FIRE DISASTER PREPAREDNESS IN SECONDARY SCHOOLS
A CASE STUDY OF ILALA MUNICIPAL COUNCIL

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By

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A Dissertation Submitted in (Partial) Fulfillment of the Requirements for the Degree of Master of Science (Applied Epidemiology) of

Muhimbili University of Health and Allied Sciences
October,

CERTIFICATION

The undersigned certifies that they have read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled ***"Fire disaster preparedness among secondary schools" A case study of Ilala Municipal Council,*** Submitted in (Partial) fulfillment of the requirement for the degree of Master of Science (Applied Epidemiology) of Muhimbili University of Health and Allied Sciences.

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Date

DECLARATION
AND
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I, **Emmanuel Nestory**, declare that this **dissertation** is my own original work and that it has not been presented and will not be presented to any other University for similar or any other degree award.

Signature: ……..…… **Date:**……..

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Firstly I wish to express my thanks and gratitude to the Almighty God for giving me the courage, ability, and guidance through the process of writing this report. I wish to acknowledge other researchers; a lot of ideas have been borrowed in the completion of this dissertation. This research work would not have been successfully completed but for the assistance of a number of people. I must express my profound and sincere indebtedness and gratitude to my supervisors, Dr. Aiwerasia V. Ngowi and Ms. Senga Sembuche for their patience in making a thorough and critical review, comments, useful suggestions and encouragement during the whole process of dissertation writting. I also acknowledge the valuable inputs from Mr. Mathias Mtalas for his valuable assistance without his efforts and help, this work would not have become a reality. I appreciate assistance of all cohort 7 residents during preparation of this report. This work would not have been complete without financial support from TFELTP and the tireless work done by my research assistant who worked hard with the limited number of days in the field.

DEDICATION

This dissertation is dedicated to my dear wife Mrs. Nsega Sitta who made me strong and gave me hope throughout the course. Secondly to my daughters Ng'walu and Minza who always made me laugh whenever I had hardships during the period of my studies and Last but not least to my family, my father Mr. Kanji Nestory Mahenge, my mother Mrs. Ng'ollo Kalidushi Pole, my brothers (Joseph & Misinzo Mahenge) and friends who supported me for the foundation from primary education up to college.

ABSTRACT

Background: Fire outbreaks in schools are now reported to be of public concern because of the increased incidences, injuries and deaths due to fire accidents. Regular media reports on fire outbreak incidences grim a picture that secondary schools are not well prepared for fire emergencies in Tanzania. Therefore this study assessed fire disaster preparedness among secondary schools in Ilala Municipal Council.

Objectives: This study specifically assessed knowledge on fire safety among secondary teachers, fire safety equipments available in secondary schools and assessed whether secondary schools provide training to school community for fire safety preparedness.

Methodology: A cross sectional study was employed where by a single cluster sampling study was used to obtain study participants. A total of 94 secondary schools and 422 teachers were included in this study. A self-administered questionnaire with closed and open ended questions were used to collect information on general information and socio demographic characteristics of study participants, fire safety measures and plans pertaining to fire disaster preparedness, determine whether secondary schools train staff on fire disaster preparedness and assessment of knowledge/awareness on fire safety preparedness among boarding secondary schools in Ilala Municipal Council. Data was analyzed by using an Epi info software version 3.5.1 whereby proportions, frequency, distribution tables and figures were used to present the results. A p-value of less than 0.05 was considered to be statistical significant.

Results: A total of 422 secondary school teachers were recruited in this study, 283 (67.1%) were from public owned secondary schools and 330 (78.2%) were from day secondary school category. Of all 422 secondary school teachers, 220 (52.6%) were females, the mean age was 40.7 years ± 6.5 SD.

Adequate knowledge on fire safety prepared was 293 (69.4%).

Of all 94 secondary schools, 57 (60.6%) had fire extinguishers, of these 43 (43.6%) had serviced fire extinguishers. Less than half, 38 (40.4%) secondary schools have fire emergency plan and 23 (24.5%) have persons responsible for fire safety.

During analysis we found that adequate knowledge, 33 (71.7%) on fire safety their schools were 9.64 times more likely to be prepared compared to 10 (20.8%) with inadequate knowledge (OR = 9.64, 95% CI; 3.74 – 24.87; p < 0.001).

Secondary schools 17 (73.9%) had person for fire safety were 4.90 times likely be prepared for fire disaster as compared to 26 (36.6%) which have no person designated for fire safety, this was statistical significant (OR = 4.90, 95% CI; 1.72 – 13.99, p < 0.001).

Head of schools with adequate knowledge on fire safety their schools were more prepared for fire disaster and it was statistical significant (AOR = 9.23; 95% CI; 3.08 – 27.63; p < 0.001). Secondary schools which are inspected once or more per annum were more prepared for fire disaster (AOR = 7.48; 95%CI; 2.15 – 26.04; p = 0.002). Having person for fire safety was not statistical significant at multivariate (AOR = 1.58; 95%CI; 0.46 – 5.47; p = 0.47).

Conclusion and Recommendations: Based on the study findings obtained on the assessed fire disaster preparedness; we found there was inadequate knowledge on fire safety preparedness among secondary school teachers, most of the schools have un serviced fire fighting equipments, lack of personal responsible for fire, lack of fire safety inspection in secondary schools and lack of fire emergency plans in school (policy) among secondary schools are contributing to unpreparedness among secondary schools. Therefore regular training on fire safety, provision of fund in secondary schools to ensure provision of fire fighting equipments and regular inspection of secondary schools for fire safety.

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LIST OF ABBREVIATIONS

IMC	Ilala Municipal Council
MoEVT	Ministry of Education, Science, Technology and Vocational Training
MoHCDEC	Ministry of Health Community Development, Gender, Elderly and Children
MUHAS	Muhimbili University of Health and Allied Sciences
NFPA	National Fire Protection Association of United states of America
OSHA	Occupation Safety and Health Authority
SD	Standard deviation
TFELTP	Tanzania Field Epidemiology and Laboratory Training Program
UNISDR	United Nations International Strategy for Disaster Reduction
URT	United Republic of Tanzania
VPO	Vice President's Office
WHO	World Health Organization

DEFINITION OF TERMS

Boarding secondary school: is the secondary school which provides accommodation and meals for students during term time.

Day secondary school: is the institution where by students are given educational instructions during the day after which students return to their homes /does not provide accommodations.

Disaster It is an extreme disruption of functioning of a society that causes wide spread losses of human life, injuries, material or environmental that exceeds the ability of the affected society to cope with the situation by using its own resources.

Emergency fire exits: These are alternative ways that can be used by people to reach a place of safety from any point in a building. This can be a window, door or other exit affording means of escape or giving access to other than the means of exit in ordinary use, in case of a fire

Fire assembly area: Is an assembly ground where people gather in case of fire to take roll call

Fire disaster preparedness: refers to activities designed to increase the level of readiness or improve the capability for responding to a fire emergency.

Fire drills: a response to a planned, simulated fire emergency event aimed at gauging the preparedness of the individuals to fire emergency.

Fire inspection: an exercise which includes assessment of fire risks and their management

Fire safety knowledge: It is the ability to recognize the danger of fire, to know what do to prevent fire as well as what actions to take in case one happens.

Fire Safety: refers to precautions that are taken to prevent or reduce the likelihood of a fire to cause death, injury, or property damage

Fire safety devices: they are equipment used to put off fire when it occurs and also alert the users of the building on the outbreak of fire in the early stages.

Fire safety plan: refers to written document that guides on what one should do in case of a fire.

Preparedness: this is the state of being ready for specific or unpredictable events or situations.
It's an aspect of pre-disaster phase which entails acquisition and identification of logistics needed to handle an emergency Such as training

Safety: refers to the state of being safe; freedom from the occurrence or risk of injury, danger, or loss.

CHAPTER ONE

1.1: INTRODUCTION

1.2: Background

Fire disaster is a public event in all parts of the world, resulting to various impacts such as live loses, destroying properties and leading to environmental pollutions. In 2010 WHO reported 3,192 human deaths and 270,000 injuries in United states due to fire (1).

The risk of death or injury from fire is higher for persons with physical and mental disabilities (2). The danger of fire disaster is always present and it is important that people are aware of this disaster and be prepared to prevent fire occurrence or lessen property losses, injuries and deaths. Like other disasters, whenever a fire happens it causes a serious disruption of functioning of institutions and infrastructures since it results in widespread human, materials, economic and environmental losses which exceed the ability of the affected community/individuals to cope by their own resources. Schools should have fire emergency preparedness plans to guide students to fire safety (3).

Various fire accidents have been reported in training institutions, for example in July 2004 in India, a fire outbreak killed 90 pupils due to lack of firefighting equipment and 21 deaths occurred in Uganda as a result of fire (4). Among other many factors that are reported to cause fire outbreaks includes; electric faults, arson and uncontrolled burning of bush or waste materials, lack of lighting in schools forcing students to use candles/open flame during studying, cooking and smoking (5). Provision of fire safety equipments are among the public health requirements for operation of schools. The fire and rescue Act, 2007, require promoting fire safety, the provision of information, publicity and encouragement in respect of the steps to be taken to prevent fires and death or injury by fire, giving advice on how to prevent fires and restrict their spread in buildings and other property in case of fire. In places/premises or schools where large number of people enter, work or live require designation of fire protection managers that ensure to prepare a fire and rescue action plan, conduct fire drills on fire extinguisher, inspect and maintain fire protection equipment, water sources or firefighting equipments, report fire and emergency

exit according to the plan and supervise the use and handling of fire and fire fighting facilities (6).

Tanzania has been experiencing a number of fire incidents in schools that have caused losses of property and lives of students. In 2009, twelve students died and twenty were severe injured on fire accidents; July 2009 Shauri - Tanga secondary school gutted fire in whereby more than 40 students died, on 12 November, 2014 one dormitory at Filbert Bai school guttered fire and properties were burnt (7,8). According to fire and rescue force Ilala regional office reported 5 fire incidents between 2013 and 2014 which occurred in training institutions including accommodations and caused human injuries and property destructions *(Source: Ilala fire and rescue regional report 2013/2014).* On 29 February 2016 two dormitories in Mbeya were destroyed and students' properties. The death of students mostly come from smokes, effects of toxic smokes generated by electrical burning materials, flames, crushed during leaving the scene of fire and other die asleep within the fire disaster scene, in order to prevent fire disasters, preparedness should be in place to protect students and properties (9). The Tanzania fire and rescue act, 2007 section 24 and its regulations of 2008 section 6, Occupational health and safety 2003 section 50, The public health act, 2009 section 163 (b) iv, v and ix, these laws require provision of fire fighting equipments, emergency exits, training and fire drills in public premises and schools. The National environmental emergency quidelines of 2014 reguire public places and schools to have fire safety plan and participate in fire drills, identify primary and alternative exits from buildings and learn the use of portable fire extinguishers. A person responsible for fire and safety required to be in schools or building or places where large number of people enter, work or live require designation of fire and safety protection manager/coordinator that ensure to prepare a fire and rescue equipment, water sources or fire fighting equipment, report fire and escape according to the plan and supervise the use fire fighting facilities (10–12), (13). Fire safety inspection and certification promote fire disaster preparedness in various premises including secondary schools it is a mandatory assessment guided by fire legislations which is required to be done annually in school premises and other areas, the fire and rescue force act, [Cap 427 0f 2007], The Fire and Rescue Force (Safety Inspections and Certificates) Regulations, 2008 (G.N. NO.106), The Fire and Rescue Force (Safety Inspections and Certificates) (Amendment) Regulations,

2012 (G.N. NO. 225), The Fire and Rescue Force (Safety Inspections and Certificates) (Amendment) Regulations, 2012 (G.N. NO. 185), The Fire and Rescue Force (Safety Inspections and Certificates) (Amendment) Regulations, 2012 (G.N. NO. 225), The Fire and Rescue force (Safety Inspections, Certificates and Fire levy) (Amendment) Regulations, 2014 (G.N.NO. 63) and fire precautions in buildings. Section 24 of this act, state that every person who owns or manage a high raise buildings, large schools, factory, department store or any building or place where a large number of people enter, work or live, or deals with chemical or petrochemical activities, shall designate a fire protection person/manager from amongst persons to perform such functions who shall; prepare a fire emergency plan, conduct fire drills on extinguishing fire, report fire and escape according to the plan and ensure free of obstruction for means of escape, inspect and maintain fire protection equipment, water sources and firefighting equipments, supervise the use and handling of fire and fire fighting facilities, control the number of persons to be admitted and perform any other function necessary for the fire and other hazard preventions, ensure fire alarm and detection system provided. In order to achieve this Tanzania fire and rescue force has a structure report form which is used as a guide during routine inspection/assessment of premises for fire Safety preparedness.

Since fire disaster preparedness is a concept developed to enable prevent and respond to fire accidents when they occur. Fire legislations and other fire related laws mandates certain necessary steps to be taken to prevent and mitigate the effects of fire in homesteads and institutions. Due to the reason that incidents of fire are still reported, therefore to assess fire preparedness in secondary schools is of paramount important so as to ascertain whether secondary schools are prepared or unprepared for fire.

1.3: Statement of the problem

There has been a global outcry from fire outbreaks with learning institutions being affected. It is estimated that between 1.5 and 2 million fire incidences occur each year in the United States with many other incidence going unreported (14). African countries are known to report more than 60% of the world fire disasters in learning institutions, which are responsible for as much as 1.6 million (70%) injuries cases in schools. In 2011 Ghana recorded 53 institutional fire outbreaks (14).

This catastrophic consequence of fire outbreaks do not only impacts on the individuals, but also on the institutions, communities and the nations at large. According to W.H.O global burden of disease estimates that over 310,000 people deaths occurs as result of fire related burns, of which 30% are under the age of 20 years and approximately 10% of all unintentional injury deaths occurs due to fire related burns.

Fire outbreaks in learning institutions are Public health problem. Although some incidences are unreported, the impacts of these fires cannot be ignored because of their immediate and long term consequences to the individuals, institutions and the country. In 2014 the fire and rescue reported 52 (0.4%) fire incidents of all 14,360 reported incidents among which 14 were from schools which caused 3 deaths of students, properties and dormitories destructions as well close of school (***Source:*** *Ministry of Home Affairs-Department of Fire and rescue brigade report, 20014).* Also in 2015, fire incidences were 39 (0.5%) of all 8,337 incidences occurred and Schools presented 11 (0.1%) of all fire incidences which caused destruction of properties and no deaths was reported (***Source:*** *Ministry of Home Affairs-Department of Fire and rescue brigade report, 2015*).

Fires are occuring in public places and especiall in schools with high frequency reported by media, whose major consequences include loss of property, pupils lives are endangered and learning process severely are interrupted. Causes of fire in schools could be complex starting from lack of understanding of legal and policy frameworks, inability to acquire resources for fire fighting to ilicit ramifications.

However, in Tanzania there is inadequate information on factors influencing fire disaster preparedness among secondary schools.

Therefore this study assessed knowledge of secondary school teachers on fire safety preparedness, the availability of fire fighting equipments and determined whether secondary schools provide training to school community for fire safety preparedness in Ilala Municipal Council.

1.4: Rationale

The findings obtained from this study will contribute to understanding on the level of knowledge among secondary school teachers and level of preparedness for fire in secondary schools in Ilala Municipal Council and it will provide recommendations in order to increase the level of preparedness in secondary schools and it will explored the fire fighting equipments available in secondary schools. The findings of this study will be used to plan a school based program on fire safety that will transmit scientific knowledge on fire safety to support preparedness in secondary schools of Ilala Municipal Council.

1.5: Research questions

1. What proportion of teachers having knowledge on fire safety among secondary schools?
2. What fire fighting equipments available in secondary schools for fire disaster preparedness in Ilala Municipal council
3. To what extent have secondary schools put in place fire safety plan as a measure of fire disaster preparedness?
4. Does secondary school train teachers on fire safety preparedness?

1.6: Objectives

1.6.1: Broad objective

To assess fire disaster preparedness in secondary schools in Ilala Municipal Council

1.6.2: Specific objectives

1. To assess knowledge/awareness on fire safety among secondary schools teachers in Ilala Municipal Council.
2. To establish how secondary schools have put in place fire safety plans as a measure of fire disaster preparedness in Ilala Municipal Council.

3. To assess fire safety preparedness equipments available in secondary schools in Ilala Municipal council.
4. To determine whether secondary schools provide training to school community for fire safety preparedness in Ilala Municipal Council.

1.6.3: Conceptual framework for fire disaster preparedness in schools

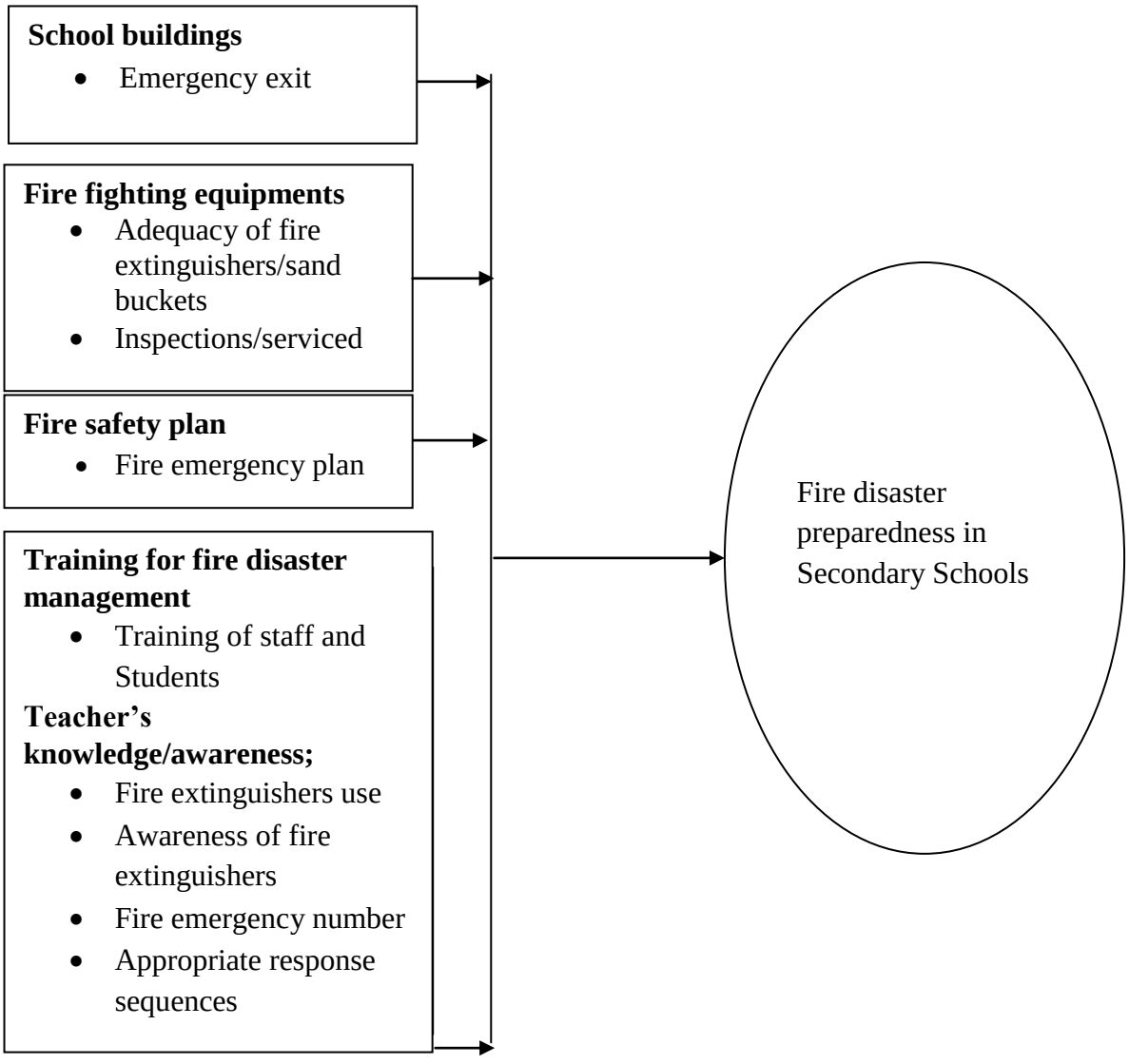


Figure 1: Conceptual framework of fire disaster preparedness

The independent variables are directly linked to fire disaster preparedness in secondary schools. Schools provided with fire fighting equipments (fire extinguishers/sand buckets)

are well prepared in case of fire disasters than the secondary schools without firefighting equipment. Secondary schools with fire exits in buildings are prepared for fire disasters than schools without. Secondary schools that have fire safety plan would know what to do in case of fire, thus they are better prepared than the schools without such plans. The schools which train staff/workers on fire disaster management are more prepared in case of a fire disaster than secondary schools which have not trained their staff on fire fighting. Also secondary schools that had teachers having adequate knowledge on fire safety are well prepared than those secondary schools with their teachers have inadequate knowledge on fire safety.

1.7: Study variables (outcome and independent variables)

The outcome variable is fire disaster preparedness; school preparedness will be assessed by using four items which the sum scores create a composite variable score (Prepared or Unprepared):-

1. Availability of firefighting equipments (fire extinguishers/sand buckets)
2. School have fire safety exits (Fire exits and are free from any obstruction)
3. School conduct training for fire safety preparedness (once or more per year)
4. Fire safety knowledge (adequate knowledge)

Thus, the school was considered to be prepared if it score three quarter and above (≥75%) and unprepared if score below three quarter (<75%) of all scores.

Independent variables:

Location of school, school category, Head of schools education level, frequency of inspections, knowledge of head of schools on fire safety, school ownership, availability fire safety person, previous fire occurrence in a school, availability of fire emergency safety plan.

CHAPTER TWO

2.0: LITERATURE REVIEW

Fire disaster preparedness

Fire disasters are accompanied with devastating impact affecting both lives and properties. The magnitude of the impacts has been severe in places with low levels of fire disaster preparedness. A study conducted in Dar es Salaam, Tanzania, to investigate the level of fire disaster preparedness considering the availability and condition of firefighting facilities as well as the knowledge on fire management among the selected 10 higher learning institutions, results from the study showed that buildings indicated that 60% of the firefighting facilities were not regularly serviced; 70% of them had no enough water storage for firefighting purposes; 60% had no identifiable fire assembly points. Further results indicated that 51% of the respondents were not able to operate the installed firefighting facilities; 80.7% of the respondents had never received any training on firefighting and prevention; 95.6% of the respondents had never participated in any fire drills; and 81.5% of them were not aware of the fire responder's contacts. This indicated that higher learning institutions were not well prepared to manage fire outbreaks(15).

Fire disaster preparedness in schools can ensure that deaths and injuries caused by fire in school premises are rare. Fire safety preparedness measures for school buildings need to be provided with alternative means of exit from the building. A school which is well planned and maintained fosters an environment that enables teaching and learning to take place effectively. It also promotes safety and reduces the fire hazards and the likelihood of fire accidents, injury and deaths. The duties of ensuring health and safety of those at school rests on the hand of head of schools, however for Local Authority schools the responsibility of fire safety is shared between the Authority and Head of schools. Therefore all kinds of fire risks need to be identified as a strategy to fire disaster preparedness, it includes built-in fire prevention, escape routes, fire alarm/detectors and extinguishing systems, training, handling and storing of flammables and electrical faults. Fire prevention regulations can be found in much different legislation. Many fire regulations come for example from the fire and rescue act, 2007, Occupational Safety and Health Act, 2003, Public health act, 2009 and Environmental regulations and Environmental emergency

guidelines, where inspectors from this authorities (building, electrical safety and work safety) have been given mandate to make inspections at least once per year for ensuring fire disaster preparedness strategy are adhered (10,16,17) .

Firefighting equipment

Fire fighting equipments are equipments that are used to put off fire, they includes but not limited, portable fire extinguishers, sand buckets and fire blankets these are used for small fire however installation of hose reels and sprinklers are for large and high raised/storey buildings. Fire extinguishers provided should comply with NFPA 10 and other standards. Extinguishers shall be conspicuously located in place where they are readily accessible and immediately available in the event of fire whereby it is preferable be located along normal paths of the exit at which it can be seen and taken easily. Owner of the premises in which they are placed have the responsibility of inspection and maintenance of fire extinguishers, the service of fire extinguisher should not exceed one year (12 months), record of the last service and next service is indicated, records shall be kept on a tag or label attached to the fire extinguisher (11,18,19). Survey conducted in Kilimanjaro among secondary schools found that 53% have fire extinguishers, 41% sand buckets and 6% fire blankets (7)

A sand bucket is a bucket filled with sand which is used to prevent or extinguish fires. Typically, fire sand buckets are painted bright red and have the word fire stenciled on them, however for Tanzania the sand buckets may not be labeled or painted. Sand buckets are placed on the accessible area and on compounds where are easily accessible by persons during fire. Fire blankets are pieces of woven fabric usually woven glass fibre that can smother a small fire or wrap around a person whose clothing is a light (www.safequip.co.za/product/fire-sand-bucket-or-fire-bucket).

Fire horse reel and Sprinklers are installed in accordance with Standards & Building codes, it used to fight fire at greater distance provided with water, it is more effective with greater flow rate every floor for storey building is required. Studies of fire incidents have revealed that in 80% of fire cases, fire extinguishers help successfully to put out fire before it got out of control. Findings on emergency preparedness in public boarding secondary schools in Kenya found that availability of basic firefighting equipment were 12.1% fire blankets, 21.2% sand buckets and 92.4% fire extinguishers (20). A study by Muindi among training

institutions found that, 90.5% of surveyed institute did not have portable fire extinguishers in work rooms and 78.9% had sand buckets (14). A study conducted in Kenya found that 23.5% of the schools visited were prepared for fire disaster because of availability of fire extinguishers in offices, dormitories and kitchens and most of them were not regularly serviced. School inspectors hardly perform safety assessment during routine checks in schools and many schools were reported to experience water shortage more often and lack hydrant points that would be effective in putting out fire (21).

Aspects of School buildings and fire safety plans

According to the Tanzania fire and rescue act, 2007 and fire precaution in buildings regulation require that every building (including school buildings) which has a storey the floor of which is more than twelve meters above the level of the street or ground surface adjoining any part of the building or a building of two thousand square meters in gross floor area shall be provided in every such storey with free and unobstructed means of escapes/exits be kept readily accessible at all times in the event of fire. Fire alarms, detection systems (smoke/fire alarm warning system) and automatic fire sprinklers for building which has a storey the floor of which is more than twenty four meters above the level of the street or ground surface. Exit doors need to be capable of being opened manually, without the use of a key, tool, special knowledge should open in the direction of exit travel (10).

Maritim Jamima Chemeli found that 66.2% of teachers reported their schools to have no fire safety plan, 22.7% reported to have fire alarms and 78.8% reported to have no water horse hydrants in their schools, further results show that 71% students reported exit doors did not open outwardly, 34.8% students reported their classrooms and dormitories windows had grills these were contrary to the requirements of school safety manual in Kenya (20).

Mwangi Paul Kapanyi found that, 44.4% of Teachers indicated that their school had an evacuation plan in case of a fire Disaster (22). Another findings on assessment of fire disaster preparedness strategy conducted by Jacqueline Ngima Gichuru, found that majority 78.6% of teachers reported their schools to have fire evacuation plan which was never being used in their schools (23).

Training and knowledge/awareness on fire safety preparedness

To improve knowledge on fire safety, training to staff, students and public at large is most important as it builds understanding of fire hazards and fire safety procedures as crucial for being prepared in the case of fire. Every member of staff and students should receive training in; general fire prevention and action to be taken if they discover a fire and how to raise the alarm for fire accidents. Huseyin and Satyven reported that fire safety training increases the level of knowledge and people with high level of knowledge respond properly to fire and take properly the precautions for fire accident (24). Ronoh Richard Kipngeno and Kyalo Wambua Benjamin reported that schools that performed fire drills, 87.5% of participants were knowledgeable on the use of fire extinguishers (25). Study in Kenya found that 48.2% of the respondents had adequate knowledge on fire safety preparedness and there was statistically significant association between staff knowledge level and cadre ($\chi 2=34.565$; $p = 0.000$). Ahmadabad found that knowledge on fire safety was 55.33%, male presented 32.58%. Adequate knowledge on fire safety preparedness are essential to reduce delay time and evacuation, therefore fire drills and fire safety training are important for fire prevention and control. Punic during fire accidents is due to lack of knowledge on fire safety; training can overcome this. Staff and pupils should receive training in; general fire prevention, action to be taken if they discover a fire, how to raise the alarm, action to be taken on hearing the alarm, evacuation, location of escape routes and assembly points (26). Study conducted in Thailand among schools showed that when person practice fire simulation they behave correctly to fire compared to 18.8% of people who were involved in evacuation practice. The findings also revealed that the students who had not been trained in fire evacuation had more inappropriate behavior or practice and poorer attitude toward fire than those had the experience (27). Study conducted among secondary school in Nyeri central District on fire disaster preparedness found that majority of the head teachers (77.8%) said were not trained and teachers who participated 39.3% reported that the members of staff were trained further results shows that 58.3% of the schools had trained personnel to handle fire disaster in case of an emergency, Over 60% of the teachers reported to have fire alert procedures (23).

A household survey conducted in Tanzania by Twaweza on awareness of police and fire emergency numbers, results showed that 96% of participants were not aware of fire emergency number (28)

CHAPTER THREE

3.1: METHODOLOGY

3.2: Study Setting

The study was conducted in Ilala Municipality which is one of three municipalities forming Dar es Salaam city in Tanzania. The municipality lies between longitude 39° and 40° east and between latitude 60 and 70 south of the Equator. It is bordered by the Indian Ocean on its eastern part with distance of about 10 kilometers. On the southern part it is bordered by Temeke Municipality, whereas on its western part it is bordered by Kisarawe District and on its northern is bordered by Kinondoni Municipality.

Ilala Municipality covers an area of 210 km^2 administratively the municipality is the headquarters of Dar es Salaam region. The council is divided into 35 wards with three zones; city centre, peri-urban and rural areas. The wards are distributed as follows;

a. City center (Kivukoni, Upanga west, Upanga east, Kisutu, Mchafukoge, Jangwani, Kariakoo and Gerezani), which have 19 secondary schools
b. Peri urban (Mchikichini, Ilala, Buguruni,Vingunguti, Tabata and Kipawa wards), there are 32 secondary schools
c. Rural – (Segerea, Kiwalani, Kinyerezi, Kitunda, Ukonga, Pugu, Chanika, Msongola, Kivule, Kimanga, Minazi mirefu, Majohe, Gongolamboto, Buyuni, Mzinga, Zingiziwa, Kisukuru, Mnyamani, Pugu station, Liwiti and Kipunguni wards), in these area there are 43 secondary schools *(IMC report 215)*

Ilala Municipal Council, as it is the fast growing a dense, economically and ethnically diverse district of Dar es salaam and it is a socio economic hub. The council which has almost an equal number of both government and private secondary schools as compares to other Municipal Councils in the region. In Ilala District there is two fire stations one within the center center and another at Tazara area peri urban, report shows that five fire incidents were reported in schools in 2013/2014 *(Source: Ilala fire and rescue regional report 2013/2014).*

3.3: Study design:

A cross sectional study was employed for this study

3.4: Target Population

The target population for this study was all secondary school teachers found in Ilala Municipal Council. The council has 94 secondary schools of which 49 are Public and 45 are Private secondary schools (29).

3.5: Sample size calculation and sampling technique

The minimum sample size of respondents involved was obtained by the formula below:

$$n = \frac{z^2\, p\,(1-q)}{d^2}$$

Assumptions made are:

- n= the required sample size of the study
- 95% confidence interval
- d=Margin of error 0.05 (5%)
- z=the value of level of significance 0.05 (1.96)
- p=estimate proportion 50.0% knowledge on fire preparedness among secondary school teachers

Thus: $\mathbf{n = \frac{(1.96^2) \times (p) \times (1-p)}{0.05^2}}$

Sample size was (n) = $\frac{1.96 \times 1.96 \times 0.5 \times 0.5}{(0.05 \times 0.05)} = 384$

Thus the minimum sample size for participants is 384 teachers and we added a 10% to the sample size to cover for non-response

Therefore: n= 384 + (384*0.1) = 422

The sample size was 422 respondents.

3.6: Sampling procedure

A simple random sampling procedure was employed by using automated generated numbers in an excel sheet aided by a Computer software to select the number of teachers in each secondary school from attendance register.

Proportional to its Population size (PPS) calculation procedure

The sample size for the study was 422 teachers

Number of teachers selected in a school was obtained by:

$$\frac{\text{Number of Teachers in a school} \times \text{sample size}}{\text{Total number of teachers in Municipal}} = \text{No. of teachers selected in a school}$$

Number of teachers selected from each secondary school in Ilala Municipal Council **(Annex 1)**.

3.7: Inclusion and Exclusion criteria

Inclusion criteria: Any secondary school teachers working in secondary school of Ilala Municipal council found in the school on the day of data collection.

Exclusion criteria: Secondary school teachers who were not available at the school on the day of data collection and who cannot talk and vision disabilities.

3.8: Instruments for data collection and data collection procedures

Three tools were used to gather information from study participants.

Information from secondary teachers were elicited by using a self-administered questionnaires on which participants were asked to choose the correct responses and filling of the space for open ended questions.

An interview guide with structured questions was used to collect information from Head of schools on this questions were read by the research assistant and responses were recorded in the space provide in the questionnaire.

An observation checklist was used to record fire safety equipments that were available within the school areas visited.

The questionnaire consisted of five parts; general information and socio demographic characteristics of participants, fire fighting equipments, school buildings and fire safety plans, training on fire safety and knowledge/awareness on fire safety preparedness were administered to secondary school teachers through drop and pick method.

Fire safety knowledge was assessed by six multiple choice questions, the questions had a total of 6 correct responses and each correct response or answer was given 1 score. Thus, the maximum total score was 6 scores. The scale was dichotomized using the two third rule was used to categorize knowledge level of teachers, with a score of 0 – 3 scores as having inadequate on fire safety and all those score 4 – 6 as having adequate knowledge on fire safety.

An interview was conducted to the head of schools to obtain information on secondary school; training on fire safety preparedness, availability of school fire emergency plan, inspection frequency on fire safety and services of fire safety equipment as a strategy for fire preparedness in secondary schools. The components of fire emergency plan were considered to be written fire safety policy, posted signage and warning information, fire evacuation area, employee training and responsibilities of members.

Observation checklist was employed to observe the fire fighting equipment (fire extinguishers and sand buckets), safety equipment (first aid kit and fire blankets) available in secondary schools and fire detection/warning signs in corridors and exits in school buildings, a response of "Yes" was given if fire fighting was available and "No" if are not available.

Participants were asked to indicate the level of agreement in relation to adequacy of firefighting equipment (five items of firefighting equipment) which were believed to be available in secondary school regarding the local environment of secondary schools in Tanzania, where by SA (strongly agree) = 4, A (Agree) = 3, D (Disagree) = 2 and SD (Strongly disagree) = 1 responses. To enable easy interpretation and reporting the responses were categorized into two categories; agree (strongly agree/agree) and disagree (disagree/strongly disagree)

Participants indicated the level of agreement in relation to school building fire safety on various statements on fire disaster management where by SA (strongly agree) = 4, A (agree) = 3, D (disagree) = 2 and SD (strongly disagree) = 1. These were dichotomized in two groups; agree (Strongly agree/Agree) and disagree (Disagree/strongly disagree).

Observation checklist was used to complement the availability of fire fighting equipments and their service/work status for fire disaster preparedness in secondary school.

Data collection was done by Principal researcher and ten research assistants were employed to collect data from secondary schools. The questionnaires were administered in English, since respondents had understanding of English language and there were no Swahili translations to questions. A one day orientation on the tool for data collection was conducted to Researcher assistants selected in order to ensure uniformity in administering the questionnaire to participants.

3.9: Data management, Processing and analysis

Manual editing of questionnaires was done every day after field work by research team to minimize unexpected errors and to detect any missing information. Corrections of errors identified were made by going back to the field for verification.

Data were captured by computer software whereby Epi info software version 3.5.1 was employed for data analysis. Data were cleaned for inconsistencies, incorrect values by double entries before analysis.

Analysis was done using Epi Info computer software; information was presented by frequency tables and texts were used to describe the level of fire disaster preparedness in secondary schools. A chi square test was used to compare proportions. A p-value of less than 0.05 was considered to be statistical significant.

3.10: Pre- test:

Prior to data collection questionnaire was pre tested in 6 secondary schools found in Temeke Municipal Council to assess the clarity and consistence of information obtained from the respondents by the questionnaire, to assess simplicity and correctness of questions administered.

3.11: Ethical clearance

Ethical clearance was obtained from Muhimbili University of Health and Allied Sciences (MUHAS) Research and Publication Ethical Committee. Permission to conduct the study in the secondary schools was obtained from Ilala Municipal Council Director through Education Department. Headmasters and Headmistress were informed about the purpose of

the study and its importance in ensuring fire safety in secondary schools. Consent to participate was obtained from each participants.

Participants' information was kept highly confidential and for this study only. Teachers were not forced to participate in the study and questionnaires were administered after class hours' sessions to avoid interferences with school lesson program. Teachers' names are not included in this report to increase anonymity and therefore assurance confidentiality of information.

CHAPTER FOUR

4.1 RESULTS

A total of 94 secondary schools and 422 teachers were included in this study.

4.2: Socio-demographic characteristics of teachers and Description of secondary schools in Ilala Municipality Dar es salaam, Tanzania

The study included a total of 422 secondary school teachers with a response rate of 100.0%. It was found that of all 422 secondary school teachers, 220 (52.6%) were females, the mean age was 40.7 years ± 6.5 SD, 229 (54.2%) were within the age group of 36 – 45. We further found that, 227 (53.8%) secondary school teachers were holder of first degree and above, while the mean teaching experience was 10.9 years ± 6.0 SD.

The mean time worked at the current station was 5.6 years ± 2.1 SD and 310 (73.4%) were not been trained on fire safety. Of all 94 secondary schools, 49 (52.1%) were private schools, 23 (24.5%) have persons responsible for fire safety and 66 (70.2%) were not inspected for fire safety.

Table 2, shows Socio demographic characteristics of secondary school teachers and description of secondary schools in this study.

Table 1: Socio - demographic characteristics of secondary school teachers and Description of secondary schools in the study

School teachers n = 422 **Characteristics**		**Frequency (n)**	**Percentage (%)**
	Sex		
	Males	200	47.4
	Females	220	52.6
	Age		
	26 – 35	108	25.6
	36 – 45	229	54.2
	46 – 55	70	16.6
	56 +	15	3.6
	Education level		
	Diploma	195	46.2
	Degree +	227	53.8
	Teaching experience (Years)		
	0 – 5	63	14.9
	6 – 10	196	47.5
	11 +	163	38.6
	Time served in the current station (Years)		
	0 – 5	225	53.3
	6 – 10	7	1.7
	11+	190	45.0
	Received training on fire safety		
	Yes	112	26.5
	No	310	73.5
Secondary Schools (n = 94)			
	School ownership		
	Public	45	47.9
	Private	49	52.1
	School category		
	Day	73	77.7
	Boarding	17	18.1
	Day and Boarding schools	4	4.3
	Location		
	Rural	75	79.8
	Urban	19	20.2
	Have person for fire safety		
	Yes	23	24.5
	No	71	75.5
	School with fire emergency plan		
	Yes	38	40.4
	No	56	59.6
	Fire inspections per Year		
	≥ Once	28	29.8
	None	66	70.2

4.3.0: Knowledge and awareness on fire safety preparedness among secondary school teachers.

Out of 422 secondary school teachers, 227 (53.8%) knew the fire emergency number to call during a fire outbreak and 192 (45.6%) reported smoke is the main cause of death during a fire outbreak. Of all teachers involved in the study, 155 (37.0%) knew to use fire extinguishers while 120 (28.8%) were aware of the action to take during fire outbreak **(Figure 2).**

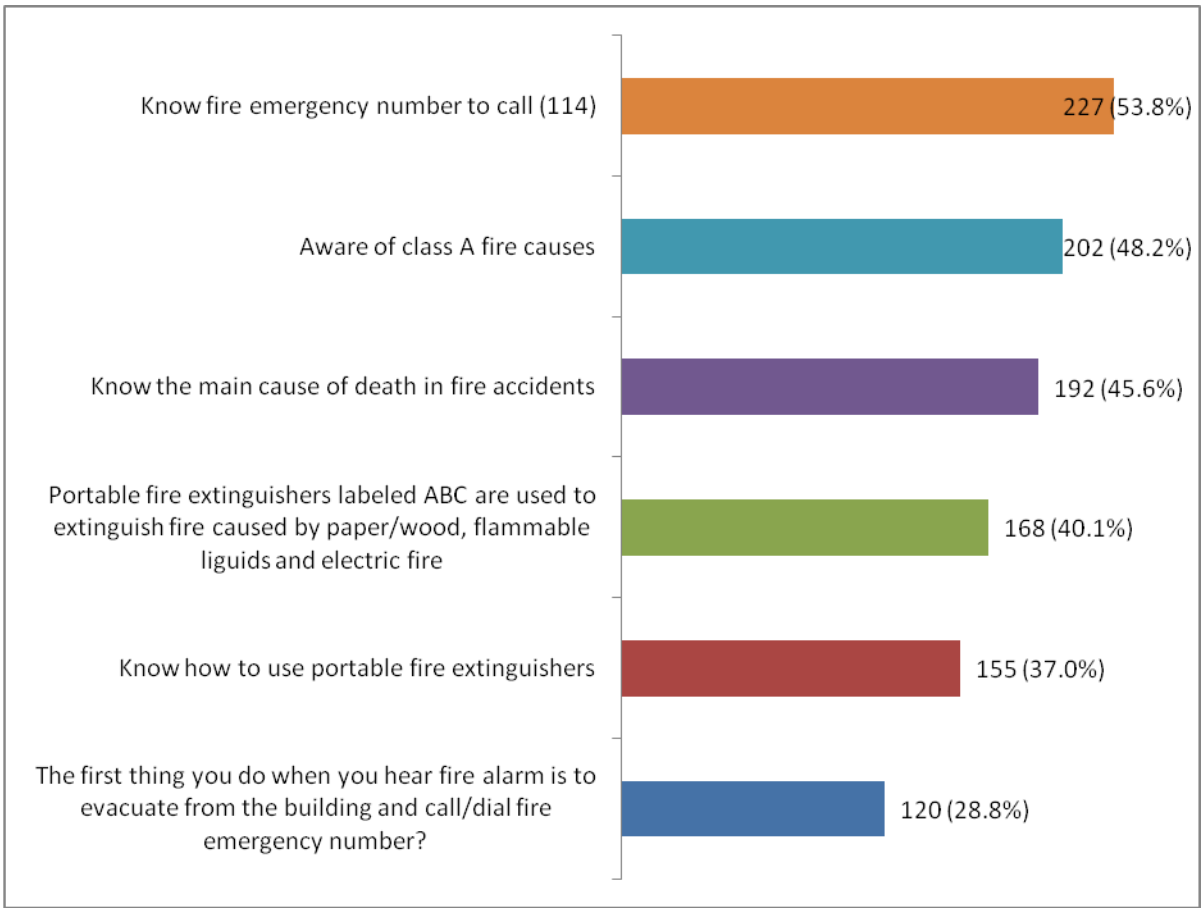


Figure 2: Fire safety knowledge among secondary school teachers in Ilala Municipal Council

4.3.1: Overall level of knowledge on fire safety preparedness among secondary school teachers

Out of 422 secondary school teachers, 293 (69.4%) had inadequate knowledge on fire safety preparedness, Figure 3. Show level of knowledge on fire safety preparedness among secondary school teachers.

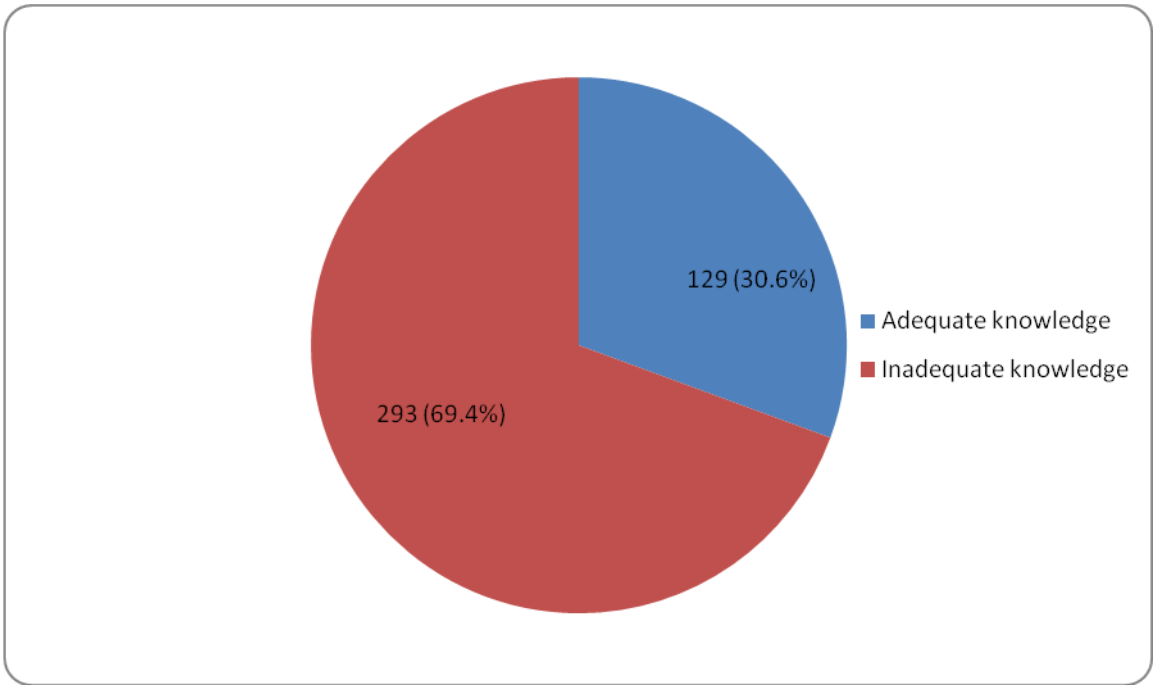


Figure 3: Level of knowledge on fire safety preparedness among secondary school teachers

4.5: Availability fire safety preparedness equipment in secondary schools

It was observed that, of all 94 secondary schools, 57 (60.6%) were found to have portable fire extinguishers, 60 (63.8%) have no sand buckets and majority 93 (98.8%) did not have fire detection alarms (Table 2).

Table 2: Availability of fire safety preparedness equipments in secondary schools (n=94)

Factors	Response	
Availability of fire safety preparedness equipments	**Yes (%)**	**No (%)**
Have fire extinguishers	57 (60.6)	37 (39.4)
With Serviced fire extinguishers	41(43.6)	53 (56.4)
Have first aid kit	79 (84.0)	38 (40.4)
First aid with medical supply	56 (59.6)	38 (40.4)
Have reliable water supply	48 (51.1)	46 (48.9)
Have sand buckets	34 (36.2)	60 (63.8)
Have fire blankets	8 (8.5)	86 (91.5)
Means of Emergency exits and warning signs		
Fire assembly	66 (70.2)	28 (29.8)
Accessible emergency exits	64 (68.1)	30 (31.9)
Telephone number of person responsible for fire displayed	32 (34.0)	62 (66.0)
Fire emergency number displayed	23 (24.5)	71 (75.5)
Warning sign and label	1 (1.1)	93 (98.9)
Exit doors readily open outward without use of key	0 (0.0)	94 (100.0)
Fire detection and alarms		
Local means of fire alert in school (bell/whistle)	70 (74.5)	24 (25.5)
Fire detection alarms	1 (1.1)	93 (98.9)

4.4: Availability of fire safety plans in secondary schools

Table 3, below summarizes the fire safety plans available in schools based on secondary school teachers' responses. Of all 422 secondary school teachers, 356 (84.4%) disagreed to have written fire safety plans, 335 (79.4) disagreed to have fire alert procedures and 340 (80.6%) disagreed to have evacuation plan.

Table 3: Availability of fire safety plans as a measure of fire disaster preparedness among secondary school teachers (n=422)

Factors	Responses	
	Agree (%)	Disagree (%)
Is there fire safety plan in the school?	66 (15.6)	356 (84.4)
Is there a fire safety plan for disability persons?	35 (8.3)	387 (91.7)
Is there a fire alert procedure in the school in case of fire?	87 (20.6)	335 (79.4)
Is there a fire assembly point in case of fire disaster?	377 (89.3)	45 (10.7)
Are students reminded of the evacuation plan	55 (13.0)	367 (87.0)
Is staffs reminded of the evacuation plan?	82 (19.4)	340 (80.6)

4.6: Training on fire safety to teachers and students in Ilala Municipal Council

Of all 422 secondary school teachers, 378 (89.5%) disagreed that new staff are oriented on escape routes available in the schools, 214 (50.7%) disagreed that staff are trained on use of fire extinguisher and 384 (91.0%) agreed that staff were trained on evacuation procedures in case of fire outbreak (Table 4).

Table 4: Level of agreement in relation to training for fire disaster management among secondary school teachers (n = 422)

Training on fire safety	Agree n (%)	Disagree n (%)
Staff are trained to fight fire	178 (42.2)	244 (57.8)
New staff are oriented on escape routes of the schools	44 (10.5)	378 (89.5)
Staff are trained on fire extinguisher uses	208 (49.3)	214 (50.7)
Staff are trained on evacuation in case of fire	74 (17.5)	348 (82.5)
Students are trained to fight fire	156 (37.0)	266 (63.0)
New arrival students are oriented on escape routes of the schools	38 (9.0)	384(91.0)
Students are trained on fire extinguisher use	186 (44.1)	236 (55.9)
Students are trained on evacuation in case of fire	59 (14.0)	363 (86.0)

4.7.0: Fire disaster preparedness among secondary schools

Of all 94 secondary schools involved in the study, 46 (48.9%) conduct training on fire disaster preparedness and 41 (43.6%) have serviced fire extinguishers (Table 5).

Table 5: Preparedness among secondary schools in Ilala Municipal council (n=94)

Variables	Frequency (n)	Percentage (%)
Availability of emergency exits free from obstruction	64	68.1
Conduct training for fire disaster preparedness	46	48.9
Adequate knowledge on fire safety of head of schools	46	48.9
Schools with working/serviced fire extinguishers/Sand buckets	41	43.6

4.7.1: Level of preparedness in secondary schools

It was found that out of 94 schools, 51 (54.3%) were unprepared for fire disaster

4.7.2: Bivariate analysis

At bivariate analysis level we found that, 36 (80.0%) private owned secondary schools were 24.00 times more likely to be prepared for fire disaster, compared to 7 (14.3%) public owned secondary schools and it was statistically significant (OR = 24.00, 95% CI: 8.12 – 70.92; $p < 0.001$). Head of schools with adequate knowledge 33 (71.7%) on fire safety their schools were 9.64 times more likely to be prepared compared to 10 (20.8%) with inadequate knowledge (OR = 9.64, 95% CI; 3.74 – 24.87; $p < 0.001$).

Secondary schools 17 (73.9%) had person for fire safety were 4.90 times prepared for fire disaster as compared to 26 (36.6%) which have no person designated for fire safety, this was statistical significant (OR = 4.90, 95% CI; 1.72 – 13.99, $p < 0.001$). Secondary schools 22 (78.6%) which were inspected once or more per year were 7.86 times more likely to be prepared for fire disaster as compared with 21 (31.8%) which were not inspected per year (OR = 7.86; 95%CI; 2.76 – 22.25; $p < 0.001$). Other factors such as secondary school category, location of schools, Education level of head of schools, previous occurrence of fire incidents in the school and availability of fire safety emergency plan were not statistical significant (Table 6).

Table 6: Analysis of various factors influencing fire disaster preparedness in secondary schools (n = 94)

Factors	Prepared n (%)	Unprepared n (%)	OR	95% CI	P-value
Secondary schools category					
Day	28 (38.9)	44 (61.1)	0.22	0.02 – 2.21	0.20
Boarding and Day secondary school	11 (64.7)	6 (35.3)	0.61	0.05 - 7.23	0.70
Boarding	Ref	Ref			
Location					
Urban	6 (31.6)	13 (68.4)	0.47	0.16 – 1.38	0.17
Rural	37 (49.3)	38 (50.7)	Ref	Ref	
Education level of Head of school					
Degree +	35 (50.0)	35 (50.0)	2	0.76 – 5.27	0.16
Diploma	8(33.3)	16 (66.7)	Ref		
Knowledge level					
Adequate	33 (71.7)	13 (28.3)	9.65	3.74 – 24.87	0.00
Inadequate	10 (20.8)	38 (79.2)	Ref		
Previous school fire accidents					
Yes	5 (50.0)	5 (50.0)	1.21	0.33 – 4.50	0.52
No	38 (45.2)	46 (54.8)	Ref		
Have person for fire safety					
Yes	17 (73.9)	6 (26.1)	4.90	1.72 – 13.99	0.00
No	26 (36.6)	45 (63.4)	Ref		
Inspection					
Yes	31 (47.0)	35 (53.0)	1.18	0.48 – 2.88	0.71
No	12 (42.9)	16 (57.1)			
Inspections per annum					
≥1per year	22 (78.6)	6 (21.4)	7.86	2.76 – 22.25	0.00
None	21 (31.8)	45 (68.2)			
Have fire safety plan					
Yes	13 (40.6)	19 (59.4)	1.67	0.68 – 4.09	0.26
No	18 (29.0)	44 (71.0)			

4.7.3: Multivariate analysis for fire disaster preparedness in schools

Head of schools with adequate knowledge on fire safety their schools were more prepared for fire disaster and it was statistical significant (AOR = 9.23; 95% CI; 3.08 – 27.63; p < 0.001). Secondary schools which are inspected once or more per annum were more prepared for fire disaster (AOR = 7.48; 95%CI; 2.15 – 26.04; p = 0.002). Having person for fire safety was not statistical significant at multivariate (AOR = 1.58; 95%CI; 0.46 – 5.47; p = 0.47) (Table 7).

Table 7: Multivariate analysis of factors influencing level of preparedness among secondary schools

Factors	COR	95%CI	AOR	95%CI	P-value
Knowledge level	9.64	3.74 – 24.87	**9.23**	**3.08 – 27.63**	**0.0001**
Have person for fire safety	4.90	1.72 – 13.99	1.58	0.46 – 5.47	0.4711
Frequency of inspections	7.86	2.76 – 22.25	**7.48**	**2.15 – 26.04**	**0.0016**

CHAPTER FIVE

5.0: DISCUSSION

This study assessed fire disaster preparedness among secondary schools in Ilala Municipal Council, the findings from this study indicated that secondary schools are not well prepared to handle fire disaster. We found that over half secondary schools were not well prepared for fire disaster. Knowledge level on fire safety and lack of fire safety inspections were the main factors found to influence preparedness in secondary schools.

Knowledge on fire safety preparedness

This study found that the proportion of secondary school teachers with inadequate knowledge on fire safety preparedness was higher than that found in the study done in Nigeria by Ogbonna Chiom I et al who found about half workers had inadequate knowledge on fire safety preparedness (30).

In this study more than half secondary school teachers did not know how to use fire extinguishers result as opposed to the study done by Ronoh RK et al who found majority of secondary schools in Turkan districts in Kenya did not know how to use fire extinguishers effectively (31). Hence there is a need to conduct training on fire safety so as to increase the knowledge level of secondary school teachers.

In our study we found that the proportion of secondary school teachers who did not know fire emergency number to call was lower than the results observed from the survey done in Tanzania by Twaweza in 2014 which found 94% citizens did not know fire emergency number to call (28). This meant that in case of fire outbreak the response by secondary school teachers would be prolonged since the schools had no fire detection and warning systems to fire emergency response teams, for example fire brigades, hence much of time would be spent searching for contacts to dial. Fire emergency number to call is important to be known because it is used to contact the competent authority (Fire and rescue) which have high technical facilities and knowledge to deal with fire accidents during fire emergencies in Tanzania. This difference might be due to the fact that the survey was

conducted in the general population of Tanzania in which various clusters are found with different social characteristics.

The present study revealed that over half of secondary school teachers do not know that the important cause of death in fire accident is smoke and fire caused by papers/wood, flammable liquids and electric are extinguished by ABC fire extinguishers, as opposed with the results observed in the study done Kulkarn et al in 2016, which found lower proportion of workers who did not knew the important cause of death in fire accident is smoke and class C fire is caused by electric equipments (32). This implies that during fire individual's scum on smoke rather than avoiding which is more risk and can eventuality cause death, many teachers do not know the appropriate type of fire extinguisher to use for different classes of fire. For instance when fire starts from electrical source individual will pick any available fire extinguisher since he/she cannot distinguish between types of fire extinguishers appropriate for the causes of fire and their uses; thus there is a possibility to use the wrong one. This study is contrasting the findings obtained by Pirutchada Musigapong et al showed that students have average level of knowledge on fire safety (27).

Training on fire safety preparedness

Most of secondary school teachers reported that they had not been trained on fire safety this might be the cause of inadequate knowledge on fire safety as results secondary schools teachers might not know what to do during fire accidents and lack of awareness on the use portable fire extinguishers as equipment used to put off fire hence they are unprepared for fire disaster. This finding is similar with the study done in Kenya by Shibutse and Omuterema, who found that most of the administrators and teachers were not trained in fire safety (33). It is important to provide fire safety training because people who had been trained on fire safety would respond appropriately to fire accidents and acquire the correct firefighting equipment, compared to individuals who have not been trained on fire safety (24). Therefore fire safety training presented a higher level of knowledge in relation to fire safety than those who had not been involved in training. Since teachers play a critical role in the evacuation from the buildings with students/children relying on them for guidance, it

is essential that they are conversant with fire safety in schools, not only the evacuation procedure but also fire prevention and protection measures.

Fire safety plans in schools

Finding from this study indicated that more than half of secondary schools' lack fire emergency safety plan as a measure for fire disaster preparedness as opposed to the study conducted in Uganda by Nakitto, M. et al they found that majority of schools had no fire safety plans (34). It is important that secondary schools should have fire safety plans outlining what should be done in case of fire accidents. The implication is that in most of the schools if a fire broke out, the students, teachers and other staff may not know what to do, because of lack of fire alert procedures. This situation limits the ability of many schools to deal with fire emergency due to absence of fire emergency.

More than two third secondary schools have no person responsible for fire safety which was higher than the result obtained by Nakitatto and Lett in Uganda, they found that secondary schools had persons in charge of fire safety (34). However this was contrary with the findings obtained Shibutse and Omuterema, found that majority of schools did not had fire safety person (33).

On review of school inspection reports we found that majority of secondary schools were not inspected for fire safety regularly each year. Frequent inspections of secondary schools are important because it increase the level of preparedness. This is important result as it is argued that during inspections enforcing authorities provide or offer information and advice, through both face to face and in writing. They also warn a duty holder that in their opinion, they are failing to comply with the law.

Availability of fire safety preparedness equipment

It was observed that the proportion of secondary schools with fire extinguishers was lower than that result obtained from secondary in Kenya (35). We found that less than half secondary schools have serviced fire extinguishers. Provision of functioning/serviced fire extinguishers in all working and public place including schools is a mandatory requirement (Fire and Rescue Act, 2007). Availability of serviced fire extinguishers is critical in the enhancement of school fire safety. Also Dancan Odiwuor Omolo in Kenya found that

majority of schools studied did not have fire extinguishers (36). Therefore it is not just enough to have portable fire extinguishers installed, but it is equally important to have them functional readiness for any eventuality. If fire extinguishers are not serviced they do not meet the purpose of installing them in secondary school compounds therefore secondary schools are unprepared for fire accidents. It can be deduced that absence of fire extinguishers or presence of un-serviced fire safety equipment in secondary schools implies that secondary schools are not in a position to counter fire emergencies that may arise in their compounds.

Notwithstanding that the reasons that were provided by Head of schools was; lacks of funds, unawareness of expire of fire extinguishers and inadequate inspections are reasons for not servicing fire extinguishers.

About two thirds of the secondary school teachers who participated in this study reported that they did not agree that fire extinguishers were adequately provided in their schools implying that secondary schools are not well prepared for fire accidents.

Fire detection alarms were almost not provided which was lower than that found in Kenya by Nthenya, study on situation analysis of school safety in public secondary schools.

None of school was found to have exits doors readily open outward freely without use of key this is contrary to finding by Nthenya who found 31.88% schools, which emergency doors were locked. This limit individual to access the exits freely during fire (20), (35) (37). This is contrary to the fire and rescue, Act, 2007 and fire and rescue force (Safety inspections and Certification) regulations of 2008, which require exits and escapes to be free from obstruction of any materials, to enable easy exit whenever need arises.

This gives the picture of the danger facing secondary schools community if at all fire erupts. In this regard, the majority of the community members are still vulnerable of the fire incidences likely to happen in their respective areas.

Fire disaster preparedness campaigns as explained in Public Fire Disaster Awareness and training need to be emphasized. Since it will serve the need to increase knowledge/awareness in school community and the public on fire safety and protection

who are the facility users and vulnerable of fire incidences forecasted. Updating the fire safety information on enlightenments in regular basis may also reduce the usual reluctance as fire incidences seldom occurred in the study areas

5.1: Limitations of the study

1. Lack of adequate sample size as design effect was not considered during sample estimation
2. Since the exact number of fire extinguishers and other fire safety preparedness equipments required vary based on the hazard level of the buildings or area, this study was limited to assess preparedness in terms of their availability but did not assess the hazard level in the buildings
3. Since consent had to be sort from the heads of schools, some fire safety preparedness items might have been put in place before data collection which could alter the true findings of the study.
4. The study relied on self-report hence result to recall bias and desirability

CHAPTER SIX

6.1 CONCLUSION AND RECOMMENDATIONS

Based on the study findings obtained we found that secondary schools are not prepared for fire disaster among secondary schools, knowledge on fire safety was inadequate among secondary school teachers, lack functional and serviced fire fighting equipments in schools, lack of personal responsible for fire, lack of fire safety inspection in schools and lack of fire emergency plans in school (policy) among secondary schools and therefore the following should be done:-

1. Regular training of teachers on fire disaster management should be done to increase the level of knowledge among secondary teachers
2. Ministry of education should provide guidelines specific for fire safety in secondary schools
3. Funds should be provided in secondary schools in order to enable secondary schools to buy fire extinguishers
4. Regular fire safety inspection in secondary schools should be done so as to enforce compliance to fire safety
5. Secondary schools should be provided with fire emergency plan and be used in all secondary schools

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APPENDICES

Appendix 1: Number of teachers selected from each secondary school in Ilala Municipal Council.

	School Name	No. of teachers in a school	No. of teachers selected per school
1	NYEBURU	29	4
2	BUYUNI	33	5
3	NGUVU MPYA	34	5
4	FURAHA	27	4
5	CHANIKA	30	5
6	DR.DIDAS MASABURI	14	2
7	BW.MKAPA	124	18
8	DSM	124	18
9	ALHARAMAINI	19	3
10	GEREZANI	38	6
11	KIPATA GIRLS	18	2
12	MCHANGANYIKO	40	6
13	MUHANGA SEC	10	2
14	GONGOLAMBOTO	20	3
15	JUHUDI	82	12
16	ULONGONI	48	7
17	ILALA ISLAMIC	18	3
18	MSIMBAZI	58	8
19	MNAZI MMNOJA	30	5
20	KAMENE	22	3
21	TABATA	65	9
22	KISUNGU	46	7
23	ARI	43	5
24	KINYEREZI	67	10

25	MID WAY	6	1
26	GOSPEL CAMPAIGN	12	2
27	ILALA	46	7
28	MAJANI YA CHAI	45	7
29	AIR WING	68	10
30	MAGOZA	39	6
31	MWENYEHERI ANITE	32	4
32	KISUKURU REGENT	8	1
33	KISUTU	47	7
34	KITUNDA	46	6
35	ST.JOSEPH CATHEDRAL	22	3
36	HOPE KIVULE	7	1
37	KANANURA	9	1
38	KEREZANGE	40	5
39	KIVULE	37	4
40	ABUUJUMAA	35	3
41	MESACK	16	2
42	MISITU	41	6
43	BINTI MUSA	38	3
44	AFRICAN TABATA	19	2
45	MAJOHE 1	9	1
46	DEORA	9	1
47	GOLDEN	11	1
48	ZINGIZIWA	28	4
49	HALISI	31	3
50	MAGNUS	7	1
51	VIWEGE	33	3
52	JAMHURI	46	6

53	MCHIKICHINI	17	1
54	MBONDOLE	30	2
55	MKERA	22	2
56	MSONGOLA	41	6
57	MVUTI	26	2
58	SANGARA	25	2
59	BRIGHT FUTURE	12	1
60	KITONGA	25	2
61	AHMADIYA	18	2
62	MISSION KITUNDA	6	1
63	MWANAGATI	31	4
64	MZINGA	15	2
65	TUMAINI MAEREZANGE	6	1
66	ROSEHILL	6	1
67	PUGU	80	11
68	KINYAMWEZI	30	3
69	PUGU STATION	42	4
70	HIGH VIEW	21	2
71	AARON HARRIS	9	2
72	MAIN GREEN HILL	15	2
73	UGOMBOLWA	42	6
74	CHRIST THE KING	15	2
75	MADIBA	4	1
76	MIGOMBANI	49	7
77	NFW-AMBASSADOR	7	1
78	SEGEREA HILL	12	2
79	ST.MAXIMILLIAN	7	1
80	TUSIIME	145	20
81	KENTON	6	1
82	REMNANT	10	2

83	TUSHIKAMANE CARE	13	2
84	ZAWADI	50	7
85	ALFAROQUE	15	2
86	MARKAZI ISLAMIC	14	2
87	ALMURTAZIL	21	3
88	AZANIA	104	15
89	JANGWANI	96	13
90	TAMBAZA	67	9
91	ALMADRASATUS	7	1
92	SHABAN ROBERT	53	7
93	ZANAKI	81	12
94	ZINGIZIWA	32	4
	TOTAL	**3031**	**422**

Appendix 2: Informed consent form (English version)

Muhimbili University of Health and Allied Sciences

Directorate of Research and Publications

ID-No: ...../ ...../.....

Consent to participate in this study

Greetings, my name is ……. student pursuing a Master of Science in Applied Epidemiology from Muhimbili University of Health and Allied Sciences, Dar es Salaam. At the moment, we are carrying out a study to assess fire disaster preparedness among secondary schools in Ilala Municipal Council.

Purpose of the study

This study aims to collect information on fire disaster preparedness among secondary schools. You are being asked to participate in this study as a stake holder and a resident from the study site. We should be grateful if you are willing to participate by answering questions from the study.

What participation involves

If you agree to participate in this study the following will occur

1. You will be required to answer questions that have been prepared for the study by self-administering questionnaire in order to obtain the intended information to inform policy maker on how to improve fire disaster preparedness in boarding secondary schools.
2. No identifying information such as name will be collected from you.
3. It will take short time about 30 minutes to answer the questions.

Confidentiality

I assure you that all the information collected from you will be kept confidential. Only people working in this research study will have the access to the information. We will ensure that any information included in our report does not identify you as respondent as we will not put your name or other identifying information on the records of the information you provide.

Risks

No any risk is foreseen in this study. But at any moment if the question you don't understand you're allowed to ask for clarification from us.

Rights to withdraw and alternatives

Your participation in this study is completely voluntary. If you choose not to participate in the study or if you decide to stop participating in the study you will not get any harm. You can stop participating in this study at any time, even if you have already given your consent. Refusal to participate or withdraw from the study will not involve loss of any benefit to which you otherwise entitled.

Benefits

The information you provide to us is very important and valuable. It will help policy maker and other stakeholders at different levels to improve or otherwise rectify logistics and circumstances in favors of fire safety, but there are no direct benefits however; individual benefit it will be obtained through intervention programs which can be conducted in this particular area.

In case of injury

We are not anticipating that any harm will occur as the result of your participation in this study

Compensation

There will be no compensation of time spent during the answering the questions; however your participation is highly appreciated.

Who to contact

If you have any questions about this study, please don't hesitate to contact

Emmanuel Nestory, the Principal investigator, MUHAS, P.O.BOX 65001.Dar es salaam. (Tel: 0715698761)

Director Research Publication/Chairman of Research and Publication committee, MUHAS, **Prof. Aboud S.** P.O.BOX 65001.Dar Es salaam (Tel: Direct: +255-022-2152489, Fax: +255-022-2152489)

DR. Aiwerasia V. Ngowi, The supervisor of this study and Lecturer at MUHAS P.O.BOX 65001 Dar es salaam (Tel no: 0754405415)

Senga Sembuche, TFELTP Co Supervisor (Tel no: 0784622968).

Certification of Consent

I have been invited to take part in the study named assessment of fire disaster preparedness among secondary schools in Ilala Municipal Council. I have read the foregoing information or it has been read to me and has understood. My questions have been answered to my satisfaction. I agree to participate in this study.

Signature (or thumbprint) of participant ……

Signature of witness (if participant cannot read) ……

Signature of research assistant …….

Date consent signed ……

Appendix 3: Informed consent form (Swahili version)

FOMU YA RIDHAA

CHUO KIKUU CHA SAYANSI ZA AFYA MUHIMBILI

KURUGENZI YA UTAFITI NA MACHAPISHO

Namba ya utambulisho ……

Ridhaa ya Kushiriki katika utafiti huu

Habari! Jina langu naitwa ……., mwanafuni wa Chuo Kikuu cha Sayansi za Afya Muhimbili, ninafanya utafiti wa kuangalia utayari wa kukabiliana na majanga ya moto katika shule za sekondari katika Manispaa ya Ilala.

Lengo la utafiti

Utafiti huu una dhumuni la kupata utayari wa kukabiliana na majanga ya moto kwa shule za sekondari katika Manispaa ya Ilala. Kama mdau unaombwa kushiriki katika utafiti huu. Tutashukuru sana kama utahiari kushiriki kwa kujibuu maswali yaliyoandaliwa kwa utafiti huu.

Ushiriki

Kama unakubali kushiriki katika utafiti huu yafuatayo yatatokea:-

1. Utatakiwa kujibu mwenyewe maswali yaliyoandaliwa kwenye dodoso ili kupata taarifa zitakazoweza kuwapa taarifa watunga sera, jinsi ya kuboresha namna ya kukabiliana na majanga ya moto katika shule za sekondari.
2. Hatutachukua jina lako.
3. Kujibu maswali yote itachukua muda mfupi takribani dakika 30 tu (Thelathini).

Usiri

Habari zote tutakazo zipata kutoka kwako zitakuwa ni siri, wala hatutatumia jina lako wala alama yoyote inayoweza kukutambulisha wewe katika ripoti ya utafiti wetu.

Faida

Taarifa zitakazopatikana ni muhimu sana niza samani mno ili kuwa na mpango wa kukabiliana na majanga ya moto.

Athari

Utafiti huu hauna madhara yoyote kwa mshiriki.

Haki ya kujitoa na vinginevyo

Kushiriki katika utafiti huu ni uamzi wako. Kama utaamua kutoshiriki au utaamua kukatisha ushiriki hutapata madhara yoyote. Uko huru kusimamisha kushiriki kwako wakati wowote hata kama ulikwisha kubali kushiriki kabla.

Watu wa kuwasiliana nao

Kama unamaswali katika utafiti huu unaweza kuwasiliana na Mtafiti **Emmanuel Nestory,** Chuo Kikuu cha Sayansi za Afya Muhimbili, S.L.P 65001, Dar Es Salaam, simu Na. 0715 698761, Msimamizi Mkuu, **DR. Aiwerasia V. Ngowi,** Mhadhiri Mwandamizi Chuo Kikuu cha Afya Muhimbili, S.L.P 65001, Dar Es Salaam. (Simu Namba: 0754405415)
Msimamizi msaidizi Senga Sembuche, Kutoka Wizara ya Afya na Ustawi wa Jamii (MoHSW) Dar es Salaam (Simu Namba: 0784622968)

Je Unakubali?
Mshiriki amekubali [ ]
Mshiriki amekataa [ ]
Mimi……nimeisoma/nimeelewa hii fomu,maswali yangu yamejibiwa.
Nakubali kushiriki katika utafiti huu
Sahihi ya Mshiriki ……
Sahihi ya Shahidi kama mshiriki hawezi kusoma na kuandika ……
Sahihi ya Mtafiti ……..
Tarehe ya Makubaliano……..

Appendix 4: Questionnaire: For Secondary School Teachers

Muhimbili University of Health and Allied Sciences

Title: Assessment of fire disaster preparedness among secondary schools

A case study of Ilala Municipal Council

Questionnaire NO…….. Date……. Name of school……... Ward/Location……

PART I: General information and socio demographic characteristics of participants

Instructions: Put √ for only one correct response in the following questions and statements:-

Q1**.** Your school ownership

1. Public school ( )
2. Private school ( )

Q2. Your school category

1. Day school ( )
2. Boarding school ( )
3. Mixed Day and Boarding school ( )

Q3. Indicate your gender

1. Male ( )
2. Female ( )

Q4. How old are you? …….. Years

Q5. For how long have you been teaching in secondary school? …… years ***(Please fill in the space)***

Q6. For how long have you served in this secondary school? …… years (***Please fill in the space)***

Q7. What is the highest level of your academic professional?

1. Certificate ( )
2. Diploma ( )
3. Degree ( )
4. Masters and above ( )

PART II: Firefighting equipments

Instructions: Put √ for only one correct response for the following questions:-

Q8. Do you have any firefighting equipments in your school?

1. Yes ( )
2. No ( )

If ***Yes,*** for question 8 above, please answer questions 9 - 11, if ***No***, proceed to question 12

Q9. Are firefighting equipments in your school adequate provided?

1. Yes ( )
2. No ( )
3. I don't know ( )

Q10. Please kindly indicate the level of agreement in relation to adequacy of the following firefighting equipments in your schools; whereby: strongly agree = SA, Agree = A, Disagree = D and Strongly Disagree = SD

Firefighting equipments	**4. SA**	**3. A**	**2. D**	**1. SD**
1. Portable Fire extinguishers adequate provided				
2. Sand buckets adequate provided				
3. Fire blankets				
4. Reliable water supply				

Q11. How often are the fires extinguishers inspected in your schools?

1. Every month ( )
2. Once per year ( )
3. Twice per year ( )
4. Never inspected ( )
5. I don't know ( )

PART III: School buildings and fire safety

Instructions: Put √ for only one correct response for the following questions:-

Q12. Are there fire exits in your school buildings?

1. Yes ( )
2. No ( )
3. I don't know ( )

Q13. For the following statements, please kindly, indicate the level of agreement in relation to your school buildings and fire safety; where by: Strongly agree = SA, Agree = A, Disagree = D and Strongly Disagree = SD

Statements	**4. SA**	**3. A**	**2. D**	**1. SD**
1. Exits are clear of obstruction at all times				
2. Exit doors in school buildings open outwards				
3. Exit windows in the school are not grilled				
4. Exits in library are free of obstruction				
5. Exits in laboratories are easily accessible				
6. Exits in offices are readily accessible				

PART IV: Fire safety plans

Instructions: Put √ for only one correct response for the following questions:-

Q14. Does your school have evacuation plan in the event of fire?

1. Yes ( )
2. No ( )
3. I don't know ( )

If ***Yes,*** for question 14 above, answer question **15**, if ***No***, for question 14, please proceed to question **16.**

Q15. Does your school have an evacuation plan for people with disability in the case of fire?

1. Yes ( )
2. No ( )
3. I don't know ( )

Q16. Does your school have fire alert procedures for fire emergency?

1. Yes ( )
2. No ( )
3. I don't know ( )

Q17. Does your school have fire assembly area?

1. Yes ( )
2. No ( )
3. I don't know ( )

Q18. Are staffs reminded on evacuation procedures in case of fire?

1. Yes ( )
2. No ( )
3. I don't know ( )

Q19. Are students reminded on evacuation procedures in case of fire?

1. Yes ( )
2. No ( )
3. I don't know ( )

Q20. If a fire accident/outbreak occurs in your school, where do you get information from? ***(Put tick for the correct answer/answers applicable at your school)***

1. School administration ( )
2. Fellow teachers/friends ( )
3. Fire alarms, siren/bell, loudspeaker or whistle ( )
4. I don't know ( )

Q21. Does your school have any kind of plan to deal with fire disaster/accidents?

1. Yes ( )
2. No ( )
3. I don't know ( )

PART V: Training on fire safety

Instructions: Put √ for only one correct response in the following statements or questions:-

Q22. Are members of teaching and non teaching staff been trained for fire disaster preparedness at your school?

1. Yes ( )
2. No ( )

If ***Yes*** for question 22 above, please answer question 23 and if ***No*** for question 22, please proceed to question 24.

Q23. Kindly indicate the level of agreement to the following statement in relation to training for fire disaster management. Where strongly agree = SA, Agree = A, Disagree =D and strongly disagree = SD

Statements	**4.SA**	**3.A**	**2.D**	**1.SD**
1. Students in the school have been trained to fight fire				
2. Staff in the school have been trained to fight fire				
3. Staff are oriented on emergency escape routes of the school				
4. Students are oriented on emergency escape routes of the school				
5. Students have been trained on the proper use of fire extinguishers				
6. Staff have been trained on the proper use of fire extinguishers				
7. Staff have been trained on evacuation procedure during fire disaster				
8. Students have been trained on evacuation procedure during fire disaster				

PART VI: Knowledge/awareness on fire safety preparedness

Q24. Do you know how to use fire extinguisher in case of fire?

1. Yes ( )
2. No ( )

Q25. An extinguisher labeled/denoted by letter ABC is used to extinguish fire caused paper/wood, flammable gases, electrical faults and combustible metals?

1. Yes ( )
2. No ( )
3. I don’t know ( )

Q26. Fire caused by ordinary combustible materials such as burning papers, clothing, woods and plastics is classified as class A type of fire?

1. Yes ( )
2. No ( )
3. I don't know ( )

Q27. The fire emergency number to call in case of fire is 114?

1. Yes ( )
2. No ( )
3. I don't know ( )

Q28. The first thing you do when you hear fire alarm is to evacuate from the building and call fire brigade on the event of fire?

1. Yes ( )
2. No ( )
3. I don't know ( )

Q29. The main cause of death during fire accident is smoke

1. Yes ( )
2. No ( )

Q30. Have you ever received any education or training about fire disaster preparedness?

1. Yes ( )
2. No ( )

Q31. What are your suggestions to improved fire disaster preparedness in schools?

1…….

2……..

3……..

Thank you for your cooperation

Appendix 5: Observation checklist

Muhimbili University of Health and Allied Sciences (MUHAS)

Availability of fire safety preparedness equipments in secondary schools

School Name ……Ward/location ……Public ( ) Private ……. ( )

School category: Day ( ), Boarding ( ), Mixed (day and boarding) ( )

Observation Area:

1. Office/Administration block(s) ( )
2. Classrooms ( )
3. Laboratory rooms ( )
4. Library ( )

No	Item	1. Yes	2. No	Remarks
Q1	**Availability of fire fighting equipments in exits/corridors**			
	Are there fire extinguishers in the school?			
	Is fire extinguisher accessible?			
	Is fire extinguisher in good working condition? (***Please record:*** ***The date of last services ……..*** ***Date of Next services……....***			***Note: if the answer is No, ask for reasons from head of schools*** 1……. 2……. 3……..
	Sand buckets			
	Fire blankets			

	Is there First aid kit in the school?			
	Is the first aid kit provided with medical supplies? (***Check expire date for supplies)***			
	Reliable water source (reserve water tank)			
Q2	**Means of exits**			
	Exit door are present?			
	Emergency exit identified/ labeled?			
	Exits are free from any obstruction materials?			
	Exit doors readily open from inside without use of a key?			
	Lighting provided in emergency exit?			
	Are lighting in good working condition? ***(Switch on electric light if any)***			
	Is there fire emergency contact information posted on wall/notice board?			
	a) Fire emergency number			
	b) Responsible person in the school for fire emergency			
	Is there fire assembly area available?			
Q3	**Fire detection and warning system**			
	Automatic smoke detection /fire alarm available in rooms or corridors?			
	Any local means of fire alert in the school (Bell/whistle) available			

Appendix 6: Questionnaire for Head of secondary schools

Muhimbili University of Health and Allied Sciences (MUHAS)

Title: Fire disaster preparedness among boarding secondary schools

Questionnaire No ……. Name of the school……. Ward/location …….

Q1. School ownership:

Public ( )

Private ( )

Q2. School category

1. Day secondary school ( )
2. Boarding secondary school ( )
3. Day and Boarding secondary school ( )

Q3. Sex of participant (***Observe do not ask)***

1. Male ( )
2. Female ( )

Q4. How long is your teaching experience? …… Years

Q5. For how long have you been a head teacher? …….. Years

Q6. For how long have you served in the current station? …….. Years

Q7. What is your highest academic and professional qualification?

1. Certificate ( )
2. Diploma ( )
3. Degree ( )

4. Masters and above ( )

Q8. How many students do you have in your school? ……

Q9. Does your school get inspection for fire safety?

1. Yes ( )
2. No ( )

If ***Yes***, for question 9 above, Please answer question 10 and 11, if No, proceed to Q12

Q10. When was the last date of inspection? ……. ***(Review inspection records)***

Q11. How often is your school inspected by fire and rescue Inspectors in a year?

1. Once per year ( )
2. Twice a year ( )
3. Every three months ( )
4. None ( )

Q12. When an incident of fire outbreak is reported at your school, do you have means of recordkeeping?

1. Yes ( ) *(If Yes, ask for log book if available)*
2. No ( )

Q13. Is there has been any fire accidents in your school for the past years?

1. Yes ( )
2. No ( )

Q15. Do you conduct training for fire safety preparedness at your school?

1. Yes ( )
2. No ( )

If ***Yes***, for question 15 above, answer question 16 – 17, if **No**, for question 15, please proceed to question 18.

Q16. How often your school is provides training for fire disaster preparedness? ***(Check any Schedule/ Time table)***

1. Every month ( )
2. Every three months ( )
3. Every Six months ( )
4. Every year ( )
5. None ( )

Q18. If **No**, for question 15 above, what are the reasons for not training?

……..

……..

Q19. Do you have a person responsible for fire safety in your school?

1. Yes ( )
2. No ( )

Q20. Do you have a fire emergency safety plan for your school?

1. Yes ( ) ***(If Yes, ask for the emergency safety plan please observe)***
2. No ( )

If ***Yes***, for question 20 above, answer questions 21, if No, proceed to question 22

Q21. What does the fire emergency safety plan contains? ***(Check the contents of the fire safety plans)***

1. Risk assessment (inspection) ( )
2. Evacuation procedures ( )
3. Fire drills ( )
4. Training/awareness schedule ( )
5. Responsibilities for each member ( )
6. Others specify ……

PART VI: Knowledge/awareness on fire safety preparedness

Q22. Do you know how to use fire extinguisher in case of fire?

1. Yes ( )
2. No ( )

Q23. An extinguisher labeled/denoted by letter ABC is used to extinguish fire caused paper/wood, flammable gases and electrical faults?

1. Yes ( )
2. No ( )
3. I don't know ( )

Q24. Fire caused by ordinary combustible materials such as burning papers, clothing, woods and plastics is classified as class A type of fire?

1. Yes ( )
2. No ( )
3. I don't know ( )

Q25. What is the fire emergency number to call in case of fire? …….. ***(Please specify)***

Q26. The first thing you do when you hear fire alarm is to evacuate from the building and call fire brigade on the event of fire?

1. Yes ( )
2. No ( )
3. I don't know ( )

Q27. The main cause of death during fire accident is smoke

1. Yes ( )
2. No ( )

Q28. Have you ever received any education or training about fire disaster preparedness?

1. Yes ( )
2. No ( )

Q29. What are your suggestions to improved fire disaster preparedness in schools?

1…….

2……..

3……..

Thank you for your cooperation.

Appendix 7: Ethical Clearance

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

Directorate of Postgraduate Studies

P.O. BOX 65001
DAR ES SALAAM
TANZANIA.

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Ref. No. MU/PGS/SAEC/Vol.XIV/

3rd December, 2015

Mr. Nestory Emmanuel
MSc. Applied Epidemiology
MUHAS.

RE: APPROVAL OF ETHICAL CLEARANCE FOR A STUDY TITLED: "FACTORS INFLUENCING FIRE DISASTER PREPAREDNESS IN BOARDING SECONDARY SCHOOL: A CASE STUDY OF ILALA MUNICIPAL COUNCIL"

Reference is made to the above heading.

I am pleased to inform you that, the Chairman has, on behalf of the Senate, approved ethical clearance for the above-mentioned study. Hence you may proceed with the planned study.

The ethical clearance is valid for one year only, from 2nd December, 2015 to 1st December, 2016. In case you do not complete data analysis and dissertation report writing by 1st December, 2016, you will have to apply for renewal of ethical clearance prior to the expiry date.

Prof. Andrea B. Pembe
DIRECTOR, POSTGRADUATE STUDIES

cc: Director of Research and Publication
cc: Dean, School of Public Health and Social Sciences

Appendix 8: Permission for Data Collection

HALMASHAURI YA MANISPAA YA ILALA

BARUA ZOTE ZIPELEKWE KWA MKURUGENZI WA MANISPAA

S. L. P. 20950
SIMU NA: 2128800
2128805
FAX NO. 2121486

Kumb. Na. IMC/LK.6/1/6

Ofisi ya Mkurugenzi
Wa Manispaa Ilala
1 Mission Street
11883 – Dar es Salaam

15/01/2016

Pugu Sekondari, Azania Sekondari, Tambaza ,
Jangwani,Mvuti, Mesack, Tusiime,
Dr. Didas Masaburi, Mzinga,
Main Green Hill Sekondari,
DAR ES SALAM

YAH: KUMTAMBULISHA NDUGU EMMANUEL NESTORY

Husika na kichwa cha habari hapo juu.

Halmashauri ya Manispaa ya Ilala imemruhusu mtajwa hapo juu ambaye ni mwanafunzi wa Chuo Kikuu **Sayansi za Afya Muhimbili** kufanya utafiti katika shule yako.

Utafiti juu ya **Sababu zinazoathiri kukabiliana na majanga ya moto katika shule za bweni.**

Utafiti utafanyika kuanzia **18/01/2016 hadi 04/03/2016.** Tafadhali mpe ushirikiano.

Nakutakia kazi njema.

V. P. Mlowosa
KNY: MKURUGENZI WA MANISPAA
HALMASHAURI YA MANISPAA YA ILALA

HALMASHAURI YA MANISPAA YA ILALA

Nakala: Mkurugenzi wa Manispaa – **(alone kwenye jalada)**
Halmashauri ya Manispaa ya Ilala