accidents they established that technical, human, operational and organizational factors were the major influence to accident occurrence.

As described by Benyakowa (2012), occupational hazards can have harmful effects on workers, their families, and other people in the community, as well as on the physical environment around the workplace. El-Wakeil *et al*. (2013) also noted that workers' families can also be exposed in a number of ways: they can be exposed to residues which may be on the workers' clothes. Other people in the community can all be exposed in the same ways as well. Overall, efforts in Occupational Safety and Health must aim to prevent industrial accidents and diseases, and at the same time recognize the connection between worker safety and health, the workplace, and the environment outside the workplace. There is therefore a need to identify the factors influencing occupational accidents among workers in food laboratories and develop ways of reducing them.

1.2 Statement of the Problem

Understanding and limiting the occurrence of organizational accidents is one of the major challenges that needs to be addressed globally. Occupational Safety and Health issues have not only become a global concern for employers, workers and national governments, but are also of major concern to managers of organizations (Nzuve, 2013). Managers are accountable for any shortcomings at the workplace and therefore recognize that it is in their interest to create safe working practices (WHO, 2010) and comply with occupational safety and health regulations.

According to ILO (2014), there is an estimate of over 2.3 million occupational accidents and work-related fatalities annually, of which over 350,000 result from occupational accidents. As a result, approximately 1,000 people die every day due to occupational accidents. There were over 313 million non-fatal occupational accidents in 2010, meaning that work provokes injury for approximately 860,000 people every day.

Kimei and Nyerere (2016) investigated factors affecting accident occurrence in the construction sector, Akinyi (2014) researched on the accident occurrences in a cement company. A study on the Medical laboratories has also been carried out (Muiruki et al., 2018) but there has been no research done about the food laboratories. This study therefore sought to investigate the factors influencing the occurrences of accident in the food laboratories.

1.3 Objectives

1.3.1 General Objective

The general objective of the study was to determine the factors that influence accident occurrence among food laboratory workers in Mombasa County.

1.3.2 Specific objectives

1. To determine frequency of accidents among food laboratory workers.
2. To determine the status of working environment in the food laboratories and its effect on accident occurrence among food laboratory workers.
3. To determine the effect of Drug and Substance use on accident occurrence among food laboratory workers.
4. To determine the level of knowledge and awareness on OSH and laboratory safety practices among the laboratory workers and its effect on Accident Occurrence.

1.4 Research Questions

1. What is the frequency of accidents among laboratory workers?
2. How is the status of working environment in the food laboratories?
3. What is the effect of Drug and Substance use on accident occurrence among food laboratory workers?
4. What is the level of knowledge and awareness on OSH and laboratory safety practices among the laboratory workers?

1.5 Research Hypothesis

H_{01}: Laboratory working environment status does not influence accident occurrence in food laboratories.

H_{02}: Knowledge and awareness on OSH and laboratory safety practices does not influence accident occurrence in food laboratories.

1.6 Justification of the study

ILO (2019) explains that the challenge of Occupational Safety and Health has been in existence for as long as people have worked in workplaces. Even though the importance of improving safety and health at work is increasingly widely recognized, there has still been an increase in occupational accidents globally (Rushton et al., 2017; Takala et al., 2017).

According to Takala et al. (2014), the health status of the workforce in every country has an immediate and direct impact on national and world economies. Total economic losses due to occupational illnesses and injuries are enormous. The International Labor Organization (ILO, 1998) estimated that in 1997, the overall economic losses resulting from work-related diseases and injuries were approximately 4-5 % of the world's Gross National Product. Therefore, with the Industrial growth which has led to creation of employment opportunities for many people, there is need to ensure compliance of OSH measures by food laboratories in Mombasa County to ensure that the safety and health of workers is safeguarded. The findings of this study will help enhance the knowledge of OSH measures and fill the existing gaps on establishment and implementation of OSH in Food laboratories within Mombasa County. The food laboratories were chosen for the study because food industry is the fastest growing industry in Kenya.

1.7 Scope of the study

The study covered the workers in the following food laboratories in Mombasa county: Kenya Bureau of Standards, SGS (Societe generale de survellaince), Polucon testing service, Government chemist, Bureau Veritas, Kenya marine fisheries research institute, Intertek testing services, Sea harvest, Wanainchi marine, Pwani oil, Diamond industries , Mombasa maize millers and Trans Africa fisheries.

1.8 Limitation of the study

Some of the respondents were not willing to share some of the information that touches on the personal behavior like alcohol and drug abuse which resulted to having slightly lower frequency of those using drugs. Similar observation was made on accidents reporting as shown in the general register where few accidents were recorded despite observation being higher.

1.9 Conceptual Framework

Figure 1.1 below shows a diagrammatic representation of variables studied as some of the factors which could influence accident occurrence in food laboratories in Mombasa County. The model shows the dependent and independent variables.

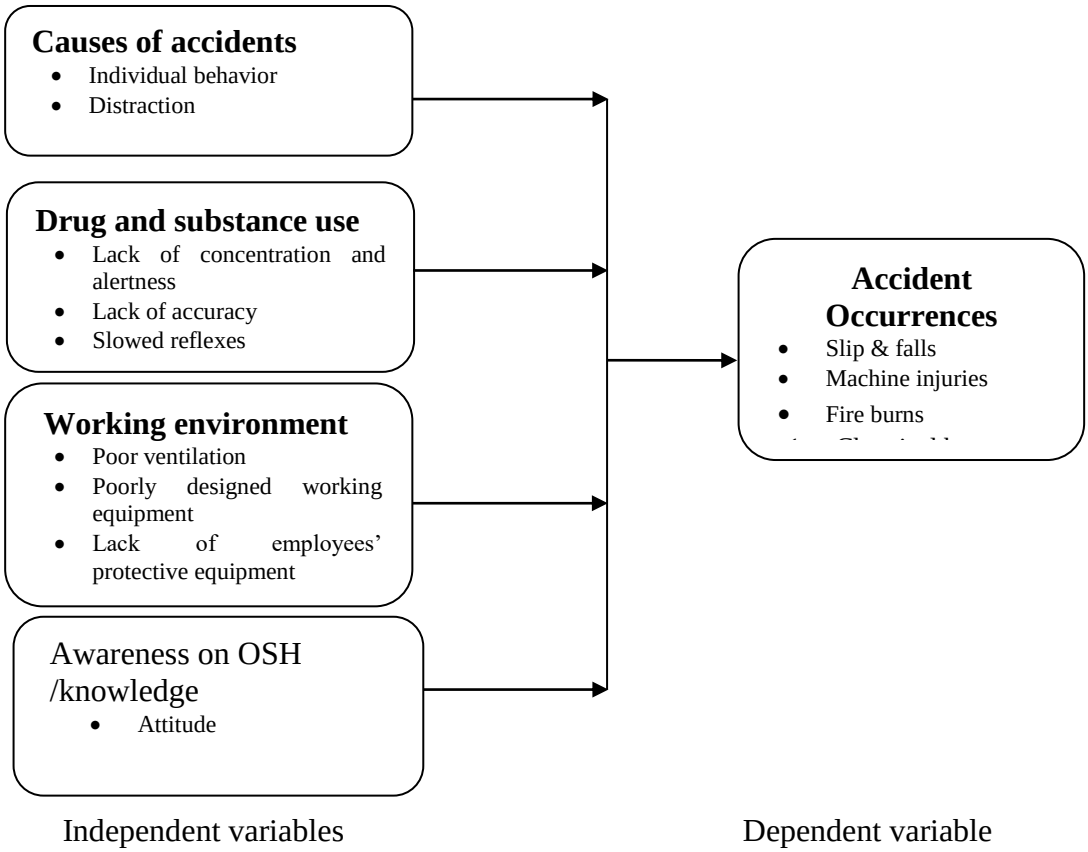

Figure 1.1: Conceptual Framework of dependent and independent variables

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the critical literature of the current knowledge on the factors influencing the occurrence of accidents in the food laboratories.

2.2 Theoretical Review

Preventing occupational accidents can be made possible by having a clear understanding of the factors affecting them. Many traditional theories about the causes of occupational accidents focus on the worker (Raouf, 2011; Wachter & Yolio, 2014). Many attempts have been made to develop a prediction theory of accident causation, but so far none has been universally accepted. Researchers from different fields of science and engineering have been trying to develop a theory of factors influencing accident occurrences which will help to identify, isolate and ultimately remove the factors that contribute to or cause accidents. Below are some developed theories.

2.2.1 The Domino Theory

The Domino theory was developed in 1929 by William Heinrich and it has been expanded over time (Raouf, 2011; Sabet *et al.*, 2013). After the study carried out by Heinrich in 1931 and the development of the Domino model, an opinion of the human playing the most crucial part in accident occurrence was formed (Barkhordari *et al.*, 2019). Based on his study, he concluded that 88% of accidents related to unsafe acts, 10% unsafe conditions and 2% unpredicted factors (Mehrdad et al., 2014). As reported by Barkhordari *et al.* (2019) one of the major cause of unsafe act is workers stress. Sabet *et al.* (2013) also states that recklessness, stubbornness, greed, bad temper, ignorance, nervousness, recklessness, excitability and violent temper are traits that can appear due to life environments contributing to unsafe acts or unsafe conditions.

Unsafe acts together with mechanical and physical hazard are acts and conditions placed at the center factor of the sequences. They significantly contribute to accident occurrences. Such acts may include careless starting of machines, insufficient light and unguarded points of operation. Dealing with the factor is the easiest and most efficient solution in preventing accident occurrences. Accident according to Sandi and Gilbride (2015) is defined as the undesirable and the unwanted events that happen and cause injury. Such events can be person's fall from height and striking a person due to collapse of objects. Damage or injury according to Zemaitis *et al.* (2019) defines injury as the consequences leading to suffering or damage to someone's body.

The sequence of the domino would be interrupted when a single domino is removed. Likewise, the accident could be prevented by removing one factor from the sequence especially the third factor. The Domino theory was one of the clearest theories defining accident processes however, it had some weakness which led to its revision. The main weaknesses were its emphasis on blaming individuals, not putting into considerations the failures from the management and the belief that a single factor can cause accidents even though there may be more than one cause (Sabet *et al.*, 2013).

2.2.2 Human Factor Theory

This model is based on the idea that human errors play a major role in the accident occurrences. Although the role that human error plays in accident causation has been accepted for many years, it is only recently that a lot of concerted effort has been put into detailed research into human error in accidents.

Beyond the technical issues two common points emerged strongly from the inquiries into these accidents, which are the influence of human error in the chain of events leading to the accident and the failures in the management and organization of safety. People can cause or contribute to accidents (or mitigate the consequences) in a number of ways (Dragan *et al.*, 2017). They can occur through a failure where a person can directly cause an accident. However, these errors are not caused by people deliberately. The main human causes of accidents occurrence include

overload, incorrect response, and improper activity. All of these can lead to the escalation of an incident (Opeyemi *et al*., 2018).

On the other hand, we can intervene to stop potential accidents. Many companies have their own anecdotes about recovery from a potential incident through the timely actions of individuals. Mitigation of the possible effects of an incident can result from human resourcefulness. The degree of loss of life can be reduced by the emergency response of operators and crew. Emergency planning and response including appropriate training can significantly improve rescue situations (Duan & He, 2015).

Traditionally the promotion of safety has been largely reactive, concentrating on accident investigation with the primary aim of avoiding repeat events. In part this arose from too simple an approach to accident causation based on the apparent importance placed on the concept of a single primary cause; either an unsafe act or an unsafe condition (as a result of the domino theory). If the former were the case, responsibility was clear and blame could be apportioned. If the latter then, a technical solution could be sought. In part this also arose from the fact that a reactive approach, based on a single primary cause was also an easy approach to handle (Burban, 2016).

Taking a blame approach to human error in accidents provides little of use in terms of future accident prevention. For example, if a man made a mistake which resulted in an accident and we work on the basis of a "blame" approach then there are only three options available to us. First, we accept that human error is inevitable, shrug our shoulders, tell him to be a bit more careful and carry on as before with our fingers crossed. Alternatively, we can say as he was responsible, we should discipline him, perhaps even sack him. The third option is a half-way house whereby we give him the benefit of the doubt and decide that he might need retraining. However, if all we have found out about the accident was that he was the "cause" we have learnt nothing new on which to base the retraining. We will almost certainly therefore be reduced to repeating the training which we know has already failed (Robertson *et al.*, 2016).

Unfortunately, this is a pretty reasonable description of the approach to human error in accidents that has existed in most industrial organizations for years. If accidents are to be prevented in the future it is no use whatsoever to “blame” people for their mistakes unless we have a detailed understanding of what caused the mistakes. Only by understanding all the issues which have caused (or could cause) an accident can we identify the way to prevent future accidents (Whittingham, 2004).

2.2.3 Multiple Causation Theory

This theory is an improvement of the domino theory. It adjusts it by arguing that for a single accident to occur there may be many contributing factors, causes and sub-causes, and that organizational, cultural and managerial causes interact and give rise to accidents (Eteifa, 2018). According to this theory, the contributory factors can be grouped into the following two categories: Behavioral factors: they include factors pertaining to the worker, such as improper attitude, lack of knowledge, lack of skills and inadequate physical and mental condition. Environmental factors: they include improper guarding of hazardous work elements and degradation of equipment through use and unsafe procedures. The major contribution of this theory is to bring out the fact that rarely, if ever, is an accident the result of a single cause or act (Garfield & Franklin, 2016).

2.3 Previous Related Studies

2.3.1 Accidents at workplaces

What leads to accidents in workplaces has been an area of concern across the globe (Kimei & Nyerere, 2016). The human related factors is often indicated when the causes are not found in the technical systems. As Robertson *et al.* (2016) points out , human errors are responsible for around 80 % of accidents. A technical perspective on safety leaves the person involved with an individual responsibility. As the injury ‘only’ affects the operator, he/she is to answer for the accident and therefore also to blame (Cohen, 2017). The human errors made by i.e. designers, manufacturers of machines, purchasers, maintenance personnel, administrators, management or safety

analysts, that may contribute to an accident are seldom analyzed or brought forward despite their contribution to the whole complexity of risks (Robertson *et al.*, 2016).

According to Cohen (2017), there are two kinds of error: active errors, committed by the sharp-end personnel where effects are felt almost immediately, and latent failures with adverse consequences that may lie dormant within the system for a long time, only becoming evident when they combine with other factors to breach the system's defences. Latent failures can contribute to a number of different accidents, and can increase the likelihood of active failures through the creation of local factors promoting errors or violations. He also stated that there is a growing awareness that it is more important to uncover and remedy the latent failures resulting from poor design, incorrect installation, faulty maintenance and bad management decisions than to minimize the error of the individual operator.

Mwangi (2016) reports that poor working conditions may have an effect of the safety and health of the workers. These unhealthy or unsafe working conditions can be found in any workplace.

2.3.2 Drug and substance use

Chalan (2019) stated that substance use refers to the overindulgence in and dependence of a drug or other chemical leading to effects that are detrimental to the individual's physical and mental health, or the welfare of others. Several studies: Frone, 2006, Moore *et al.* 2009 and Ndetei *et al. (*2004) have established that globally some of the most commonly abused drugs include alcohol, amphetamines, barbiturates, benzodiazepines, and opiates (codeine, hydrocodone, cigarettes, heroin, morphine etc. In Kenya however, NACADA (2011) established that alcohol, tobacco, Khat and Cannadis are the most commonly used drugs. A recent survey carried out on Kenyans aged 15-65 showed that 12.2% were using alcohol, 8.3% were using tobacco, 4.1% were using Khat and 1.0% were using bhang/cannabis (Munene, 2019).

As Dubljević (2018) explained, drug use is looked at mainly from two perspectives namely: The use of illegal drugs and the misuse of legal drugs. Such illegal drugs include cocaine, marijuana and heroin. Legal drugs on the other hand include alcohol, cigarettes, and prescription drugs among others. Such intakes of substance can affect how ones brain work and when one cannot function properly under the influence of that substance.

According to UNODC (2018), there is positive relationship between alcohol use and work-related injuries. The fact that some people use substances such as alcohol or illicit drugs, or that some people misuse prescription drugs is not new. The awareness that the abuse of substances may affect the workplace is, however, increasing in acceptance. According to Ministry of Labour (2014), some of the effects of alcoholism and drug abuse include; addiction, absenteeism, brain damage, low concentration, quarrelsome, low productivity, withdrawal from family functions, change in daily habits, mood swings, accidents, poor hygiene, poor health, vulnerability to disease, conflict with the law, outbursts of violence, anti-social behavior and disorientation in time, space and even death. However, many aspects of the workplace today especially laboratories require alertness, and accurate and quick reflexes which are affected by the drug use and misuse.

The use of drugs in Kenya is escalating rapidly from alcohol and cigarettes to the more dangerous drugs such as marijuana, cocaine and heroin among other drugs. In addition, there are marked changes in the demographic profile of users: women and youth are increasingly initiating use of drugs. According to the study of NACADA (2017), 8 % of 10-14 year olds have used some alcohol at least once in their life and about 13 % of them have used other drugs or substances such as cigarettes. The same study found that close to 40 per cent of adults aged between 15 and 65 years have used one type of alcoholic beverage or another in their lifetime, with huge variations in the types and the rate of the consumption across regions, rural-urban residence, age, gender, education level, religion and economic status. At least 13 % of people aged 15 to 65 from all regions in Kenya except North Eastern region are current consumers of alcohol (Munene, 2019).

The Coastal Region of Kenya is considered to be very much affected by drug use with the port of Mombasa being a major transit point for drug trafficking in Africa (Kelekye, 2018). In 2009 alone, 192 cases of drugs involving 49 traffickers were handled by police in the Kenyan Coast. The most prominent one being that of suspects linked to five kilos of heroin worth Ksh. 10 million (Mugusia, 2009). According to the UNODC Report (2009) there are 20,000 heroin and cocaine addicts in the Coast province and between 100,000 and 1,300,000 in East Africa. There has been a remarkable upsurge of heroin and cocaine addicts at the Kenyan Coast from 10,000 in 2002 (Beckelerg, 2018) to the current 20,000 addicts, this for sure is a dangerous trend.

As pointed out by USDHHS (2016), despite the numerous safety measures at the workplace, 40% of all industrial workplace fatalities are caused by substance abusers. These people may not realize the danger they create by using them at work, or while recuperating from alcohol or drug abuse. An individual who is inebriated or hangover has decreased productivity and alertness. This means workplace accidents are more likely to happen. In fact, workplace accidents caused by inebriation or a hangover are five times more likely to injure someone. (Chandler, 2016). In addition, substance abusers are ten times more likely to miss work, negatively impacting themselves and others by jeopardizing their jobs and creating backlogs (Toney-Butler & Siela, 2019).

2.3.3 Working environment

Workplace environments have impact either positive or negative on the employees' productivity, moral, concentration and satisfaction. The status of workplace environment in most industries and companies is unsafe and unhealthy in terms of the poor building design and workstation set-up, unsuitable furniture and equipment, excessive noise, poor lighting system, insufficient safety measures in fire emergencies and lack of personal protective equipment (Elnaga, 2013; Salunke, 2015; Sarodo & Shirsath, 2014).

According to Crabbe and Close (2016), the following environmental hazards may require consideration in the workplace to prevent accidents: Noise: it can influence

workers as they do their work (Sarodo & Shirsath, 2014). Many people cannot concentrate on the jobs when there is a lot of noise, this may reduce productivity and concentration.

Lighting: A poor lighting system in a work environment can result in eyestrain, headaches, irritability and, inevitably, reduced productivity. Light sources, including the sun, can create unwanted reflections, glare and shadows in the workplace that can cause discomfort and distraction, and can interfere with the performance of visual tasks. Low levels of lighting can cause depression, which for some people may be severe ((Sarodo & Shirsath, 2014)).

Overcrowding: As indicated by Rigler (2017), there is a statistically significant correlation between overcrowding and increased accident rates. Overcrowding will lead to an increased risk of accidents as there'll be insufficient space for the workers to perform their tasks comfortably. This will lead to stress due to invasion of personal space. 'Stress is deemed one of the biggest health risks people currently face at work and overcrowding is a contributing factor

Ministry of Labour and Social Protection (2018) explains that with respect to workers' rights, the OSH Act (2007) generally provides that each employee must be told about hazards existing at the workplace, and receive training on how to avoid those hazards. Employees also have a right to information about the safety and health laws applicable to the business. They must have means to file a complaint with the government if it appears the laws are being broken, on a confidential basis, and without fear of retaliation.

Employers have duties under the OSH Act to seek out potential threats to the wellbeing of their employees. In other words, business owners must be proactive, and take it upon themselves to discover hazards before they cause harm. Once discovered, hazards must be removed or otherwise addressed in order to minimize the risk to employees. Hazards that cannot be rendered safe must be brought to the attention of the employees, and appropriate training and safety gear provided. (Ministry of Labour and Social Protection, 2018). Finally, employers are required to maintain accident records and make them available for viewing. Australian Federal

regulations implemented under the OSH Act are administered by the Occupational Safety and Health Administration (OSHA). Well-known among members of the construction and mining industries in particular, OSHA sends officials to physically inspect workplaces and issue citations for violations. It also provides educational outreach programs for businesses (Abdalla *et al*., 2017).

2.3.4 Training on OSH

According to Armstrong (2012), safety training spells out the rules and provides information on potential hazards and how to avoid them. It is part of a preventive program done through: Induction course; Transfer to new job or change in working methods; Refresher course and training should be provided to deal with aspects of safety and health to employees. Rosenfield (2016) also argues that lack of experience and poor training is the main causes of accidents at workplace. Training and inductions in workplace helps inculcate in employees a positive safety and health culture. Preventive training and induction procedures in the workplace environment are important tools in preventing accidents at work. All new employees should receive a full induction as soon as possible after starting a new site so that they are made aware of potential hazards and given instruction on how to avoid the possible risks.

Management commitment gives a powerful message to the workforce by what they do for safety and health. They should personally get involved in safety and health inspections and audits, safety and health consultation meetings and also in the investigation of accidents, ill-health and incidents so that they can identify areas of correction (Hughes & Ferrett, 2012). Supervisory and management training will play a pivotal role in avoiding common managerial failures such as, lack of safety and health awareness, enforcement and promotion, lack of supervision and communication with employees and lack of understanding of the extent of the responsibility of the supervisor (Hughes & Ferrett, 2012).

Some workers fail to carry out their work according to formal procedures and requirements, resulting in more unsafe or unhealthy acts and higher risks of accidents or ill-health (Shamsuddin *et al.,* 2015). Rotich and Kwasira (2015) argues that the

aforementioned problem can be solved through application of traditional OSH approaches such as training and control. However, he advocates for a cultural perspective on OSH issues. It is observed that one of the espoused values that are relevant to occupational safety is promoting training measures for the workers (EU-OSHA, 2011). According to Robson *et al.* (2012) training interventions aimed at improving the skills of employee on matters of OSH are influenced by the individual factors that include the learning style, cognitive ability, attitude and previous training.

The immediate outcomes achieved from training are change in behavior, attitude, enhance skills and motivation to act. These changes help in total control or minimization of hazards injuries, illness, machines and material damages, disabilities and costs associated to them (Weinstock & Slatin, 2012). With such positive impacts the morale of employees is improved and thus enhanced work productivity.

2.4 Research gap

According to the NACADA (2017) Alcohol, Tobacco, Khat and Cannadis were identified as the most commonly used drugs. USDHHS (2016), also pointed out that 40% of all industrial workplace fatalities are caused by substance abusers however, there is no study to show the laboratory workers who are under drug and substance abuse and whether the situation is same in the food laboratories.

Crabbe and Close (2016) explained that lighting, overcrowding, building design and noise were the work environment conditions that could lead to accident occurrences in workplaces. Not so much has been done to check whether the same conditions lead to accident in the food laboratories.

Rosenfield (2016) stated that poor training is one of the main causes of accidents at workplace. There is no much documented literature about the condition of training in Food laboratories and how this is being achieved in the food laboratories operating in the Mombasa County. It has not yet been established how the management ensures safe and secure environments for the employees in the food laboratories.

CHAPTER THREE

MATERIALS AND METHODS

3.1 Introduction

This chapter describes the methodology that was used in conducting the study. It describes the research design, the target population, sampling technique, sample size, data collection tools and data analysis technique.

3.2 Study design

The study utilized descriptive cross sectional survey design. Descriptive survey study was used because it is best suited to answer the research questions in the study because it helps to acquire accurate. The research was descriptive and both qualitative and quantitative data was collected.

3.3 Study area and population

Orodho (2005) stated that the target population is the aggregate of elements of interest to the researcher. The study was carried out in Mombasa County which is the smallest county in Kenya, covering an area of 229.7 km^2 excluding 65 km^2 of water mass. The county is situated in the south eastern part of the former Coast Province**.** The researcher carried out a cross-sectional survey research on the available population of food laboratories in Mombasa County which are thirteen in number as listed in the Kenya Accreditation Service (KENAS) Website (http//kenas.go.ke) The study population for this study was the technical food laboratory workers in Mombasa County. The total number of the technical staff in the laboratories was approximately 200 workers based on the numbers collected by the research from Human resource managers of the food laboratories.

3.3.1 Inclusion Criteria

The Permanent and Contracted employees working across the 13 laboratories. However only the employees willing to participate were involved.

3.3.1 Exclusion Criteria

The students on internship in the laboratories were not involved in the research.

3.4 Sampling frame

The sampling frame displayed a list of members of the research population from which a sample was drawn (Bryman & Bell, 2007). Since the study was focusing on causes of accidents in the laboratories, all the food laboratory workers provided relevant information to the study. All the laboratory workers regardless of their education levels, gender, their job position, their job experience and age were considered during the sampling. Sampling frame was obtained by contacting various laboratories through phone calls to ascertain the number of personnel working in certain laboratories. The researcher established the population to be 200 laboratory workers as at the year 2015 as shown in Table 3.1 below.

3.5 Sample size and Sampling procedure

Estimation of sample size was calculated using Krejcie and Morgan (1970) method. Krejcie and Morgan (1970) used the following formula to determine sampling size:

$$s = X^2 NP(1-P) \div (d^2(N-1) + X^2 P(1-P)),$$

Where:-

s = required sample size.

X2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population size (200 workers).

P = the population proportion (assumed to be 0.50 since this would provide the maximum sample size).

d = the degree of accuracy expressed as a proportion (0.05).

For this study therefore the following formula was employed

s= 3.841 x200x 0.59(1- 0.5)/0.5 x 0.05(200-1) + 3.841 x 0.5(1-0.5) =132 respondents

The study used a simple arithmetic formula to calculate the sample sizes for each laboratory which was treated as a stratum , thus $s = (Ns / N) n$, where s is the sample size for each stratum , Ns is the population size for stratum , N is total population size, and n is total sample size. The results are shown in Table 3.1.

Table 3.1: Sample Size

Institution name	**Population of laboratory workers**	**Sample size**	**Actual Response per laboratory**
Kenya Bureau of Standards	20	13	7
SGS (Societe generale de survellaince)	30	19	11
Polucon testing service	22	15	9
Governent chemist	20	13	8
Bureau Veritas	6	4	3
Kenya marine fisheries research institute	32	21	11
Intertek testing services	20	13	9
Sea harvest	6	4	3
Wanainchi marine	10	7	4
Pwani oil	13	9	6
Diamond industries	10	7	5
Mombasa maize millers	6	4	3
Transfrica fisheries	5	3	2
Total	200	132	81

In ensuring that a good representativeness of the sample, the study adopted stratified random sampling to identify those to get questionnaires, the required number of staff was picked randomly from each food laboratory.

3.6 Data Management

3.6.1 Data collection

Primary data for the study was gathered using self-administered questionnaires (Appendix II), supplemented by interviews and observations schedules. The questionnaire contained closed ended multiple choice questions as well as short answer questions. Secondary data derived from published material such as journals and books with content material related to the study was also used. Reliability of data collection instruments refers to the accuracy and precision of the measuring procedures. In order to ensure reliability of the data collection instruments, the researcher carried out a pilot test by randomly selecting 10 food laboratory workers across the food laboratories, administering the questionnaire and observe the response to note if the questions were well understood, and if the answers given are relevant to the study. Some weaknesses were observed in the data collection instrument and corrections were made before the questionnaires were administered. The 10 food laboratory workers were randomly selected from a list of laboratories which were not included in the study area.

3.6.2 Data Entry and Data analysis

All the questionnaires were numbered, each question in the questionnaire was transcribed, coded, and systematically entered into the SPSS computer software. The Quantitative data was analyzed using inferential statistics especially in testing the hypothesis. The data was granted numeric values so that frequencies, variance, standard deviations would be used. One-way ANOVA was used to compare and check the relationship between the Accident Occurrence and Working environment, Drug use, Awareness on OSH and Training. Data collected was analyzed both qualitatively and quantitatively using the SPSS computer software and results were presented in tables as percentages and frequencies.

3.7 Ethical consideration

A written consent letter was obtained from JKUAT and participating laboratories/institutions. The participants were given a consent form which they signed before participating in the study. Ethical consent was also obtained from the ethical review committee as shown in Appendix VII.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Response Rate

The Questionnaire were distributed to thirteen institutions. Although the initial response to the questionnaires was slow, an extension to the completion deadline helped in achieving a response rate of 61.4 % (n = 81). A higher response rate results in a better and more useful survey McCabe (2015). According to Fincham (2008), with the response rate of 60% and above, the study does not suffer from non-response bias error which occurs when the response rate is 30% and below, therefore the results can be relied on.

4.2 Sociodemographic characteristics among the respondents

4.2.1 Gender

A general invitation had been sent out to both men and women, but a larger percentage of men responded to the questionnaires. This is shown in the figure 4.1 below where 55.6 percent of men responded as compared to 44.4 % of women. The unequal gender distribution was attributed to the general gender disparities in the formal employment in the country. For example, the Kenya Economic Survey (KNBS, 2017) indicated that there are 66% male employees compared to 34 of female.

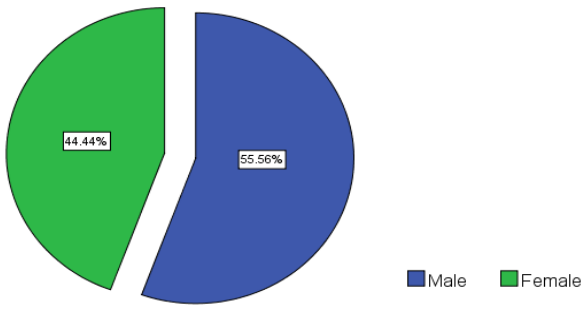

Figure 4.1: gender of the respondents

4.2.2 Level of Education and Employment Type

Most of the respondents (61.73%) were Degree Holders in the areas related to food Science and microbiology. The distribution of the education level is shown in figure 4.2 below. Compared to a study by Agumba (2011), unlike the food laboratories, most of employees in the Hotel industry in coastal region were Diploma and Certificate holders.

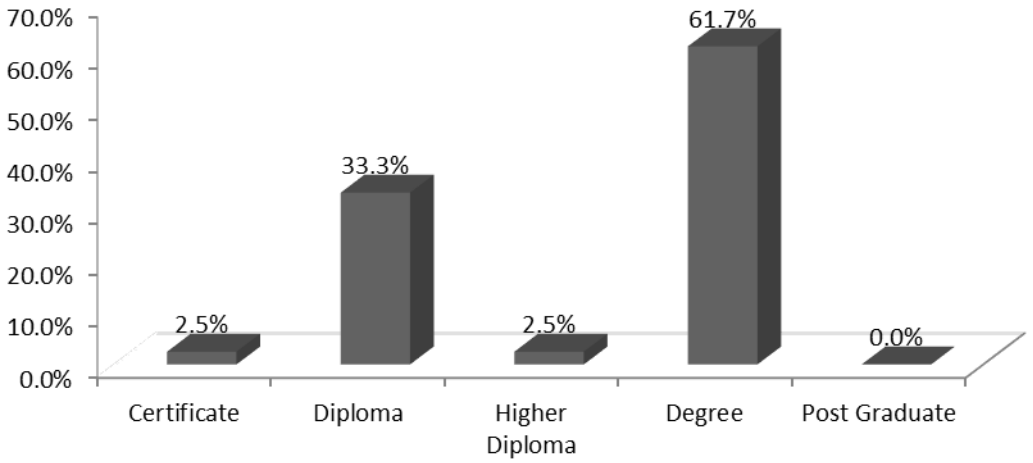

Figure 4.2: Distribution of education

4.2.3 Years of Work Experience

The work experience of the respondents was investigated and the feedback was as shown in figure 4.3 below. Most of the respondents (55.6%) have worked in the positions between two and five years. All (100%) the respondents were on permanent employment basis.

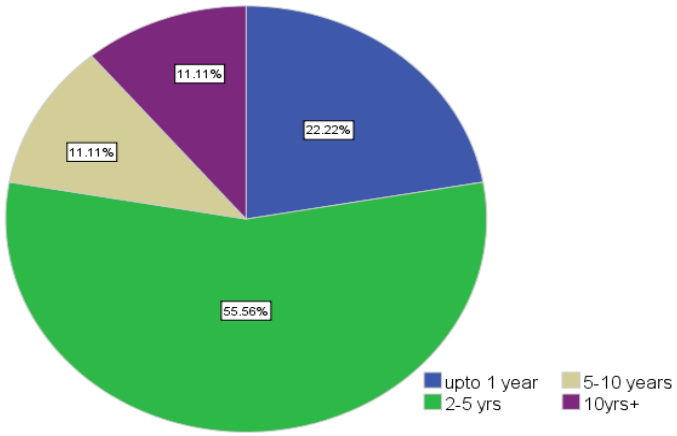

Figure 4.3: Work Experience

4.2.4 Age of the respondents

The study sought to establish age distribution among the respondents. This would help to determine if there was variation of the study findings based on age. The results are presented in Figure 4.4 below. Majority (40.7%) of the respondents were in the category of 30-45 years. These results agree with the Kenya Demographic Health Survey (2015) report which explained that the highest age of employed professionals and technical workers fell under the age bracket of 30-45 years (KDHS, 2015). There were no respondent who were above 70 years.

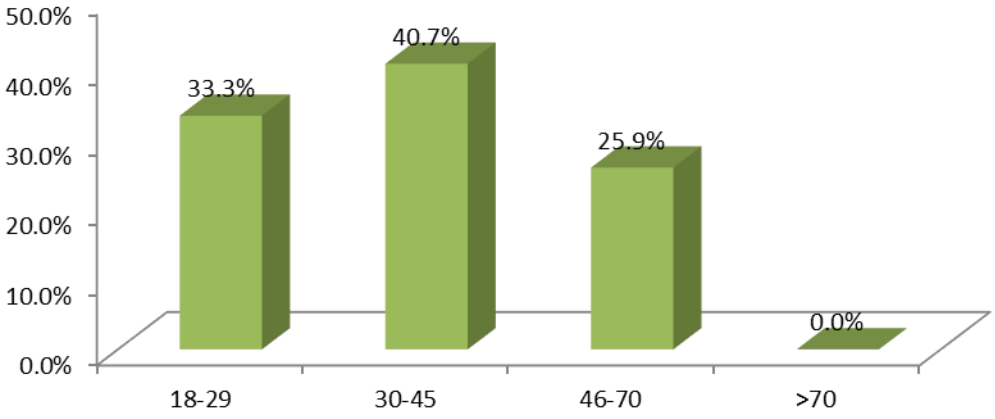

Figure 4.4: Age of the respondents

4.3 Accident Occurrences

4.3.1 Suffered and Witnessed Accidents

Most of the respondents (66.7%) have witnessed an accident taking place in their presence. Although most of respondents witnessed an accident, just a few of the respondents (22.2%) have ever suffered an accident. This could be interpreted to mean that either the respondents were afraid of revealing the truth about themselves or most of those who experienced accident were not available or were not selected during the exercise. This is shown in Figure 4.5 below.

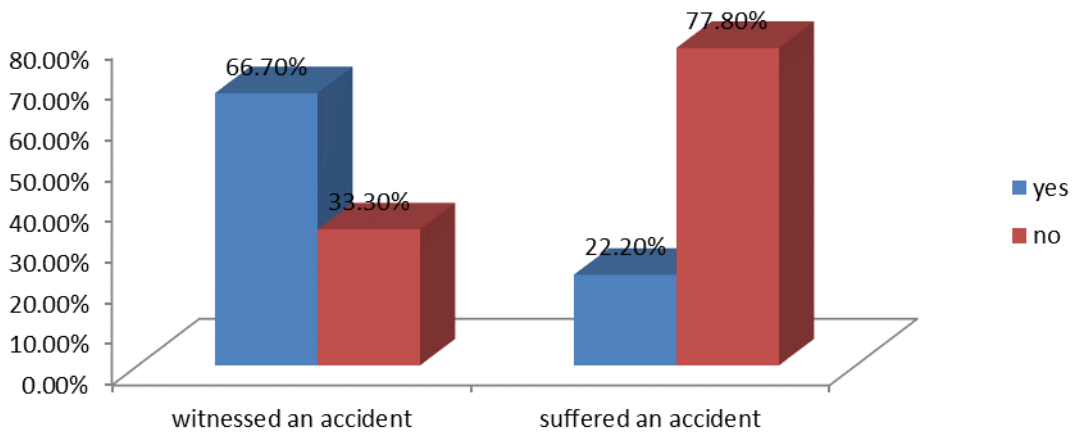

Figure 4.5: Accident occurrence

4.3.2 Types of Accidents

The respondents were asked to react on the types of accidents that commonly occur in the laboratories. The results are as shown in the Figure 4.6 below. Most (39.6%) of the respondents reported that slip and fall accidents were the leading accident types. The results agree with a study by Chena et al. (2015), which reported that a survey published by Institute of Occupational Safety and Health in 2013 identified slip and fall as the most common and leading type of accident. Some of the most common types of injuries suffered in slip and fall accidents include fractures, sprains, knee injuries and hand or wrist injuries. However, 35% also reported that the common types of accidents were machine injuries especially when the employees are

not very conversant with the machines they are operating. There were also respondents (22%) who reported that chemical and fire burns were common in the laboratories. The question was an open one and the respondents had freedom to respond with more than one type.

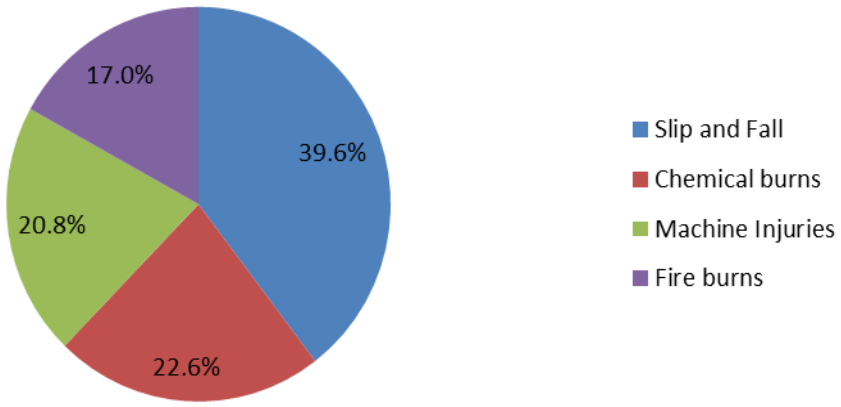

Figure 4.6: Types of Accident

This could be interpreted to mean the most of the employees in the laboratories were very careful while handling machines, chemicals and other operations. An analysis of types of accidents suffered by the staff who suffered from an accident was also carried out and the results are presented in the Table 4.1 below. The results concurred with the results of the most common accidents experienced in food laboratories as presented in figure 4.6 because slip and falls were the highest (38.9%) accidents incurred. However, chemical burns were less and fire burns were more when compared with the results previous results. The study also established that all (100%) those who suffered accidents were degree holders. No diploma and post graduate and higher Diploma holders suffered any accident. 50% of the respondents who suffered accidents had worked for up to 1 year and the other 50% were those who have worked for more than 10 years.

Table 4.1: Accidents suffered by the workers

Types of accident	Frequency	Percentage
Slip and Fall	7	38.9%
Chemical burns	2	11.1%
Machine burns	4	22.2%
Fire burns	5	27.8%

4.3.3 Correlation between education level and suffering an accident

A Pearson correlation analysis was conducted to check the correlation and significance between level of education, work experience and accident occurrence. The results are presented in table 4.2 show that there is a significant moderate negative correlation ($r = -0.410$; p-value <0.001) between education level and suffering an accident. This implies that 16.81% (0.410^2) of variation in suffering an accident is explained by level of education.

The results can be interpreted to mean that education level is correlated with accident Occurrence. The results concur with a research carried out by Kalogirou *et.al* (2019) on manufacturing workers in Greece which concluded that there is a great correlation between education level and accident occurrences.

Table 4.2: Correlations between Education level and Accident Occurrence

		Ever suffered any accident?	Education Level
Ever suffered any accident?	Pearson Correlation	1	-.410**
	Sig. (2-tailed)		.000
	N	81	81
Education Level	Pearson Correlation	-.410**	1
	Sig. (2-tailed)	.000	
	N	81	81

**. Correlation is significant at the 0.01 level (2-tailed).

4.3.4 Correlation between Work Experience and suffering an accident

The research also sought to establish the relationship between work experience and accident occurrence and the results were as shown in Table 4.3 below. The results of the Pearson correlation show that there is a strong significant correlation between the work experience and suffering an accident. This is because the resulting Pearson correlation value (-0.659) is closer to -1 which indicates a strong inverse correlation. The results mean that work experience are strongly correlated with accident Occurrence. The resulting value was negative which could be interpreted to mean that an increase in the duration of years worked leads to reduction in the rates of accident occurrence. The results also showed statistically significant correlations of 0.001 between the two variables. That means, increases in work experience do significantly relate to decreases in accident occurrence.

The results from the above correlation concur with the findings by Benley et al. (2002), McCall and Horwrtz (2005), Bell and Grusheckry (2006) and Chi et al. (2005) whereby their researches show that the relationship between work experience and accidents occurrence is of a negative linear trend. That is; as an employee's work experience increases, their likelihood to cause an accident decreases.

Table 4.3: Correlations between Work Experience and accident occurrence

		Work Experience	Accident Occurrence
Work experience	Pearson Correlation	1	-.659**
	Sig. (2-tailed)		.001
	N	81	81
Accident Occurrence	Pearson Correlation	-.659**	1
	Sig. (2-tailed)	.001	
	N	81	81

**. Correlation is significant at the 0.01 level (2-tailed).

4.4 Causes and frequency of accidents

4.4.1 Causes of Accidents

The Table 4.4 below shows the list of causes of accident as reported by the respondents.

Table 4.4: Causes of Accidents

Causes	Frequency	Percent
lack of adequate training	33	40.7
non provision of adequate protective cloths	11	13.6
Drug and Substance	20	24.7
Not sure	3	3.7
Ignorance on safety and health matters	14	17.3
Lack of adequate training	33	40.7

The results from the study showed that lack of adequate training on safety and health rules was the main cause of accident. Results also show that a number of accidents that occur could also be as a result of drug and substance abuse. This is based on 40.7% and 24.7% response from Table 4.4 above. Many of these accidents are as a result of the worker failing to follow the safety procedures that have been put into place by the company where he or she works.

According to Abdalla et al. (2017), majority of industrial injuries happened in the service-related industry when the proper equipment is not used by personnel and when personnel attempt to use improper tools to work on equipment. This can damage the machines and create a safety hazard. However, based on the observation by the researcher, the workers in nine (9) laboratories were provided with the information on the safe operation of the machines and frequent maintenance was also present, the machines were reliable and had a guarantee. Therefore, it can be stated that there are minimal chances that status of machinery could cause accident in the laboratory

Bureau of Labor Statistics (2009) also noted that when personnel are not trained properly or adequately, industrial accidents are more likely to occur. Workers should be taught how to operate the equipment in the way it was designed to be used. They should also learn to employ correct safety procedures when they are operating the equipment. Employees should be well versed in what to do if something goes wrong so that they can work to correct the problem quickly before it gets out of control. Based on the data capture sheet in thirteen (13) laboratories where research was carried out even though training was carried out, there was minimal evidence of training in laboratory safety practices equipment operation and good laboratory practices. This therefore explains the reason why 41% of the respondents stated that lack of training was the main cause of accident among laboratory workers.

The research also observed the presence or absence of Personal Protective equipment so that a comparison with the respondent's feedback can be done. It was observed that eleven (11) laboratories provided for the Personal Protective equipment (PPE) and an accommodation for clothing to the staff members. Therefore, the result of 11.5 % by respondents is in agreement with the fact that PPEs are provided and that they could not be the main cause of accidents in the laboratories.

4.4.2 Accident Reporting Procedure

The procedure for reporting incase an accident has occurred was assessed. The results are presented in the figure 4.8 below. 55.6% of the respondents said that they have reporting procedures for accidents in their places of work, but 44.4% of the respondents said that they did not have reporting procedures. Even though majority of them said that they had the procedures, most (62.5%) of the respondents were not aware of the reporting procedures. Also, for the 66.7% of the respondents who witnessed accidents only 37.5% reported to the appropriate authorities, 62.5% reported to the appropriate authorities.

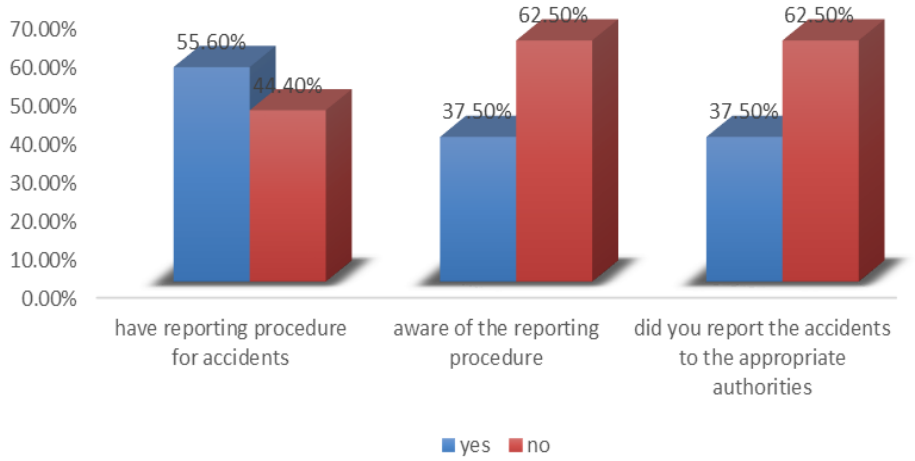

Figure 4.7: Accident Reporting

Maina (2018) explains that most work place has its own policy on reporting of accidents when they occur but overall, authorities have set up channels for employers to report accidents that happen at their work place. This agrees with the results as discussed above, however Nyakong'o (2016) reported that more than half of the accidents go unreported. This concurs with the results presented in the figure 4.8 above. As reported by Maina (2018), notice of Accident by Employee to Employer concerning any occurred accident must be reported by or on behalf of the employee concerned to the employer after accident happens (OSHA, 2007) .Workers should not be blamed whenever they report an accident to the required channels, this could be interpreted to mean that the main reason why employees do not report accidents is because they might be afraid of being blamed for the accident (Maina, 2018).

4.5 Working Environment

4.5.1 Perception on environment

The study through the questionnaire tried to identify what the respondents felt about the working environment. The Figure 4.9 below shows the areas checked and the response.

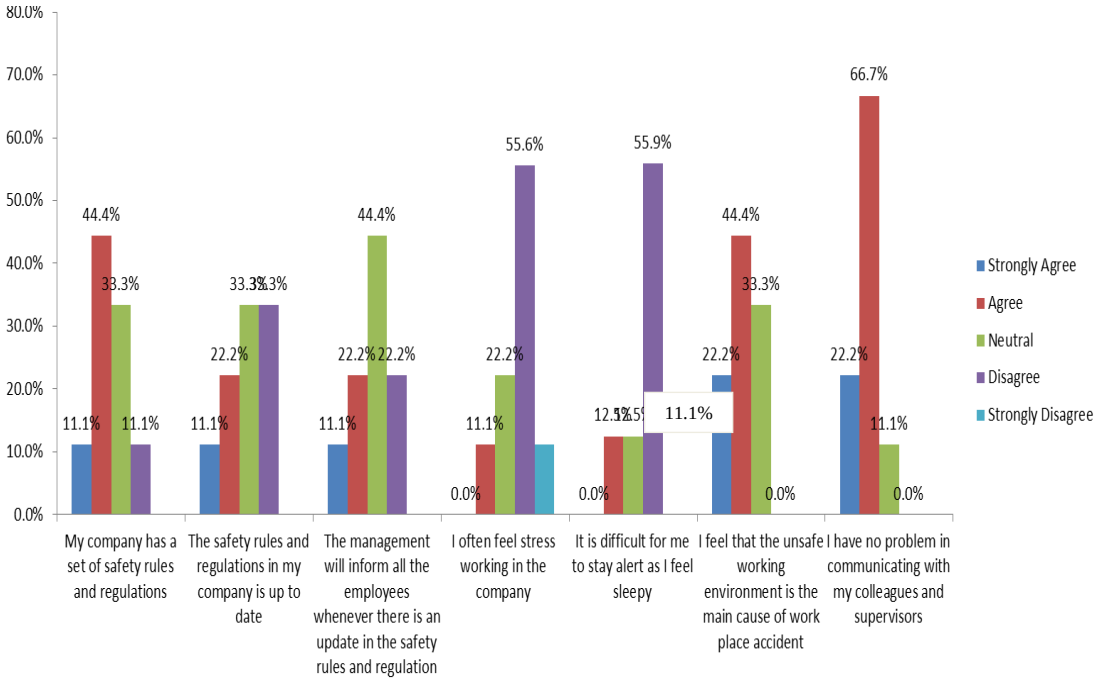

Figure 4.8: Perception on Environment

From the findings, majority (44.4%) of the respondents strongly believed that their place of work has a set of safety rules and regulations. This concurs with the researcher's observation on management commitment where 8 out of the 13 laboratories have a safety and regulations in place. However, 33.3% were neutral and disagreed with the fact that the safety rules and regulations are up to date. Whenever there is an update to the rules and regulations, most of the respondents (44.4%) were neutral that the management informs the employees about those updates.

Most of the respondents (55.6%) disagreed that stress and frustrations affected their work in their current place of work. However, 11% and 22.2% is still a big percentage for the people who are agreed and were neutral that stress and frustrations affected their current work place. 55.9 % of the respondents disagreed with the fact that it was difficult for them to stay alert because they were sleepy. Based on the observation eleven (11) out of thirteen (13) laboratories working environments observed cleanliness, there was no overcrowding and the places were well ventilated. This implied that in these laboratories the general working condition was good for the operations and that could explain why most respondents (55.6%) were not

stressed and frustrated at the work stations. 55.9% could always be alert as the perform their duties due to the good ventilation and lack of overcrowding in the work place.

The Table below shows the relationship between work environment and incidence of stress among workers. The results showed a positive correlation 0.351, the significance (2-tailed) is 0.000 in total respondents numbering 81. Correlation is significant at the 0.01 level (2 tailed), 0.000 is <0.01, this means that there is a significant correlation between work environment and stress levels.

Table 4.5: Correlations between work environment and stress level

		Work Environment	Stress Level
Work Environment	Pearson Correlation	1	0.351
	Sig. (2-tailed)		.001
	N	81	81

Concerning the safety of the working place, 44.4% think that the working environment is the main cause of accidents in the work places. It is interesting to note that, none of the respondents thinks otherwise. 66.7% of the respondents do not have any problems communicating with their colleagues and supervisors.

As Zakaria et al. (2012) points out, these aspects are correlated with occurrence of accidents in many workplaces. The research Zakaria et al. (2012) concluded that irregular workplace layout, the absence of safety features, improper communication among the staffs, and inability of the supervisors to provide clear explanation and communication, may cause problems to the workers in operating effectively hence forming the critical elements that contribute to the workplace accidents. Effective design and layout of workplace can eliminate some workplace hazards and help get a job done safely and properly. Shannon et al. (1997) also points out that poor design

and layout of work place can frequently contribute to accidents by hiding hazards that cause injuries.

The respondents were also asked whether there was adequate lighting in the workplaces; the results indicated that 88.9% of the respondents argued that the lighting was adequate enough while 11.1 % stated that the lighting was not adequate enough. This was important to check because working in dim or over bright workplaces could result in reduced productivity or even accident occurrences. However, light was not a severe issue of concern.

A test was carried out on the status of lighting in the food laboratory following the criteria: BS EN 12464-1:2011- lighting of workplaces, Part 1-Indoor Work Places standard, the results are presented in the table 4.6 below.

Table 4.6: lighting in the in the food laboratories

Name of the Laboratory	Illuminance on the Task area	Requirements lux)Min
Kenya Bureau of Standards	510	500
SGS (Societe generale de surveillance)	505	500
Polucon testing service	500	500
Government chemist	510	500
Bureau Veritas	506	500
Kenya marine fisheries research institute	501	500
Intertek testing services	508	500
Sea harvest	501	500
Wanainchi marine	500	500
Pwani oil	500	500
Diamond industries	500	500
Mombasa maize millers	480	500
Trans Africa fisheries	500	500

From the results above, one out of thirteen laboratories did not meet the lighting requirements. Twelve laboratories lighting was adequate as it met the threshold equivalent to 92%. The results agree with respondent's feedback of which 88.9% of

the respondents argued that the lighting was adequate enough while 11.1 % stated that the lighting was not adequate enough.

The study also sought to establish whether there was overcrowding in the laboratories. This was done by measuring the average working space in the thirteen food laboratories was measured and the results are presented in Table 4.7 below.

Table 4.7: overcrowding in food laboratories

Laboratory	**Population of Laboratory staff**	**working space Measurements**	**Result of average working space**	**Unit**	**Requirement- Minimum working space**
Kenya Bureau of Standards	20	**3***3*2.5	**22.5**	m^3	10 m^3
SGS (Societe generale de surveillance)	30	3*2.8*2.5	**21**	m^3	10 m^3
Polucon testing service	22	2.5*2.4*2.5	**15**	m^3	10 m^3
Government chemist	20	3*3*2.5	**22.5**	m^3	10 m^3
Bureau Veritas	6	2.4*2.3*2.5	**13.8**	m^3	10 m^3
Kenya marine fisheries research institute	32	**2**.8*2.7*2.5	**18.9.**	m^3	10 m^3
Intertek testing services	20	3*2.5*2.5	**18.75**	m^3	10 m^3
Sea harvest	6	2.1*1.4*2.5	**7.35**	m^3	10 m^3
Wanainchi marine	10	1.8*1.6*2.5	**7.2**	m^3	10 m^3
Pwani oil	13	2.4*1,8*2.5	**10.8**	m^3	10 m^3
Diamond industries	10	2.1*2.4*2,5	**12.6**	m^3	10 m^3
Mombasa maize millers	6	1.8*1.5*2.5	**6.75**	m^3	10 m^3
Transfrica fisheries	5	2*1.5*2.5	**7.5**	m^3	10 m^3

From the results on overcrowding above, it can be concluded that Sea Harvest, Wananchi Marine, Mombasa Maize millers and Trans Africa Fisheries does not meet the minimum requirements of the working space. The reason can be that these laboratories are only meant for the general quality control checks of their product status and the management have not put a lot of resources in their testing laboratories since they are not profit making

It is also noted that Kenya Bureau of standards and Government Chemist has the biggest average working space. This can be due to the fact that these two laboratories are Government owned and the laboratories serve many clients. This means that the Government has put a lot of resources both the space and capacity.

4.5.2 Hypothesis Testing

Through linear regression, the study attempted to test null Hypothesis 1(Ho1) which stated that "Laboratory working environment status does not influence accident occurrence in food laboratories". The results are based on Table 4.8.

Table 4.8: Regression Coefficients of Work Environment on Accident Occurrence

	Unstandardized coefficients		**Standardized coefficients**		
Model	B	Std. Error	Beta	t	Sig.
(Constant)	2.409	.159		15.186	.000
Work Environment	.350	.043	.432	8.216	.000

The results show that working environment is significantly ($r = 0.432$; p-value <0.001) affecting Accident Occurrence Therefore, hypothesis H_0: Laboratory working environment status does not influence accident occurrence in food laboratories is rejected and the alternative that Laboratory working environment status does influence accident occurrence in food laboratories is accepted.

4.6 Drug and Substance use

4.61. Prevalence of Drug Use

The study attempted to establish the prevalence of drug use in the food laboratories. The results are shown in the Table 4.9 below. There is prevalence of drug use among the laboratory workers. This is confirmed by the response by 66.7% of the respondents who said that there was drug use among laboratory workers in their institution.

Table 4.9: Drug use

Drug use	Yes	No
Is there drug use among laboratory workers in your institution?	66.7%	33.3%
Does the use of drugs affect the performance among laboratory workers?	85.2%	14.8%

4.6.2 Types of Drugs and Substance in use

The respondents were asked to state the common drugs that are being use in the institutions. The results are presented in Table 4.10 below. Results indicated that cigarette (46.3%) and alcohol (29.6%) were the common types of drugs used by employees in the food laboratory. These results agree with studies carried out by NACADA (2011) and Munene (2019) who concluded that alcohol, cigarette and Khat were among the substances that have been widely used in Kenya. The prevalence in the use of these drugs would be attributed to their legality, availability and accessibility. Table 4.6 showed that 85.2% of the respondents believe that drugs affect the performance among laboratory workers.

Table 4.10: Types of Drugs

Drugs Types	Percent
Alcohol	29.6%
Cigarettes	46.3%
Depressants	13.0%
Khat(Miraa)	11.1%

The most common effects of drug use indicated by the respondents included depression, anxiety, complaints about others, and mood changes after lunch or break, emotional unsteadiness and irritation. These effects could easily lead to accident occurrences since they distract one's mind. Despite the number of safety procedures implemented at the workplace, based on results in Table 4.6, 22.3% of the workplace accidents are caused by substance abusers. This is confirmed by a study carried out by OSHA (2015) where they found out that 10 to 20 percent of those who cause work accidents test positive for drugs or alcohol. These people may not realize the danger they create at a workplace. Of course an individual who is inebriated or who has hangover has decreased productivity and alertness. These means workplace accidents are more likely to happen.

4.7 Knowledge and Awareness on OSH and Laboratory safety practices

The survey to identify whether there is adequate OSH and laboratory safety practices was conducted based on the institutions sampled by the use of a data capture sheet.

4.7.1 Knowledge and Awareness on OSH

The results on the knowledge and awareness on OSH are presented in the Table 4.11 below.

Table 4.11: Awareness on OSH

Institution name	Yes	No
Existing safety and health policy	69.2%	30.8%
Written safety program, OSH manual and safety management	69.2%	30.8%
Employees aware of the safety procedures for handling chemicals	46.2%	53.8%
Employees have seen material data safety sheets for chemicals that they use	46.2%	53.8%
safety and health responsibility part of job description?	53.8%	46.2%

Most of the respondents (69.2%) said that the institutions they work for have an existing safety and health policy and also a written safety program, OSH manual and safety management. However, 53.8% of the respondents were not aware of the safety procedures for handling chemicals and have not also seen material data safety sheets for chemicals that they use. 53.8% of respondents have safety and health as part of their job description. The analysis on safety and health based the questionnaires and data capture tools received from various institutions were compared and it could be summarized that safety and health issues were well addressed in six institutions, the safety and health issues were averagely addressed in three institutions and in four institutions, safety and health have not been well addressed.

The respondents from different institutions were also asked to comment on the extent the institutions comply with OSHA 2007. They stated that there was compliance in areas like safety and health audits conducted on yearly basis by designated person registered by directorate of Occupational Safety and Health, inspections and submit

reports to relevant people, medical examinations of the staff and recommendations are given and when issues are raised, the organization acts and puts corrective control measures. However, based on the results, Knowledge and Awareness on OSH and laboratory safety practices was not well covered even though efforts are being put in place by the management. This is because from the results in Table 4.7, most employees are still not aware of the safety precautions when handling chemicals and they also have not seen material data safety sheets for chemicals that they use.

4.7.2 Training on laboratory safety practices

The study sought also to establish whether the respondents have ever attended training on several aspects related to laboratory work. The findings are as tabulated below.

Table 4.12: Training

Aspects of laboratory training	Yes	No
Ever trained on Safety rules and regulations	22.2 %	77.8%
Has Supervisor shown you all the safety measures	44.4%	55.6%
Ever been taught on Machine Operation	66.7%	33.7%
Ever attended a training on Hazard avoidance	6.2%	93.8%

Very small percentages (22.2%) of the respondents have ever attended a training concerning safety rules and regulations. The findings show that most of the respondents have never attended any safety rules and regulations training. On whether the supervisors have ever shown them all the safety measures of the laboratory, 55.6% of the respondents have never been shown against 44.4% of the respondents who were shown. Most of the respondents (66.7%) have been trained on how to operate machines and what to do when around heavy duty machine. 93.8% of the respondents have never attended any training on how to avoid hazards.

Based on the data capture tool, training has been conducted in various areas in Eleven (11) institutions as follows: an average of 16 employees have been trained on laboratory safety practices, on areas of occupational safety rules and regulations average of 17 employees were trained, an average of 14 employees were trained on equipment operation and maintenance, in average 14 employees in every institution was trained on identification of laboratory hazards, good laboratory practices, firefighting and fire marshals and first aid. However, two institutions did not conduct any training. The trainings were conducted between 2010 and 2015.

Even though the data capture tool from the management files shows that most of the institutions have been conducting training on its employees, most of the respondents have never attended training on safety rules and regulations and also on how to avoid hazards. Rosenfield (2016) explains that poorly trained employees are a danger to themselves and their workmates. He also explains that some employee are usually not provided with adequate safety procedures or protocols to follow while carrying out their duties, and that the employees are not provided detailed information concerning the risks that are specific to their occupations.

The study observed that in most (11out of 13) of the laboratories surveyed, there was no classification of hazardous chemicals, substances and chemical segregation. 93.8 % of those interviewed hadn't undergone chemical safety training and had poor knowledge on chemical and hazardous substance handling practices. OSHA ACT 2007

4.7.2 Hypothesis testing

Linear regression was carried out on the study to test null Hypothesis 2 (Ho2) which stated that "Knowledge and awareness on OSH and laboratory safety practices does not influence accident occurrence in food laboratories". The results are based on Table 4.13.

Table 4.13: Regression Coefficients of Knowledge and awareness on OSH and Safety Practices on Accident Occurrence

	Unstandardized coefficients		**Standardized coefficients**		
Model	B	Std. Error	Beta	t	Sig.
(Constant)	2.488	.150		16.624	.000
Knowledge and awareness on OSH and Safety Practices	.359	.044	.431	8.189	.000

The results indicate that Knowledge and awareness on OSH and safety practices is significantly ($r = 0.431$; p-value <0.001) affecting accident occurrence. Therefore, hypothesis Ho2: Knowledge and awareness on OSH and laboratory safety practices does not influence accident occurrence in food laboratories is rejected and the alternative that Knowledge and awareness on OSH and laboratory safety practices does influence accident occurrence in food laboratories is accepted.

4.8 Hypothesis Testing

The study also sought to establish the main causes of accidents among laboratory workers. The alternate hypothesis for the study was that Laboratory working environment status does not influence accident occurrence in food laboratories.

To test the hypothesis, the study performed regression analysis on all factors that could lead to accident occurrence and determine the level of significance. The factors to be tested were computed through SPSS based on the questions indicated on the questionnaire based on each aspect. The factors were based on the main causes as indicated by respondents, they included drug use, working environment, trainings and safety, and use of protective equipment. For the hypothesis to be true, then the significance level should be the highest among all other factor. The factors analyzed were training, working environment and human actions. Regression analysis was used to determine the how each factor affects Accident Occurrence.

The model summary Table shows that the degree R squared value which indicates how much the dependent variable (Accident Occurrence) can be explained by the independent variables has a value of 0.575. This means that 57.5 % of accidents can be explained by the independent variables.

Table 4.14: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.758[a]	.575	.562	39768

a. Predictors: (Constant), Poor working environment, Drug use, awareness on OSH, Lack of protective equipment's, Training

The ANOVA results are indicated in the Table 4.15 below; the results indicate that the regression model predicts the outcome model significantly well. This is indicated by the statistically significant p-value of 0.047 less than 0.05 will indicate that the overall model applied is significantly good enough in predicting the outcome variable.

Table 4.15: Regression ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.061	4	.015	2.557	.047[a]
	Residual	.373	63	.006		
	Total	.434	67			

a. Dependent Variable: Accident occurrence

b. Predictors: (Constant), Working environment, Drug use, awareness on OSH, Lack of protective equipment's, Training

By looking at the sig. column the constant, drug use, working environment and trainings on safety contribute significantly to the model derived from the results.

Table 4.16: Regression Coefficients

Coefficient	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	SE	Beta		
(Constant)	2.629	.773		3.400	.001
Drug and Substance Use	.208	.116	.216	1.789	.003
Working environment	.031	.125	.030	.245	.004
Knowledge on OSH and safety Practices	.759	.252	.39	3.01	.003

a. Dependent Variable: Accident occurrence

The second, third and fourth rows of data in the table above show that the coefficients for Drug use, Working Environment and Knowledge and Awareness on OSH and safety practices are statistically significant at 0.05 level. This indicates that these three factors mainly affect accident occurrence among laboratory workers. These results provide support for the alternate hypothesis of the study that Laboratory Working Environment mainly influence accident occurrence in food laboratories. Because drug use is a human action and trainings also can be categorized as human action. The results generated from the regression coefficient table could be interpreted to mean that one-unit increase in drug use could lead to 20.8% increase in accident occurrence in food laboratories and one-unit increase Knowledge on OSH and safety Practices could lead to 75.9% decrease in accident occurrence in food laboratories.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The aim of this study was to investigate the factors influencing accident occurrence among food laboratory workers in Mombasa County. This chapter is organized in the following subsections: introduction, summary of the findings, conclusions, recommendations and suggestions for further studies.

5.2 Conclusion

1. Inadequate training on occupational safety and health, drug use among the food laboratory workers and poor working environment were the key causes of accident occurrence in food laboratories.
2. All workers require safety trainings regardless of their education level
3. The level of awareness on occupational safety and health was inadequate as 53.8% of the workers were not aware of the safety precautions when handling chemicals and had not seen material data safety sheets for chemicals that they use.
4. Prevalence of accident in food laboratories within Mombasa County was at 22.2%.
5. The relatively conducive work environment could have led to low level of accident occurrence.

5.3 Recommendations

The following are the recommendations of the study:

1. Most of the accidents within the food laboratory workers occurred due to poor inadequate training on occupational safety and health. Therefore, the study recommends inclusion of training programme for all workers.
2. Develop and implement alcohol and substance policy. Institute Screening of all workers before accessing their station of work and rehabilitate the addicts.

3. Staff to be made aware of MSDS and their use
4. Inspection of work environment should be done regularly to ensure that the environment is conducive to all workers. The environment should always be well lit, ventilated and not overcrowded.

The subject of accident occurrence in Kenyan coastal region has attracted limited attention even though it is the lives of workers at stake. The study only focused on food laboratories. However, it is important that further research is carried out to check other laboratories.

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APPENDICES

Appendix I: Consent Letter

Florence Mary Kisulu

P.O B0X 99376-80100

MOMBASA.

Dear Sir/Madam,

RE: LETTER OF INTRODUCTION

I am a student pursuing Master of Science degree in Occupational Safety and Health at Jomo Kenyatta University of Agriculture and Technology (JKUAT). Currently I am in the process of writing my thesis and my research topic is factors influencing accident occurrence among food laboratory workers in Mombasa County. Your response to the questions in this questionnaire will be very valuable to me in my academic and career endeavor.

I would like to kindly request your assistance by filling my questionnaires. The purpose of the questionnaires is to gather information that will better assist me in my research work and I assure you that the data collected will be held in confidentiality and in anonymity to be used only for the purpose of my research. Looking forward to your support.

Yours Sincerely,

Florence M. Kisulu

Appendix II: Consent Form

Researcher`s name:

……

I am Occupational Safety and Health student at Jomo Kenyatta University of Agriculture and technology Mombasa CBD campus.

Research purpose:

I am carrying out a study titled factors influencing accident occurrence among food laboratory workers in Mombasa County. The findings of this study will be used to propose recommendations which if adopted by the laboratories will reduce risks faced by workers as they carry out their duties thus safeguarding workers safety and health.

Interviewee's involvement in the research:

The participants in the research study will be expected to provide information as required in the questionnaire.

You are requested to fill the questionnaire .You may ask questions concerning the study or the questionnaire. Information given will be confidential and used for the study purpose only.

Participation:

The participation is voluntary and may choose to withdraw his or her participation at any time.

Confidentiality:

The information shared will be kept secret and will be used only for the purpose stated.

If you consent please sign below

Participant's name: ---------- Signature----------

Date:

Researcher`s name:

…Florence Kisulu……..

Phone no 0722486412: ……

E mail address: …kisuluf@kebs.org…….

Date ……

Appendix III: Questionnaire

Dear respondent, your participation in this study about is completely voluntary and you are free to decline to answer any or all of the questions.

Part A: Personal information

1. Your Sex

   Male ☐ Female ☐

2. Please indicate your age

   ……..

3. What is the level of your education?

   Certificate ☐ Diploma ☐ Higher Diploma ☐

   Degree ☐ Postgraduate studies ☐

4. Please specify the field you studied/specialization

   ……
……

5. Which laboratory do you work?

   ……
……

6. What is the nature of your employment?

   Contractual ☐ permanent ☐ other☐ specify
   ……

7. For how long have you worked?

   Up to 1yr ☐ 2-5 yrs ☐ 6-10 yrs ☐ 10yrs+ ☐

Part B: current status of Occupational Safety and Health at the workplace

8. Indicate how satisfied you are with the current Occupational Safety and Health measures put in place

   Very satisfied ☐ satisfied ☐ Dissatisfied ☐ Very Dissatisfied ☐

9. The person ultimately responsible for your safety and health in the performance of your duties is? The head of the organization ☐ Yourself ☐ Your supervisor ☐ Not Sure ☐

10. Work areas contains adequate lighting

    True ☐ False ☐ Not sure ☐

11. Staff is required to put on protective clothing in the performance of their duties.

    True ☐ False ☐ Not sure ☐

Part C: Perception on Environment and Training

Here are a number of characteristics that may or may not apply to you. You may use any of the numbers to show how strong your levels of agreement. There are no right or wrong answers - all we are interested in isa number that best shows your levels of agreement about the characteristics that applies to you.

	Strongly agree	agree	Neutral	disagree	Strongly disagree
A. Environment					
My company has a set of safety rules and regulations					
The safety rules and regulations in my company is up to date					
The management will inform all the employees whenever there is an update in the safety rules and regulation					
I often feel stress working in the company					
It is difficult for me to stay alert as I feel I'm lack of sleep					
I feel that the unsafe working environment is the main cause of work place accident					
B. Training					
I have no problem in communicating with my colleagues and supervisors					
I know exactly what to do if workplace accident occurs					

Part D: Training

12. Have you ever attended training on safety rules and regulations?

    Yes ☐ No ☐

13. Has your supervisor ever shownyou all the safety measures of the laboratory?

    Yes ☐ No ☐

14. Have you ever been taught how to operate machine and what to do when around heavy duty machine?

    Yes ☐ No ☐

15. Have you ever attended training on how to avoid hazards?

    Yes ☐ No ☐

Part E: accidents in the work place

16. Have you ever witnessed any accident in the laboratory?

    Yes ☐ No ☐

    If yes what type of accident was it?

    ……..

17. Do you have a reporting procedure for accidents?

    Yes ☐ No ☐

    If yes have you ever been given awareness on the reporting procedure?

    Yes ☐ No ☐

18. Have you suffered any accident or injury in the organization since you were engaged?

Yes ☐ No ☐

19. If yes what were the causes of the accident?

Lack of adequate training on safety and health☐ Non provision of adequate protective clothing and equipment ☐ Ignorance on safety and health matters☐ Drug and substance

☐Not sure

20. If yes, did you report the accident to the appropriate authorities?

Yes ☐ No ☐

21. If yes, what actions were taken to forestall the occurrence of the same accident or injury in the future?

……
……
……

22. State some of the findings from the investigation?

a) Inadequate protective clothing and equipment ☐
b) Lack of personal consciousness to Occupational Safety and Health rules ☐
c) Lack of training on Occupational Safety and Health☐
d) All of the above ☐
e) Other causes please specify

……

Part F: Prevalence of drug abuse

23. Is there drug use among laboratory workers in your institution?

Yes ☐ No ☐

24. List the types of drugs that are commonly used by the laboratory workers.

……
……
……
……

25. Does the use of drugs affect the safety performance among laboratory workers?

Yes ☐ No ☐

26. If yes, what are some of the effects experienced within your organisation

……
……
……
……

Part G: Data Capture Sheet

a. Training

	Number Trained	**Date**	**Refresher training**
i. Laboratory safety practices			
ii. Occupational safety rules and regulations			
iii. Equipment operation and maintenance			
iv. Identification of laboratory hazards			
v. Good laboratory practices			
vi. Firefighting and fire marshals			
vii. First aid			

b. Prevalence of drug use

	Number
i. Disciplinary records	
ii. Absenteeism	
iii. Rehabilitation records	
iv. Disciplinary memos	

Part H: Knowledge and Awareness on OSH and laboratory safety practices

27. Does the institution have a safety and health policy?

Yes ☐ No ☐

28. Does the institution have a written safety program, OSH manual and safety management system

Yes ☐ No ☐

29. If yes, is it readily available to all the employees

Yes ☐ No ☐

30. Are you aware of safe procedures for handling chemicals

Yes ☐ No ☐

31. Have you seen the material data safety sheets for chemicals that you use

Yes ☐ No ☐

32. Are safety and health responsibility part of your job description?

Yes ☐ No ☐

Appendix IV: Observation Checklist Working Environment Machinery

Provision of the design criteria

Present ☐ Absent ☐

a) Provide information on the safe operation of the machine

Present ☐ Absent ☐

b) State of Maintenance

Good ☐ Bad ☐

c) Reliability

Present ☐ Absent ☐

d) Guarantee period

Valid ☐ Invalid ☐

HEALTH GENERAL PROVISIONS

a) Cleanliness

Present ☐ Absent ☐

b) Overcrowding

Present ☐ Absent ☐

c) Ventilation.

Adequate ☐ Inadequate ☐

d) Lighting

Adequate ☐ Inadequate ☐

e) Drainage of floors

Good ☐ Excellent ☐

f) Supply of drinking water

Present ☐ Absent ☐

g) Washing facilities

Present ☐ Absent ☐

h) Accommodation for clothing

Present ☐ Absent ☐

i) First-aid facility

Present ☐ Absent ☐

j) Supervision of apprentices and indentured learners

Present ☐ Absent ☐

k) Meals in certain dangerous trades

Present ☐ Absent ☐

l) Personal Protective equipment's

Present ☐ Absent ☐

CHEMICAL SAFETY

a) The handling, transportation and disposal of chemicals and other hazardous substances materials.

Present ☐ Absent ☐

b) Material safety data sheets.

Present ☐ Absent ☐

c) Labelling and marking.

Present ☐ Absent ☐

d) Classification of hazardous chemicals and substances.

Present ☐ Absent ☐

e) Chemical storage and segregation

Present ☐ Absent ☐

f) Warnings and placards

Present ☐ Absent ☐

Appendix V: Management Commitment and Employee involvement

1. a) Is there a safety and health policy in place YES ☐ NO ☐

   b) If no please give a reason…….

2. a) Is there a safety and health committee? YES ☐ NO ☐

   b) If no please state the reason. ……

3. What mechanism(s) is/are there to reduce the extent and severity of work related injuries and illnesses? ……
4. How does the management Improve employee morale and productivity in order to motivate the worker?
   ……
   ……
   …
5. What is the level of the Management commitment? ……
6. How does the management allocate resources for organizing and controlling activities within the food laboratories to address hazards?
   ……
   ……
   ……
7. To what extent is Employer involved providing means through which workers develop and express their own commitment to safety and health protection…….
8. a) Are there measures in place for safety and health performance? YES ☐ NO ☐

   b) If yes which ones are they? …….

   c) If No what is/are the reasons? .....

Hazard prevention and control

9. a) Are there mechanisms to determine that a hazard or potential hazard exists

   YES☐ NO ☐

   b) If no, please state the reason…….

10. What measures are in place to prevent hazards by effective design of job or job site

    ……
    ……

11. Where elimination is not feasible, control hazard to prevent unsafe and unhealthful

    exposure……..……
    ……...

12. How long does Elimination or control take to be accomplished? .....

13. a) Are there Procedures for safe work which are understood and followed as a result of training, positive reinforcement, correction of unsafe performance, and enforcement Provision of personal protective equipment YES ☐

    NO ☐

    b) If no, please state the

    reason……...

    ……
    …….

14. a) Do you address the safety and health responsibilities of all personnel, whether salaried or on contract YES☐ NO ☐

    b) If no, please state the reason…….....

    ……
    ……...

15. a)Is there a system to ensure that supervisors carry out their safety and health responsibilities?

    …….

    ……

    ……

    b) How do supervisors analyze the work under their supervision to identify unrecognized Potential hazards?

    ……

    ……

    c) How do the supervisors maintain physical protection in their work areas?

    ……

    ……

    ……

    d) What measures are in place for enforcement of safe work practices and reinforcement of employee for continual performance

    ……..……

    ……..

16. To what extent do you comply with OSHA, 2007?.

    .....……

    ……

    ……

Appendix V: Certificate of Ethical Approval

NACOSTI **ERC/MSc/011/2016R**

ETHICS REVIEW COMMITTEE ACCREDITTEDBYTHE NATIONAL COMMISSIONFOR SCIENCE, TECHNOLOGY ANDINNOVATION (NACOSTI, KENYA)

CERTIFICATE OF ETHICAL APPROVAL

THIS IS TOCERTIFY THATTHEPROPOSALSUBMITTEDBY:

FLORENCE M.KISULU

REFERENCENO:**ERC/MSc/011/20 16R**

ENTITLED: **Factors influencing accident occurrence among food laboratory workers in Mombasa County**

TO BE UNDERTAKEN AT:

MOMBASACOUNTY, KENYA

FOR THEPROPOSEDPERIOD OFRESEARCH

HAS BEEN**APPROVED** BYTHE ETHICS REVIEW COMMITTEE ATITS SITTINGHELDAT PWANI UNIVERSITY, KENYA

ON THE **4th**
DAY OF
AUGUST
2016

CHAIRMAN SECRETARY LAY MEMBER

PTO

NOTICE:

This decision is subject to the information available at the time of APPROVAL. The Committee may on its own motion and/or by application by a Party, review its decision on the grounds of discovery of new and important information which was not reason ably within its knowledge at the time of decision or on account of mistake or error apparent on the face of the record, or for any other sufficient reason, provided the researcher shall be given prior opportunity to be heard.