UNIVERSITY OF NAIROBI

DEPARTMENT OF SOCIOLOGY AND SOCIAL WORK

THE ROLE OF SECURITY PERSONNEL IN FIRE DISASTER PREPAREDNESS: CHALLENGES OF PROTECTION AGAINST FIRE DISASTER IN THE UNIVERSITY OF NAIROBI.

BY

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DECLARATION

This Research Project is my original work and has not been presented for a degree or diploma in any other University.

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This Research Project has been submitted for examination with my approval as the University Supervisor.

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DEDICATION

I wish to dedicate my work to the following special people in my life:

- My son Leon and daughter Daisy for giving me courage. I have managed this research project through your moral support and not giving up on me as a mother for the time I was away concentrating on my studies instead of taking care of you given your tender age.

- My husband Faustine and sister Susan for encouraging me all through my study period.

- My late father and mother who both cherished education. Your memories are what kept me working hard to attain what you would have wished me to achieve.

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ABSTRACT

The purpose of this study was to establish the challenges faced by University of Nairobi security personnel in their role of fire disaster preparedness. The objectives of this study was to ascertain the extent to which security personnel in the University of Nairobi are knowledgeable on fire preparedness, to examine the forms of training on fire disaster preparedness that security personnel have been given, to establish the adequacy of firefighting equipment at the University of Nairobi and to Identify logistical administrative and other constraints to an improved to an improved capacity of security personnel to implement an adequate fire disaster set up in the University of Nairobi.

The study purposeful sampled Main campus, Student Welfare Authority, Chiromo campus and Kikuyu campus because each campus has its own unique characteristics that can be generalized to apply to the rest. Simple random sampling was used to obtain a population of 76 respondents. Primary data was collected through questionnaires and key informant interviews. Quantitative data was collected through structured questionnaires while qualitative data was collected through interviews with key informants and unstructured observations. Quantitative data was analyzed by using frequency tables and percentages while qualitative data was analyzed by reduction, data display and conclusion drawing.

The study shows that security department is composed of educated human resource with a minimum of secondary education and majority of employees in the department are male.

Findings show that University of Nairobi has got some fire disaster preparedness in place such as existence of well-marked fire assembly points, fire emergency alarms and emergency communication systems. In case of fire disaster evacuation may be hampered by locked emergency exit doors which are permanently under key and lock for security reasons.

Findings show that Security personnel are faced with several constraints and challenges that impact on their preparedness capacity negatively; among the challenges are lack of trained fire marshals, vandalized firefighting equipment in the halls of residence and lack of community awareness and participation.

CHAPTER ONE : INTRODUCTION

1.0   Background to the Study

Human beings have always lived with disasters since time immemorial. Disasters cause premature death, weaken quality of life and alter health status. According to FEMA(2006 b), a disaster is an event which happens occasionally and in which the affected people do not have the capability to manage the situation at hand in order to save lives, to protect property, uphold the social, economic, environmental and political stability property and to maintain the affected area.

For milleniums, all kinds of disasters have been part and parcel of human existence. Man has experienced both man- made and natural disasters leading to loss of live and destruction of properties. Among these disasters, fire is one catastrophe which has a long-term effect on the economy and social aspect of the affected area down the centuries (Weil, 2013)

Fire is a useful aspect in human beings lives. Early man used fire in several ways such as keeping his dwelling warm, chasing away animals that were dangerous to him and his properties as well as cooking food.

Up to date people fire is still being used by the modern man for cooking and warming their homes, but when fire is mishandled it can cause havoc irrespective of the source as long there is enough fuel to feed it. Yearly fires raze many homes and businesses. Fire is expensive, it can cause more damage than floods, tornodoes and other disasters combined (Dueep, 2014).

1.1.   Causes of Fire

According to Kumar (2013), fire may be caused due to any of the following reasons:

Open Flames

Open flames can be ceased by negligence in welding, cutting and grinding i.e conducting hot work, when candles are left unattended, when flammable or combustible liquids or flammable gases are not handled appropriately or near potential ignition sources. When matches and cigarettes are improperly disposed or left unattended.

Electrical

Electrical fire may be caused by use of damaged plug wires, extension cords or electrical conductors, using unapproved or faulty electrical equipment, insufficient space between electrical heating equipment and combustibles, overloaded short circuits and loose electrical connection or wiring.

Cooking

Unattended cooking appliances whereby fire can spill to the surrounding, deep frying on stove tops leading to emergence and placing combustible materials near cooking place can cause fire.

Spontaneous Ignition

When combustible materials such as oil rugs, wood finishing, oil based polish, wood chips are placed near a likely source of fire may cause spontaneous fire.

1.2. Recent Cases of Fire Disasters in Kenya

In May 2016, fires gutted down a dormitory in Komothai girls' in Kiambu whereby students lost their properties.

In April 2016, University of Nairobi students went on rampage and set on fire prefabs hostels and SONU office as a result of disputed SONU elections.

In August 2015, two boys lost their lives while at least 10 others were injured in a dormitory inferno that occurred at the Stephjoy Boys High School in Limuru area, Kiambu County. The fire affected a dormitory that hosted up to 60 boys.

In August 2012, a fire reported to have been caused by electricity fault razed a dormitory at Asumbi girls boarding primary and as a result eight pupils were burnt to death beyond recognition.

In March 2001, fifty eighty students were burnt beyond recognition after fire burned down their dormitory in Kyanguli mixed secondary school, in Machakos County. Twenty eight others were critically injured.

In 1998 Twenty six girls died in Bombolulu girls' secondary school near Mazeras, Kwale County. Reports indicated that all the students who perished were in full packed dormitory of about 130 students.

In 1999, student arsonists set prefects cubicle on fire in Nyeri high school, and as a result four prefects lost their lives.

In all the above incidents it was assumed that security personnel (security guards) were on duty and are always on duty since they work in shifts and usually take over duties from each other therefore they could have been the first people to respond to the fire disaster before outside help arrives.

1.3. Private Security Personnel

In reality private security have a rich world history and calling full of traditional origins. Just as human kind developed all over the world so did the private security field in a local area in some shape or form. Historically wealthy member of a society relied on their private security personnel to ensure safety and economic order in a given region. (Maggio, 2009).

According to Hess 2008, private security meets the needs of individuals, businesses, institutions and organizations that require more protection than is accorded by public police officers.

According to Abraham Maslow, security or safety need is a basic need that is placed second in his hierarchy of needs, "people want to be free of physical danger and of fear of losing a job, poverty, food or shelter" (Goble 2004).

Private Security is a multifaceted industry that has made great advances since the day of lone watchman or single guard in a guardhouse. As a profession, it has truly evolved in its own as evidenced by the development and proliferation of college or degree programmes in security and state and national efforts to license and register security professionals.

Consumers of private security services seek protection against many types of natural and human-made risks with emphasis on human made risks of accidents, theft, pilferage, fraud, employee disloyalty and subversion; espionage, sabotage, riots and demonstrations and violent crimes

including terrorist acts. (Hess 2008). The Private Security Regulation Bill 2014 outlines the roles played by security guards in Kenya.

1.4. Statement of the Problem

Fire is a good servant but a poor master. Regardless of how a fire might start, it could lead to destruction of property and loss of life making it imperative for preparedness. For example it was reported that unattended lit candle caused fire that gutted down fifty iron structures in one of Nairobi slums (DN, March 16).

According to FEMA 2006, preparedness is defined as the range of deliberate, critical tasks and activities necessary to build, sustain, and improve the operational capability to prevent, protect against, respond to, and recover from domestic incidents. Preparedness is a continuous process that encompasses endeavors at all government levels and between government and private sector and nongovernmental organizations to identify threats, determine vulnerabilities, and identify required resources.

The University of Nairobi Security Safety Department is headed by a director, it compromises of internal and outsourced security personnel. The department's cardinal function is ensuring safety of members of staff, students and property.

Security personnel play a crucial role in fire disaster preparedness; they patrol the premises to identify fire hazards such as faulty electrical switches, leaking gas and unattended fires. For preparedness to be effective it must identify hazards to which the organization is at risk, this increases the level of preparedness for hazard which the organization is at risk with.

Security personnel carry out fire drills and trainings to sensitize members of staff and students on how to deal with fire emergencies, types of fires and fire extinguishers used for each kind of fire. In order to alleviate disaster situations effectively it is often important to imitate disaster situations to see reaction of staff and students in the facility (The Joint Commission 2005). This simulation in the form of fire emergency drills should always be intervallic so as to get everyone prepared. Training equips personnel response in disaster situations and it raises understanding of all involved. The pitfalls that have continued to dodge real disaster situations are the "the individual short comings of the participants themselves" (Silverman 2006)

Security personnel also carry out inspections to ensure that fire extinguishers are in good condition, fire exit routes are clear and fire signage are well positioned.

Preparedness which is the second phase of disaster management acts as the base foundation for disaster management cycle. Therefore it is very important to stress on disaster preparedness as a way of preventing or reducing the magnitude of disaster in cases where disaster are not preventable. Although Security personnel are usually the first to arrive at the scene of fire due to their nature of work, their ability to cope with the fire calamity largely depend on extent of advance plans that have been made, resource availability identified and key personnel trained for execution of plans. (Kramer & Bahmer, 2003)

In the eyes of the victims and the bereaved it is immaterial whether the mishap is large enough to be publicized nationally or noted to be seen as a disaster. Disaster will depend on ones conceptualization therefore it is important to prepare for fire disasters.

Most of the fire disaster studies that have been done have majorly focused on fire disasters in secondary schools. Kenya School Safety & Standard Policy (2008) and IFC Disaster Emergency Preparedness (2007) address only the primary and post primary schools leaving out Universities. In primary and post primary schools students do not cook in their halls of residence (dormitories), compared to public universities whereby students cook from their halls of residence and yet these hostels were not designed to accommodate cooking. When students join public universities, they acquire false freedom which makes them to go against the institutions' laid down rules and regulations.

Now that the University of Nairobi authority has ruled out cooking from halls of residence, the students who are used to preparing their own meals will be tempted to cook secretly in the hostel. For example since the halls custodians and security personnel carry out inspections to find out which students are cooking, they are now more than before likely to engage in risky cooking behaviours such as hiding electrical cookers in wardrobes while cooking, locking up doors and windows while cooking or those caught in the process hiding hot electrical coils under their beds or wardrobes. All these activities are fire hazards.

The security department is mandated to deal with security and safety issues of students; therefore it is important to carry out a study on security's role in fire preparedness given that from the recent happenings at University of Nairobi students have used arson as a way of protesting. This shows that fire incidents at the university are likely to emanate from sources other than cooking in the hostels. From all the media reports carried out on fire disasters in learning institutions in Kenya, it was established that either fire brigade reached the scene after fire had burnt out itself or reached when fire had already destroyed everything beyond salvage. Given the laxity of Nairobi County Fire Brigade which is mandated with dealing with huge fires in the city but it has failed.

1.5. Research Questions

i.   To what extent are security personnel knowledgeable on fire preparedness?

ii.   How does the security department carry out fire drills?

iii. What kind of firefighting equipment are available and are they easily accessed?

iv.   To what extent is the security department allocated resources for fire disaster preparedness?

1.6. Objectives of the Study

1.6.1. General Objective

This study examined the role played by security personnel in fire disaster preparedness: challenges of protection against fire disaster in the University of Nairobi.

1.6.2. Specific Objectives

This study was guided by the following specific objectives:

i.   To ascertain the extent to which security personnel in the University of Nairobi are knowledgeable on fire preparedness.

ii.   To examine the forms of training on fire disaster preparedness that the security personnel have been given.

iii. To establish the adequacy of firefighting equipment and other resources at the University of Nairobi.

iv.   To identify logistical, administrative and other constraints to an improved capacity of security personnel to implement an adequate fire disaster set up in the University of Nairobi.

1.6   Study Justification

In recent times the frequency of fire incidents on learning institutions has increased alarmingly, therefore it is important to carry out a study on the role of security personnel in fire disaster preparedness. The study delved in the fire preparedness of security personnel, to establish their strengths and weakness if any and potential threats.   Moreover public universities are increasingly vulnerable to fire disasters as a result of over concentration of student population, cooking in hostels. Citing the Kikuyu campus incident where an underground electrical cable exploded sending fear and panic among the students, as a result one student died and several sustained serious injuries, this clearly shows that disaster preparedness is wanting. Therefore it is important to assess the role of security in fire disaster preparedness since they are always on campus throughout and will be the first people to reach the disaster scene.

It is envisaged that the information that was gathered here will go a long way in helping to improve preparedness towards fire disaster.

1.7   Scope and Limitations of the Study

The research covered Chiromo Campus, Student Welfare Authority (SWA) hostels and Kikuyu Campus in the University of Nairobi. This is because these campuses have got students cafeterias, hostels as well as tuition blocks. The study was limited to fire disaster preparedness mainly because majority of the students prefer cooking in their tiny congested cubicles using naked electrical coils which are a fire hazard and also engage in arson as a way of protesting whenever they feel discontented with anything especially SONU elections.

The study intended to ascertain the extent to which security personnel in the University of Nairobi are knowledgeable on fire preparedness, to examine the forms of training on fire preparedness the security personnel have been given, to establish adequacy of firefighting equipment and to identify logistical, administrative and other constraints to an improved capacity of security personnel to implement an adequate fire disaster setup in the University of Nairobi.

A major limitation of the study was that many students failed to give full information in fear of exposing their activities to the administration, therefore the researcher majorly used snow ball sampling whereby after identifying a few students who cook in their rooms they referred the researcher to the next respondent until the research reached his or her target. The respondents were assured of confidentiality and anonymity. The researcher collected data from members of staff from security department, administration and halls custodians. The security personnel provided vital data since they are deployed in all section of the University and this complimented the shortfall from the students.

In addition, the respondents from security and administration may have given wrong information regarding fire preparedness so that their efforts can be seen as effective. The respondents from this group were assured that the study is meant to improve preparedness and not to discriminate or judge their performance.

The study used structured questionnaires which consisted of structured or prompted questions with predefined response. The investigator anticipated all possible answers with pre-coded responses. This is mainly because the investigator carried out bulky interrogation programmes and it was carried out over the telephone, face-to-face and self-completion depending on the respondent type, the content of questionnaire and the budget.

The language phrasing in the questionnaires was simple to make the respondent easily understand the questionnaires, this saved time on the part of the respondent as well as the researcher.

CHAPTER TWO : LITERATURE REVIEW AND THEORETICAL FRAMEWORK.

2.0   Introduction

The literature review consists of the logical identification, location and analysis of documents containing information related the research problem being investigated. It pulls together, integrates and summarizes what is known in an area. (Mugenda and Mugenda 1999).

2.1.   Literature Review

2.1.1. Disaster Preparedness

Preparedness within the field of emergency can be viewed as readiness to deal with a disastrous occurrence.

The case of disaster preparedness is demonstrated in the book of Genesis chapter six whereby God told Noah that the end of the earth was about to come since it was filled with sins and all flesh would perish except for Noah and his entire family. God told Noah to make an ark using gopher wood and inside the ark he should make rooms and seal it inside and outside with pitch. Noah was also told to make roof of the ark and the ark to be three levels up with a door in the side. In addition he was told to gather enough edible food because it was going to rain for forty days and nights and the water would take duration of one hundred and fifty days to subside. Noah was told to bring a male and a female of every species to preserve them for future multiplication. The floods were going to destroy all living things under the sky. Noah did what he was told and it came to pass (Gen 6:13-22)

Disaster preparedness helps to reduce or lessen both the number of human fatalities and damage to property, infrastructure, agriculture and forestry. The superseding objective is to guarantee that the people at threat and the responsible governmental and nongovernmental organizations already know- before an extreme event occurs- what to do when it does occurs. These actors should also be assisted to make the needed logistical and organizational arrangements. Example of disaster preparedness activities include: establishing early warning systems; participatory preparation of emergency and evacuation plans; intensification of coordination and deployment planning; infrastructural and logistical measures such as emergency shelters, and stores for food

and medicine; training measures, and disaster preparedness exercises for institutions and affected populations.(Bradley 2010).

2.1.2. Preparedness Planning Cycle

Preparedness planning cycle is depicted by an illustration below (Figure 2.1) The illustration clearly shows two circles; the exterior circle shows the general preparedness process whereby an organization starts by making assessment of fire threats and hazards, planning and evaluation of preparedness planning. The interior circle is more detailed and uses a systematic approach to disaster preparedness planning which follows a process.

Figure 2-1: The Preparedness Planning Cycle

Source: National Fire Protection Association

The first procedure is carrying out a detailed assessment of fire threat and hazards in which the organization is likely to face. The threats include technological threats and manmade. Findings from the assessment are used to determine the organization level of disaster planning. The next procedure is for the organization to assess their vulnerability level. Different organizations are more vulnerable to different types of fires as compared to others, therefore it is critical for an organization to establish the type of fire threat it is exposed to; and to what extent the impact of fire threat may cause. Assessment of vulnerability helps in identification of shortfalls that exist in the current disaster planning and what are the requirement for rectifying the identified shortfalls. Identification of shortfalls shows whether they originate from disaster planning or lacking of

resources and training. Requirements to meet an appropriate preparedness planning are established.

Implementation and enhancement may be determined by industrial standards set by external bodies such National Disaster Management Unit, National Fire Protection Association, International organization for Standards. County by-laws can also determine intensity of preparedness by using statutory requirements. Implementation enhancements are then tested through exercises such as fire disaster drills and trainings to assess the improvements. When systems meet the standards determined in earlier stages and if such is proved to be effective, the aim of readiness concerning a well known threat is met.

Reassessment of fire disaster threats, vulnerability, shortfalls and requirement is done mainly because fire threats and hazards are dynamic and preparedness planning need to reassessed from time to time to ensure that it is up to date and system is ready and equipped well to respond in case of an emergency situation, more importantly, that each of the individual functional areas are prepared as well.

2.1.3. Definition of Fire: Types, Classification and Extinguishers

Fire is a chemical reaction caused by mixing fuel and oxygen and application of adequate heat to effect ignition. Fuel can either be a gas, liquid or solid (state). The quantity of temperature required to release a vapour which allows burning to take place will depend upon the fuel's condition For example a block of wood requires a higher intensity of heat to be applied than petrol because petrol is in liquid form and its molecule are tiny and widely spread.

2.1.3.1. Fire Triangle

Firer triangle is a simple illustration of three prerequisites for a blaze. To begin and survive, fire needs three components- heat, oxygen and fuel. Just two of these are not enough and if any one of them is not present there won't be fire, by the same token if there is fire, remove one of the components and fire will go out.

All the factors have the capability of burning if sufficient heat is applied to affect the molecules to break down and give off vapour. Once the vapour gas is free it is that which ignites causing further heat to be released transmitting further reactions.

Figure 2-2: Triangle of Fire

Fuel
Combustible gases

Combustible fluid
Combustible solids

Heat (Ignition source)
Hot sources, electrical equipment

smoking, naked flames, the oxidising
substances, static electricity

Oxygen

Always present in the air
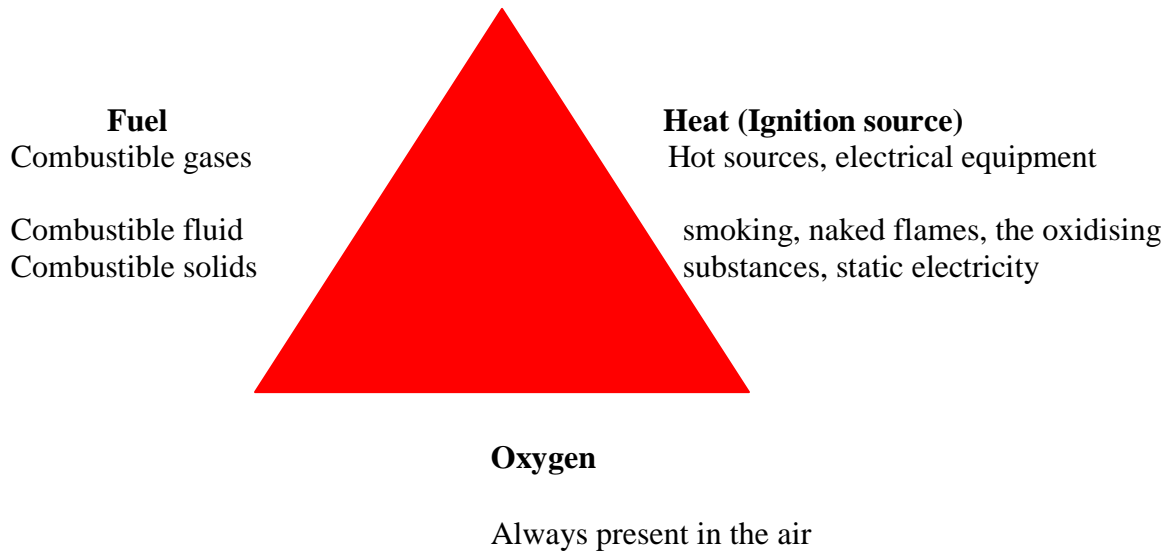
Source: NFPA 921.2011

Oxygen is the base component of our triangle but it is not practicable to remove it since we breathe oxygen it is always present unless in controlled industrial settings. Ignition sources are common and many in any given set up since heat is unavoidable part of life. Fuel is equally common and found everywhere.

Figure 2-3: Diagramatic Representation of Fire Process
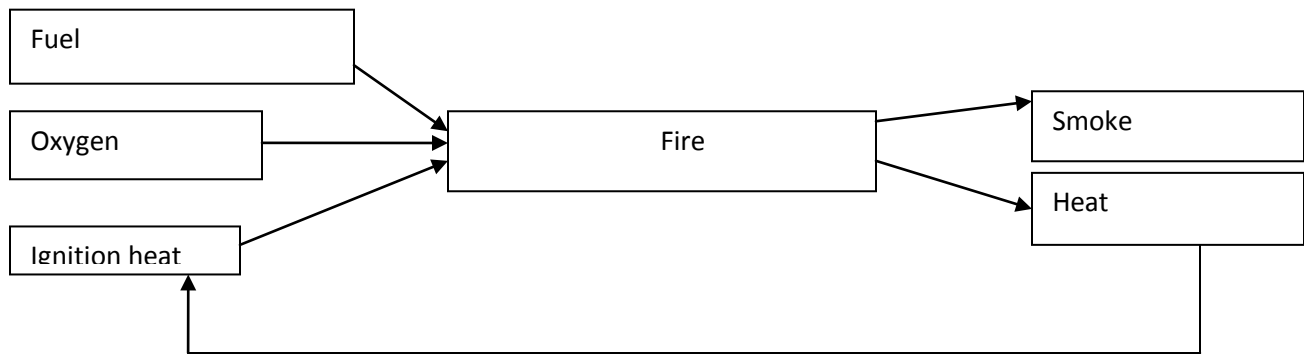
Source: Researcher's (2018)

2.1.3.2. Fire Initiators

Fire can start favorably where there is adequate heat from an initiator or ignition source. Sources of ignition are practically found in all places used by human; this could be at home, school or office. Different kinds of fire initiators can be found both at home and work place. Examples of fire initiators are open fire flames, scorching surfaces, electrical sparks (internal or external) electrically generated arcs, friction (machinery), chemical reactors or even the compression of gases.

From recorded events, initiators of fire can be easily identified and equally how many times they caused fire.

2.1.3.3. The Stages of Combustion

According to Muckett & Furness (2007), there are generally four recognized stages of combustion within the process. The process of combustion takes place when oxygen, heat and fuel come together. This stage is known as induction.

The first stage takes place when there is enough continuous supply of oxygen and fuel, this activates combustion making the fire to grow big in volume and create large amount of smoke. The stage is referred as expansion stage.

The second stage which is known as flash over is characterized with consumption of all combustible materials by fire. The prevailing conditions determine the duration of combustion to

reach flash over depends on prevailing conditions such as room size, availability of oxygen, fuel and a number of chemical interactions.

The stage at which the intensity of fire reactions reduces is known as fully developed phase, in these phase reaction are not rapid as in the growth stage. The stage is characterized by violent fires which exhaust the available oxygen supply and fuel sources. The most notable element of this stage is emission of massive flames with very high temperatures in excess of 300C, at this point fire is controlled by quantity of oxygen and not amount of fuel it feeds on.

The last is decay stage whereby fire will have exhausted all the available fuel then the fire dies down and extinguishes eventually.

2.1.3.4. Types of Flames

There are four most visible types of fire: diffusion flame, smoldering flame, spontaneous combustion or self heating and premixed flame. Although all require fuel, a source of heat and oxygen, each type of fire has unique characteristic (Jones 2013), (Burke 2003).

The most recognizable type of fire is diffusion fire, this kind of fire is seen when a match is lit, and it can also be seen from lit candle, forest fire, camp fire or structure on fire. As clearly shown by this examples natural fires are diffusion flame fires. Presence of flammable gas is required since the visible flame is gaseous reaction.

Charcoal in backyard grill, cigarette tobacco butt burning in ash tray is a good example of smoldering flame. Actually there is nil flame in smoldering fire but a considerable heat, the air flows over the surface area of burning material and in the process provides sufficient oxygen to maintain slow combustion mode. Smoldering fire will glow when appropriate amount of oxygen is applied and the considerable heat generated will erupt into fire.

Spontaneous flame is when the fire starts without known external heat source applied to the material. The process of material oxidation in limited heat dissipation environment can cause spontaneous combustion, this happens when oxidation process emits heat that is easily released in air.

Premixed flame is more common when heating water or air with gas fuel, cooking meals or driving motor vehicle that is a gasoline powered ,a premixed flame fire is involved ,this kind of

fire requires gas fuel and air to mix prior to ignition or combustion. Gas fuel and air mix prior to ignition in this kind of flame.

2.1.3.5. Classification of Fire

In the early 1900s, Underwriters Laboratories developed a method of classifying or categorizing fires based on the extinguishing agent that was appropriate for the type of fire. The classification system recognized that fire involve different materials which necessitate use of specific extinguishing agents and techniques. Letters from the alphabet were used to designate the classification. Still in use today, labels bearing the classification are affixed to portable fire extinguisher tanks and vessels containing extinguishing agents, and appear in literature regarding fire hazards. (Jones 2013)

Class A fires these are kind of fires that are caused as a result of ordinary combustible materials such as thrash, wood, cardboard, and most paper. It leaves ash.

Class B fires are fires caused by flammable liquids such as kerosene, gasoline, diesel and petrol.

Class C fires these are energized electrical fires which involve electrical equipment, such as appliances, wiring, circuit breakers and outlets.

Class D fires are commonly found in a chemical laboratory. They involve combustible metals, such as magnesium, titanium, potassium and sodium.

Class K fire extinguishers are for fires that are caused by cooking oils, trans-fats, or fats in cooking appliances and are typically found in restaurant and cafeteria kitchens.

 Some fires may involve a mixture of these classifications.

2.1.3.6. Types of Extinguishers

According to Fire Equipment Manufacturers Association (2006), Burke (2007) and Jones (2013) types of fire extinguishers have been documented as follows:

 Dry Chemical fire extinguishers they cause extinguishment by smothering the fire process. Dry chemical is very effective for extinguishment of three dimensional flammable liquids or gas fires. It is nonconductive and therefore can be used on live electrical equipment. Dry chemical agents reduce visibility when they are discharged as they pose a breathing hazard to human, clog

ventilations filters and residue may induce corrosion of exposed metal surfaces. Dry chemical also presents a cleanup problem after use especially for indoor application.

Water and Foam fire extinguishers water is the most extensively used and cheap form of extinguisher, when applied to fire it removes heat and prevent re-ignition. Water added with chemicals makes form which soaks deeply in fire, it is very effective extinguisher for Class A fires only; when used in class B, the ejection stream multiplies the flammable liquids therefore causing fire to expand and when used in class C it generates shock. Foam extinguishers can be used on Class A & B fires only. They are not for use on Class C fires due to the shock hazard.

Carbon (IV) Oxide fire extinguishers displaces oxygen, thus preventing it from forming enough concentration to support combustion and fire goes off causes separation of oxygen from fuel and heat thereby extinguishing fire, it removes heat with a very cold discharge. Carbon dioxide can be used on Class B & C fires. They are very ineffective on Class A fires.

Wet Chemical has a slight advantage over dry chemical systems in that they can coat the liquid surface of fire and can absorb the heat there by preventing re-ignition. Wet chemicals systems are primarily provided for kitchen cooking appliances such as grill fryers among others. They provide fixed fire suppression application of liquid fire suppressant through fixed nozzles.

Clean Agent extinguishers were made deliberately for commercial and industrial facilities protection that normally contains sensitive and irreplaceable equipments and materials that are destroyed by water, foam, dry chemical or carbon dioxide. Clean agent is non-toxic and environmentally friendly. They have been specified in place of halon fire protection systems. These systems may be considered a hazard to personnel when they discharge and therefore alarms and warning systems should be installed.

Dry Powder extinguishers are similar to dry chemical but they extinguish the fire by separating the fuel from the oxygen element of the fire, this type of extinguishers are effective for Class D or combustible metal fires only. They are ineffective on all other classes of fires.

Water Mist extinguishers were developed to supplement clean agent extinguishers where contagion is a concern, they work by taking away heat from fire and in the process fire goes off. Water mist extinguishers are primarily for Class A fires, although they are safe for use on Class C fires as well.

2.1.3.7. Fire Exit Routes

Existence of sufficient and accurately planned fire escape route is vital. Exit routes can follow the National Fire Protection Associations' Life Safety NFPA101-2000. The following highlights the requirements for exit routes:

- Work places must create allowance for exit routes and should be mandatory.
- Fire resistant materials should separate exit routes from other parts of work place.
- Exit routes should have self closing doors and opening into an exit should be limited.
- Several exit doors and alternatives should be made readily available.
- Discharge of exit routes doors should be to the outside, street, walkway, public way, opens space with access to outside and must accommodate a number of evacuees.
- Exit doors should remain open to allow evacuees to escape unhindered.
- Exit doors must be not be fixed with any device that can deter opening in case of emergency.
- Provision of adequate exit routes in comparison to work place occupants is mandatory.

2.1.3.8. Fire Prevention Strategies

In latest years there has been some increasing pressure on fire deterrence as one of the most cost effective procedures in dealing with the fire problem. It is always easier to prevent fire from starting than to control them when they are in combustion process. (Purpura2013).

A fire entails fuel, an ignition source and some mechanism to bring fuel and ignition source together in the presence of air (oxygen). If one of the elements is removed then fire will not start and there will be no cause of alarm or panic. Alternatively if one of the elements is reduced then it will minimize the impact of loss resulting from fire.

Fire deterrence focuses on the strategies that help to avoid the initiation of fires.

Inspection

To uncover shortcomings and deviation from codes, a routine inspection should be carried out, it also helps in coming up with remedial actions.

Safety

A few safety tips are as follows:

I. Smoking zones must be set up in appropriate areas and they should be clearly marked.

II. Cigarette butt and match receptors or sand urns should be installed in smoking zones

III. Safety precautions should be followed strictly when using heating systems such as boilers.

IV. Wielding machines should not be used near flammable materials.

V. Use appropriate electrical circuit loads and never use a faulty electrical gadget.

VI. Regular inspections should be carried out to identify and remedy deficiencies

Training

Train people to make sure that training on fire prevention is embraced by everybody. Employees must be made to understand the devastating effects fire causes. This could range from destruction of properties to loss of live and most of damages caused by fire are irreversible. Training topics can include causes of fire, types of fire extinguishers, first aid, evacuation and hazardous substances.

2.2. Theoretical Framework

Theoretical framework is a collection of interrelated ideas based on theories; it accounts for or explains phenomena. It attempts to clarify why things are the way they are based on theories.(Kombo and Tromp 2006)

2.2.1. Functionalism

Functionalism as a sociological theory is prominent in the work of Auguste Comte (1798-1857) and Herbert Spencer (1820-1903). It was further developed by Emile Durkheim (1858-1917) and refined by Talcott Parsons (1902-1979).

Functionalism is a theory that defines the functions of components of a system. It believes that a system is composed of several parts which work separately in conjunction with each other to compliment the whole; in fact it equates the system to human body and its components. No component can work independently without relying on one another. That understanding of one body part involves understanding of its relation to other body parts and how it contributes to maintain the organism. In order to understand any part of society one needs to analyze its relationship to other parts and more significantly its role in the maintenance of the society (Haralambos & Holborn 1990).

University of Nairobi can be viewed as a system composed of several departments which play different roles in relation to others contributing to its maintenance. The security department plays the role of providing security and ensuring safety of students and members of staff, so that they can also play their respective roles. Safety in this sense includes fire disaster preparedness planning. Preparedness planning cycle starts with assessing the threats, the security personnel carry out beats and patrols to identify and assess fire disaster hazards in the buildings and compound such unattended electrical machines, unattended lit fires that can cause fire. The second procedure in fire disaster preparedness planning is assessing vulnerability, the security personnel assess the extent of exposure of students and members of staff to fire hazards and advice them accordingly. The third procedure involves identifying the short falls, the security personnel does this by carrying out inspection on firefighting equipment, fire exit routes and signage to identify faults . The security personnel liaise with the concerned department such as Maintenance department to rectify the faults.

 The fourth procedure of fire disaster preparedness planning is training, Security department organizes for training on fire disaster preparedness, and such trainings enhances preparedness incase of fire disaster. The security personnel reassess fire preparedness readiness by carrying out fire drills and inspecting firefighting equipment.

At the University of Nairobi, the security department plays its role of ensuring security and safety of students and members of staff while other departments play their respective role to maintain the institution.

2.2.2. Symbolic Interactionism

Symbolic interactionists are concerned with explaining social actions in terms of the meaning that individuals give them. George Herbert Mead (1863-1931) is generally regarded as the founder of symbolic interactionism. According to Mead all human actions are basically social, majority of which are contained in language. Human can interact significantly with their natural and social world through symbols. Symbols are made by humans and refer to the ways they perceive them and not to the intrinsic nature of objects and events.

Disasters are largely interpreted according to the meaning people have assigned them; and the preparedness and response given to a certain disaster will depend on how it is interpreted. For example fires and their extinguishers are classified according to the fuel feeding the fire. Different fire classes are assigned symbols ranging from A-K. The security personnel carry out fire disaster training to sensitize members of staff on meaning of different fire symbols used and objects as a way of preparedness.

According to Blumer (1962), human beings take action on based on the meaning which they give to the objects and events. In fire preparedness, several symbols are used which have been given different meanings, for example fire escape routes are marked with red or green arrows pointing towards the exit door, fire extinguishers are marked with symbols such as A,B,C,D all these symbols have been given meanings. The security personnel ensure that the fire symbols and firefighting extinguishers are placed in appropriate positions as a way of fire disaster preparedness. Symbolic interaction argues that humans create society through their own actions. At the University of Nairobi the security personnel create a safe environment by working towards minimizing fire hazards through identifying potential hazard that may cause fire disasters.

2.2.3. Theory of Anomie

The idea of anomie means the lack of normal ethical or social standards. This concept first emerged in 1893, when French sociologist Emile Durkheim published his book entitled, *The Division of Labor in Society.* In this book, according to Durkheim rules guiding interaction among individuals were disintegrating and therefore people are not capable of determining how to act with each other, he believed that anomie was a state whereby behaviors by individuals were not guided by any law owing to the system break down. This is state is referred as normless. Durkheim indicated that normlessness resulted into deviant behaviors. Durkheim's theory foundation was the idea that deficient of rules and clarity caused psychological status of worthlessness, frustration, lack of reason and misery. Since there is no idea of what is considered enviable, to strive for anything would be futile.

At the University of Nairobi, most students lack normal social standards, the campus atmosphere provides students with false freedom which makes them to become normless; whereby they expose themselves to fire hazards through engaging in prohibited activities such as cooking from their residential rooms. The security personnel carries out beats and patrols to detect and deter students who may be engaging in fire risk activities such as cooking from their rooms, smoking in prohibited areas such as libraries and laboratories.

Due to students' normless behavior, they mutilate firefighting equipment especially those located in residential hostels. Security personnel carry out patrols to detect and prevent mutilation of fire hose reels and extinguishers.

2.3. Conceptual Framework

The component fire disaster preparedness will be influenced by fire hazards in the University setting and vulnerability of the University to fire disasters. The dependent variable (fire disaster preparedness) will be influenced by the capacity to handle fire disasters and implementation of fire safety standards (intervening variables). The independent variables are firefighting equipment, awareness, supportive resources, mitigation. Alterations in the four independent variables are likely to impact on the level of fire disaster preparedness.

Figure 2-4: Conceptual Framework

Independent variables
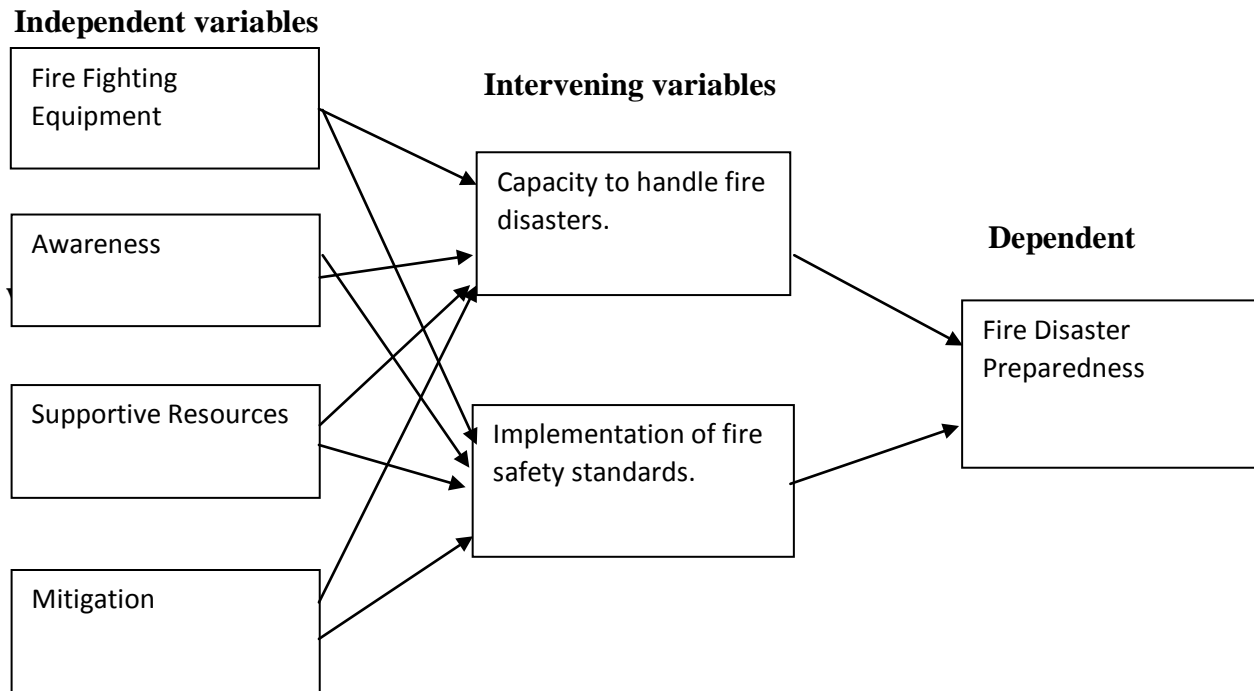
Source: Researcher's (2018)

Firefighting Equipment

Firefighting equipment are very vital in fire firefighting, trained fire marshals use available firefighting equipment to contain fire before it spreads further. Firefighting equipment are specified depending on what is feeding fire, when it is used wrongly it may escalate fire. For example water based fire extinguishers are not suitable for gaseous based fire since water is denser than gas.

Awareness

The entire fire disaster preparedness actions must be based on the knowledge about fire risk the likelihood of different types of fires and likely impacts on property and life. An emphasis should be put that the university community begins with knowing facts about fire hazards. Students and members of staff should be trained on what type of fire is likely to occur in their work places, what type of fire extinguisher should be used for each given type of fire. Fire drills should be

carried out at regular intervals to sensitize members of staff and students on fire disasters. Awareness will create capacity to handle fire disasters appropriately and minimize its impact on property and life.

Supportive Resources

Preparedness agreements can only be implemented if the resources are made available for the purpose. Resource management is useful once internal and external resources for fire disaster response have been identified. The concept of resources encompasses funding, human, material and informational sources of support. The most critical resources are skilled, well trained personnel and staff. Basically communication and warning systems are vital component in fire disaster emergency response, emergencies report, warning personnel of danger and keeping everybody informed is achieved through communication and warning systems. Another dimension of resource is efforts designed to mobilize resource to enable operations when key resources are ruined by fire.

Mitigation

The long term prospect of safety is what is viewed as mitigation. In practice it is thinking ahead and putting mechanism in place that will help in ripping benefits. It alleviates the impact of future fire disaster.

Fire Disaster Preparedness

The dependent variable is fire disaster preparedness, it is affected by variations in independent variables namely firefighting equipments, awareness, supportive resources and mitigation measures. Capacity of players in fire disaster preparedness is likely to be affected by alteration in any of the four independent variables.

CHAPTER THREE : RESEARCH DESIGN AND METHODOLOGY

3.0   Introduction

Research methodology focuses on research and the kind of tools and procedures to use. For example document analysis, survey methods, analysis of existing data (secondary data/statistics)

3.1.   Site Description

The University of Nairobi has got six campuses and two satellites each with its distinctive characteristics. Out of the six campuses, three campuses namely Main campus, Chiromo and Parklands are located near the city centre while Kikuyu, Lower and Upper Kabete campuses are located far. The location of each campus defines its distinct characteristics. The University has also got Student welfare Authority (SWA) which is located between Chiromo and Main campus. SWA comprises of administration blocks, cafeterias and residential hostels which houses thousands of students from University's campuses.

University of Nairobi is composed of a high population consisting members of staff and students, it is usually very busy, there are usually students attending lectures and members of staff at work. There are also laboratories like in the chemistry department that use and store highly flammable materials such as benzene, ethyl alcohol, propane and dimethyl-sulfide just but to name a few, the university libraries stores research papers and books which could act as readily available fuel for fire, in addition the cafeterias use cooking gas that is usually stored in wire meshed cages in open places.

3.2.   Research Design

According to Orodho(2003) research design is viewed as the scheme, outline or a plan that is utilized generate answers to research problems. According to Kothari (2003), it comprises the blueprint for collection, measurement and analysis for data. This study used descriptive research design also referred to as survey design.

3.3.   Unit of Analysis and Units of Observation

The unit of analysis is the major entity that is being analyzed in a study (Babbie 2012). This study analyzed group of individuals on several issues related to fire preparedness. The unit of observation was security personnel; it also included key informants such as representatives of security personnel, SWA director and student representatives.

3.4. Target Population

Population is a group of individuals, objects or items from which samples are taken for measurement (Kombo & Tromp 2006). The target population was the University of Nairobi security staff. The University of Nairobi has a population of 164 security personnel who are distributed as shown in Table 3.1 below.

Table 3-1: Distribution of Security Personnel

Campuses /Satellite campuses/ Research Station	No. of Security Personnel
Main Campus (CHSS)	49
SWA	21
Chiromo (CBPS)	15
Upper Kabete (CAVS	13
Lower Kabete	10
Parklands	8
Kikuyu (CEES)	10
Kenya Science (KSC)	9
Kenyatta (CHS)	13
Kibwezi (Research Station)	6
Kisumu	5
Mombasa	5
Total	164

Source: UoN Security Office

3.5. Sampling Procedure and Sample Size

Purposive sampling was used to select the Main campus, SWA, Chiromo and Kikuyu campus because of the following reasons: first, SWA hosts thousands of students from most of University of Nairobi campuses. SWA hostels comprises of many student residential hostels for both male and female students, Secondly, Chiromo campus was selected because it has got University of Nairobi's vital installations such as Examination centre, ICT centre as well as a mortuary, a facility that serves the Public and has been preserving bodies from national disasters such the Kapedo, Garissa and KDF from Somalia. In addition Chiromo Campus accommodates first year classes for medicine and veterinary students from College of Health Science (CHS) and College of Agriculture &Veterinary (CAVS) respectively.

Third, Main Campus has got the Central Administration where policies pertaining to fire disasters and funding are made. The campus also has the largest library which stores academic researched papers which informs policies. All the mentioned study sites have got characteristics that are representative of other colleges of University of Nairobi. Fourth, Kikuyu campus was selected because it is located far away from the city centre.

A sample of 76 respondents was selected proportionately to represent security personnel in the three campuses including SWA. The sample is distributed as shown in Table 3.2 below

Table 3-2: Sample Distribution in the Selected Campuses

Place of Selection	Number of Security Personnel	Sample Distribution
Main Campus	49	39
Chiromo Campus	15	12
Kikuyu	10	8
SWA	21	17
Total	95	76

The procedure used in selecting respondent was simple random sampling which followed the following steps:

First, a list of all of security personnel in Main Campus was made.

Second, sequential numbers were allocated to each security personnel to obtain a sampling frame.

Third, the numbers were folded into similar shapes and put in a small container and randomly picked to obtain the sample size of respondents.

The same procedure was repeated to pick the respondents for SWA, Kikuyu campus, and Chiromo campus.

3.6. Methods of Data Collection.

According to Kathuri and Pals(1993), most techniques for measuring environment rely on verbal material in the form of questionnaires and interviews, especially one addressed to statistically significant number of subjects as a way of gathering information for survey. The methods of data collection that was used in this study included face to face interviews with key informant, respondents filling questionnaires and researchers observation schedule.

The researcher developed three data collection instruments comprising of structured questionnaire for security personnel, open ended questionnaire for key informants and an observation schedule for the researcher. Further probing to obtain more information was done through interviews. The observation schedule was used by the investigator to note down important elements to the study among the things that were seen are fire safety measures that exist in the buildings, fire escape routes, fire assembly points, fire extinguishers and other firefighting equipment.

3.6.1. Collection of Quantitative Data

Structured questionnaires were used to collect data for quantitative data. The questionnaires were drawn from the study objectives. The questionnaires were administered to security personnel working at the University of Nairobi. Questionnaire is a form of inquiry document, which contains a systematically complied and well organized series of questions intended to elicit information which provide insight into the nature of problem under study. The questionnaires were structured with some answers from which the respondent was expected to choose from.

3.6.2. Collection of Qualitative data

Qualitative data was collected through focused interviews and unstructured observation. Unstructured observation is whereby observer takes the position of onlooker and focus interview as the name suggests, focuses on the respondent's subjective responses and experience on the subject matter to elicit more information. As the story unfolds the researcher can chip in a stimulating question to encourage flow of the conversation. This method renders respondents to volunteer more information. Focused interviews was used to collect qualitative data from key informants such as student leaders, campus security chiefs and halls managers.

Data was collected in the form of descriptive accounts. The use of interview allowed further probing to obtain more information.

3.7.   Ethical Considerations

The respondents were accurately informed of the nature of the study and they gave a verbal consent agreeing to be involved.

The respondents were assured of keeping their identity anonymous; the questionnaire did not require them to indicate their name or designation. The researcher assured respondents that the information collected was for the study only and would not be used discriminate them in any way.

The researcher did not cause any physical or psychological harm to the respondents (students) by using threatening statements. Participation in the study was voluntary; no respondent was forced to participate. Respondents' desires were respected, when expressed will not to answer certain research questions or provide other information to the researcher.

The information obtained was for the purpose of this study only.

3.8.   Data Analysis

Editing of data was carried out to inform accuracy, consistency and completeness; it was coded and categorized according to the items in the questionnaire and the interview schedule using frequency distribution tables. Content analysis was applied for the interview schedule.

Results of the study are presented in frequency tables and percentages.

3.9.   Challenge Experienced in the Field.

Students were initially not willing to give out information about cooking from their hostels, given that at the time of carrying out research cooking from hostels had been banned and those found cooking were being kicked out of their rooms. The researcher talked to halls custodians who identified a student who had been kicked out of the room. The researcher contacted the student and such student when talked to confidentially would identify one or two people whom they know and cook from their hostel rooms but have not been discovered by the authority. The approached students gave out vital information and were assured of anonymity.

Some students expressed hostility towards the researcher; such students were left out and replaced by those who were willing to participate. Some members of staff were not willing to give full information, fearing that such information may expose their laxity at work. The security personnel gave all the information that had been withheld because they are deployed in most areas and have access to the areas.

CHAPTER FOUR : DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.0   Introduction

Thematic sub- sections were used to discuss findings in line with research objectives. These themes include: knowledge on fire preparedness, forms of training on fire disaster preparedness, firefighting equipment, constraints to an improved fire disaster setup in the University of Nairobi and challenges faced. The researcher also used observation chart to observe if the following exist: dry chemical extinguishers, halon extinguishers, overhead sprinklers, hose reels, wet chemical, fire/smoke detectors, emergency communication systems, fire assembly points fire emergency disaster kits, emergency population warning methods, fire hydrants, and open spaces for evacuation, fire escape routes and fire instructions.

4.1.   Questionnaire Return Rate

Research questionnaires were collected from 76 respondents out of 76 sampled giving a response rate of 100%. The respondents were requested to fill data within one to two days and return to an appointed central place for collection. Five security personnel who were on leave were contacted via mobile telephone and questionnaires were sent to them through email.

4.2.   Social and Demographic Characteristics

The findings of social and demographic characteristics of the respondents are indicated below:

4.2.1.   Distribution of Respondents by Age

Knowledge on the age bracket of respondents assisted the researcher to know composition of respondents by age. The respondents were asked to indicate their ages. The findings of the study are as presented in figure 4.1. The finding from this study show that 59.2 % of the security personnel are in age bracket of 31- 40 years which is an active age group, therefore security department is endowed with active security personnel who are capable of firefighting if given the capacity. 25% of security personnel fall in age group 41-50. The age group 50 and above is 15.8% and composed of males only. Figure 4.1 below shows distribution of respondents by age.

Figure 4-1: Distribution of Respondents by Age (N=76)
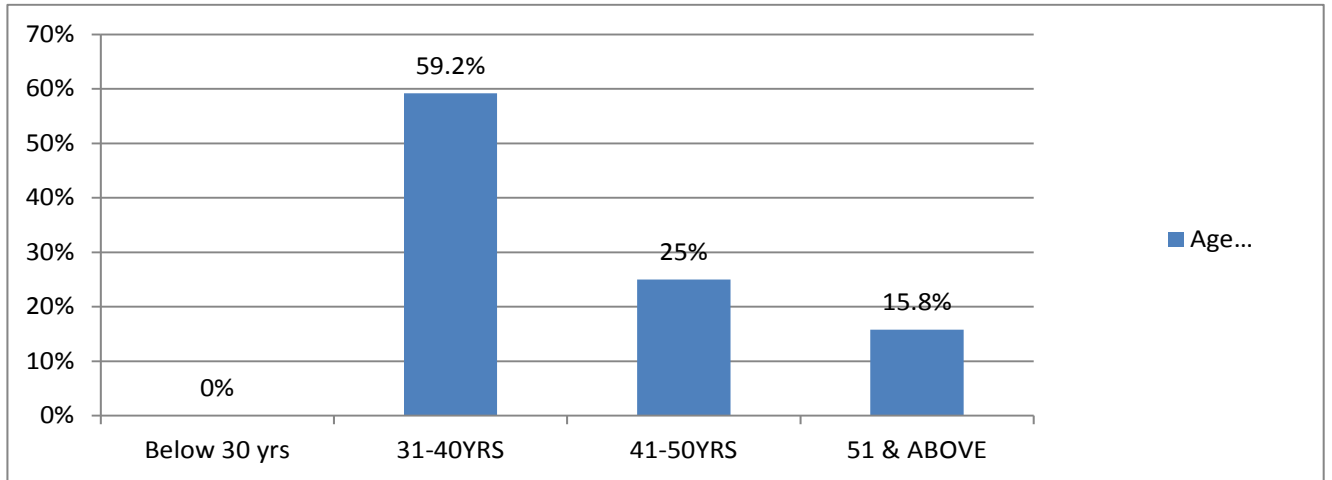
4.2.2. Distribution of Respondents by Gender (N= 76)

The study established that security department is dominated by male which stands at 72% against their female counterparts at 28%. This implies that security department has got a strong work force capable of managing fire disaster in case of breakout. Figure 4.1 shows the distribution of security personnel by gender.

Figure 4-2: Distribution of Respondents by Gender (N=76)
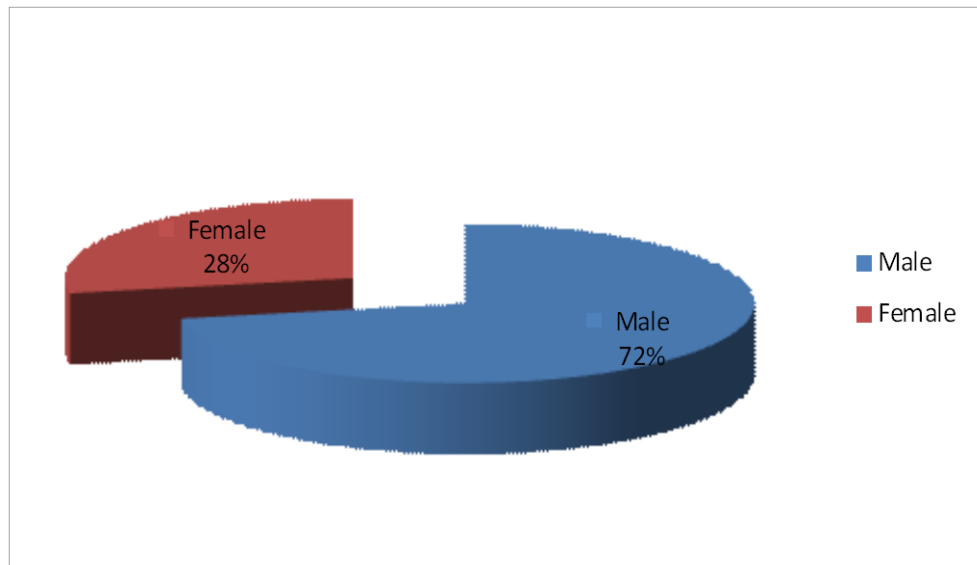
4.2.3. Educational level of Respondents

Findings from this study show that 26% of respondents have attained secondary education, 53% middle level colleges and 21% attained university level education. It can therefore be concluded that all security personnel have attained a reasonable level of education which can enable them get trained to understand issues of fire preparedness. When training is carried on fire preparedness all the security personnel have the capacity to understand and apply whatever is taught. Figure 4.2 below depicts level of education attained by security personnel.

Figure 4-3: Education level of Security Personnel. (N= 76)
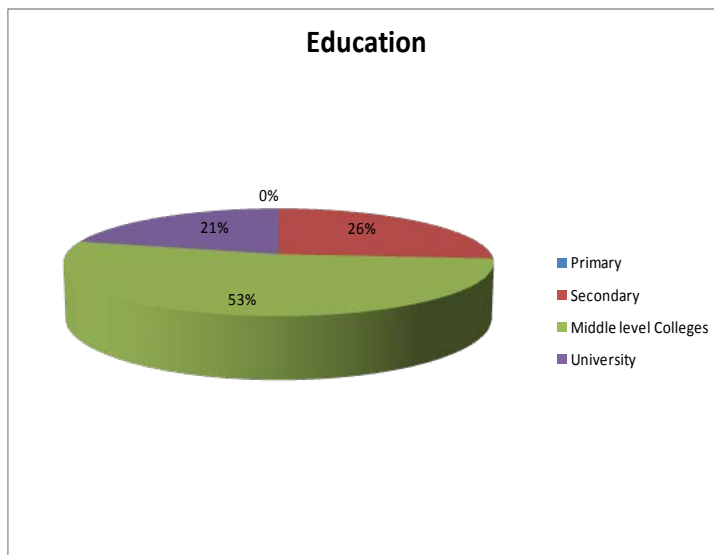
4.2.4. Respondents who have ever experienced fire outbreak in the University before.

This study established that only 21% of respondents had experienced fire while 79% who were the majority had not experienced fire. This shows that incidents of fire outbreaks are not common occurrences in the University. Figure 4.3 below shows the percentage of respondents who had experienced fire.

Figure 4-4: Percentage of Respondents Who Experienced Fire. (N= 76)
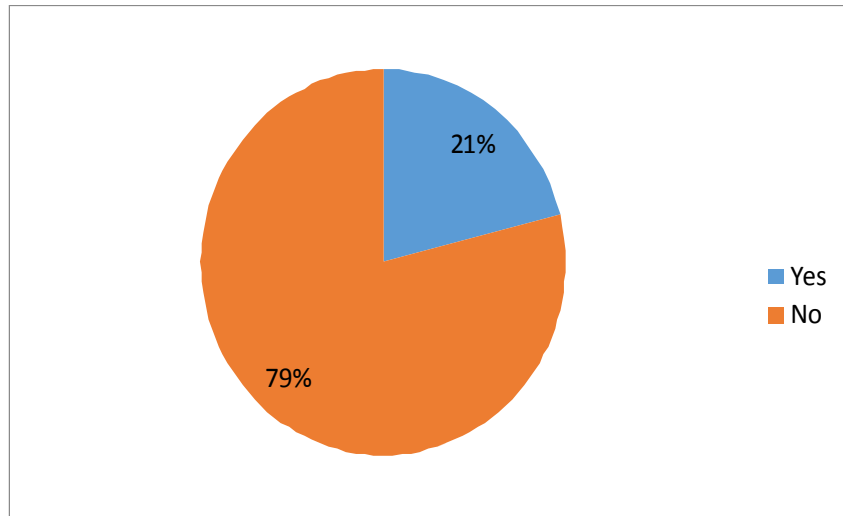
4.3. Knowledge on Fire Preparedness

4.3.1. Awareness of Preparedness Measures in case of Fire Outbreak at Work place

Respondents were provided with preparedness measures in which they were instructed to tick in one box against each measure according to their opinions.

100% respondents ticked on aware in emergency communication systems. This shows that all respondents are aware of that preparedness measure.

A question on regular inspection and maintenance of firefighting equipment enlisted the following responses; 47.4% respondents were of the opinion that they were aware, 26.3% indicated not aware and 26.3% not sure. Findings from these responses show that only 47.4% respondents are aware of regular inspection and maintenance of firefighting equipment while 52.6% respondents are not aware or not know. The findings from this study show averagely the respondents are aware of regular inspection. This shows that respondents are prepared in case of fire outbreak.

Asked to give their opinions on training on emergency services in case of fire outbreak as a measure, 81.6% respondents indicated they were aware, 5.3% not aware while 13.1% do not know. Findings on this preparedness measure shows that majority of respondents are aware. It can be concluded that respondents are prepared in case of fire outbreak. On existence of fire

emergency assembly points, 100% respondents indicated aware. The study shows that incase of fire outbreak they know where to direct for counting and confirmation. Further probing revealed that fire assembly points which are marked alphabetically exist all over the University.

Respondents were asked if they are aware of an availability of emergency fire disaster kit 52.6% indicated not aware and 47.4% do not know. Findings from this study show that an emergency fire disaster kit does not exist. It can be concluded that the respondents are not prepared. On accessibility to fire hydrants 13.1% respondents indicated aware 37.4% not aware and 39.5% do not know. Further probing revealed those fire hydrants are located in places where they cannot easily be accessed in case of fire outbreak. That some members of staff and students park their vehicles in front of fire hydrant therefore blocking access in case of an emergency. The study shows that majority of respondents are not aware of this preparedness aspect which put them at a risk.

100% respondents are aware of existence of fire emergency alarms. This shows that the respondents are well prepared with this aspect of fire disaster preparedness.

Asked on regular fire drills 2.6% respondents were of the opinion that they are aware of regular fire drills, 65.8% not aware and 31.6% do not know. From this study it can be concluded that fire drills are not carried out regularly according to majority of respondents. This indicates that respondents are not prepared in cases of fire outbreak. On if emergency exits were clear, 2.6% indicated aware, 78.9% not aware and 18.4% do not know. The study shows that emergency exits are not clear, this implies that rescue efforts may be hampered in case of fire disaster. On other measures 100% respondents indicated that smoking zones do not exist, this poses a great fire hazard. Table 4.1 shows awareness on preparedness measures at work place.

Table 4-1: Percentage Awareness on Preparedness Measures at Work Place

Preparedness Measures	Aware	Not Aware	Do Not Know	Total	
				%	N
Emergency communication systems (alarm, telephone, Mobile No.)	100	-	-	100	76
Regular inspection and maintenance of firefighting equipment	47.4	26.3	26.3	100	76
Trained on emergency services in case of fire outbreak.	81.6	5.3	13.1	100	76
Existence of fire emergency assembly points	100	-	-	100	76
Availability of an emergency fire disaster kit.	0	52.6	47.4	100	76
Accessibility to fire hydrants.	13.1	47.4	39.5	100	76
Existence of fire emergency warning alarms.	100%	-	-	100	76
Regular fire drills.	2.6	65.8	31.6	100	76
Emergency exits are clear	2.6	78.9	18.4	100	
Any Other (specify) Emergency doors always locked and enhanced with burglar prove doors for security reasons. Smoking zones do not exist.	100	-	-	100	76

4.3.2. Perception on the Level of Preparedness (N= 76)

From the respondents sampled, 26.3% said that they were satisfied with the preparedness level while 73.6% indicated that they were not satisfied. The findings from this study shows that majority of the respondents are not satisfied with the level of preparedness, it can be concluded that the level of preparedness is below the average and incase of fire break out security personnel may not have the capacity to contain it

Upon probing further majority of respondents said that from their past experience with fire outbreak the only part which security has played effectively is crowd control. That for security department to be seen as prepared they should have their own firefighting vehicle to be on standby.

4.3.3. Training on Fire Disaster Emergency Preparedness Measures (N= 76)

According to all questionnaires analyzed, 65.8% respondents indicated that they have been trained while 34.2% marked not trained. Findings from this study show that trainings are offered and probably it is the security personnel who take the training for granted.

Upon further probing a respondent said that security personnel's fire preparedness skills are wanting and they need further training to enhance their skills. That security department should set up a fire marshal unit which should undergo intensive training on fire disaster preparedness given the recent incidences of fire breakout in Kenya secondary schools and the same students are transiting to universities. That apart from combating fire security personnel should also be trained on first aid in order to be able to attend to the causalities incase of incase of an emergency.

4.3.4. Frequency of the Training Offered.

From the 65.8% of respondents who said they had received training, 52.6% indicated that trainings are offered once a year while 13.1% marked Do not Know. From this study it can be deduced that trainings on fire disaster preparedness is not frequently offered. Lack of frequent training may impact negatively on security personnel's capacity handle fire disasters in case of break out.

4.3.5. Forms of Training on Fire Disaster Preparedness Offered.

Respondents were asked what forms of training on fire disaster you have been offered. Forms of training were enlisted where by respondents were asked to rate the forms of training by ticking against one suggestion that is satisfactory, not satisfactory and do not know.

On fire drills 53.9% respondents ticked against satisfactory, 39.4% Not satisfactory while 6.6% indicated do not know. This study shows that a fire drill is satisfactory form of training as indicated by the majority of the respondents. Further probing revealed that fire drill is the most common form of training used by the university.

Asked to rate demonstration as a form of training, 26.3% respondents ticked against satisfactory, 67.1% on not satisfactory and 6.6% do not know. Findings from this study show demonstration as a form of training was not satisfactory.

On theory as a form of training 78.9% of respondents were of the opinion that it was satisfactory, 13.1% not satisfactory and 8% do not know. It can be concluded that theory as form of training was satisfactory.

Asked to rate simulation as a form of training, 19.7% respondents indicated satisfactory, 26.3% not satisfactory and 54% do not know. The findings show that simulation as a form of training was not satisfactory.

On coaching as a form of training, 61.8% of respondents were of the opinion that it was satisfactory, 26.2% not satisfactory and 25% do not know. Coaching method of training was satisfactory.

On apprenticeships as form of training there was no response from all the 100% respondents. An apprenticeship as a form of training is not used in the university according to the study.

13.1% respondents were of the opinion that role –playing as a form of training was satisfactory, 52.6% indicated not satisfactory and 34.3% do not know. The findings show that role playing as a form of training was not satisfactory. Figure 4.4 below gives a summary of responses

Figure 4-5: Responses on forms of training offered on fire disaster preparedness. (N= 76)
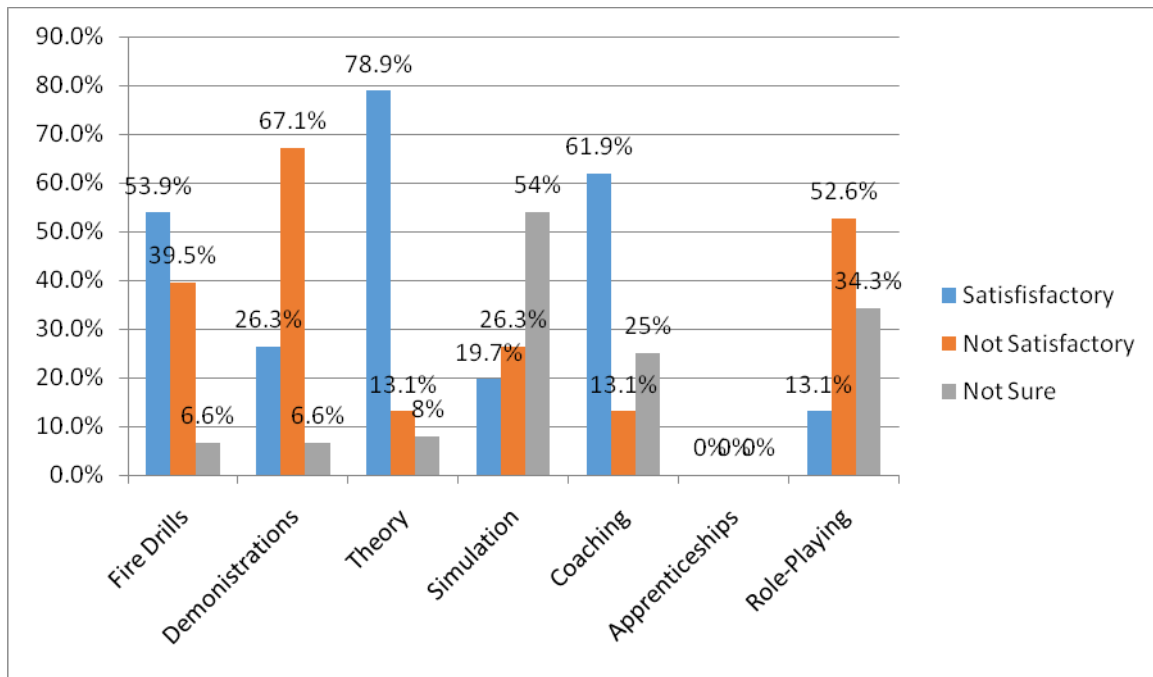
4.3.6. Perception on the Forms of Training

Respondents were asked what your perception on the forms of training was, 34.2% respondents were of the opinion that they were satisfied with training while 65.8% were not satisfied. Therefore it can be concluded that despite the training being offered majority were not satisfied with it. Figure 4.5 below shows the perception on the forms of training.

Figure 4-6: Perception on the forms of training in figures 4.4 above. (N= 76)
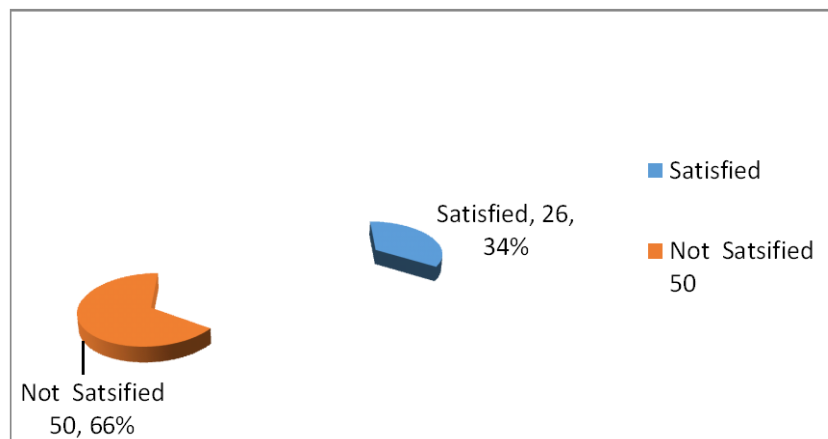
4.3.7. Frequency of Training Offered

Asked on how often does the security department carry out training?

According to the respondents, 39.5% indicated once a year, 60.5% do not know. Findings from this study shows that majority do not know the frequency at which training are offered. It can be concluded that either the trainings takes long before they are offered or the respondents are not interested. This attitude may impact negatively on security personnel's level on fire disaster preparedness.

4.3.8. Evaluation of the Training Offered

Respondents were asked to evaluate the training offered by responding to analysis of training.

Respondents were provided with various analysis training aspects and were asked to give their responses.

39.5% respondents agree that the objective of training was clearly defined, 60.5% do not agree. Findings from this study shows that the objective of the training was not clearly defined. Asked on if participation and interaction were encouraged 78.9% agree, 21.1% do not agree. This shows that interaction during training was encouraged.

92.1% respondents were of the opinion that topics covered were relevant to them and 7.9% were of different opinion. Findings show that according to the majority of respondents training was relevant. Therefore it can be concluded that such training enhances the skills towards fire disaster preparedness. The respondents were asked if the content was organized and easy to follow, 65.8% respondents agree, 21.1% not agree and 13.1% not sure. The majority of respondents agreed that the content was organized and easy to follow.

On the training experience is useful in my workplace, 92.1% respondents ticked against agree and 7.9% respondents do not agree. Findings from this study shows that majority of the respondents agreed that the training experience is useful in their duty of fire disaster preparedness. Asked whether the trainer was knowledgeable about the training topics, 65.8% were of the opinion that they agree while 34.2% were of different opinion. It can be assumed that security personnel are trained by competent trainers.

Asked if time allotted for training was sufficient, 52.6% respondents agree, 34.2% not agree and 13.2% not sure. According to this study majority of respondents agreed that time allotted for the training was sufficient. 13.1% respondents indicated that training facilities were adequate and comfortable for training 72.4% respondents indicated do not agree and 14.5% not sure. Upon further probing respondents said that only one fire extinguisher is used for demonstration during training and if there are many participants it is not easy to see the demonstration being carried out. Findings from this study indicate that 72.4% of respondents were not satisfied with the training facilities. Table 4.2 below shows responses on evaluation on training offered.

Table 4-2: Percentage Responses on Evaluation of Training Offered

Types of Evaluation	Agree	Do Not Agree	Not Sure	Total	
				%	N
The objective of training was clearly defined.	39.5	60.5	-	100	76
Participation and interaction were encouraged.	78.9	21.1	-	100	76
Topics covered were relevant to me.	92.1	7.9	-	100	76
The content was organized and easy to follow.	47.4	52.6	-	100	76
The training experience is useful in my work place.	92.1	7.9	-	100	76
The trainer was knowledgeable on the training topics.	65.8	21.1	13.1	100	76
Time allotted for training was sufficient.	52.6	34.2	13.2	100	76
Training facilities were adequate and comfortable for training	13.1	72.4	14.5	100	76
Any Other (specify)	-	-			

4.3.9. Satisfaction with the training offered.

According to the responses, 26.3% respondents indicated that they were satisfied while 73.7% said that they were not satisfied. Findings from this study shows that respondents were not satisfied with the training.

4.4. Firefighting Equipment

The question sort to establish existence of firefighting equipment at work place. The respondents were asked to identify firefighting equipment that existed in their work place.

Respondents gave varied responses, 34.2% respondents indicated that dry chemical extinguishers existed, 52.6% do not exist and 13.2% respondents were not sure. This study shows that dry chemical extinguishers are not common. On halon extinguishers 39.5% respondents were of the opinion that they do not exist and 60.5% respondents were not sure. This shows that respondents are either halon extinguishers do not exist or respondents are not familiar with them.

Asked on the existence of foam cylinders, all 100% respondents sampled indicated that they exist. Findings from this study shows that this type of extinguisher is common in most places therefore all respondents were familiar with it 100% respondents indicated existence of carbon dioxide extinguishers. It can be assumed that this type of extinguisher is common in the university. 65.8% respondents indicated that hose reels existed and 34.2% said that they do not exist. Further probing revealed that hose reels were not many and are installed only one hose reel exists in every building and if not keen you may not notice them since some are encased. The researcher found that most of hose reels in halls of residence were vandalized most of them did not have nozzles.

On existence of wet chemicals 26.3% respondents indicated exist, 52.6% do not exist and 21.1% not sure. This study shows that wet chemical extinguishers are not common in the University. 100% respondents indicated that they are not sure about the existence of fire blankets. It can be assumed that either fire blankets do not exist or they are located in places where respondents do not access like kitchens. Table 4.3 show responses on existence of firefighting equipment.

Table 4-3: Percentage Responses on Existence of Firefighting Equipment

Fire Equipment	Exist	Do not Exist	Not Sure	Total	
				%	N
Dry chemical extinguishers	34.2	52.6	13.2	100	76
Halon Extinguishers (vaporizing Liquids	0	39.5	60.5	100	76
Foam Cylinders	100	0	0	100	76
Carbon Dioxide Extinguishers	100	0	0	100	76
Hose Reels	65.8	34.2	0	100	76
Wet chemicals	26.3	52.6	21.1	100	76
Fire Blankets	0	0	100	100	76

4.4.1. Satisfied with the number of firefighting equipment in your workplace

The respondents were asked if they were satsified with number of firefighting equipment in their work place. 13.2% respondents indicated yes while 86.8% responded No. Findings from this study shows that firefighting equipment are not adequate and this impacts negatively on security personnel's role of fire disater preparedness.

4.4.2. Ability to operate the firefighting equipment in table 4.3 above

The question sort to find out if respondents are able to operate the enumarated equipment in table 4.3 above.

On dry chemicals extiquishers 52.6% respondents indicated able to operate, 39.5% not able and 7.9% respondents were not sure. The study established 52.6% of the respondents are able to operate dry chemical extinguisher, it can be concluded that security personnel have got a level of preparedness towards fire disater. 3.9% respondents indicated able to operate halon extinguishers liquids, 73.7% not able to operate and 22.4% respondents were not sure. Asked

about foam cylinders 56.6% respondents indicated able to operate, 26.3%S not able to operate and 13 not sure.

On carbon dioxide extinguishers 59.2% respondents indicated able to operate, 39.5% repondents not able to operate and 1.3% not sure.this study shows that majority of the respondents know how to operate carbon dioxide extinguisher, in case of fire outbreak they are prepared. Asked about hose reels 80.3% respondents indicated able to operate, 13.1% not able to operate and 6.6% respondents were not sure. The findings show that respondents majority of respondents are able to operate hose reels. This is a positive indication of respondents towards fire disater preparedness.

19.7% respondents indicated able to operate wet chemical, 65.8% not able to operate and 14.5% respondents were not sure. Findings show that majority of respondents are not able to operate wet chemicals. This has got a negative impact towards fire disaster preparedness. On fire blankets, 78.9% respondents indicated not able to operate while 21.1% indicated not sure. It can be assumed that majority of respondents are not able to operate fire blankets. This impacts negatively to fire disaster preparedness. Table.4.3 shows responses.

Table 4-4: Percentage Responses on Ability to Operate Fire Equipment

Fire Equipment	Able to operate	Not able to operate	Not sure	Total	
				%	N
Dry chemical extinguishers	52.6	39.5	7.9	100	76
Halon Extinguishers (vaporizing Liquids	3.9	73.7	22.4	100	76
Foam Cylinders	56.6	26.3	17.1	100	76
Carbon Dioxide Extinguishers	59.2	39.5	1.3	100	76
Hose Reels	80.3	13.1	6.6	100	76
Wet chemicals	19.7	65.8	14.5	100	76
Fire Blankets	0	78.9	21.1	100	76

4.4.3. Satisfaction with Ability to Operate Equipment Indicated in Table 4.3 Above

According to respondents, 27.6% indicated yes, while 72.4% of said No. Finding from this study show that majority of the respondents are not satisfied with their ability to operate firefighting equipment. This places their preparedness capacity towards fire disaster in doubt.

4.5.   Constraints to an Improved Capacity of Security Personnel to Implement Fire Disaster Set Up

The respondents were provided with a set of constraints on which they were to indicate tick in the box according to their perceptions of the constraint issues raised by the researcher.

On lack of trained fire marshal as a constraint, 86.8% respondents were of the opinion that they agree, 11.8% do not agree and 1.3% respondent not sure. Majority of respondent concurred that lack of trained fire marshals is a constraint. Findings from this study show that lack of trained fire marshals is a constraint to an improved security personnel's capacity towards fire preparedness. Asked if inadequate firefighting equipment is a constraint 92.1% respondents ticked on agree 3.9% respondents do not agree while 3.9% respondents were not sure. Further probing revealed that fire extinguishers in the halls of residence are inadequate and the few available are always kept in the custodians' office and in addition hose reels are mutilated. This shows that incase of fire outbreak firefighting equipment may not be available therefore this impacts negatively on fire disaster preparedness capacity.

92.1% respondents indicated that lack of coordination was a constraint, 3.9% do not agree and 3.9% not sure. This implies that security personnel are negatively affected by this aspect. On poor time management as a constraint 90.8% respondents indicated agree, 7.9%do not agree and 1.3% respondent were not sure. The study shows that poor time is a constraint towards improved capacity of security personnel to fire disaster preparedness.

94.7% respondents were of the opinion that that lack of community awareness and participation was a constraint while 3.9% were of different opinion. Further probing revealed that students and other majority of members of staff are not involved in fire drills. This implies that for fire disaster set up to be effective community awareness should be embraced. All the 100% respondent were of the opinion that that there was lack of fire disaster response capacity. It was

revealed the University does not have firefighting vehicles. The implication of this is that this is a serious constraint that is likely to affect the University set up in case of fire outbreak.

Asked if lack of operational fire disaster plan policies was a constraint, 52.6% respondents indicated agree, 34.2% do not agree and 31.2% respondents were not sure. Further probing revealed that the security department does not have an operational fire disaster plan. This implies that students and members of staff do not understand the importance of fire disaster preparedness. On lack of disaster emergency communication system, 39.5% respondents indicated agree, 59.2% do not agree and 11.3% respondent not sure. This shows that lack of emergency communication system is not a constraint.

On lack of recognition 92.1% respondents ticked against agree, 7.9% do not agree. Further probing revealed that non-teaching members of staff especially security personnel are not recognized for the roles they carry. This implies the security personnel are demoralized due to lack recognition and therefore this impact negatively on their capacity to implement an improved fire disaster set up. Asked whether locked /blocked emergency exit doors was a constraint 98.4% respondents indicated agree and 1.3% do not agree. Further probing revealed that doors are locked due to security reasons. The study shows that locked/blocked emergency exit doors is a major constraint, open emergency exit doors plays a major role during fire disaster emergencies.

Asked on lack of cooperation as constraint 96.1% respondents ticked against agree, 1.3% do not agree and 2.6% not sure. Students do not cooperate with members of staff and they assume excessive powers and in the process defy laid down guide lines. This affects fire disaster preparedness negatively. Lack of education and awareness, 97.4% respondents indicated agree and 2.6% do not agree. Further probing revealed that only a few people are trained and students are not involved in the disaster training at all. The study shows lack of education and training is major constraint. This implies that incase of fire disaster emergency people may not know what to do or how to respond. Summary of the responses are captured in Table 4.4.

Table 4-5: Percentage Responses on Constraints to an Improved Capacity to Implement Fire Disaster Set Up

Constraints	Agree	Do not agree	Not sure	Total %	N
Lack of trained fire marshals	86.8	11.8	1.3	100	76
Inadequate fire firefighting equipment	92.1	3.9	3.9	100	76
Lack of coordination	92.1	3.9	3.9	100	76
Poor time management	90.8	7.9	1.3	100	76
Lack of community awareness and participation	94.7	3.9	1.3	100	76
Lack of fire disaster response capacity	100	-	-	100	76
Lack of fire disaster plan and policies	52.6	34.2	13.2	100	76
Lack of fire disaster emergency communication systems	39.5	59.2	1.3	100	76
Lack of recognition	92.1	1.3	-	100	76
Locked/ blocked emergency exit doors	98.7	1.3	-	100	76
Lack of cooperation	96.1	1.3	2.6	100	76
Lack of education and awareness	97.4	2.6	-	100	76

4.5.1. Rating of Constraints

Respondents were asked to rate the constraints in Table 4.4 by indicating have impact or No impact. 97.4% respondents said the constraints have impact while 2.6% indicated No impact. The study shows that the enlisted constraints are real and impacts negatively on an improved capacity of security personnel to implement a sound fire disaster set up.

4.6. **Challenges Experienced by Security Personnel in their Role of Fire Disaster Preparedness**

Respondents were presented with open-end questions, whereby several spaces for answers were provided. The questions that were asked revolved around the challenges they experienced in carrying out their role in fire disaster preparedness.

From all the 100% sampled questionnaires, the most common answers among them were as follows:

Lack of cooperation from some members of staff and students; for example when there is training on fire disaster preparedness you will find that only the security personnel attend yet the training is essential to other members of staff and students.

Security job as a career is regarded as a low cadre job therefore security personnel get demoralized by other members of staff and students who view them as illiterate and therefore they do not take any advice from security seriously.

Students have defied the ban on cooking from hostels rooms at times they turn violent when confronted to stop the practice. For example hall custodian was accosted by students when he tried to stop them from cooking

Most of the firefighting equipment especially in the halls of residence have been vandalized and defaced yet it's the halls of residence which is likely to experience fire outbreak due to overloading from cooking appliances. For example hose reel nozzles have been cut and halls custodians are forced to lock fire extinguishers in their offices making them not easily accessible in case of emergency.

Fire emergency exit doors are permanently under key and lock whereby keys are kept by the custodians.

The ban on cooking from hostels has led to students improvising cooking gadgets that pose more danger to users and their properties. For instance during one of the raids in students' rooms several electrical coils confiscated were bore naked electrical wires and connections, meko gas grills were found attached to coils and naked wires used for cooking.

4.7. Observations Made by the Researcher

The researcher used an observation chart to guide her on what to observe while in field. The researcher made the following observations fire extinguishers namely dry chemical, hose reels and halon extinguishers existed. The most available types of fire extinguishers were water extinguisher, carbon dioxide and dry chemical powder extinguisher; the three types were mostly placed together.

In the halls of residence hose reels have been vandalized, fire extinguishers are kept in the custodians' offices and fire instructions exist but are defaced.

Fire detectors are found only in a few departments for example in Chiromo campus, they are found at ICT department. Fire blankets were found available in a few kitchens. There is existence of various fire assembly points which are well marked.

Fire escape routes exist but are locked with padlocks and further enhanced0 with metal grills. In some building fire exit routes are not clearly indicated. Summary of observation is captured in table 4.5 below.

Table 4-6: Observation Chart used by the Researcher

Observation detail	Exist	Do not Exist	Remarks
Dry Chemical extinguisher	✓		Not adequate
Halon extinguisher (vaporizing liquids)	✓		Not adequate
Overhead sprinklers	✓		Only in a few departments
Hose reels	✓		Vandalized in halls of residence
Wet chemical	✓		
Fire detectors/smoke detectors	✓		Not in all departments
Fire blankets	✓		Only in a few kitchens
Emergency communication systems	✓		Not adequate
Existence of fire assembly points	✓		Well marked
Availability of an emergency fire disaster kit		✓	
Existence of emergency population warning methods	✓		Not adequate
Existence of fire hydrants	✓		Not adequate
Existence of open spaces for evacuation	✓		
Existence of fire escape	✓		Locked with padlocks
Existence of fire instructions	✓		Some defaced

CHAPTER FIVE : SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0   Introduction:

This chapter presents summary of findings, conclusion and recommendation for the study.

5.1   Summary

Major finding are captured according to the objectives of study as follows:

5.1.1.   Extent to which security personnel are knowledgeable on fire preparedness

The first objective of this study was to ascertain the extent to which security personnel of University of Nairobi are knowledgeable on fire preparedness. Data analysis and presentation revealed that 100% of respondents are aware of emergency communication systems, existence of fire warning alarms. 81.6% respondents were trained on emergency services in case of fire outbreak. 65.8% respondents are not aware of regular fire drills and 78.9% are not aware if emergency exits are clear. 100% respondents concurred that emergency doors are always locked and enhanced with burglar prove doors.

5.1.2.   Forms of training on fire preparedness

The second objective of the study was to examine forms of training on fire preparedness that security personnel have been given. Data analysis and interpretation shows that 53.9% 0f respondents were satisfied with fire drills as a form of training, 67.1% respondents indicated that demonstration as a form of training was not satisfactory. 78.9% of respondents were satisfied with theory as a form of training and 100% of respondents indicated that apprenticeship as a form of training is not used. 66% of respondents perceive training as not satisfactory. 60.5% of respondents do not agree that the objective of training was clearly defined 92.1% of respondents were of the opinion that topic covered were relevant to them. 72.4% do not agree that training facilities were adequate and comfortable for training. 73.7% of respondents indicated that they were not satisfied with the trainings offered.

5.1.3.   Adequacy of firefighting equipment

The third objective of the study was to establish the adequacy of firefighting equipment and other resources at the University of Nairobi. Data analysis and interpretation shows that 100% of

respondents foam cylinders and carbon dioxide extinguishers exist, 52.6% indicated that dry chemical and wet chemical extinguishers do not exist. 100 respondents indicated that they were not sure if fire blankets existed. 86.4% respondents were of the opinion that they were not satisfied with the number of firefighting equipment in their workplace. On average respondents are able to operate dry chemical extinguishers, foam cylinders extinguishers, carbon dioxide extinguishers and hose reels. 78.8% of respondents are not able to operate fire blankets while 21.1% were not sure.

5.1.4. Logistical administrative and other constraints to an improved implementation of fire disaster setup

The fourth objective of the study was to identify logistical, administrative and other constraints to an improved capacity of security personnel to implement an adequate fire disaster setup in the University of Nairobi. Data analysis and interpretation shows that on average all the constraints mentioned were actual hindering implementation of an adequate fire disaster setup. On challenges experienced by security personnel in their role of fire preparedness; challenges cited are vandalism of firefighting equipment especially in the halls of residence, fire emergency exit being permanently under key and lock for security reasons.

5.2   Conclusion

The study assessed challenges of protection against fire in the University of Nairobi. This was in relation to the fact that fire had in the recent past occurred in many institutions of learning leading to fatalities and loss of properties and hence the need to put in place appropriate and adequate measures which could prevent, protect and mitigate against fire disaster.

This study sought to establish challenges faced by security personnel in their role of fire disaster preparedness since these are the people who are always on the campuses throughout the day and night, their cardinal mandate being security and safety of staff, students and University properties. In this respect it was important to find out the challenges and propose the possible ways of minimizing them as to maximize the capacity of security personnel's fire disaster preparedness.

In seeking to establish the adequacy of preparedness of the University the study concluded that despite security department having competent security personnel and equipment for fighting fire

they are ill equipped and prepared to handle eventualities of fire. It is therefore important the University address this to enhance their preparedness.

The study concluded that security personnel are not satisfied with their level of preparedness. They proposed that they be regularly trained in fire safety to boost their satisfaction, emergency exit doors should be opened, training of other members of staff and students and collaboration between all members of staff and students to minimize challenges and enhance preparedness. They further proposed creation of smoking zones because lack of the same is a potential fire hazard.

5.3   Recommendations

The study investigated challenges faced by security personnel in their role of fire disaster preparedness in the University of Nairobi. Following the analysis of the data from participants, the following recommendations were made.

5.3.1   Recommendation to the University Administration

i.   There is need of inspecting the existing fire infrastructure in the University in order to improve and upgrade them to an acceptable standard.

ii.   All extinguishers should be coloured red and marked with their respective fire classes and extinguisher operation manuals appended should match the extinguisher.

iii.   Fire preparedness measures should be enhanced through fire safety programs such as regular fire drills/evacuation procedures, regular fire safety inspection and timely servicing and maintenance of fire equipment.

iv.   There is need of University acquiring it own firefighting vehicles to be on standby instead of relying on firefighters from the county government, passed experience shows that county government firefighting vehicles take longer to arrive at the scene of fire incident.

v.   The security department should come up with mechanism of securing emergency exit doors so that they can be left open for emergency purpose.

vi.   The administration should set up central cooking areas within the hostels since students are adamant of preparing their own meals.

vii. The administration should set up smoking zones since it is an open secret that some members of staff and students smoke.

5.3.2 Recommendation to the Members of Staff and Students.

i. Students should stop the habit of mutilation and vandalism of firefighting equipment installed in the halls of residence.

ii. Students should strictly follow the laid down regulation and desist from cooking in their residential rooms since it overloads the power supply hence a fire hazard.

iii. Vehicles should be parked in designated parking areas to avoid blocking fire hydrant areas.

REFERENCES

Babbie, E. (2015) 10th ed. *The Practice of Social Research* Wadsworth, Thomson Learning Inc.

Blumer, H. (1962) '*Society as Symbolic Interaction' in Rose*. Prentice Hall. Englewood Cliffs.

Burke, R.(2007) *Fire Protection Systems and Response*: CRC Press. New York

Collins, L. (2000) *Disaster Management & Preparedness*: Lewis Publishers. New York

Curzon S.C. (2006). Coming *Back from Major Disaster: Month One*. Public Library Quarterly, 25.

Dempsey, J .(2008), *Introduction to Private Security*. Thomson Wadsworth, USA

DHS, FEMA (2006) *Principles of Emergency Management Study*

Dueep, S. (2014). *Begginer's Guide to Fire Disasters*.JD-Biz Publishing. New Delhi

Forbes, H. (2003) *Preparation, Prevention and Practice: Attempting to Avoid Disasters at Cantebury Cathedral Archives*. Journal of the Society of Archivists 24.

Genesis, (6, 13-22)

Goble, F. G. (2004). *The Third Force*: The Psychology of Abraham Maslow.

Harambos, M. & Holborn. (1991) *Sociology: Themes and Perspectives*. Harper Collins Publishers . London.

Hess K. M. (2008). *Introduction to Private Security* . Thomson Wadsworth, USA

IFC, World Bank Group (2007). *Disaster and Emergency Preparedness*: Guidance for Schools.Jones, M. (2013) *Fire Protection Systems: 2nd ed. Jones & Bartlett Learning*. Alexandria Virginia

Kathuri, J.N. and Pals, D.A. (1993). *Introduction to Educational Research.* Njoro: Egerton University Press

Kenya Safety Standards in Schools Manual, April 2008

Kombo, D.K. &Tromp D. L.A. (2006)Proposal *Writing: An Introduction. Paulines Puublications Africa.* Nairobi.

Kramer, W. & Bahmer C.(2003), *Fire Officer's Guide to Disaster Control*. Pennwell Publishing Co. USA

Maggio, E. J. (2009). *Private Security in the 21ST Century: Concept and Application.* Jonnes and Bartllet Publisher, USA

Mwiria, K. (2007), Public & Private Universities in Kenya: New Challenges, Issues &Achievements .EAEP, Nairobi

Mugenda &Mugenda (1999) *Research Methods: Quantitative and Qualitative Approaches*. African Centre for Technology.

National Research Council(USA), *School Safety: Approach to Life Safety*.

Kumar, A. (2013). *A Text Book for Security.* Goyal Brothers Prakashan Education Publishers, New Delhi.

Stellaman, .J. M. (1998) *Encyclopedia of Occupational Health and Safety 4th ed. ILO.* Geneva.

The Private Security Regulation Bill 2014- Kenya Law.

Weil, A. (2013). *Fire Disasters*. Saddle Back Educational Publishing, USA.

www.nation.co.ke.news

www.standardmedia.co.ke

APPENDICES

APPENDIX I: QUESTIONNAIRE FOR SECURITY PERSONNEL

Introduction

My name is Evalyne Oloo, a postgraduate student at the University of Nairobi undertaking a study on challenges of protection against fire in the University of Nairobi in partial fulfillment of my masters degree in Disaster Management. The information you give in this questionnaire will be used for this study only. Your participation will be highly appreciated.

Thank you

Section A: Social and Demographic Characteristics (tick on the appropriate box)

1. What is your age bracket?

Below 30 [ ]   31-40 [ ]   41-50 [ ]   51 years and above [ ]

2. What is your gender?

Male [ ]   Female [ ]

3. What is your highest level of education?

Primary [ ]   Secondary [ ]   University [ ]   Other

Specify……………………

4. For how long have you worked with the University?

Less than 3 years [ ]   4-6 Years [ ]   7-9 Years [ ]   above 10years [ ]

5. Have you ever experienced any fire outbreak in the University before?

Yes [ ]   No [ ]

Section B: Knowledge on Fire Preparedness (tick on the appropriate box)

1. Which among the following fire preparedness measures are you aware of in your work place (if any) in case of fire outbreak?

Preparedness Measures	Aware	Not aware	Do not know
Emergency communication systems (alarm, telephone, mobile no.)			
Regular inspection and maintenance of firefighting equipment			
Trained on emergency services in case of fire outbreak			
Existence of fire assembly points			
Availability of an emergency fire disaster kit			
Accessibility to Fire hydrants			
Existence of fire emergency warning alarms			
Regular Fire Drills			
Emergency exits are clear			
Any other (specify)			

2. Which is your perception on the level preparedness in your workplace?

Satisfied ☐   Not satisfied ☐

3. Are security personnel trained on fire disaster emergency preparedness measures?

Yes ☐   No ☐

4. If yes, how often are the trainings offered?

Twice a year ☐   Once a year ☐   Do not know ☐

Section C: Forms of Training on Fire Disaster Preparedness Offered.

1. What forms of training have you received on fire disaster preparedness (Tick where appropriate).

Form of Training	Satisfactory	Not Satisfactory	Do Not Know
Fire Drills			
Demonstrations			
Theory			
Simulation			
Coaching			
Apprenticeships			
Role- playing			

2. What is your perception on the forms of training in (1) above?

Satisfied ☐   Not satisfied ☐

3. How often does the security department carry out trainings?

Twice a year ☐   once a year ☐   Do not know ☐

4. How would you evaluate the training offered? (Tick in the appropriate box)

Analysis of Training	Agree	Do Not Agree	Do not Know
The objective of training was clearly defined			
Participation and interaction were encouraged			
Topics covered were relevant to me			
The content was organized and easy to follow			
The training experience is useful in my work place			
The trainer was knowledgeable about the training topics			
Time allotted for training was sufficient			
Training facilities were adequate and comfortable for training			
Any other (specify)			

5. Were you satisfied with the training offered?

Satisfied ☐   Not satisfied ☐

Section D: Firefighting Equipment

1. Which of the firefighting equipment exist in your place of work? (Tick against one answer)

Fire Equipment	Exist	Do not exist	Not Sure
Dry chemical extinguishers			
Halon extinguishers (vaporizing liquids)			
Foam cylinders			
Carbon dioxide extinguishers			
Hose reels			

Wet chemicals			
Fire blankets			
Any other (specify)			

2. Are you satisfied with the number of firefighting equipment in your work place?

Yes [   ]   No [   ]

3. Are you able to operate the Firefighting equipment enumerated in (1) above?

(Tick against one you are able to operate)

Fire Equipment	Able to operate	Not able to operate	Not Sure
Dry chemical extinguishers			
Halon extinguishers (vaporizing liquids)			
Foam cylinders			
Carbon dioxide extinguishers			
Hose reels			
Wet chemicals			
Fire blankets			
Any other (specify)			

4. Are you satisfied with the ability to operate indicated in (1) above?

Yes [   ]   No [   ]

Section F: Constraints to an Improved Fire Disaster setup in the University of Nairobi.

1. What are the constraints to an improved capacity of security personnel to implement adequate fire disaster set up?

(Tick where appropriate box)

Constraints	Agree	Do not agree	Not Sure
Lack of trained fire marshals			
Inadequate fire firefighting equipment			
Lack of coordination			
Poor time management			
Lack of community awareness and participation			
Lack of fire disaster response capacity			
Lack of fire disaster plan and policies			
Lack of Fire disaster emergency communication systems			
Lack of recognition			
Locked/ blocked emergency exit doors			
Lack of cooperation			
Lack of education and awareness			
Any other (specify)			

2. How would you rate the constraints?

Has impact [   ]   No impact [   ]

Section G: Challenges Faced (complete in the spaces provided)

What are the Challenges that security personnel experience in their role of fire disaster preparedness?

1……………………………………………………………………………………………………
………………………………………………………………………………………………………
………………………………………………………………………………………………………

2……………………………………………………………………………………………………
………………………………………………………………………………………………………
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3……………………………………………………………………………………………………
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4……………………………………………………………………………………………………
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5……………………………………………………………………………………………………
………………………………………………………………………………………………………

APPENDIX II: KEY INFORMANT INTERVIEW GUIDE

Date: …………………………………………………………

Name of person being interviewed: …………………………………………………

Interviewer: …………………………………………………………………………

Introduction

My name is Evalyne Oloo, a postgraduate student at the University of Nairobi undertaking a study on challenges of protection against fire in the University of Nairobi in partial fulfillment of my masters degree in Disaster Management. Your participation will be highly appreciated.

Thank you.

Interview questions

1. Could you please tell me about your work in the University?

Section A: Fire disaster preparedness

1. In your view are security personnel knowledgeable on fire disaster preparedness?
2. Which areas of preparedness do you think they are well versed with?
3. How do you perceive their fire disaster preparedness?

Section B: Security personnel training on fire disaster preparedness

1. Have security personnel ever been trained on fire disaster preparedness?
2. Do you think the methods for training and content were appropriate?
3. What would you recommend to improve their skills on fire disaster preparedness?

Section C: Firefighting Equipment

1. What kinds of firefighting equipment are available?
2. Are you satisfied with the number of firefighting equipment in your work place?
3. What areas should be improved on?

Section D: Logistical, administrative constraints to improved capacity of security personnel to implement adequate disaster set up.

1. What are the constraints to an improved capacity of security personnel to implement adequate disaster set up?
2. Does the security department have fire disaster plan?
3. Does the administration support security department towards it role of fire disaster preparedness?

APPENDIX III: STRUCTURED OBSERVATIONS CHART

Observation detail	Exist	Do not exist	Remarks
Dry chemical extinguishers			
Halon extinguishers(vaporizing liquids			
Overhead sprinklers			
Hose reels			
Wet chemical			
Fire detectors/smoke detectors			
Fire blankets			
Any other (specify)			
Emergency communication systems			
Existence of fire assembly points			
Availability of an emergency fire disaster kit			
Existence of emergency population warning methods			
Existence of fire hydrants			
Existence of open spaces for evacuation			
Existence of fire escape routes			
Existence of fire instructions			