THE ASSESSMENT OF FIRE SAFETY AND EMERGENCY PREPAREDNESS AT OLD AGE HOMES IN POLOKWANE MUNICIPALITY AREA,

LIMPOPO PROVINCE.

By

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Disclaimer

This dissertation is submitted in partial fulfilment of the requirements for the Degree of Masters in Disaster Management for consideration by the Disaster Management Training and Education Centre for Africa at the University of Free State. This disclaimer enlightens readers that the views, thoughts and opinions expressed in this thesis report belong solely to the author. All information and content contained in this thesis may not be reproduced in any form without the concern and permission of the researcher, as well as that of the Disaster Management Training and Education Centre for Africa at the University of Free State.

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Masinge Granny Malope Date

Abstract

Older people at old age homes are subjected continuously to fire hazards and emergency preparedness evacuation challenges. The purpose of the study was the assessment of fire safety and emergency preparedness at old age homes in Polokwane municipality area, Limpopo Province.

The study aimed to investigate the condition of fire safety and emergency preparedness at old age homes. Study assumptions of the study were that older people residing in old age homes are more vulnerable to fire disasters than older people living with the entire family structures and older people react slowly to emergency situations. Lastly, old age home institutions are not practicing emergency evacuation drills for older people; emergency preparedness and fire safety precautions measures are not undertaken.

In achieving the research objectives, the mixed method of study was implemented through qualitative and quantitative data collection methods in a single study. The researcher incorporated both qualitative and quantitative methods for data collection and data analysis to achieve more results.

The outcome of the study highlighted minimum knowledge on evacuation plans, fire safety knowledge and lack of emergency strategic plans at old age homes. The conditions can be improved by providing effective training, education and awareness to capacitate old age home residents and staff members.

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Abbreviations and acronyms

DMISA:	Disaster Management Institute of Southern Africa
EOP	Emergency Operational Plan
FET	Further Education training
GSM	Global System for Mobile
HFS:	Home Fire Safety
HFSC:	Home Fire Safety Check
IDP	Integrated Development Plan
LPG	Liquefied Petroleum Gas
ROPSA:	Royal society for the prevention of accidents
SA:	South Africa
SANS	South African National Standards
SFDRR	Sendai Framework for Disaster Risk Reduction
SMS	Short message service
StatsSA	Statistics South Africa
NDMF	National Disaster Management Framework
NGO	Non-Governmental Organization
NPO	Non-governmental organization
TUT	Tshwane University of Technology
UNISDR:	United Nations International Strategy for Disaster Reduction
US	United States
UK:	United Kingdom
WHO:	World Health Organization

Definition of terms

Disaster

Disaster means a progressive or sudden, widespread or localised, natural or human-caused occurrence causes or threatened to cause death, injury or disease, damage to property, infrastructure or the environment or significant disruption of the community life and is of a magnitude that exceeds that ability of those affected to cope with its effects using only their own resources (South African Disaster Management Act, no 57 of 2002).

Disaster risk reduction

The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disaster including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events (UNISDR, 2009).

Emergency preparedness

Emergency preparedness means a state of readiness which enables organs of state and other institutions involved in disaster management, the private sector, communities and individuals to mobilise, organize and provide relief measures to deal with an impending or current disaster or the effects of a disaster (South African Disaster Management Act, no 57 of 2002).

Hazard

Hazard refers to a potentially damaging physical event, phenomenon or human activity, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation (Blaike et al,1994).

Prevention

Prevention in relation to a disaster means measures aimed at stopping a disaster from occurring or preventing an occurrence from becoming a disaster (South African Disaster Management Act, no 57 of 2002).

Risk

Risk refers to the combination of probability of an event and its negative consequences, the probability of harmful consequences or expected loss resulting from interactions between natural or human induced hazards and vulnerable/capable conditions. Conventionally risk is expressed by the equation Risk= Vulnerability /Capacity (UNISDR, 2009).

Risk assessment

Risk Assessment refers to the methodology to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability/ capacity that could pose a potential threat or harm to people, property, livelihoods and the environment on which they depend (UNISDR,2009) .

Safety

Safety is concerned with injury causing situations and hazards to humans that result from sudden severe conditions and health deals with adverse reactions to prolonged exposure to dangerous hazards such as noise and dust (Steenkamp & Van Schoor, 2013).

Old people

Old age refers to ages nearing or surpassing the life expectancy of human beings and is thus the end of the human life cycle (Zimmer, 2016).

Vulnerability

Vulnerability refers to a set of conditions and processes resulting from physical, social economic and environmental factors, which increases the susceptibility of a community to the impact hazards (UNISDR, 2009).

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Chapter 1: Research overview

1.1. Introduction

This study explores the assessment of fire safety and emergency preparedness at old age homes in the Polokwane Municipality in Limpopo Province, South Africa. This study aims to furnish a comprehensive understanding of the conditions of fire safety and emergency preparedness at old age homes. Thus, to explore aspects contributing to fire disasters and make recommendations to improve the conditions of fire safety at old age homes. The contribution of the study ought to compel other stakeholders to execute further research in subjects that may result from this study that requires further investigation.

The South African Disaster Management Act 57 of 2002, section 53 (a) compels all municipalities to conduct a risk assessment for its municipal area and (b) identify, map risks, areas, ecosystems, communities, and households that are exposed or vulnerable to physical and human-induced threats. The study was executed as guided by the disaster risk assessment process which provides that a disaster risk assessment should be executed utilising a staged approached to enable synchronization with the requirements of the planning process (NDMF, 2005).

According to Esterhuyzen, Louw, Mostert, Whitebooi-Naidoo, and Van-Loggerenberg (2015), the risk assessment process allows the researcher to:

- Identify the hazard that could cause accidents, referring to the load being handled, the task, the environment, and the individual;
- Decide on who could be harmed and how;
- Decide whether the existing condition could harm and how;
- Decide whether the existing controls are adequate or whether more should be done to reduce the risk to an acceptable level; and
- Monitor the risks and continuously review preventative measures.

The number of people at risk has been growing from 70 to 80 million per year and every year the potential loss to lives and livelihood soars as people converge in cities (UNISDR, 2002). Therefore, older people are among the population more at risk of natural and man-made disasters.

Human beings are vulnerable when they are not aware of the hazards that pose a threat to their lives and assets (UNISDR, 2002). The study serves as a risk awareness to the people at old age homes so that preventative measures can be taken to promote fire safety and emergency preparedness. The senior citizens are vulnerable to emergency events, from the preparation phase, through the response and into the recovery phase (Arbon, Cornell, and Cusack, 2012). However, when assessing risks, based on vulnerability and hazard analysis, there are required steps for the adoption of adequate, successful disaster reduction policies and measures (UNISDR, 2002). The study findings will contribute to the improvement of emergency preparedness and fire safety at old age homes.

This chapter stipulates the description of the study area and research problem of the study under assessment, it furthermore describes the key research questions, the aims and objectives of the research, the methodology, delimitations and limitations of the study, as well as the ethical consideration and an outline of the study were also given.

1.2. Description of the study

Description of the study area entails that the discussion of the study area is focusing at provincial, district and local contexts.

1.2.1. Provincial context of the study

Limpopo province is essentially a rural area with no large cities except Polokwane. Hence, most of the population is in rural towns and villages within the former homelands (Limpopo Development Plan,2015). Limpopo province comprises of five district municipalities and 25 local municipalities and Polokwane is the capital city of the province (Limpopo Development Plan ,2015). The total area in Limpopo represents

about 10% of the total surface area of South Africa (Limpopo Development Plan 2015-2019).

Figure 1: Map of Limpopo, Source: Places,

Source: Places, 2018

Limpopo has 184 traditional leaders and is home to a large religious community, the Zion Christian Church (Limpopo Development Plan, 2015). Limpopo is rich in cultural heritage, languages, and cultures as it directly links with the countries that surround the province. The surrounding countries are, namely, Botswana, Zimbabwe, and Mozambique. Limpopo province has 41 hospitals, 409 clinics, 27 community health centres and 18 Gateways in 2011, evenly distributed across the five districts in the province (Limpopo Development Plan, 2015)

Statistics South Africa indicates that the midyear population estimate for Limpopo province population was 5.631 million in 2014. The population of Limpopo increased from 4.99 million in 2001 to 5.4 million in 2011 which is an average growth of 0.82% (Limpopo Development Plan, 2015). The crime rate in Limpopo at 13.2 cases per 100,000 people has consistently been the lowest of all provinces in South Africa.

1.2.2. District context of the study

The Capricorn district municipality has four local municipalities after Aganang Municipality was disestablished in August 2016 (Capricorn district municipality IDP, 2017). The remaining municipalities are Polokwane, Blouberg, Molemole and Lepelle Nkumpi (Capricorn district municipality IDP, 2017). The population of the district is estimated at about 1241 167 with 342 837 population employed with forty-seven percent (47%) of the economic population is unemployed and 8% lives in the informal settlements (Stats, 2011). The study is conducted in the local municipality of Polokwane in the Capricorn district area of the Limpopo Province. Capricorn District Municipality covers an area of 16, 970 3 km² which constitute 12% of the total surface area of Limpopo Province (Capricorn District Municipality IDP, 2017). The percentage distribution of the population of the district municipality by broad age groups is 0-14 years consist of thirty-three point six percent (33.6%), 15-16 years consist of fifty-nine percent point nine (59.9%) and 65 years and older comprised of six point six percent (6.6%) of the population (Census,2011).

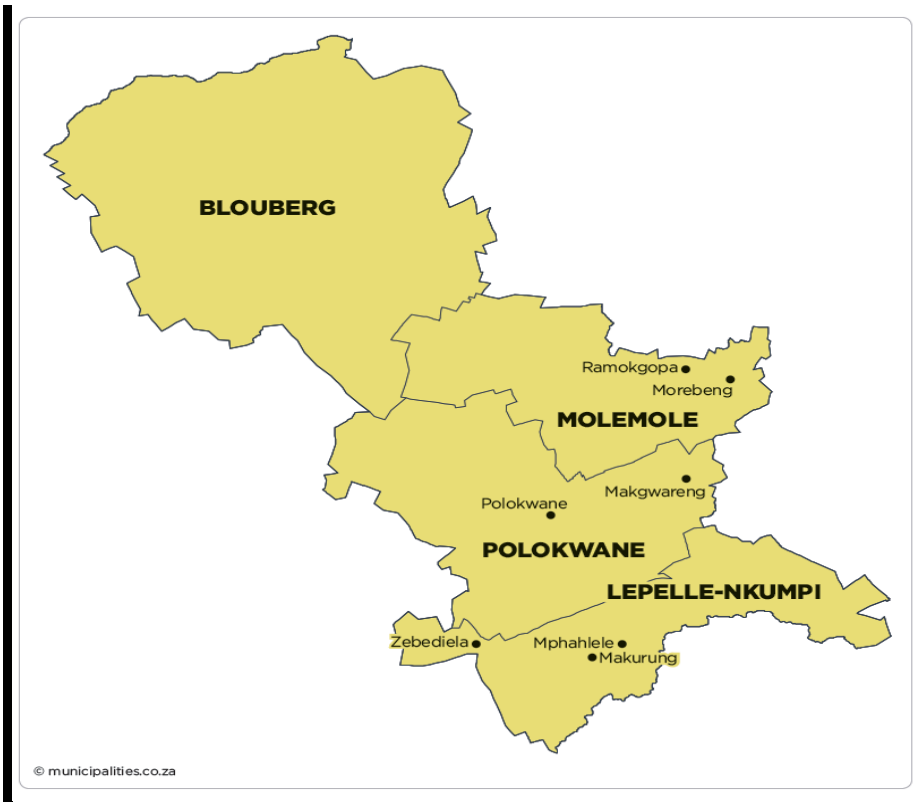

Figure 2:Map of Capricorn District Municipalities.

Source: Image, 2018

1.2.3. Local context of the study area

The Polokwane municipality comprises of a total area of +/- 377578.99 hectors located at the heart on the Limpopo Province within Capricorn District Municipality (Polokwane Municipality IDP, 2017). Polokwane Municipality accounts for 3% of the Province total surface area of +/- 124 00km² (Polokwane Municipality IDP, 2017). Currently, the population is standing at 702 190 persons with an average household size of six persons (Stats SA, 2016). Polokwane municipality is currently at 40% level of urbanisation (Polokwane Municipality IDP, 2017). The total number of households for the Polokwane municipal area is 214 451 households in the year 2016 (Stats SA, 2016). Most of Polokwane population have Matriculated, followed by those holding grade 10-11, then grade 7-9 (Polokwane Municipality IDP, 2017). The people holding certificates/ diplomas without matric have also increased, although it is at a slower rate. People with no schooling in 2016 were 24 433 which is higher than the number in 2011 (21 957) but

lower than the rate in 2007(26 261) (Polokwane Municipality IDP, 2017). According to Statistics South Africa Census (2016), 155 690 people are employed and 74 785 are unemployed in Polokwane Municipality.

The percentage distribution of the population of Polokwane Municipality by broad age groups is 0-14 years consist of thirty-point zero percent (30.0 %), 15-16 years consist of sixty-four nine points eight (64.8%) and 65 years and older consist of five-point one percent (5.1%) of the population (Census, 2011). The statistics indicate that the number of older people in the Polokwane area is lower than compared to other age groups. Polokwane Municipality consists of 32 Old age homes and 10 Old age social clubs. Ten old age homes are in the urban part of the municipality and 27 old age homes are in the rural part of the municipality.

Figure 2: Map of Polokwane Municipality

Source: Venues, 2018

The municipality has six educational institutions to capacitate and develop the community namely the University of Limpopo, UNISA Polokwane Campus, TUT Polokwane Campus, Capricorn FET College, Boston City Campus and Business

College (Polokwane Municipality IDP, 2017). There are four racial categories which people can classify themselves in, namely African, White, Coloured and Asian (Polokwane Municipality IDP, 2017). The population structure of Polokwane depicted that 94.0% of the total population are black Africans, followed by White population with 4.4%, then Coloured at 0.9% and the Asians which accounts for only 0.6% (Polokwane Municipality IDP, 2017).

Polokwane Municipality currently has three (3) fire stations ; namely, main station (Polokwane Ladanna), sub fire station (Polokwane Silicon) and Mankweng . Disaster Management and Fire Services department is currently having a total staff component of 70 employees.

1.3. Research Problem

Research problem refers to any issue, problem or question that becomes the basis of your enquiry (Kumar, 2012). , the research problem for this study has been identified from the Polokwane Municipality Disaster Management Plan on the risk assessment profile report of the financial year 2016/2017.

The disaster risk assessment profile report indicates the following prioritised hazards as the greatest risks in the Polokwane Municipality:

1. Fire;
2. Natural phenomena such as floods, severe weather;
3. Technology hazards;
4. Mass events;
5. Transportation;
6. Infrastructure failures and
7. Environmental threats (Polokwane Municipality Disaster Management plan; 2016/17).

The identified risks have been ranked according to the priority risk above and the frequency of their occurrence according to the Disaster Management Plan of Polokwane

Municipality (20016/ 2017). Fire incidents have been identified as a common risk by most communities of Polokwane Municipality. According to Steenkamp & Van Schoor , (2013), in most cases fire incidents are caused by small mistakes. Small mistakes can have a big effect and disasters do not have borders or nationalities, which is why nations should unite and promote health and safety vigorously to reach the common goal of quick warning , prevention and protective systems for all (Steenkamp & Van Schoor , 2013).

The disasters management, therefore, do not have borders or nationalities, which is the reason why nations should unite, to promote health and safety vigorously to reach the common goal of quick warning, prevention, and protective systems for all (Steenkamp & Van Schoor, 2013). The most important part of emergency procedures is to ensure that everyone knows where to go and what to do in an emergency (Naidoo, 2015). The procedures should be in place for all major safety issues (Naidoo, 2015).

The South African Disaster Management Act 57 of 2002, Section 47 subsection 1 stipulates that a municipality disaster management centre, to the extent that it has the capacity, should give guidance to organs of state, the private sector, non-governmental organisations, communities and individuals in the municipality area. This is to assess, prevent the risk of disaster including ways and means of determining the level of risk. However, through assessing the vulnerability of communities, households to disasters that may occur. Through increasing the capacity of communities, also household to minimize the risk, the impact of disasters that may occur by monitoring the likelihood of occurrence and the state of alertness to disasters that may occur.

The South African Disaster Management Act 57 2002, Section 47 subsection 2 indicates that municipal disaster management centre should promote formal and informal initiatives that encourage risk non-governmental organisation, communities, households, and individuals in the municipal area. The study focuses on implementing risk assessment at old age homes around Polokwane Municipality. The level of awareness, safety precaution practices and emergency preparedness will be assessed. The study will contribute in addressing the gap in information relating to fire safety and emergency preparedness at old age homes.

1.4. Research Questions

The study pursues to respond to the main research question: what are the circumstances of safety and emergency preparedness at old age homes? More in highlights regarding the research problem can be attained from the following sub-questions:

- What are the conditions of emergency preparedness in case of fire disaster at old age homes?
- What are the conditions of fire safety of old age homes residents?
- What is the level of awareness on fire safety and emergency preparedness of old age home residents?
- What are the causing factors leading to fire disaster at old age homes?
- What are the recommendations that can be made to indicate the importance of emergency preparedness and the safety measures to prevent fire disasters?

1.5.1. Aim of the study

The aim of the study was to investigate the condition of fire safety and emergency preparedness at old age homes.

1.5.2. Research objectives

The following specific objectives are drawn from the primary aim of the research:

- To assess the conditions of safety and emergency preparedness of old age home.
- To determine the conditions of the vulnerability of old age home residents to fire disasters.
- To examine the knowledge and level of awareness on fire safety and emergency preparedness of old age home residents.

- To relate and examine the essential factors contributing to fire disasters at old age homes.
- To make recommendations on emergency preparedness and the safety measures precaution to prevent fire disasters at old age homes.

1.6. Significance of the study

The study is essential to assess the conditions of fire safety and emergency preparedness of older people at old age homes for Polokwane municipality. The old age homes are non-governmental organisations (NGO) were older people reside. The NGO's participate in the disaster risk assessment and the preparation of the disaster management plans of the municipality.

The risks faced by the old age homes in the Polokwane Municipality area are incorporated into the municipality disaster management plan. The study will assist in highlighting the risks and the hazard identification at an organisational level and the information will be communicated during the advisory forums and IDP consultation meetings for preparations of disaster management plans as advised by the South African Disaster Management Act 57 of 2002, section 52. The study is also important as it aims to implement the Sendai Framework for Disaster Risk Reduction (2015) objectives that are aiming at the substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries.

Most importantly, to attain the expected outcome, the following goal ought to be pursued: Prevent new and reduce existing disaster risk through the implementation of integrated, inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent or reduce hazard exposure. When hazard risks are minimized, vulnerability to disaster can increase preparedness for response and recovery, and thus strengthen resilience (Sendai Framework of Disaster Risk Reduction , 2015).

The outcomes of the research report contribute to the preparedness, prevention and mitigation processes to minimise and eliminate fire risk at old age homes.

Contributions made to the study will assist as awareness to the old age homes residents and staff members, families, NGO's and government officials that support older people.

1.7. Research design and methodology

This section outlines the research design and methodology. It presents the study design, sample selection, and size. This section also presents the study methodology and data analysis. This section provides a conclusion on the research design and the research methodology.

1.7.1. Research Design

According to Huysamen (1993), the research design is a blueprint of the research project that precedes the research process. The research design for this study is descriptive. A descriptive study presents a picture of the specific details of a situation, with the primary aim of describing phenomenon (Neuman, 1997 and Bless and Higson-Smith, 2000). Descriptive research "paints a picture with words or numbers, presents a profile, outline stages or classifies types (Neuman, 2014). The descriptive research will be assumed with the aim of describing the condition completely and precisely at Polokwane municipal area. The study was cross-sectional, endeavoring to provide a description of participating old age homes safety and emergency preparedness conditions.

1.7.2. Research methodology

The study used mixed method research described by Creswell (1999) as the study that the researcher incorporates both qualitative and quantitative method of data collection and analysis in a single study.

Quantitative research aims at acquiring a deeper insight into a complex phenomenon that can be quite specific and unique, which appears in different ways in the various units of the population (Bless et al, 2014). In the quantitative method, the researcher asks participants in a study to respond, rate, rank or check information on an instrument that can be evaluated for validity and reliability (Creswell, 1999).

Qualitative research method allows the researcher to study selected issues in depth, openness and detail as they identify and attempt to understand the categories of information that emerge from data (Durrheim, Painter and Terre Blanche, 2008).

Qualitative research is a multi-perspective approach to social interaction, aimed at describing and making sense of means that the respondents attach to them (Dezin and Lincoln, 1994). The contextual nature of the study implies that the meaning in this qualitative research can only be understood within the context at Polokwane Municipality area where the sample is drawn.

Convergence model

The researcher collected both qualitative and quantitative data and then examined both data to determine the findings of a study (Creswell, 1999).The study intends to converge or triangulate the findings, then the methods can be administered at the same time (Creswell, 1999). Each research method provided diverse data to extend the study and afforded intensive understanding to achieve more practical reality. The researcher complied research questions that correlate to qualitative and quantitative methods of data collection.

1.7.3 . Target Population

Wiid and Diggines (2013), defines a population as the total group of people or entities from whom information is required. The population of the study is ascertained by age residents and staff members at Old age home from Polokwane municipality. The research population is ten (10) old age homes from Polokwane municipality. Polokwane municipality has 32 old age homes of which 5 are in the township and other 27 are in the villages.

1.7.4. Sample design

Sample refers to the subset of the whole population, which is investigated by a researcher (Bless et al, 2014). Kumar (2012), describes a sample as a group of the population which is the focus of your research enquiry and is selected in such a way that it represents the study population. Purposive sampling refers to purposively chosen elements that wish to be included in the sample, based on the list of characteristics (Bezuidenhout et al, 2014). A purposive sampling method is utilised to look at the research question and the list of characteristics that determine the old age homes that are important for the study. A sample is selected from a list of old age homes that are based in the Polokwane Municipal area. A list of the old age homes area is collected from the Municipal Special Focus Unit of the municipality. Sample for the study consists of five old age homes from the village and five old age homes from the township.

1.7.5. Data Collection

According to Babbie and Mouton (2001), the basic objectives of a questionnaire are to verify facts and opinions about a phenomenon from people who are informed on an issue. Questionnaires were used to collect primary data directly by communicating with the participants at the old age homes. The data that was collected by means of hand-delivered structured questionnaires. Instructions were given fully explained to the responded before the completion of the questionnaire. Open-ended questions allowed

the respondents to answer in their own words as well as a closed-ended questionnaire with pre-determined response were utilized .

The questionnaire covered the information on demographics, livelihood patterns, fire disasters impacts on wellbeing, infrastructure, personal belongings education, housing, property, and vulnerable groups due to fire disasters. The fundamental roots of vulnerability are caused by fires, safety precaution measures, emergency preparedness, disaster response mechanism, and the disaster management readiness strategies were also be addressed.

1.7.6. Data Analysis

According to Strydom, Fouche, and Delport (2005: 218), data analysis means finding answers by way of interpreting the data and results. Interpreting data refers to describe and establish meaning. The aim of data analysis is to lesson data to comprehensible and interpretable form so that the relations of research challenges can be examined, and conclusions are made. Raw data collected from the participants are analysed, interpreted, and presented in a form of figures. Percentages are implemented to present the analyzed data. The data collected from old age homes through questionnaire was captured in a computer and analysed systematically by the researcher.

1.8. Study delimitations

Delimitations refer to the characteristics that limit the scope and define the boundaries of the study (Simon, 2011). The delimiting influences include the selection of objectives, interest from the participants, the research questions, the literature review studied, the population and samples selected. In this study, the older people's homes are selected as they are in high numbers within the jurisdiction of the Polokwane Municipality in the Capricorn District. The older people at the old age homes are residing alone in their apartments and more vulnerable to disasters such as a fire. This study aims to assess

and provide advice to individuals at old age homes regarding the safety and emergency preparedness in case of fire disasters.

1.9. Study limitation

Study limitations are potential weaknesses in the study and are out of the researcher's control (Simon, 2011).

The limitations of this study are as follows:

- The language barrier becomes a challenge as the questionnaires are structured in English and most of the participants are Sepedi and Afrikaans speaking people.
- The participants gave wrong information or return incomplete research questionnaire due to minimum interest.

1.10. Assumptions of the study

Assumptions are part of theories that are not tested, though act as starting points or basics beliefs about the world (Neuman, 2014). The assumptions for this study research study are as follows:

- The older people residing in old age homes are more vulnerable to fire disasters than the older people residing with the entire family structures.
- Older people react slowly to emergency situations, as the results during fire emergencies they will need assistance to evacuate the building safely.
- The old age home institutions are not practicing emergency evacuation drills to prepare older people on how to evacuate during disasters and implementing fire safety precautions frequently.
- It is further assumed that employees working at old age homes are not prepared to deal with fire emergency situations at old age homes.

1.11. Ethical Considerations

Ethics refers to the morals or professional code of conduct that sets a standard for attitudes and behavior (Bezuidenhout et al, 2014). Ethical practice is describing as a professional practice undertaken in accordance with the principles of accepted codes of conduct for a given profession or group (Kumar, 2012).

The researcher has the responsibility to respect the rights, needs, worth and the desires of the respondents. The respondents were given a written consent form that outline the following:

- The importance and objectives of the study was clearly outlined in writing to the participants.
- The rights of the respondence to participate in the study.
- Participants guidance on voluntary kind of the study.
- Confidentiality of the information provided by the participants.
- Acknowledgement was given to the work of others by referencing the source of the information to avoid plagiarism.

10.11. Conclusion

The fire emergency preparedness is important at old age homes to assist older people to react and act positively during unforeseen fire incidences. This research document will assist the municipality, old age homes and other affected stakeholders to upgrade the existing emergency preparedness plans that involve older people. This research document further establishes the author's efforts in facilitation and contributing towards reduction of fire incidents at old age homes.

Chapter 2. Legislative framework, policies, and theories

2.1. Introduction

This chapter discusses the theoretical and legislative framework that provide information and guidance on emergency preparation to promote fire safety measures to older people residing at old age homes.

2.2. International Legislative framework

2.2.1. Sendai Framework for Disaster Risk Reduction (2015-2030)

The Sendai Framework for Disaster Risk Reduction 2015-2030 was adopted at the Third UN World Conference in Sendai, Japan, on March 18, 2015. The Sendai Framework is the successor instrument to the Hugo Framework for Action 2005-2015: Buidling the Resilience of Nations and Communities to Disasters. The Sendai Framework for Disaster Risk Reduction goal is to prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, thus strengthen resilience (SFDRR, 2015).

The Sendai Framework for Disaster Risk Reduction 2015-2030 scope and purpose apply to the risk of small-scale and large scale, frequent and infrequent, sudden and slow-onset disasters, caused by natural or manmade hazards as well as related environmental, technological and biological hazards and risks (SFDRR, 2015). It aims to guide the multi-hazard management of disasters risk in development at all levels as well as within and across all sectors (SFDRR, 2015).The expected outcome of the Sendai Framework for Disaster Risk Reduction (2015) focuses on the substantial reduction of disaster risk and losses in lives, livelihood and health in the economic, physical, social ,

cultural and environmental assets of persons , business , communities and countries (SFDRR, 2015).

2.3. National Legislation Framework

The legislation framework lays emphasis on the discussions pertaining to the relevant regulations that guide old age homes for the services that are required to be provided to older people.

2.3.1. Constitution of the Republic of South Africa of 1996

The Constitution is the supreme law of the land in South Africa. There is no other law or government action can supersede the provisions of the Constitution. The older people at old age homes are protected by the constitution of the country. They therefore, have equal rights as other people as it is elaborated in chapter two of the Bill of Rights.

Chapter 2: Bill of Rights

7. (1) The Bill of Rights is a cornerstone of democracy in South Africa. It enshrines the rights of all people in our country and affirms the democratic values of human dignity, equality, and Freedom.
(2) The state should respect, protect, promote, and fulfil the rights in the Bill of Rights (South Africa, 1996).

Housing

26. (1) Everyone has the right to have access to adequate housing.

Older people are entitled to have access to safe housing at homes or old age homes that have minimum basic services required for a human living (Constitution of South Africa, 1996).

2.3.2. Older Persons Act 13 of 2006

The Older Persons Act provides to deal with the plight of older persons by establishing a framework aimed at the empowerment, protection of older persons , at the promotion, maintenance of their status, rights, well-being, safety and security, to provide for matters connected therewith.

The objectives of the Act are to:

(a) Maintain and promote the status, well-being, safety and security of older persons;
(b) Maintain and protect the rights of older persons;
(c) Shift the emphasis from institutional care to community based-care to ensure that older person remains in his or her home within the community for as long as possible;
(d) Regulate the registration, establishment, management of services, the establishment and of residential facilities for older persons and;
(e) Combat the abuse of older persons (South Africa,2006).

The Older Persons Act obliges old age homes to ensure that all the objectives are achieved and maintained for older people.

Rights of older persons in residential facilities

Chapter four of the Older Persons Act advice about the rights of elder persons at residential facilities as follows:

16. An older person residing in a residential facility has, in addition to the rights he or she has in terms of the Bill of Rights or any other rights he or she may have, the right to:

(d) Have access to basic care;

(f) Participate in social, religious and community activities of his or her choice;

(g) Privacy and;

(h) His or her own physician if he or she can afford it.

Services at residential facilities for older people

17. The following services can be provided at residential facilities, namely:

(a) 24-hour care and support services to frail older persons and older persons that need special attention;

(b) Care and supervision services to older persons who are suffering from dementia and related diseases;

(c) Rehabilitation services;

(d) Public education on issues of aging, including dementia;

(e) Counselling services to residents and family members who need these services;

(f) Implementation and monitoring of outreach programmes;

(g) Training of volunteer's caregivers to deal with frail older persons; and

(h) Sport and recreational activities (South Africa, 2006).

Provision of basic care such as health services to older people is significant as they will improve health conditions, become active and ready to effectively respond to emergency situations. Participation of older people in social, religious and community activities will smoothen the emergency preparedness processes. This because, older people will be active and have communication network with other individuals.

Senior citizens at old age homes should be given privacy and opportunity to appoint their own physician to evaluate, diagnose, discuss diets, medications, health, hygiene. Thus, for promotion and to promote preventative health care that will enhance emergency preparedness. Outreach programmes, public education, awareness for older people. Their families and visitors are imperative in the emergency preparedness processes as it increases the existing knowledge, skills, capacity and bringing new ideas. Participation of older people in sports and recreational activities keep older people active and will enable them to respond positively in emergency evacuation drills for emergency preparation.

Prohibition on the operation of unregistered residential facilities and registration of such facility

18. (1) (a) Subject to section 35, no person may operate a residential facility unless such facility has been registered under this section.

(b) Paragraph (a) does not apply to a private residence in which an older person is looked after by a family.

(2) A person who wishes to operate a residential facility must, in the prescribed manner, apply to the Minister for registration thereof.

(7) A person to whom a registration certificate been issued in terms in terms of subsection (3) may not transfer it to another person.

(9) Any person who contravenes or fails to comply with a provision of this section, or of a condition imposed thereunder, is guilty of an offence (South Africa, 2006).

In South Africa it is important to register old age home facility with the Department of Social Development. This means that social workers can invite other stakeholders to participate in monitoring the building quality, fire safety, electrical safety, assessment of the risks, emergency preparedness and other compliance requirements to ensure the safety of people in the building. Registration of authorised old age facilities assists in reducing the mushrooming of non-compliant of old age homes that expose older people to disasters and risks.

The older people have equal rights to be registered and admitted at the old age of their choice. Old age homes are expected to procedurally register the older people. This ensures that older people access all the basic services, care and services should be easily accessible to them. Older persons' environment (facility) should promote the culture of respect, protection of older people and promotion of older improved health conditions.

2.3.4. Local Government: Municipal Systems Act 32 of 2000

The Local Government Municipal Systems Act provide for the core principles, mechanisms, and process that are necessary. Thus, to enable the municipality to move progressively towards the social, and economic uplifting of local communities. Ensure universal access to essential services that are affordable to all; to define the legal nature of a municipality as including the local community within the municipal area, working in partnership with the municipality's political and administrative structures; to provide for the manner in which municipal powers and functions are exercised and performed to provide for community participation; to establish simple and enabling framework for the core process of planning, performance management, resource mobilisation and organisational change which underpin the notion of developmental local government (South Africa, 2000).

Municipalities in South Africa should use integrated development planning as a method to plan future development in their area. Integrated development Plans are regulated by the Local Government Municipal Systems Act no. 32 of 2000 and regulations. The Act and regulations guide as follow:

Section 26: Core components of the development plans.

An integrated development plan should reflect:

(b) An assessment of the existing level of development in the municipality, which should include an identification of communities which do not have access to basic municipal services;

(g) Applicable disaster management plans;

(h) The financial plan, which has to include a budget projection for at least the next years; and;

Section 34: Annual review and amendment of integrated development plans.

A municipal council

(a) Reviews its integrated development plan-

(i) Annually in accordance with an assessment of its performance measurements in terms of section 41 (South Africa, 2000).

The Integrated Development Plan of the Polokwane Municipality has to also include the existing information regarding fire safety and emergency preparedness for Old ages homes. Therefore, older people at old age home management should be given an opportunity to participate in Municipal IDP Consultation to identify their needs in preparation for improved health and emergency preparedness. Budget allocation for the project that needs to improve the conditions of Old age homes should also be allocated and integrated with other municipal projects and be reviewed annually as required.

2.3.5. Disaster Management Act 57 of 2002 and Disaster Management Amendment Act 16 of 2015

The Act provides for an integrated and coordinated disaster management policy that focuses on preventing or reducing the risk of disasters. Mitigating the severity of a disaster, emergency preparedness, rapid, effective response to disasters, post-disaster recovery and rehabilitation.

Disaster Management Act 57 of 2002 section 53 (c) provides for all municipalities to prepare disaster management plan setting out:

(iii) Its role, responsibilities regarding emergency response. Post-disaster recovery and rehabilitation;

(vi) Contingency strategies and emergency procedures in the event of a disaster, including measures to finance these strategies; and

(viii) Specific measures are taken to address the needs of women, children, the elderly and persons living with a disability during the disaster management process**.**

Section 33: To achieve this, it is important:
(a) To prepare or review the periodically update disaster preparedness and contingency policies, plans, and programmes with the involvement of the relevant institutions, considering climate change scenarios and their impact on disaster risk, an facilitating, as appropriate, the participation of all sectors and relevant stakeholders;

(b) To invest in, develop, maintain and strengthen people-centred multi-hazard, multi-sectorial forecasting and early warning systems. The disaster risk and emergency communications mechanisms, social technologies and hazard-monitoring telecommunications systems; develop such systems through a participatory process; tailor them to the needs of users, including social and cultural requirements, in particular gender; promote the application of simple and low-cost early warning equipment and facilities; and broaden release channels for natural disaster early warning information (South Africa, 2002).

Thus, old age homes are obliged by the disaster management act to have in place disaster management plan for older people that includes protection of older people against fire emergencies, identify all the potential risks involved, effective evacuation plan, emergency communication plan, emergency evacuation map, emergency medical ID bracelets for older people, emergency medical kit, travelling plan, disaster supplies kit, emergency response drill plans and identification of emergency assembly point with a register.

2.3.6. Policy Framework for Disaster Risk Management of South Africa of 2005

The national disaster management framework is the legal instrument specified by the Act to address such needs for consistency across multiple interest groups, by providing a coherent, transparent and inclusive policy on disaster management appropriate for the Republic as a whole (section 7(1)).

The national disaster management framework also informs the subsequent development of provincial and municipal disaster management frameworks and plans, which are required to guide action in all spheres of government (South Africa, 2005). The disaster management policy framework for the Polokwane Municipality should include disaster risk reduction plans that involve old age homes and older people.

Structure of the national disaster management framework

The national disaster management framework comprises of four key performance areas and three supportive enablers required to achieve the objectives set out in the KPAs.

Key Performance Area 1

Integrated institutional capacity for disaster risk management

Key Performance Area 1 focus on establishing the necessary institutional arrangements for implementing disaster risk management within the national, provincial and municipal spheres of government. It specifically addresses the application of the principle of cooperative governance for the purpose of disaster risk management. It also emphasises the involvement of all stakeholders in strengthening the capabilities of national, provincial and municipal organs of state to reduce the likelihood and severity of disasters (South Africa, 2005). Old age home representatives should take part of the stakeholders participating in the institutional arrangements for disaster risk management in the local municipality.

Key Performance Area 2

Key performance area 2 addresses the need for disaster risk assessment and monitoring to set priorities. Guide risk reduction action and monitor the effectiveness of our efforts. Although, South Africa faces many different types of risks, the disaster risk especially refers to the likelihood of harm or loss due to the action of hazards or other external threats on vulnerable structures, services, areas, communities, and households. KPA 2 outlines the requirements for implementing disaster risk assessment and monitoring by organs of state within all spheres of government (South Africa, 2005). Old age homes should also conduct the risk assessment processes and implement the corrective measures to save lives, property, and the environment.

Key Performance Area 3

Key performance area 3 introduces disaster risk management planning and implementation to inform developmentally orientated approaches, plans, programmes and projects that reduce disaster risks. Key performance area 3 addresses the requirements for the alignment of disaster management frameworks and planning within all spheres of government. It also gives particular attention to the alignment to the

planning for and integration of the core risk reduction principles of prevention and mitigation into ongoing programmes and initiatives (South Africa, 2005). Old age homes and older people should form part of the risk reduction ongoing programmes, initiatives and aligned with other risk prevention activities.

2.3.7. Municipal Disaster Management Plan 2018/2019

A disaster management plan for a municipal area must:

(a) Form an integral part of the municipality's integrated development plan

(b) Anticipate the types of disaster that are likely to occur in the municipal area and the possible effects

(e) Identify the areas, communities or households at risk

(h) Identify and address weaknesses incapacity to deal with possible disaster;

(i) Provide for appropriate prevention and mitigation strategies

(j) Facilitate maximum emergency preparedness and

(k) Contain contingency plans and emergency procedures in the event of a disaster for:

(i) The allocation of responsibilities to the various role players and coordination in the carrying out of those responsibilities;

(v) The dissemination of information; and

(vi) Other matters that may be prescribed (Polokwane Municipality Disasater Management plan, 2018).

A Municipal Disaster Management plan is part of the integrated development plan that focuses on institutional arrangements for disaster risk management. Hence, putting in place plans for responding to known priority threats as identified at the community level and other stakeholders. Disaster Management Plan establishes the operational procedures for disaster risk reduction planning as well as the emergency procedures to

be implemented in the event of a disaster occurring or threatening to occur in the municipal area. The plan provided as a guideline to execute the disaster risk assessment and planning in all organ of states and including old age homes. The contingency plans in line with the municipal risk profile of the municipality. Hence, other old age homes should be aligned to ensure a coordinated approach in case of preparedness and disaster responses. The plan has to be timeously communicated to relevant stakeholders that provide services to older people.

2.3.8. Occupational Health and Safety Act 85 of 1993 and Amendment Act 181 of 1993

Objectives of the Act is to provide for the health ,and safety for persons at work, for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety out of or in connection with the activities of persons at work; to establish an advisory council for occupational health and safety and to provide for matters connected therewith.

Section 17: Health and safety representative

(1) Subject to the provision of sub-section (2), every employer who has more than 20 employees in his employment at any workplace, shall, within four months after the commencements of this Act or after commencing business, or from such time as the number of employees exceed 20, as the case may be, designated in writing for a specific period health and safety representative for such workplace or for different sections thereof (South Africa, 1993).

(4) Only those employees employed in a full-time capacity at a specific workplace and who are acquired with conditions and invites at that workplace or section thereof, as the case may be shall be eligible for designation as health and safety representatives for that workplace or section (South Africa, 1993).

Functions of the Health and Safety representation

1. A health and safety representatives may perform the following functions in respect of the or section of the workplace for which has been designated, namely –
   (a) Review the effectiveness of health and safety measures;
   (b) Identify potential hazards and potential major incidents at the workplace;
   (c) In collaboration with his employer, examine the cause of incidents at the workplace;
   (d) Investigate complaints by any employee relating to that employee's health or safety at work;
   (e) Make representatives to the employer or a health and safety committee on matters arising from paragraphs (a),(b), (c) or (d), or where such representations are unsuccessful, to an inspector;
   (f) Inspect the workplace, including any article, substance, plant, machinery or health and safety equipment at that workplace with a view to the health and safety of employees, at such intervals as may be agreed upon with the employer;
2. An employer shall provide such facility, assistance, and training as a health and safety representative may reasonably require and as have been agreed upon for the carrying out of his function (South Africa, 1993).

According to the Health and Safety Act, old age homes are compelled to appoint health and safety representative that will be responsible to identify potential hazards, communicate potential hazards, ensuring health safety and protection of the environment. Health and safety representatives at old age homes ensures that safety inspections are conducted regularly, training needs for caregivers and older people are identified, safety plans and programmes that involve older people are in place, all injuries and accidence at old age homes are investigated, safety committee is appointed and active.

It is important that all old-age home organisations comply with the Occupational Health and Safety Act. This to minimise potential hazards and risk that may affect

residents or employees. The workers at old age homes are not only responsible to provide hospitality and daily requirements of the residence, but also to ensure that all residence is safe, protected from any potential hazards and emergency conditions.

2.3.9. National Health Act 61 of 2003

The objects of this Act are to regulate health and provide uniformity in respect of health services across the nation by-

(a) Establishing a national health system:
  (i) Encompasses public and private providers of health services; and
  (ii) Provides in an equitable manner the population of the Republic with the best possible health services that available resources can afford;
(b) Setting out the rights and duties of health care providers, health and workers, health establishments and users; and
(c) Protecting, respecting, promoting and fulfilling the right of the constitutional right of access to health care services, including reproductive health care
  (i) The people of South Africa to the progressive realisation of the constitutional right of access to the health care services, including reproductive health care;
  (iii) A vulnerable group such as women; children, older persons and persons with disabilities(South Africa, 2003).

Old age homes are necessitated by the National Health Acts to ensure that the health services are provided to older people at their respective old age homes. Old age homes are obliged to provide access to medication, health screens, caregiving, precautionary care, nutritious support, physical, professional therapy, and psychological care. Old age homes are required to ensure that they employ specialist and professionals. They should ensure that they have contacts that are accessible to older people as required.

2.3.10. Fire Brigade Services Act 99 of 1987

Firefighting services in terms of Schedule 4, part B of the South African Constitution is the responsibility of local government with national and provincial oversight. The Fire Services Act is the primary piece of legislation regulating fire services and provides for the establishment, maintenance, employment, coordination and standardization of fire brigade services. The Fire Brigade Service Act was enacted in order to regulate and ensure the efficient operation of a fire safety system in South Africa and provides for the following:

- The establishment, maintenance, employment, coordination and standardization of fire brigade services;
- Preventing the outbreak or spread of a fire;
- Fighting and extinguishing a fire;
- Controlling incidents involving hazardous or dangerous goods and materials;
- Protecting life and property against a fire or other threatening danger;
- Rescuing life or property from fire or other danger;
- Rendering an ambulance service as an integral part of the fire services, subject to the provision of the National Health Act 61 of 2003;
- Fire Safety functions;
- The performance of any other function connected with any of the matters contemplated in the items above; and
- To be a world-class fire service (South Africa, 1987).

The Fire Brigade Services Act applies to all citizens who own or operate a property, business or activity in any local municipal area. They, therefore, have to find out the location and the contact details of the local fire brigade including old age homes.

Old age homes have to have local firefighting by-laws, other by-laws and comply with them. Most importantly, old age homes are obliged by the act to fire-fighting equipment which may be used in the premises in the case of fire. The equipment should be inspected by the fire services authorities.

2.3.11. National Fire Protection Association Life Safety Code

Life safety code is published by NFPA and it addresses the construction, protection and occupancy features necessary to minimise the hazards of fire, smoke, fumes, and panic at old age homes. The basic requirements of the safety code are as follows (Goesch, 2014):

Every old age home structure, new and existing that is to be occupied by people shall have a means of aggress and other fire protection safeguard that:

1. Ensure that occupants can promptly evacuate or be adequately protected without evacuation and;
2. Provide sufficient back-up safeguards to ensure that human life is not endangered if one system fails.

- Every old age home structure should be constructed or renovated, maintained and operated in such a way that occupants are:

1. Protected from fire, some or fumes.
2. Protected from fire-related panic.
3. Protected long enough to allow a reasonable amount of time for evacuation and;
4. Protected long enough to defend themselves without evacuation (Goetsch, 2014).

In providing structures with means of aggress and other fire protection safeguard at old age homes, the following have to be considered:

- The character of the occupancy;
- Capabilities of occupants;
- Number of occupants;
- Available fire protection;
- Height of the structure;
- Type of construction and
- Any other applicable concerns (Goetsch, 2014).

According to Goetsch (2014), all exits structures such as old age homes have to satisfy the following criteria:

- Be clearly visible or marked in such a way that an impaired individual can readily discern the routes to a place.
- All routes to a place of safety have to be arranged or clearly marked.
- Any other doorway and passageway that may be mistaken as a route to safety must be arranged.
- All appropriate steps must be taken to ensure that occupants do not mistakenly enter a dead-end passageway or clearly marked in such a way as to prevent confusion in an emergency.
- The fire alarm system has to be provided in any facility that is large enough or so arranged that fire itself may not adequately warn occupants of the danger.
- The fire alarm should alert occupants to initiate appropriate emergency procedures.

All stairs, ramps and other means of moving from floor to floor should be enclosed to afford occupants at old age homes protection when used as a means of aggress in an emergency situation. This means vertical movement should also serve to inhibit the spread of fire, fumes, and smoke from floor to floor at old age home buildings.

2.3.12. The South African National Standard 10090 of 2003 on Community Protection against fire

The purpose of this standard is to provide advice on the measures that are taken to ensure that fire services are efficient. It includes a schedule against which the performance potential of each aspect, as well as of the whole, fire service, can be judged. The standard outlines a system of determining the requirements for the operational and fire safety functions of emergency services rendered to communities. It also gives recommendations for water supplies for firefighting.

The standards are as follows:

- NFPA 291 standard provides for fire flow testing and marking of hydrants at buildings including old age homes.
- NFPA 1201 standard requires the development of fire protection services for the public including older people.
- NFPA 1500 standard caters for fire department occupational health and safety programmes for citizens including older people.
- NFPA 1710 standard provides for the organisation and deployment of fire suppression, emergency medical operations, and special operations to the public by career fire departments (South Africa, 2003).

It is important for old age homes with the NFPA standards that govern the inspections, investigating and protection of water-based fire protection systems to reduce the fire risks. The NFPA standards assist the old age homes buildings to comply with the Fire Service Act. Thus, it ensures that older people are safe from fire hazards, reduced injuries, assets and the environment are protected.

2.3.14. Standard Operating Procedures for Emergencies

Standard Operating Procedures are designed to describe related considerations such as safety, command structures and reporting requirements in case of emergencies. SOP's of the organisation should comply with all applicable local, state and federal laws. The organisations need to ensure that written operational procedures are established that organisation will implement management process during emergencies (IAFC & NFPA, 2010).

The elements of those plans define how emergency incidents should be managed, how information exchange needs to occur, how resources should be tracked and requested of particular importance is the need to establish guidelines that define how to evacuate members from an area if hazardous conditions intensify or cannot be controlled and how to account for the safety of those personnel (IAFC & NFPA, 2010). The organisation has to specify methods to notify all members in the affected hazardous area immediately by any effective means including audible warning, devices, visual, signal and radio signals (IAFC & NFPA, 2010).

According to IAFC & NFPA (2010), many organisations have established evacuation signals such as the sounding of apparatus air horns or the use of whistles or radio activated signals to order an evacuation of hazardous areas. Even if the organisation does not have the capacity, there should be an SOP detailing the procedure to follow regarding the role the organisation plays. Who will be in charge, methods of obtaining the necessary rescue resources and any other special procedures where appropriate (IAFC & NFPA, 2010). The SOP for old age homes shall be in a written document with the emergency search and rescue details. Hence, it shall be accessible to distributed to relevant stakeholders such as Social Development, SAPS and Disaster Management.

2.4. Theoretical framework

This section deliberate on the fire hazard analysis, aging theories, and theories of adjusting to adulthood.

The theoretical framework discusses the theories with relevant information that is linked to the research problem, aims, and objectives. The lessons learned from the theories of the research contributes in establishing a solution to the identified problem and contribute to the relevant recommendations to be made.

2.4.2. Hazard analysis

Hazard analysis involves the identification of situation or conditions that may injure people or damage property or the environment (IAFC & NFPA, 2010). The organisation needs to determine not only the possibility but more importantly the probability of the various type of incidents occurring within their jurisdictions. Therefore, old age homes need to execute their own hazard analysis in their buildings to identify the possible disasters and prepare precautionary actions in advance.

2.4.3. Fire Hazards

Fire hazards are conditions that favour fire development and growth (Esterhuyzen & Louw, 2014). The three elements required to start and sustain a fire are oxygen, fuel, and heat (Esterhuyzen & Louw, 2014). According to Esterhuyzen & Louw (2014), almost everything in an industrial environment can burn that includes metal furniture, machines, plasters, and concrete block walls are usually painted. Most fatalities associated with fire are from breathing toxic gases and smoke from being suffocated because of oxygen deprivation (Esterhuyzen & Louw, 2014). Gases that can be produced by fire include acrolein, ammonia, carbon dioxide, carbon mono oxide, hydrogen bromide, hydrogen chloride, hydrogen sulphide and nitrogen dioxide (Esterhuyzen & Louw, 2014). Fire hazards at old age homes involve cooking accidents, grease flare-ups, unattended pots, smoking cigarettes, matches, and lighters heaters, fireplaces, electrical faults, flammable liquids, and office material. The utilisation of medical support systems such as medical oxygen poses an additional risk to the residents and the staff. Hence, the cylinders need to be kept away from infections and uncleanness. It is important for the old age home management to identify all the potential hazards to safeguard and protect the vulnerable older people.

2.4.4. Fire Tetrahedron

For combustion to occur four components are necessary; oxygen, fuel, heat and self-sustained chemical reaction (Adams &Hall, 1998). Remove any one of the four components and the combustion will not occur (Adams &Hall, 1998). The four components of fire are as follows:

(a) Oxygen

Oxidising agents are those materials that yield oxygen or other oxidising gases during a chemical reaction (Adams &Hall, 1998). Oxidizers are not themselves combustible, but they support combustion when combined with fuel (Adams &Hall, 1998). Oxygen is air around us and is considered as the primary oxidising agent (Adams &Hall, 1998). Many

materials do not burn in normal oxygen levels but burn more rapid in oxygen-enriched atmospheres and can ignite easier normal. Fires in oxygen-enriched atmospheres are more difficult to extinguish and present a potential safety hazard to firefighters' operation them (Adams and Hall, 1998). These conditions can be found in health care facilities, industrial occupancies and even private homes where occupants use oxygen breathing equipment (Adams and Hall, 1998). Old age homes can have oxygen enriched atmospheric conditions as some of them provide health care serves and accommodates older people residents that utilises oxygen-breathing equipment.

(b) Fuel

Fuel is the material or substance being oxidised or burned in the combustion process. According to Adams and Hall (1998), fuels can be broken down to hydrocarbon-based fuels (such as gasoline, fuel oil and plastics) and cellulose-based materials (such as wood and paper). The combustion process involves two key related fuel factors; the physical state of the fuel and its distribution (Adams and Hall, 1998). The fuel can be found in any state of solid, liquid or gas (Adams and Hall, 1998). However, fuel involves ingredients that can be burned to produce heat such as coal, wood, and papers. The fire extinguishing processes involves the lowering of fuel utilisation.

(c) Heat

Heat is the energy component of the fire tetrahedron (Adams and Hall, 1998). When heat come in to contact with fuel, the energy supports the combustion reaction in the following ways:

- Causes the pyrolysis or vaporization of solid and liquid fuels and the production of ignitable vapours or gases.
- Provides the energy necessary for ignition and
- Causes the continuation production and ignition of fuel vapours and gases so that the combustion reaction can continue (Adams and Hall, 1998).

Heat as a form of energy can be conveyed from one item to another or even created at the cost of loss of other forms of energy.

(d) Self-sustained chemical reaction

A chain reaction is a series of reactions that occur in sequence with the results of each individual reaction being added to the rest (Adams and Hall, 1998). According to Adams and Hall (1998), they elaborate on the self-sustained chemical reaction, also the related rapid growth are the factors that separate fire from slower oxidation reaction. Therefore, the slow oxidation reactions do not produce heat fast enough to reach ignition, and they cannot generate enough heat to become self-sustained (Adams and Hall, 1998). The self-sustained chemical reaction involves the self-spreading capability of combustion that is caused by the reaction between oxygen, heat, and fuel. The fire will proceed to burn if the three components are available.

2.4.5. Sources of Fire

Almost, everything in an industrial environment can burn. Metal furniture, machines, plaster, and concrete block walls are usually painted (Esterhuyzen and Louw, 2014). Solid fuels include wood, building decorations, furnishings such as fabric curtains, wall coverings and synthetics used in furniture (Esterhuyzen & Louw, 2014). The firewall does not stop fires, although they are defined by their ability to slow the spread of fire (Esterhuyzen & Louw, 2014). Nonetheless, wood and textile can be treated with fire- or flame-retardant chemicals to reduce their flammability Class (Esterhuyzen and Louw, 2014). Health and safety representatives and caregivers at old age homes should have knowledge of different types of material that are combustible. When they are exposed to high temperatures, some paintings attract heat and they can easily get burned. It is important to store possible inflammable material, liquids at proper places and ensure that all caregivers are awareness.

2.4.5. Classes of fire

The Health and safety representatives, caregivers at old age homes should have a better understanding of different classes of fire to contribute effectively in fire emergency preparedness plans that affect older people.

Four classes of fires are discussed as follows:

Class A: Solid material such as wood, plastics, textiles and their products such as paper, housing, and clothing.

Class B: Flammable liquids and gases.

Class C: Electrical fires referring to live electricity situations, not including fires in other materials started by electricity.

Class D: Combustible, easily oxidizers or mixtures, flammables containing oxygen, nitric acid, hydrogen peroxide and solid missile propellants (Esterhuyzen and Louw, 2014). The importance of knowing the classes of fires assist in knowing the type of fire extinguisher each class of fire requires to extinguish the fire safely.

2.4.6. Portable Fire Extinguishers

A portable fire extinguisher is excellent to use on incipient fires and can extinguish a small fire in much less time than it would take to deploy a hose line (Adams and Hall, 1998). NFPA 1901 Standard for Automotive Fire Apparatus requires that pumping apparatus have two approved portable fire extinguishers with mounting brackets.

Adams and Halls (1998), describes various type's portable fire extinguishers are as follows according to:

2.4.6.1. Pump-Tank Water Extinguishers

Adams and Halls (1998) describe, pump-tank water extinguishers are intended for use on small Class A fires. There are several kinds of pump-tank water extinguishers but all

operate in a similar manner (Adams and Halls, 1998). Pump-tank water extinguishers are equipped with double acting-up pump (Adams and Halls,1998). It is safe to utilize pump tank water extinguishers for a class of fires.

2.4.6.2. Stored-Pressure Water Extinguishers

Stored-pressure water extinguishers are also called air-pressurised water extinguishers, are useful for all types of small class A Fires and are often used for extinguishing confined hot spots during overhaul operation as well as for extinguishing chimney flue fires (Adams and Halls,1998). Water is stored in a tank along with either compressed air or nitrogen (Adams and Halls,1998). Class A foam concentrate is sometimes added to a water extinguisher to enhance its effectiveness (Adams and Halls,1998). The addition of Class A foam serves as a wetting agent that aids in extinguishing deep-seated fires, vehicle fires, and wildland (Adams and Halls,1998). It is important for the public to know a different kind of fire extinguishers to extinguishers fire appropriately.

2.4.6.3. Aqueous film forming foam extinguishers

Aqueous film forming foam extinguishers (AFFF) are suitable for use on Class A and Class B fires (Adams and Halls,1998). They are particularly useful in combating fires or suppressing vapours on small liquid fuel spills (Adams and Halls,1998). The AFFF extinguisher tank contains a specified amount of AFFF concentrate mixed with the water, and it has an air aspirating nozzle that aerates the foam solution, producing a better quality foam than a standard extinguisher nozzle provides (Adams and Halls, 1998). When AFFF and water are mixed, the resulting finished foam floats on the surface of fuels that are lighter than water (Adams and Halls, 1998). The vapor seal created by the film of water extinguishes the flame and prevents re-ignition (Adams and Halls 1998). The researcher assumes that the foam protects the property to avoid further damages and burning.

2.4.6.4. Carbon Dioxide extinguishers

Carbon Dioxide extinguishers are effective in extinguishing Class B and Class C fires. Carbon dioxide is stored under its own pressure as a liquid compressed gas ready for release at any time (Adams and Halls,1998). The agent is discharged through a plastic or rubber horn on the end either a short hose or tube (Adams and Halls,1998). The gaseous discharge is usually accompanied by little dry ice crystals or carbon dioxide (Adams and Halls,1998). When released, the carbon dioxide gas displaces available oxygen and smothers the fire (Adams and Halls,1998). The Carbon dioxide produces no vapour-suppressing film on the surface of the fuel; therefore re-ignition of the fuel is always a danger (Adams and Halls,1998). Carbondioxide extinguishers are safe to utilize as they provide coldness to fire conditions.

2.4.6.5. Dry Chemical extinguishers

Dry chemicals agents are for use on Class A-B-C fires and dry powders agents are among the most common portable fire extinguishers in use today (Adams and Halls 1998). The dry chemicals are non-toxic and generally considered quite safe to use. The cloud of chemicals can reduce visibility and create respiratory problems like any airborne particulate(Adams and Halls1998). Many dry chemicals are corrosive to metals and some dry chemicals are compatible with the foam but others will degrade the foam blankets (Adams and Halls, 1998). When the flames have been knocked down, then the agent should be applied intermittently as needed on any smouldering hot spots(Adams and Halls,1998). It is advantageous to use dry chemicals fire extinguishers as it extinguishes different classes of fires.

2.4.7. Inspection of fire extinguishers

Fire extinguishers have to be inspected regularly to ensure that they are accessible and operable (Adams and Halls, 1998). Verify that extinguishers are in their designated

locations, that they have not been activated or tampered with and that there is no obvious physical damage or condition that prevents their operation (Adams and Halls, 1998). Servicing of the portable fire extinguisher is the responsibility of the property owner. Inspection of the fire extinguishers should focus on its serviceability, its accessibility and the user's ability to operate it (Adams and Halls, 1998). According to NFPA 10 standard, the following fire extinguisher aspects should be inspected:

- Check to ensure that the extinguisher is in a proper location and that is accessible.
- Inspect the discharge nozzle or horn for obstructions. Check for cracks and dirt or grease accumulations.
- Inspect extinguishers shell for any physical damage.
- Check to see if the operating instructions on the extinguishers nameplate are legible.
- Check the lock pins and tamper seals to ensure that the extinguisher has not been tampered with.
- Determine if the extinguisher is full of agent and fully pressurised by checking the pressure
- Gauge, weighing the extinguisher or inspecting the agent level.

Old age homes are coerced by legislation to purchase, service annually various kind of fire extinguishers and place them at strategic points of the building to extinguish different types of fires as they occur.

2.4.8. Detection of fire hazards

There are several automatic fire detection system used in the industry today. Many fire hazards systems can be utilised to warn of the presence of smoke, radiation, elevated temperature or increased light intensity (Esterhuyzen and Louw, 2014). Adams and Hall (1998) elaborate the importance of fire detectors as follows:

- To notify the occupants of the facility to take necessary evasive action to escape the dangers of a hostile fire;

- To summon organised assistance to initiate or to assist in fire control activities;
- To initiate automatic fire control and suppression systems and to sound an alarm;
- To supervise fire control and suppression systems to assure that operational status is maintained and

To initiate a wide variety of auxiliary functions involving environmental utility and process control. The old-age homeowners need to evaluate the effective fire detection sensors that can be utilised to minimise the risk of fire spreading in the old age home building. Different types of fire detectors are as follows:

2.4.8.1. Thermal expansion detectors

Use a heat-sensitive metal link that melts at a predetermined temperature to make contacts and ultimately sound an alarm. Heat sensitive insulation can be used, which melts at a predetermined temperature, thereby initiation a short circuit and activating the alarm (Esterhuyzen and Louw, 2014). Old age home facility owners and safety representatives have to familiarise themselves with detectors to make a good choice for installation and improve early warning systems.

2.4.8.2. Photoelectric fire sensors

Photoelectric fire sensors detect changes in infrared energy that is radiated by smoke, often by smoke particles obscuring the photoelectric beam (Esterhuyzen and Louw, 2014). A relay is open under acceptable conditions and closed to complete the alarm circuit when smoke interferes (Esterhuyzen and Louw, 2014). This kind of fire sensors can be utilised at old age homes to warn the older people and staff members of any possible fires. Old age homes' health and safety representatives need to conduct awareness and share information on the existing functional fire sensors that are installed in their building.

2.4.8.3. Ultraviolent or infrared detectors

Ultraviolent detectors utilises sound to alarm when the radiation from fire flames is detected (Esterhuyzen and Louw, 2014). When rapid changes in radiation intensities are detected, a fire signal alarm is also given (Esterhuyzen and Louw, 2014). The purpose of the sound alarm is to alert individuals in the building about the potential fire. Older people and staff members have to be trained on what actions should be taken by individuals during the sound alarm signals and safe evacuation procedures. According to the South African regulations SANS 10139: 2012, fire detection equipment's should be serviced every six months. Old age homes are obliged to service the available fire detecting systems falls and provide good proper maintained.

2.4.9. Fire dangers to human life

Direct contact with flames is obviously dangerous to humans (Goetsch, 2014). NFPA statics show that most people die in fires from suffocating or breathing smoke and toxic fumes (Goetsch, 2014). Carbon dioxide can lead to suffocation because it can be produced in large volumes, depleting oxygen from the fire. The number one killer in fires is carbon mono oxide, which is produced in large volumes and can quickly reach lethal dosage concentrations. National Fire Protection Association statistics show that people die in fires from suffocating or breathing smoke and toxic fumes (Esterhuyzen and Louw, 2014). Carbon dioxide can lead to suffocation because it can be produced in large volumes, depleting oxygen from the air (Esterhuyzen and Louw, 2014).

The number one killer in fires is carbon monoxide, which is produced in virtually all fires involving organic compounds (Esterhuyzen and Louw, 2014).

When fire incidence occurs, there is a limited time to plan for an escape route and be safe. The fire spread quickly, the house or area will be dark with dangerous gases and toxic smoke. The house will be hot and can lead to dehydration of the people in the house that lead to easy for burning in case they fail to manage to escape. Most of the people in fire incidents die of collapsing as they are trying to run away, inhaling dangerous smoke and lack of oxygen. Old age homes need to provide training and

awareness to older people to capacitate them about the dangers of some fire and safe evacuation procedures.

2.4.10. Reduction of Fire Hazards

The following fire hazards should be taken into consideration at old age homes:

- Reducing fire hazards by means of isolation of the three triangle elements that include fuel, oxygen, and heat. Several ignition sources can be eliminated through:
- Prohibit smoking near any possible fuels.
- Store fuels away from areas where electrical sparks from equipment, wiring or lighting may occur.
- Keep fuels separate from areas where therefore open flames.
- Isolate fuel from tools or equipment that may produce mechanical or static sparks.
- Clean up spills of flammable liquids as soon as they occur properly dispose of the material used in the clean-up.
- Run electrical cords along walls rather than across aisles or in other trafficked areas.
- Turn off the power and completely de-energise equipment before conducting maintenance procedures.
- Don't use spark or friction prone tools near combustible materials.
- Routinely test fire extinguishers (Goetsch, 2014).

Fire hazards are present in all areas including the low-risk environment. However, It is important for the old age homes management and staff to control fire hazards by identifying the fire hazards, evaluating the risks, eliminate the activities that pose fire risks and monitoring the identified hazards. It is significant for old age homes to communicate the identified fire hazards with relevant stakeholders for effective intervention plans.

2.4.11. Factors contributing to fires

(a). Electrical Equipment

Overheating of electrical equipment and of arcs resulting from short circuits in improperly installed or maintained electrical equipment are two of the leading causes of fire in buildings (Krieger and Montgomery, 1997). Installation and maintenance of electrical equipment must be done in accordance with NFPA 70, National Electrical Code. Temporary and makeshift wiring, particularly if defective or overloaded, it is a common cause of electrical fires. Overloaded or partially grounded wiring may also heat up enough to ignite combustible without blowing fuses or tripping circuit breakers. (Krieger and Montgomery, 1997). It is important to periodically inspect and test all electrical installations and equipment for fire safety at old age homes.

(b) Smoking

Carelessly discarded cigarettes, pipe embers, and cigars are a major source of the fire. It is important to allow smoking at specified times and in a safe place where supervision is maintained. Smoking should be prohibited especially is woodworking shops, textiles mills, flour mills, grain elevators and a place where flammable liquids or combustible products are manufactured, stored or used.

It is important to do the following:

- Mark NO-SMOKING areas with conspicuous signs
- Discard matches and smoking materials in a safe container rather than on the floor
- Encourage the use of safety matches
- Allow smoking only in designated locations (Krieger and Montgomery, 1997).

Smoking at old age homes should be prohibited to avoid exposing older people to second-hand smoke and potential fire burn from cigarette materials. Smoking safety alerts should always be communicated to old age home residents and staff to avoid careless smoking that leads to fire deaths.

(c) Friction

Excessive heat generated by friction causes a high percentage of industrial fires. Fires frequently result from overheated mission bearings and shafting in buildings elevators, cereal, textile, woodworking, plastics, metalworking plants where dust accumulate (Krieger and Montgomery, 1997). It is to make frequent inspections to ensure that all sources of friction have adequate lubrication and are kept oiled so that they do not run hot. At old age homes equipment' involves cooking utilities, laundry machines that require proper inspections and monitoring.

(d) Foreign objects

Foreign objects can strike sparks where there are flammable dust, gases or vapour or combustible material (Kreiger and Montgomery,1997). It is important to store and keep foreign material separately at old age homes. Gas bottles at old age homes should be stored at lockable gas cages outside the building.

(e) Housekeeping

(i) Collection and storage of waste

Poor housekeeping is another factor that contributes to industrial fires (Kreiger and Montgomery; 1997). Clean waste that is readily combustible should be kept in metal cans or bins with self-closing covers (Kreiger and Montgomery,1997). A schedule for safe collection of all combustible waste and rubbish should be part of the fire prevention programme. Check collection practices to be sure that may ashtrays, which may contain smoldering material are not emptied into combustible bags or cartoons or into containers of combustibles.

(ii) Rubbish disposal

Fires are often caused by burning rubbish in yards, near combustible buildings, sheds, lumber piles, fences, grass and other combustible material (Krieger and Montgomery, 1997). If rubbish is being burned, the best safe-way is with well-designed incinerator

that meets the requirements for environmental pollution control laws (Krieger and Montgomery, 1997). However, the Waste removal and disposal management at old age homes should be the responsibility of all staff and residents. The old-age management has to train the staff on the different types of waste, waste separation, waste reuse methods, improving the health and hygienic practices at their institutions.

2.4.12 Fire safety programs

The best way to be prepared is to establish a comprehensive fire safety programme that encompasses all the functional activities required for being prepared (Goetsch 2014). Fire safety programmes at old age homes can assist in reducing the fire risks by containing small fires to expand, ensure that older people know how to react during fire incidents, safe evacuation procedures, minimise possible injuries protect older people, protection of the environment and the assets.

A comprehensive fire safety program should have at least the following:

- Assessment;
- Planning;
- Awareness;
- Prevention; and
- Response.

It is important to implement by establishing the cross-sectional fire safety committee that consists of members from all the organisations various functional unit. The committee should be staffed and chaired by the organisation highest ranking safety and health professional.

(a) Assessment

Assessment of the workplace for fire hazards should be continues and on-going. Members of the safety committee should be trained in the fundamental of fire hazard assessment by the safety and health professional. They should then pass on this knowledge to employees in their departments, units and teams (Goetsch, 2014). In this

way the all employees and residents are involved in continuity looking for fire hazards and communicate their concerns to the safety committee.

(b) Planning

OSHA requires that an organisation emergency fire safety plan have at least the following components:

- Emergency escape procedures and routes;
- Critical shutdown procedures;
- Employees headcount procedures;
- Rescue and medical procedures;
- Procedure for reporting fires and emergencies;
- Important contact personnel for additional information;
- Once the plan is in place, it should be reviewed at least annually and updated as necessary (Goetsch; 2014).

Importance of emergency planning assists everyone to make decisions on the right actions to implement during emergencies (Goetsch; 2014). Planning assists in the mobilisation of resources and how to use them. All planned activities must be communicated to the affected individuals in advance

(c) Awareness

All employees should receive awareness training so that they understand their role in carrying out the emergency plan. The fire safety committee should evaluate the training programme periodically using the guidelines:

- Is the alarm system checked periodically
- Is a comprehensive drill undertaken at least once a year
- Are sufficient fire detection devices in place? Are they tested periodically?
- Do all employees know most likely causes of fire?
- Do all employees understand the escape plans? Evacuation procedures?
- Are all employees familiar with the sound of the alarm system?
- How are employees with disabilities provided for (Goetsch; 2014).

Old age homes have to create emergency protocols, procedures, and notifications to all affected individuals and have the correct crisis communication systems in place to popularise the unfolding emergency-related event such as fire incidents.

(d) Response

Accidents can happen in the event where it seems to be safe at the organisations (Goetsch;2014). It is important that employees understand the emergency plan and periodically practice responding (Goetsh, 2014). People do not always think clearly in an emergency (Goetsch;2014). They will however, apply what they have learned to do through practice (Goetsch;2014). Consequently, one of the fire safety committees' most important responsibility is to arrange periodic drills so that employees automatically respond properly (Goetsch; 2014). It is vital to involve older people and other individuals on emergency preparedness, notifications and response in preparation for readiness during emergencies such as fire incidence.

2.4.13. Fire prevention activities

(a) Fire inspections

Hence, some building and operations require daily inspection, while others can be inspected weekly, monthly or at other regular intervals. The function of the fire safety inspection if to check for proper placement and operation of fire protection equipment's and to correct common fire such as poor housekeeping, improper storage of flammable materials, smoking violations and excessive accumulation of dust or flammable material (Krieger and Montgomery, 1997). Old age home building should be inspected regularly to ensure that older people are safe because most they are unable to execute other things. Caregivers and OHS representatives are ought to ensure that the inspections are conducted as required to minimise the risk.

The fire inspection should cover the following:

- Control valves on piping that supplies water for fire protection
- Hydrants;

- Fire pumps;
- Hose house and associated equipment's;
- Sprinkler system water supplies, including tanks;
- Portable fire extinguishers;
- Fire doors, aisles, and exits;
- Detectors;
- Alarm and communication system and routines and
- Communication to the fire department and other mutual aids (Krieger and Montgomery, 1997).

The fire inspections assist in ascertaining any potential challenges of fire hazards. The available identified hazards can be rectified and awareness can be made to the public on how to identify and react to the fire hazards. The fire inspection provides an opportunity for firefighters to interact directly with the public and give direct relevant advice, according to the current situations..

(b) Protecting adjacent building

When the fire breaks out in a building, protecting an adjacent building is important by doing the following:

- Closing every window facing the burning building;
- Stationing fire brigade workers with fire extinguishers or fire hoses at each window nearest the fire; and
- Stationing firefighters on the exposed building's roof with hose lines to keep the roof wetted down and with extinguishers to put out any burning embers (Krieger and Montgomery, 1997).

The spread of fire from one building to another or from one yard to another can be separated by open space in between. It is the responsibility of the buildings owners to provide the space and other fire prevention methods to separate and contain fire spread to the adjacent buildings or yards.

(c) Training

Fire extinguisher training is intended to teach employees how to stop small fires from spreading out of control (Krieger and Montgomery, 1997). The fire extinguishers are effective only when the fires are in their first stage; ensure that extinguishers are immediately reachable and promptly used by trained personnel (Krieger and Montgomery, 1997). The good time to do a demonstration is when the fire extinguishers are scheduled for recharging (Krieger and Montgomery, 1997). Fire safety training will capacitate the old age home residents and staff with the knowledge on how to protect themselves, others, building, and the property. The training can assist the old age home staff and residents to eliminate fire hazards, act promptly during fire incidents, respond quickly and effectively to the fire incidents.

(d) Communication

Once a fire has been detected, especially in a potentially disastrous situation, good communications are necessary as a means of alerting occupants to the emergency and as a way to mobilise fire protection forces whether fire brigade, municipal fire or both (Krieger and Montgomery, 1997). An emergency condition has the potential to cause panic and poor communication channels can worsen the situation. Therefore, for effective communication channels and systems must be established and communicated to everyone. The communication should consist of the before, during and after an emergency. The old age homes are obliged to have a communication plan and appoint a communication leader or officer who will be the key person to disseminate information and confirm other emergency conditions of the organisation.

2.4.14. Fire protection

(a) Planning for Fire Safety

Building fire defenses, both active and passive should be designed in such a way that the building itself assists in the manual suppression of fire. Interior layout, circulation patterns, finish material, and building services are all important to the fire safety considerations in the building design. Building designs play a significant influence on the efficiency of fire department operations. All fire suppression activities ought to be considered during the design phase. (Krieger and Montgomery, 1997).

Objectives of the Fire safety design are:

1. Life safety: design considerations ought to address who utilises the building, Who will be using the building most of the time.

2. Continuity of operation: design considerations to consider those specific functions conducted in a building that are vital to the continued operation of the business, and that cannot be transferred to another location.

3. Property protection: design considerations to consider any specific high-value content that needs special design protection (Krieger and Montgomery, 1997).Old age home buildings should consider fire safety measures from the design, construction, building operation, and renovation stage to prevent the start of unrestrained fires and limit the expansion of fires.

(b) Fire Safety drills

Fire drills involve training employees to leave their workplaces promptly at the proper signal and to evacuate a building speedily but without confusion is largely accomplished through fire drills (Krieger and Montgomery, 1997). It is significant to prepare an emergency manual to outline procedures and drills to assign responsibilities to each individual involved (Krieger and Montgomery, 1997). The purpose of the drill is to eliminate panic in the event of an emergency and to guarantee the smooth functioning of the emergency plan (Krieger and Montgomery, 1997). Post-up-to-date instruction

sheets, including evacuation routes must be distributed to all employees. (Krieger and Montgomery, 1997). However, maps that are posted have to show alternative routes in case the first route is closed (Krieger and Montgomery, 1997). Fire drills should be conducted at frequent intervals and have to serve as a reminder that all fire prevention practices are important. Emergency fire drills also serve as a valuable way to check the adequacy and condition of fire exits and the alarm system.

(c) Emergency procedures and preparedness

Esterhuyzen, Louw, Mostert, Whitebooi-Naidoo, and Van-Loggerenberg (2015), elaborates that written emergency procedures need to be in place for fires, gas leaks, explosions, pressure vessel ruptures, building collapses, chemical spillage, leaks, bomb threats, and all other workplace emergencies. Preparedness refers to anticipate and prepare for impacts and responses to such impacts. Preparedness is a result of the consideration of disaster hazards, options available to avoid or reduce those hazards, a realistic assessment of the possible negative hazard impact remaining and then putting measures in place so that a state of readiness for that can be achieved (Carstens and Minnie, 2017).

Individuals and households in a community at risk of being impacted upon by any specific hazard cannot be mere spectators; they will need to consider what they will do when an impact is imminent or is occurring and they will need to go over to action achieved (Carstens and Minnie, 2017). According to the studies preparedness is implemented through a continuous cycle of planning, training, equipping, exercising, evaluating and acting to correct and mitigating (Carstens and Minnie, 2017). Preparedness planning includes anticipating and planning for a specific occurrence but not yet implemented the plan (Carstens and Minnie, 2017). According to Esterhuyzen el al (2015) the following are important for emergency procedures:

- Access control forms an important part of emergency preparedness. Safety personnel needs to know who is on the property and where they are in the event of an emergency evacuation.

- The property should have sufficient lighting and parts of the property that are not open to visitors should be fenced off.
- Security officers can have access to all emergency contact numbers and the emergency evacuation procedure needs to be displayed prominently.
- The security officer is ought to ensure that emergency doors are unobstructed at all times and that the evacuation alarm can be heard everywhere.
- Fire drills should be scheduled regularly to check the response time for all parties.
- Emergency preparedness is vital is it assist at effective preventing and responding to disastrous conditions. The old age should develop an emergency protocol, procedures, notifications and communicate all the plans to visitors, staff, residents and other affected stakeholders. The preparedness plan should also include the crisis communication plan that enables smooth communication.

(d) Emergency response plan

The pre-incident planning involves the process of compiling information that will assist the organisation should an incident occur. The major component of the plan must include the identification of the problem, resource identification, and allocation and in some cases, suggested mandatory procedures need assessment must be in the plan. (IAFC and NFPA, 2010). The emergency response plan must be done in writing and be accessible to everyone in the old age homes as it contains the information that needs to be actioned in an emergency situation.

(e) Victim Assessment and Management Plan

A victim assessment plan is a process that involves the assessment of patient injuries and identifies any adverse medical conditions patients may be suffering from (IAFC and NFPA,2010). The assessment is necessary to determine whether each victim is a viable patient and if so, how treatment priorities should be established (IAFC & NFPA,2010). Patience assessment methods and patience treatment have to always follow the medical protocol which in turn comply with all applicable local, state and federal laws (IAFC and NFPA, 2010). Victim management plan involves all aspects of

an incident involving one or more victims such as identifying hazards to which a victim may be exposed, accessing a victim, performing triage of multiple victims, assessing patient injuries, stabilising victims' injuries and interacting with victims (IAFC and NFPA,2010).

The victim assessment and management plan in old age homes is important as it gives a guideline on the management of affected people during e disaster incidents such as fires. The plan will clarify the registration of people, casualties and how they are transported to the nearest hospitals. All the trauma and crisis management available programmes that can be offered to the victims and the contact details for professionals.

(f). First Aid

According to Goetsch (2014), first aid consists of life-saving measures are taken to assist an injured person until medical help arrives. For that reason, there is no way one can predict when first aid can be needed. So, providing first aid training to employees should be part of preparing for emergencies. OHSA requires that companies have at least one employee on-site who has trained in first aid Basic First Aid training program should cover the following:

- Cardiopulmonary resuscitation;
- Broken bones and fractures;
- Burns;
- Head injuries and concussion;
- Eye injuries;
- Rescue;
- Moving an injured person;
- Unconscious victim;
- Severe bleeding;
- Electric shock;
- Cuts and abrasions;
- Heart attack;

- Stroke recognition (Goetsch; 2014).

It is crucial for old age home organisations to train all staff members for First Aid as part of the emergency preparedness.The importance of First Aid assists in providing emergency medical assistance to injured people until the ambulance arrives. The first aid will assist in reducing the risk of infections, further injuries and assist in positioning the injured people. All staff members at old age homes should be capacitated on emergency life support skills application. The First Aid training should consist of the practical and demonstration sessions and should be done every two years.

All old age homes are advised to have first aid kit and refill the material frequently as and when required with medical treatment. The Frist Aid kit assists in providing medical material and equipment that assist in lessening the severity of injuries and infections. It is important to have all the required equipment's in the kit and all staff members to have knowledge and skill to effectively utilise them.

2.4.15 . Old Age Homes

Estimates show that nearly 80% of residents have mobility problems and more than one third have mobility, eating and incontinence issues (Blanchard -Fields and Cavanaugh, 2015). The average nursing homes has a significant mental and physical problems (Blanchard -Fields and Cavanaugh, 2015). A large number of nursing homes have cognitive impairment, most of those individuals have dementia (Blanchard -Fields and Cavanaugh, 2015).

Well-designed special care units for people with dementia provide a supportive and therapeutic set of programmes that help the person function at the highest level possible. The best units have physical design elements that take functional limitations into account. Most facilities have residents with cognitive impairment wear wrist or ankle bands that trigger alarms if they wander beyond a certain point or exit the facility (De la Rey, Duncan, Swartz, Townsend and O'Neil, 2016). Hence, older people required

proper homes, with equipment and a healthy living lifestyle as promoted by the Constitution of the country.

2.4.15.1. Important aspects of old age home

- Ensure that the facility and its administration are fully licensed.
- Ensure the residents' core plan is put together by a team of professionals and residents have choices, can exert some control over their routines and care;
- Safety: whether there is enough staff and hallways are free of clutter;
- Quality of care: whether staff responding quickly to calls, whether staff and family are involved in care are decisions;
- Quality of life for residents: whether residents are well-groomed, the food is tasty, and rooms contain comfortable furniture (Blanchard -Fields and Cavanaugh, 2015).

It is imperative for individuals that are willing to operate old age home to take care of older people register with the Department of Social Development in South Africa. The old age homes are registered as NPO's and receiving fund from the government in support for healthy living lifestyle of older people.

2.4.15.2. Old age health risk

Health risks in early adulthood include death or injury due to violence and car accidents, males are at higher risk here than females. Other major health problems include HIV and Tuberculosis. In middle adulthood there is an increasingly perceptible decline in physical attributes and functioning women reach menopause. Male experience a decline in sex responsiveness (De la Rey et al, 2016).

Regular exercises and a good diet can slow the aging process and reduce health risk (De la Rey et al, 2016). Health risks include increased risk of cardiovascular disease, various forms of cancer, arthritis and respiratory diseases (De la Rey et al, 2016). Lifestyle stress can contribute to mental and physical ill-health (De la Rey et al, 2016).

In late adulthood, there is an increasing decline of all the body systems, in sensory and psychomotor abilities (De la Rey et al, 2016). The experience of health in old age may vary widely depending on social-economic status gender and where people live. Health risks in late adulthood include greater vulnerability to injuries, infections. Hence, there is an increase in non-communicable disease like cancer, diabetes, strokes, and hypertension. These are made worse by a lifetime of poor diet, arduous physical labour, multiple pregnancies and inadequate reproductive health care (De la Rey et al, 2016). Health and safety plans along with strategies must take into consideration of older people's health risk and inabilities.

2.5 Conclusion

This chapter discussed the theories, policies and frameworks that advises on fire, older people's development and emergency preparedness legislations that provide guidelines on the rights and responsibilities of older people at old age homes. The lesson learned from the theories of aging, policies and legislative framework governing emergency preparedness can be utilised to develop strategies and guidelines to minimise fire hazards at old age homes. The research findings can be utilised to influence policies as they are practical and connect with the expectations.

Chapter 3: Literature Review

3.1. Introduction

In this chapter the researcher discusses the related literature reviewed from books, journals, newspapers, government publications, conference presentations and websites to give an overview of emergency preparedness in old age homes to deal with fires.

A review of literature is aimed at contributing towards a clear understanding of the nature and meaning to the problem that has been identified (Delport, Fouche and Strydom, 2005). In a good literature review, the researcher does not merely report the related literature. The researcher also evaluates, organises and synthesise what others have done (Leedy and Ormrod, 2005). According to Neuman (2006), the goals of a literature review is to learn from others and stimulate new ideas. A literature review is essential to provide the substance of knowledge on the research topic and present tribute to other researchers.

3.2. International statistics for older people

In 2017, there were an estimated 962 million people aged 60 and over in the world, comprising 13% of the global population (World Population Prospects, 2017). The population aged 60 or above is growing at 3% per year (WPP, 2017). The global proportion of people over 60 years of age was 8 % in 1950 and rose to 11 percent in 2009 (Devi, Gishy and Preethy, 2016). However, globally the population of older persons growing at a rate of 2.6 % per year (Devi et al, 2016). Thus, by 2050 the number of people aged 60 and over will double to reach 2 billion globally, with fast majority of older people living in low and middle-income countries (WHO, 2017). The projections indicate that older people's population statistics still continues growing faster and increase more as compared to previous records of population growth rate. The longevity of older people on the planet has an influence on well-being issues, social safety matters, education, cultures, household life and employment market. Basic services, more care and economic assistance are provided to older people as they live longer.

3.2.1. China Statistics for older people

According to the National Bureau of Statistics, at the end of 2014, China is home to not only 212 420 000 aged at 60 years old and above, accounting for 15.5% of the total population but also 137 550 000 aged at 65 years old and above accounting for 10.1% of the total population (Siqi, 2016).

By comparing the fifth and sixth census data, it discovered that in 2000 the aged population who are 65 years old or older reached 279 000, 6.44% of the total population; in 2010 citizens whose age are 65 or older was about 389 000, 7.71 of the total population (Siqi, 2016). However, from 2000 to 2010 the population of Nanchang rose from 4.33 to 5.04 million with an increase of 16.4% while people at 65 years old and above grew from 279 000 to 389 000 in the corresponding period with an increase of 39.30% which indicates the average annual growth rate of the ageing population is faster than the average annual growth rate of the total population in Nanchang (Siqi, 2016).

According to researchers confirmed that the ageing of elderly proves to be an inevitable trend of population development (Siqi, 2016). Therefore, with the advancement of the socio-economy, improved medical, health conditions, perfected supporting facilities for the elderly, this trend will become increasingly apparent (Siqi, 2016). The increasing number of older people in the world causes economic and social challenges to the government and society. Most significantly, an increased number of older people increases prompt the government budget on pension funds, medical care, social security, sports and recreational activities while older people are not economically active and not taxpayers or paying lower taxes.

3.2.2. India Statistics for older people

In India longevity has increased over the years and the number of elderlies, 80 years and above has also increased (Kumar and Pathak, 2017). Most financially self-sufficient elderly was found living in private or paid old age homes which provided them better services and facilities (Kumar and Pathak, 2017). According to Kumar & Pathak (2017), in future more and more elderly will have to live in old age homes in India in the context of the emerging family norm, strained relations among family members and

occupational mobility of children (Kumar and Pathak, 2017). The study suggests that old age homes are recommended to be a safe place to accommodate older people as they retire to avoid isolation and easy access to basic services.

3.2.3. England statistics for older people

On the other side, England is also an ageing society. Since the early 1930s, the number of people aged over 65 has more than doubled and today a fifth of the population is over 60 (National Service Framework for older people, 2001). According to the National Service Framework for older people (2001), between 1995 and 2025 the number of people over the age of 80 is set to increase by almost a half and the number of people over 90 will double. The National Service Framework for older people (2001), reports that the National Health Service spent around 40% of its budget -£10 billion on people over the age of 56 in 1998/99. In the same year social services spent nearly 50% of their budget on the over 65s, some £ 5.2 billion. Older people tend to have a greater need for health and social care resources are directed at their needs. Royal Society for the prevention of accidents (2016), elaborates that older people over the age of 65 of age are most at risk, suffering both the highest mortality rate and the most severe injuries. The matter is supported by the records that indicate that in 2009 in England and Wales alone, people aged 65 or over accounted for 7 475 deaths as a result of an accident of which 49% were due to fall (ROSPA, 2016).Global population growth suggests that there is an older person's population growth in all countries, an increase in life expectations and increase in longevity.

China, England and India globally experience an increase in longevity of older people and an increase in the number of older people. Therefore, most countries have suitable strategies and policies that assist to minimise the risks that affect older people's life and decrease in death rate among older people. Older persons are gradually perceived as contributors to development and the stakeholders in all the countries. Thus, they should involve them in the global world development planning processes, especially for emergency preparedness.

3.3. South African Statistics for older people

Presently the number of South Africans who are 60 years and older sits at around 4 209 million people (World Health Organisation, 2015). Projections estimate that in 2050 the older peoples population rise to 10.06 million (WHO, 2015). The number of older people in South Africa increased from 4 151 759 in 2011 as compared to 3 280 505 in 2001 (Stats, 2011). South African Census 2011 findings show that about 2.9 million households (19.9%) were headed by elderly persons; an increase from 1.7million in 1996 (Stats, 2011). The number has increased from 2.8 million in 1996 to 4.1 million in 2011, and the proportions from 7.1% in 1996 to 8.0% in 2011 (Stats, 2011).

According to South African Statistics (2011), provincial variations show that in 2011, the highest proportion of elderly persons relative to adults and children was recorded in Eastern Cape (9.7%), followed by Western Cape (8.9%) and Limpopo (8.7%). Statistics (2011), results indicate that Limpopo and Eastern Cape provinces had the highest proportions of poor elderly persons (77.1% and 64.4%), while Western Cape and Gauteng provinces had higher proportions of rich elderly persons (57.5% and 50.4%). Many South African elder persons are confronted with the decision to remain economically active by participating in informal employment until the oldest ages particularly those that did not accumulate enough savings during their productive years' Statistics (2011). Older people's record-keeping and estimations are significant to ensure that government, community and stakeholders plan effectively to provide relevant services and support to older people without any deficiency from the national level. Older people deserve support from the government, private sector, donors, stakeholders and the community on their initiatives and programmes to strengthen and give encourage them to be active.

3.4. Provincial Statistics for older people

Limpopo Province had the lowest number of elderlies per 100 elderly women over the period 1996-2011 (Statistics, 2011). This profile of sex ratios may be partly attributed to the high levels of out-migrated of adult males from this province (Statistics, 2011).

Percentage distribution of elderly person aged 60 years and older in South Africa constitute 65.6%, White 5.3%, Indian or Asian 0.2%, Coloured 0.2% and Black African 94.2%. Compared to all provinces, Limpopo has the highest proportion of men and

women aged 80 and older (Statistics, 2011). The projected number of black African elderly will be the highest between 1996 and 2030 compared to other population groups (Statistics, 2011). The statistics indicate that Limpopo Province has a high number of very old people that are unable to execute activities by themselves, they need full-time care and support from caregivers, helpers and the family members. Increase population reveals that there is a need for additional financial demands at provincial level for older people as there is an increased health care, basic services, medical care and security matters. The increase in older people's population indicates that the province is progressing positively in reduction of non-communicable diseases that lead to death of older people**.**

3.5. International emergency preparedness for old age homes fires

In the following part, the researcher focus on literature that gives an indication of the preparedness at old age homes globally for fire disasters.

3.5.1. New York emergency preparedness for old age homes fires

According to reports, by the Department of Health and Human Services, 92 percent of nursing homes have plans for handling tornados, hurricanes, floods, fires and 72 percent have staff trained in emergency procedures as required by federal law of New York (Graham, 2012). After conducting in-depth inspections at 24 institutions, officials found significant gaps in preparations (Graham, 2012). Each home had experienced a flood, a hurricane or wildfire from 2007 to 2010 and 17 reported substantial challenge responding to these disasters (Graham, 2012). Yet, 22 homes failed to specify how patient's medical records and medications would be dealt with in an emergency (Graham, 2012). Twenty-three had no plan for handling the illness or death or a resident in a disaster (Graham, 2012).

Lack of medical response preparedness plan will impotent caregivers and family members to provide for chronic medications and other treatments to older people during fire emergencies. Older people with pre-existing chronic well-being situations are vulnerable to be in unfavorable impacts if they do not obtain their usual medical therapy on the stipulated time. Older people's interruption in consuming some medicines may aggravate triggered chronic diseases and cause additional misperception, anxiety and

interactive change. Non-compliance of majority old age homes on medical preparedness poses a high risk to older people and may lead to increased number of injuries, diseases and death during fire disasters.

3.5.2. Italy emergency preparedness for old age homes fires

One retirement community village on the Isle in Venice, Fla, has taken preparedness to extraordinary lengths (Graham, 2012). Each year, it evacuates more than 10 percent of independent living residents by bus to a site 145 miles away to learn how to deal with the unexpected (Graham, 2012). Ten homes had not addressed the need for adequate staff evacuation during emergencies, 15 didn't detail how patients' needs for items such as feeding tubes, ventilators or oxygen would be handled (Graham, 2012). Emergency transport access for older people is crucial because most of them suffer from breathing challenges, complaints about cardiac seizure and spinal pains. Old age homes that are not arranging effective emergency transport for their residence, they are putting older people's lives at risk and they may increase injuries and pains. It is important for old age homes to have emergency plans that include approaches to transport mobile equipment including respiratory machines and feeding tubes that utilized solar energy or batteries in a safe way.

3.6. South African Fire Statistics

In 2015 nearly 46 000 fire calls attended, 57% were to deal with grass fires, bush and agriculture. The data only reflects fires attended by reporting fire services and therefore exclude underground fire, those that have happened in areas where no professional fire services exits (South African Fire Statistics, 2017). In the year 2006 formal dwellings affected by fires were reported to be 26475 whereas in 2015 the formal dwellings affected by fires were 45784 (South African Fire Statistics, 2017). The statistics clearly indicate that the number of formal dwelling fire is increasing every year. Never less, the statics indicates the decrease in number of affected as compared to the year 2014 as it affected 46187 (South African Fire Statistics, 2017). In 2015 the total number of fatalities resulting from fire incidents in the flats (8), formal dwelling (82), informal dwelling (219), department stores (01), restaurants and cafes (1), shops (3), hotels and boarding houses (1) and warehouses (2) add up in to a total of 317 deaths (South

African Fire Statistics, 2017). The fire incidents statistics for old age homes are included on the flats and formal statistics as they are not specifically categorised. The old age homes are operating at formal buildings and flat structures.

South African Fire Statistics (2017), reports indicate that in 2015 South Africa had operational 49 fire brigade services institutions such as Municipalities, EMS, Fire department brigade and fire departments that respond to reported fire incidents. These institutions attended a total of 45784 reported incidents in the year 2015. Cape Town Metro city has the highest fire incident amounting to the total of 13236 Polokwane Municipality was the ninth out of 47 institutions on the rank of a high number of fire incidents attended with the total of 907. The cases emanate from residential area (114), institutional (13), commercial (14), storages (1), public assembly (8) and other is 565 (South African Fire Statistics, 2017). Fire statistics increases due to world-wide climate variation and the winter fire period that affect the frequency of fire occurrences. The increase in number of fire incidents has a negative impact on the community, budget, property, environment and increase loss of life.

3.7. National fire incidents at old age homes

In 2010 eighteen elderly people were killed and several others injured when a fire broke out at an old age home in Nigel (Accidents, 2010). The incident occurred at Pieter Wessels old age home out at around 21h00 and left 18 people dead and 84 were rescued (Accidents, 2010). The cause of the fire was unknown (Accidents, 2010). Ekurhuleni Metro has previously appointed a task team after devastating fires raged through the Struisbult Care Center in 2011 and the Pieter Wessels old age home in 2012 (Ekurhuleni Metro, 2014).

According to the study reports, of the 89 old age homes 27 are in the process of upgrade and the installation the necessary safety equipment, 28 did not comply, four homes closed down and seven homes were classified for other use (Ekurhuleni Metro, 2014). The reports stipulate that the main reason for non-compliance to the relevant fire safety requirements are insufficient funds and budgetary constraints (Ekurhuleni Metro, 2014). The other report states that a woman has died in a fire after a section of Huis Lizelle old age home caught fire in Willington (Eyewitness News, 2017).

The cause of the fire was unknown and all other residents at the facility were unharmed (Eyewitness News, 2017). Three people died at the old age home when it caught fire and two people with epilepsy died of smoke inhalation and the third person was in a wheelchair died from burn wounds (News24, 2017). It is indicated in the report that old Ekurhuleni old age home at Port Elizabeth did not have fire detectors as they reported that they since requested Department of Social Development to install fire detectors, but they did not get a response from the government by the time of the incident (News24, 2017).

According to Shaver (2017), when a fire breaks out, a functional smoke detector can be the difference between life and death. From 2007 to 2011, three of every five home fire deaths resulted from fires in homes with no smoke alarms or no working smoke alarms, according to the National Fire Protection Association (Shaver, 2017).In 2018 it was also reported that, a unit was burnt down at Moffatt view Old Age home and it was unclear what lead to the fire and no fatalities were reported (Southern courier, 2018). According to the studies, the most common source of apartment fires is in the kitchen and cooking is leading causes of fire (Shaver, 2017).

The above statistics indicate that the risk of old age homes fires is increasing continuously. According to the reports, most of the causes of fires at old age homes are not known and there is no clear information on how the fires have started. These imply that there is a gap in the fire risk assessment of the old age homes. Fire incidents occur accidentally, but some of the cases can be prevented by conducting risk assessment to identify the potential hazards that can cause fire at old age homes. The responsibility of conducting the risk assessment and awareness should involve all the stakeholders such as the residents, security personnel, employees, management, government and other supporting institutions.

3.8. National fire incidents financial costs

Residential losses due to fire incidents in South Africa cost the amount of R 1 186 434 833 resulting from dwellings formal, informal dwellings, flats, hotels and

boarding houses (South African Fire Statistics, 2017). The cost has increased as compared to 2014 (South African Fire Statistics, 2017). The total number of population loss in 2015 due to fire incidents is 54.3 million and it has increased from 53.5 million in 2014 (South African Fire Statistics, 2017). Fires continue to plague the country and consuming a large number percentage of the official Gross National Income (South African Fire Statistics, 2017). Therefore, the country should be able to reduce fire losses through ever-improving fire prevention capabilities. Homeowners and landowners are obliged to ensure that fire prevention policies, strategies and plans are in place and implemented to identify the potential fire hazards and implement fire prevention actions.

3.9. Household emergency preparedness

The study conducted by Community health, presents a synthesis of available literature on household preparedness published over the past 15 years (Community health, 2017). Its emphases that the complexity of preparedness, involving personal and contextual factors such as health status, self-efficacy, community support and the nature of the emergency. In addition, people require enough knowledge, motivation and resources to engage in preparedness activities. A prominent gap in the literature is the need for evidence-informed strategies to overcome the identified challenges to household preparedness (Community health, 2017). Community-based emergency and disaster preparedness constitute a major impact on household emergency preparedness. The advantage of community-based emergency and disaster planning comprises of sharing of resources, knowledge and communication among the households.

Bainbridge, Eaton, Feroz and Kohn (2012), signifies that factors influencing preparedness attitudes, behaviors are complex and multifaceted, including demographic characteristics, trust in government efforts, previous exposure to a disaster and a number of dependents in a household. Personal emergency preparedness is critical, individuals require partial or complete self-sufficiency for at least the first 72 hours following a disaster (Bainbridge et al, 2012).

The household disaster and emergency preparedness should take in to account the number of people residing in the house and their personal abilities. The information

from the past experiences of disaster exposures has to be incorporated in the emergency plan in including the causes, reactions taken and the actions that need be executed to improve the previous actions.

3.10. Old Age Home Fire Safety preparedness

Due to the higher risk of severe burn injury and mortality faced by older adults, assessing fire safety knowledge and preparedness in the homes is an essential step in fire prevention (Carlee, Lehna, Erin, Stephanie and Nurse, 2014).

The study concluded that older adult's lack of home fire safety preparedness is an underreported health hazard (Carlee et al, 2014). The study highlighted the importance of home fire safety education and fire prevention efforts geared towards older adults cover multiple aspects plan, the importance of alarms, proper installation and care of smoke alarms, proper setting of hot water heater temperatures and safe cooking practices (Carlee et al, 2014). Home fire safety education should be tailored to meet the needs of older adults by considering mobility limitations, effects of chronic illnesses, learning ability and living conditions (Carlee et al, 2014). Educational instruments and teaching efforts should be customised to specific risk factors faced by older adults, taking in to account potential cognitive decline, isolation, poverty, crime, lack of transportation and other determinants should be considered when creating realistic goals for home fire safety education (Carlee et al, 2014).

Fires may arise at old age homes any time in the present or absent of residents in the old age home building. Fires can expand from one building to another fast and has the possibility of overpowering the firefighters as it increases. At old age homes fire is utilised to cook, heat and signaling, so it is vital to prepare safety measures for all the affected areas to alarm the residents of the potential fire hazards and how best can they be avoided. The fire safety measure should be developed and implemented in strategic places such as kitchen, bedrooms, near fireplaces to minimise the fire risks at old age homes.

3.11. Home fires and emergency evacuation

Gerges, Mayouf, Moore and Rumley (2016), conducted a study in high rise residential building to identify the challenges and the factors that affect occupants' decision during an emergency, the study revealed that occupants have limited knowledge and skills on how to deal with fire emergencies. The study discovered that occupants tend to ignore the fire alarm and usually they investigate if it is true or false (Gerges et al, 2016). Shaver (2017), identified the importance of holding fire drills and meetings to reinforce emergency preparedness at homes. Emergency fire drills will assist individuals to respond positively to emergency alarms and evacuate to a safe identified assembly point identified in advance.

According to Shaver (2017), at Chicago, apartment owners and managers provide information in lease packages about where fire exits are located, and what to do during a fire. The evacuation plan and maps at homes assist individuals in evacuating in the right direction during emergency. Old age homes should develop fire emergency evacuation plan with the indication of all escape routes to direct older people in case of emergencies.

3.12. Evacuation and older people

According to the study conducted in 2013 for the Fukushima nuclear disaster, there was a high mortality rate due to initial evacuation, suggesting that evacuation of older people was not done through the best lifesaving strategy (Gilmour, Kami, Nomur, Shibuya, Sugimoto, Tsubokura, Oikawa, and Yoneoka (2013). According to Gilmour et al (2013), facility-specific disaster response strategies, including in-site relief and care, may have a strong influence on survival and where evacuation is necessary, careful planning and coordination with other nursing homes, evacuation sites and government disaster agencies is essential to reduce the risk of mortality.

Old age homes are ought to develop evacuation plans that involves the strategies to save the lives of the older people. The strategies have to involve the emergency transportation of medication, identification of older people in chronic medication and safekeeping of emergency medical equipment during fire incidence. Clark and Smith

(2015) analysis on the investigation regarding people's experiences during domestic fires in UK, also identified, the importance of clear communication in prevention strategies, including with respect to communicating the causes of fire and the "get out-stay out'' message.

This includes how individuals come to reflect on and understand the incident, how they articulate how events unfolded leading up to, during and immediately post-incident, and how experiencing an incident may influence an individual's perception of fire risk or the possibility of him or her experiencing a further fire (Clark and Smith, 2015). Old age homes must develop communication plans that specifically addresses procedures for communication in case of emergency. All the resources should be allocated to allow effective communication with emergency preparedness stakeholders.

Smith and Swacina (2017), they conducted a study that identified vulnerable residents as being over 80 years of age, frail, dependent, male residence with multiple comorbidities and made recommendations on disaster preparedness. The research is done on the effect of evacuation on nursing home residents which is surprising considering the elevated risk of mortality post evacuation. According to Smith and Swacina (2017), evacuation seems to have a negative effect on the survival of nursing home residents in depended of the effect of the disaster. Standard evacuation procedures may be less applicable to this vulnerable population because of extra challenges they face in disasters (Smith and Swacina, 2017). Thus, older people require additional care, provision of special resources for effective emergency evacuation as they are likely to fall and get injuries. Old age homes need to develop strategies with special needs and identify the emergency coordinators that will assist older people to evacuate, caregivers that will support and older people with movement restrictions.

The others study conducted reviewed how to safely exit the home during fire and discovered the inability to exit in case of a fire due to history of falls, immobility issues that required the use of a walker or wheelchair and presence of multiple chronic illnesses (Carlee et al, 2014). There was also a concern regarding the ability of older people to understand the teaching that occurred during the intervention due to dementia and cognition issues (Carlee et al, 2014). The method of communication and giving

instructions to older people during fire emergencies may be affected by the health status of older people and less concentration.

3.13. Older people and disaster preparedness challenges

The exploratory project aimed to provide information about the evacuation experiences and characteristics of vulnerable nursing homes residents. The project revealed that physical harm, psychological distress, cognitive decline and increases social isolation were areas that deserved special attention for this vulnerable groups during evacuation period (Claver, Dobalian, Fickel, Mallers and Ricci, 2013). The research findings contribute to the general conversation about meeting the bio-psychosocial needs of nursing homes residents in an integrated health care services system and more broadly, the role of long-term care facilities in general in planning for future disasters (Claver et al, 2013). However, both natural and conflict-related emergencies pose serious threats to human security, health and well-being apart from direct deaths, crises increase the risk of disease, damage health, social services, displace people from their homes, families and disrupt their livelihood (WHO,2008).

According to WHO (2008), the occurrence of more emergencies and disasters in an ageing world means that older persons will be endangered. Including older persons in planning and responding to emergencies, thus benefit the whole community. The goal is to enhance support for older people in emergency to minimise harm and help them maintain the highest possible level of health and functional capacity or recover them as fast as possible (WHO,2008). Statistics estimated that about 38.4% of South Africans between the ages of 65 and 74 have limitations in eating, bathing, dressing, getting in and out of bed or using the toilet (WHO, 2015). It is proven that aging occurs with many challenges and difficulties. They need to be incorporated in the integrated disaster management plans of the old age homes and the stakeholders involved in emergency cases.

3.14. Technology fire sensors and old age homes

Doughty and Orton (2014) have investigated the opportunities where technology interventions could help manage the risks associated with fire and explosions in old age homes. The authors found that the number of incidents and fatalities continues to decrease as a result of preventative measures such as greater use of smoke detectors, but that there remained issues with cooking safety (Doughty and Orton, 2014).The research concluded that the challenges are making both professionals and the public aware of the available technologies. The use of technology in fire risk reduction at old age home is significant as the fire sensors can detect fire and send an alarm to alert residents to actively respond to the incidence. Early fire detection and immediate respond to minor fires have a positive impact on the lives of older people, property and the environment as the fire will not spread from one place to another to cause more damages.

3.15. Older people and smart homes

Rajput and Ransing (2015), come to a realisation that with increasing age, people tend to forget things which create safety problems for them. In the conference held in 2015 there was a proposal for the development of a Wireless Sensor Network based smart home system for older people to help them ease their work, provide them safety, sound and secure living (Rajput and Ransing 2015). The recent development in the concept of smart homes that integrate many devices that can sense the required parameters and control the characteristics of the home (Rajput and Ransing, 2015). The researchers have proposed sensors like temperature sensor, LPG sensor, and contact sensor that are proposed to be deployed for the fire detection, gas leakages detection and determination of whether any door is closed or open respectively (Rajput & Ransing, 2015). The study also proposed the Labview is used as a graphical user interface. In case of emergency, a warning message will be generated and played through a loudspeaker for the users to take notice of the same and SMS will be sent to the caregivers using GSM modem to take preventive action.

The advantages of smart homes for older people involves making life easier and safe and costs as automation is controlled remotely. Smart homes for older people promote luxury and enjoyable life for older people and their caregivers. Smart cooking and lights

have the advantage of saving electricity and minimise the fire risks at old age homes as the processes are done automatically.

3.16. Home fire safety checks

In 2014, Fire and Rescue in New South Wales piloted a programme called Home Fire Safety Checks (HFSC), aimed at high-risk households (Broomhall, Fish, Frank, Olleranshaw, Lewis, Tannous, Watson, & Whybro, 2018). In total, 228 homes in 8 suburbs received safety checks, including having smoke alarms installed, having batteries changed in smoke alarms and being provided with fire blankets and fire safety information (Broomhall et al, 2018). The findings of the programmes demonstrate that a full-roll out of the HFSC program warrants ongoing funding as they have obtained a 0.75 % reduction in several fires incidents (Broomhall et al, 2018). It is important for fire services and disaster management authorities to conduct home visits for inspections and awareness.

According to the research outcomes that was conducted by Grant (2013), it was recommended that home health care agencies should have policies and procedures in place. Documentation and communication regarding home safety measures are ought to include all the members of the health team who will be interacting with the client (Grant, 2013). It is essential for old age homes to establish safety committees and appoint responsible caregivers that will receive training on health and safety matters . The safety committee inspection reports must be communicated to relevant stakeholders.

3.17. Training, education and emergency drills

Furmanek, Lehna, Merrell and Twyman (2017), conducted a pilot study to evaluate the effects of a home fire safety (HFS) education program developed in the US, on improved HFS knowledge and practice in urban older adults living in Swansea. According to Furmanek et al (2017) there is a need for educational HFS intervention programs aimed at older adults. The highlights discovered was that older adults are at higher risk for morbidity and mortality due to burning and there is a need for home fire safety knowledge improvement (Furmanek et al, 2017). The study also recommends

that fire safety research is needed with community-dwelling older adults living in other types of housing (Furmanek et al, 2017). Educational programs, awareness campaigns also fire safety research should involve older people and old age homeowners. Thus, to educate them on the fire safety rules, regulations that promote a safe environment, minimise injuries, protect lives and properties.

3.18. Conclusion

The literature review process assisted the researcher in recognising various aspects that affect the applicable planning of disaster management. The fire emergency preparedness that involves older people with special needs at old age homes. The lesson learned from the various sources will enable the researcher to make appropriate recommendations of the research and assist in improving the existing fire emergency preparedness at old age homes. Inefficiencies in emergency preparedness and fire safety at old age homes should allow planners to relate the existing disadvantage, limitations and the potential corrective procedures that can result in the reduction of fire risks in the future.

Chapter 4: Research Methodology

4.1. Introduction

This chapter deliberates the type of research, research design, sampling, target population and data collection method of the study.

4.2. Type of research

The study used mixed method research described by Creswell (1999) as the study that the researcher incorporates both qualitative and quantitative method of data collection and analysis in a single study.

Quantitative research aims at acquiring a deeper insight into a complex phenomenon that can be quite specific and unique, which appears in different ways in the various units of the population (Bless et al, 2014). In quantitative method the researcher asks participants in a study to respond, rate, rank or check information on an instrument that can be evaluated for validity and reliability (Creswell, 1999).

Qualitative research method allows the researcher to study selected issues in depth, openness and detail as they identify and attempt to understand the categories of information that emerge from data (Durrheim, Painter and Terre Blanche, 2008). Qualitative research is a multi-perspective approach to social interaction, aimed at describing and making sense of means that the respondents attach to them (Dezin and Lincoln, 1994). Convergence model

The researcher collected both qualitative and quantitative data and then examines both data to determine the findings of a study (Creswell, 1999).The intent of the study is to converge or triangulate the findings, then the methods can be administered at the same time (Creswell, 1999). Each research method provided diverse data to extend the study and afforded intensive understanding to achieve more practical reality. The researcher complied research questions that correlate to qualitative and quantitative methods of data collection. The contextual nature of the study implies that the meaning in this mixed-method research can only be understood within the context at Polokwane Municipality area where the sample is drawn.

4.3. Research Design

According to Huysamen (1993), the research design is a blueprint of the research project that precedes the research process. The research design for this study is descriptive. A descriptive study presents a picture of the specific details of the situation, with primary aim of describing phenomenon (Neuman, 1997 and Bless and Higson-Smith, 2000). Descriptive research defined which one “paints a picture with words or numbers, presents a profile, outline stages or classifies types (Neuman, 2014). The descriptive research is assumed with the aim of describing the condition completely and precisely at Polokwane municipal area. The study was cross-sectional and endeavoring to describe participating old age homes and safety and emergency preparedness conditions.

4.4. Target Population

The population for the study is that group (usual people) about whom we want to draw conclusions (Babbie, 2013). According to Babbie (2013), we are rarely able to study all the members of the population that interest us, but we can never make every possible observation about them. Wiid and Diggines (2013), defines a population as the total group of people or entities from whom information is required. The population of the study is ascertained by Old age home residents and staff members that are affected by the fire disasters. Research population will be ten old age homes households around Polokwane. The focus will be on the people that reside in the old age homes, the employees in the old age homes such as security officers, administrators, and the cleaners. The municipality has 32 old age homes of which five is in the township and other 27 is in the villages. The old age homes consist of five from the village and five from the township.

4.5. Purposive sampling

Purposive sampling is a type of non-probability sampling in which the units to be observed are selected based on the researchers' judgement about which ones will be the most useful or representative (Babbie, 2013). Silverman (2006), advises that purposive sampling allows us to choose a case because it illustrates some features or progress in which we are interested. Old age homes are purposefully selected for the collection of data.

4.6. Sample

Sample refers to the subset of the whole population, which is investigated by a researcher (Bless at al, 2014). Sampling is a statistical procedure for finding cases to study. It has two functions as It allows you to estimate the representatives of the case study. Therefore, the degree of confidence in any inference you draw from them (Silverman, 2006).

Purposive sampling refers to purposively choose the elements that wish to include in our sample, based on the list of characteristics (Bezuidenhout et al, 2014). The purposive sampling was executed in this study to save the costs, time and traveling less. The purposive sampling method is utilised to look at the research question and the list of characteristics that determine the old age homes that are important for research. A sample is drowned from a list of 37 old age homes based in Polokwane Municipality.

4.7. Data Collection

According to Babbie and Mouton (2001), the basic objectives of a questionnaire are to facts and opinions about a phenomenon from people who are informed on a issue. Questionnaires were used to collect primary data directly by communicating with the participants at the old age homes. Data was collected by means of hand-delivered structured questionnaires. Instructions were fully explained to the respondents before completion of the questionnaire. Open-ended questions allowed the respondents to answer in their own words as well as a closed-ended questionnaire with pre-determined

responses. The participants were interviewed from their houses and offices at old age homes. The household's questionnaire covered the information on household demographics, livelihood patterns, fire disasters impacts on wellbeing, infrastructure, personal belongings education, housing, property, and vulnerable groups due to fire disasters, the fundamental roots of vulnerability, causes of fires, safety precaution measures, and emergency preparedness

4.8. Questionnaire

A questionnaire is a document containing questions and other types of items designed to solicit information appropriate for analysis (Babbie, 2013). Every questionnaire whether it is to be completed by a respondent or administered by interviewers, should contain clear instructions and introductory comments where appropriate (Babbie, 2013). The research study has administered open-ended and closed-ended questions collect data from the respondents.

4.8.1. Closed-ended questions

Closed-ended questions refer to survey questions in which the respondents are asked to select an answer from among a list provided by the researcher (Babbie, 2013). Additionally, for the purpose of the study the respondents at old age homes are asked questions and are requested to choose from the provided answers.

4.8.2. Open-ended questions

Open-ended questions refer to questions for which the respondents are asked to provide his or her own answer (Babbie, 2013). Furthermore, for the purpose of this study both open and close-ended questions have been utilised to get information from the respondents. The questionnaire started with closed-ended questions and asked for additional information from the respondents through open-ended questions at the end of each section excluding the general information section. The questionnaire consists of four sections that are general information, injury safety and risks, emergency preparedness and fire risks.

4.9. Research Respondents

The following participants have taken part as respondents during the research study:

Table 1: Research respondents

Institution	**Occupation/designation**	**Tools utilised**	**Number of participants**
Old-age organisations	Nurse	Questionnaire	03
	Security officer		03
	Resident Older person		10
	Admin officer		05
	Management Representative		05
	Board member		02
	Receptionist		08
	Caregiver		08
	Cleaner		04
	OHS Officer		02
	Bookkeeper/Financial representative		02
Total number of Respondents	**50**		

4.10. Conclusion

The chapter covered the research methodology of the study by indicating all activities and research design utilised. These include the study area, population, instruments used when collecting data and type of sampling utilised. The data collected is analysed in chapter five.

Chapter 5: Data analysis

5.1. Introduction

This chapter focuses on the data analysis whereby figures are used to analyze and interpret all the data that were gathered during the data collection phase. The analyzed and interpreted data is presented in the same four sections as they were in the questionnaire. Section A focuses on general information, section B explores on injury, safety and risks of older people, section C that concentrates on emergency preparedness at old age homes and lastly, section D deliberate on fire safety risks at old age homes.

According to Strydom, Fouche and Delport (2005), data analysis means finding answers byways of interpreting the data and results. Interpreting data refers to describing and establishing the meaning of the data. Data analysis aims to lesson data to comprehensible, interpretable form so that the relations of research challenges can be examined, and conclusions be made. The main purpose of the data analysis is to discover the patterns among the data, patterns that point to the theoretical understanding of social life (Devos et al, 2005).

The researched used an excel computer program to code the collected data. Raw data collected from the participants is analysed, interpreted and presented in the form of bar graphs. Once data has been collected, it must be analysed to make sense of it (Naidoo, 2015). The data collected from Old Age Homes through questionnaires were captured in a computer and analysed systematically. Percentages are utilised to present the analysed data for clearer understanding of the final presentation of the report.

5.2. Section A: General Information

A1: Gender of the respondents

The study was represented by 50 respondents, 48% were male and 52 % were female. The study respondents were dominated by female participants as they constituted 52% of the participants. Gender balance for study participants was maintained as men and

women were provided an opportunity to participate in the study to provide a different experience from man and women perspective at old age homes.

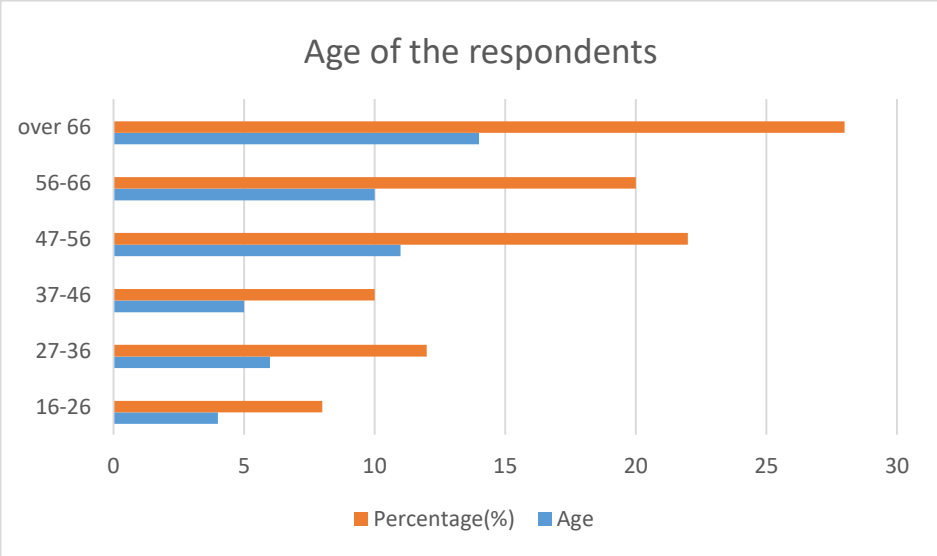

Figure A 1: Age of respondents

Figure A1 reflect that out of 50 respondents that participated in the study, 8% fell in the 16-26 age group, 12% of the participants were between 27-36 age group. 10 % of the respondents were between 47-57 age group, 20% of the participants were between the age group of 57-66. The age group of 67 and above constituted by 28% of the participants as the majority. About, 28 % of the respondents are represented by a great number of elderly people that reside at old age homes. The researcher realises that the high number of elderly people participated in the study correlate with the literature statistics that indicate that older people's statistics in Limpopo Province are high as compared to other provinces of the country. The high number of older people at old age homes in the Polokwane area, contribute to the increases number of the current population in the country and globe.

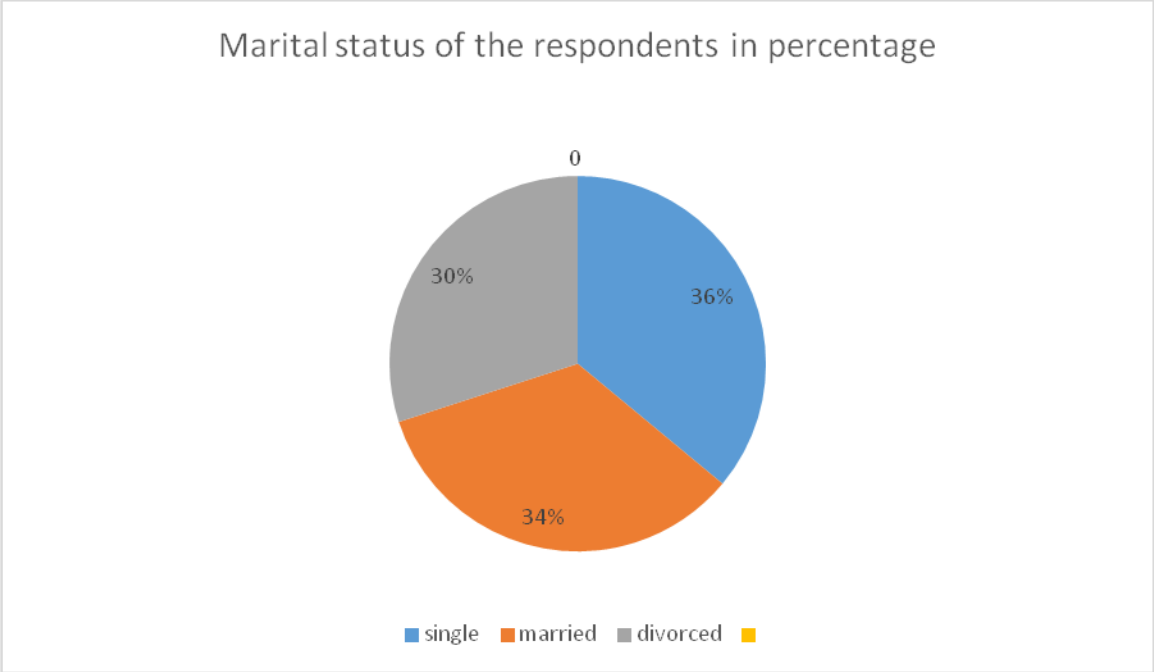

Figure A 2: Marital status of respondents

Figure A2 indicates that during the time of the study, 30% of the respondents were single, 34% of the respondents were married, whereas 36% of the respondents were divorced during their participation of the study. The study suggests that the majority of the old age home residents and employees is dominated by participants that were divorced.

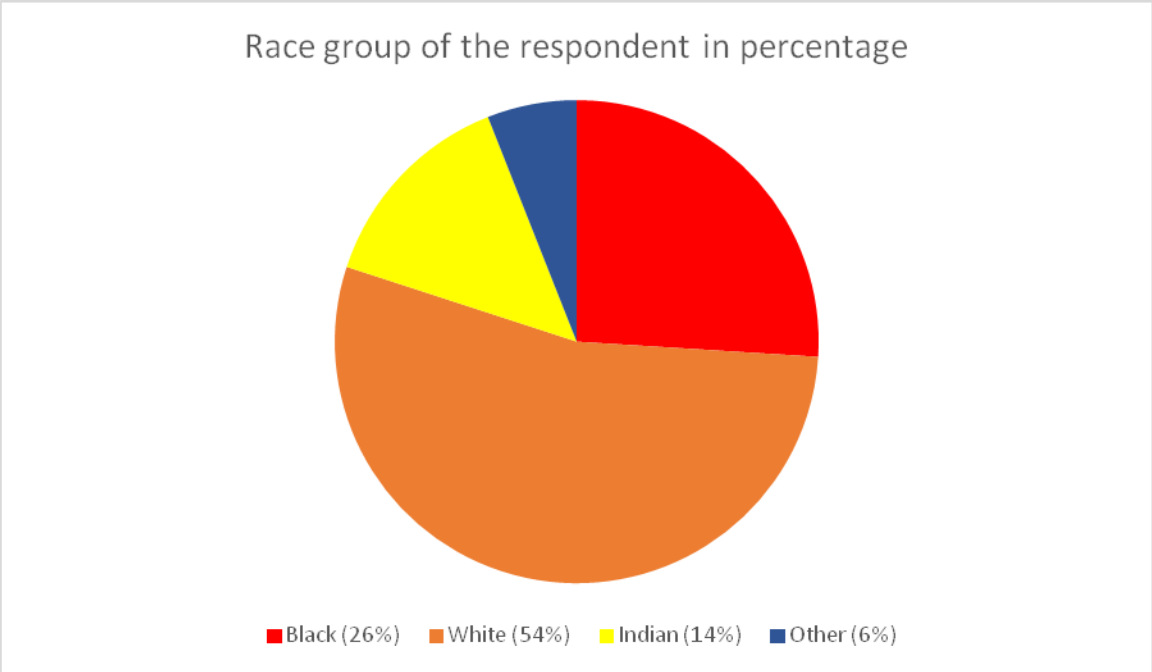

Figure A 3: Race group of the respondents

Figure A3 reflects that the study participants were dominated by white race group that composed of 54%, followed by the black race group at 26%. Whereas, the Indian race group constituted 14% of the respondents. The other race group that was mentioned, was coloured people, who comprised only 6% of the respondents. Majority of the old age home residents and employees during the study were white people as they consist of more than 50% of the participants. The researcher presumes that the high number of white people participated in this study triggered by old age homes located in urban areas of Polokwane Municipality area. The researcher managed to collect data from various racial groups with different beliefs, cultures, biological characters, physical and social qualities.

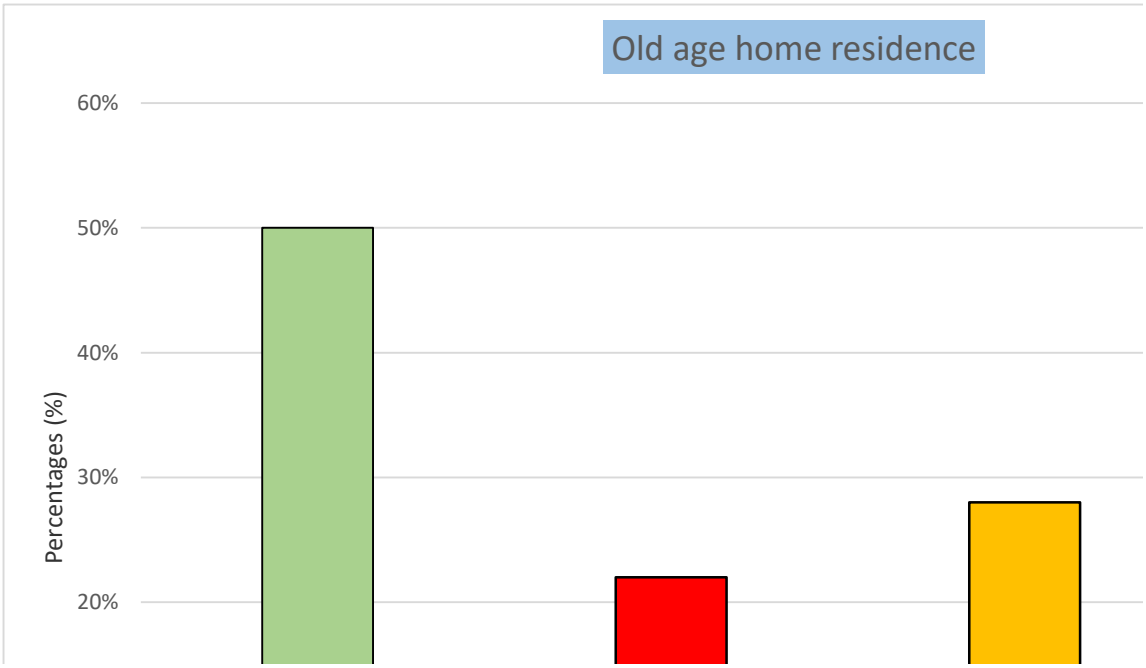

Figure A 4: Old age home residents

According to Figure A4, 50% of the respondents were the residents of the old age homes, 28% of the respondents were the employees, whereas 22% of the respondents were the visitors at old age homes during the time of the study. The study highlights that most of the respondents were residing at the old age homes followed by the employees. Collecting data from people that are residing at old age homes means that important relevant information is obtained from long term and short time residents.

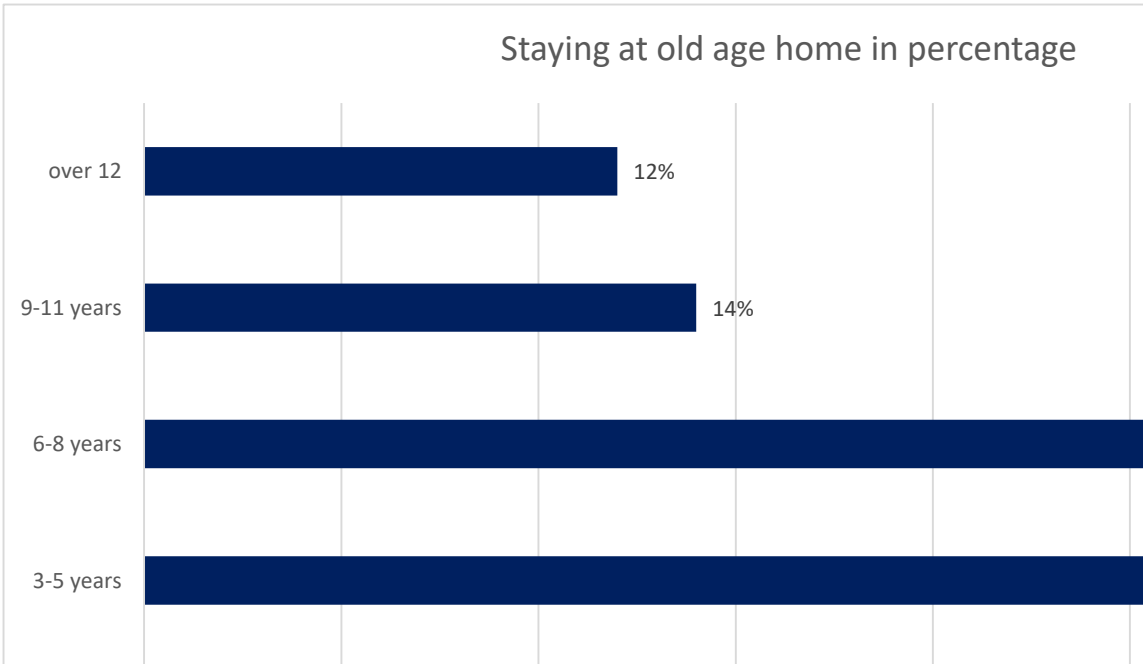

Figure A 5: Staying at old age home in percentage

The above Figure A5 reflects the number of years that the respondents have been staying at various old age homes. The graph indicates that the 0-2 years category was represented by 16% of the respondents. Therefore, the 3-5 years category constituted by 30% of the respondents at majority level. In addition, about 28% of the respondents stayed at old age homes between 6-8 years, 14% of the respondents stayed at old age homes between 9-11 years, whereas only 12% of the respondents indicated that they stayed at old age home for more than 12 years. Old age homes are for pensioners and elderly people with shorter life expectancy. The low percentage of residence residing for more than 12 years at the old age home is indicative.

Section B: Injury, safety and risks at old age homes

Figure B 1: Established health and safety committee at old age homes

It is of extreme importance that the health and safety committee be established in the old age home institutions. This is to increase awareness on health and safety issues. Furthermore, to minimise injuries and promote safety, conduct inspections and investigate inspections as advised by OHS Act 85 of 1993 Section 8 of South Africa. Figure B1 indicates 12% of the respondents indicated that their safety committee is not functional. The significance of health and safety committee is supported by 76% of the respondents who agree that the health and safety committee at their old age homes is established and functional. This implies that most old age homes are in better understanding of the significance of the health, and safety committee, its roles and responsibilities. Other representatives indicated that their old age homes did not have health and safety committee in place while others indicated that they were planning to appoint the committee.

Majority of the appointed committees indicated the importance of holding frequent safety meetings by 68% of the respondents that agree to hold frequent meetings

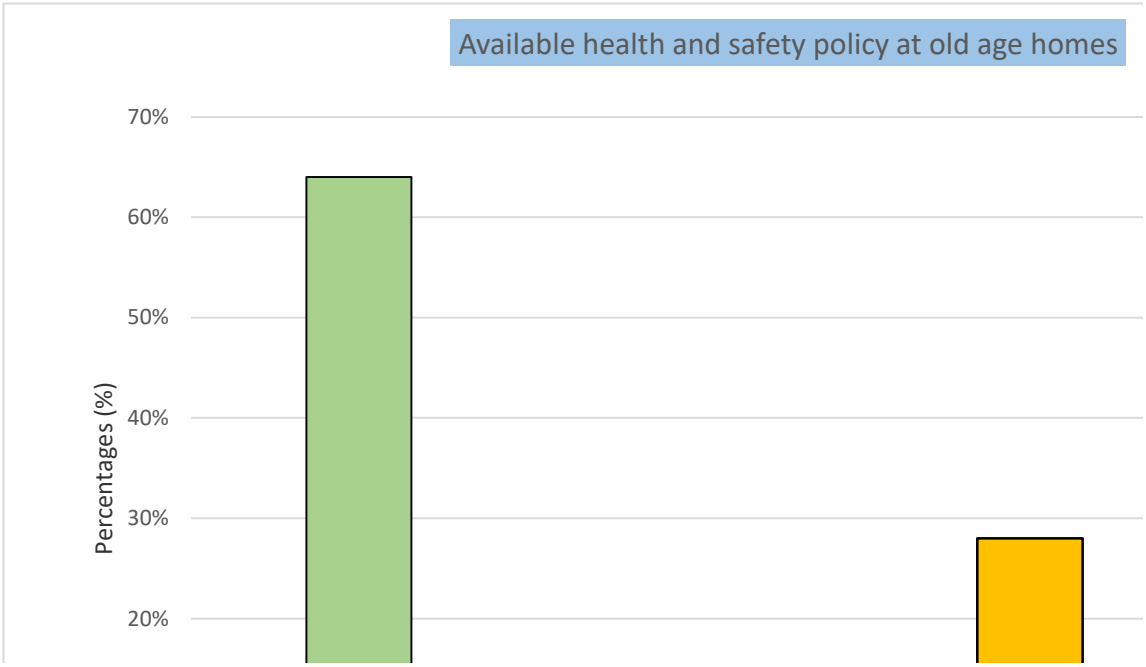

Figure B 2: Available health and safety policy at old age homes

It is important for old age home institutions to have a health and safety policy that is in the form of written statement. The policy needs to document the principles, practices, objectives, responsibilities and commitments that guide on promoting safety culture, decision making on health and safety at old age homes. Figure B2 indicates that only 28% of the respondents disagree with the health and safety policy availability. About 84% of the respondents comprehended the availability of the safety policy at old age homes. This implies that majority of old age homes are prepared in terms of emergencies as they have the health and safety policy that is in place.

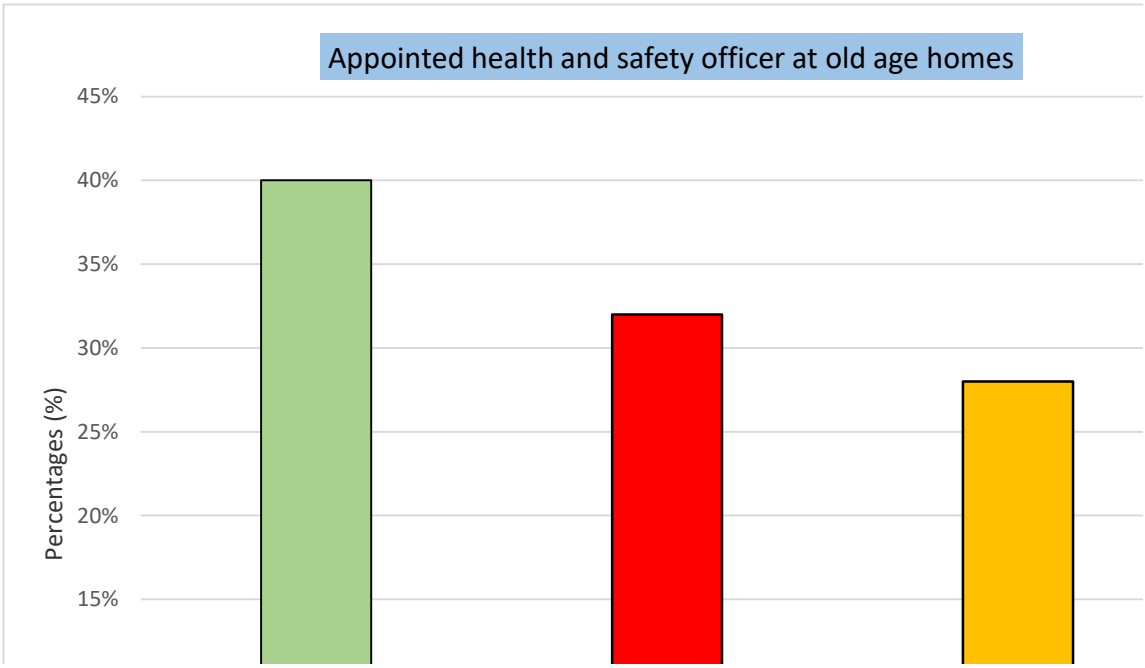

Figure B 3: Available health and safety policy at old age homes

The importance of the appointment of health and safety officers at old age homes includes the coordination of the development of health, safety plans and policies. Therefore, ensuring that they are implemented to promote health and safety at the institution. In this research Graph B3, elaborate that 28% of the respondents did not support the appointment of health. The appointment of the health and safety officer is maintained by 40% of respondents that agree. The results indicate that there is a need to encourage and enforce the appointment of safety officers at old age homes.

Lack of appointment of responsible, dedicated health and safety officers at old age homes expose older people to unsafe and unimproved safety conditions that contradict with the Constitution of the country. The study revealed that majority the old age homes have appointed managers as the Health and Safety officers. Multi-tasking always leads divided focus and compromised quality of services that need to be provided to older people.

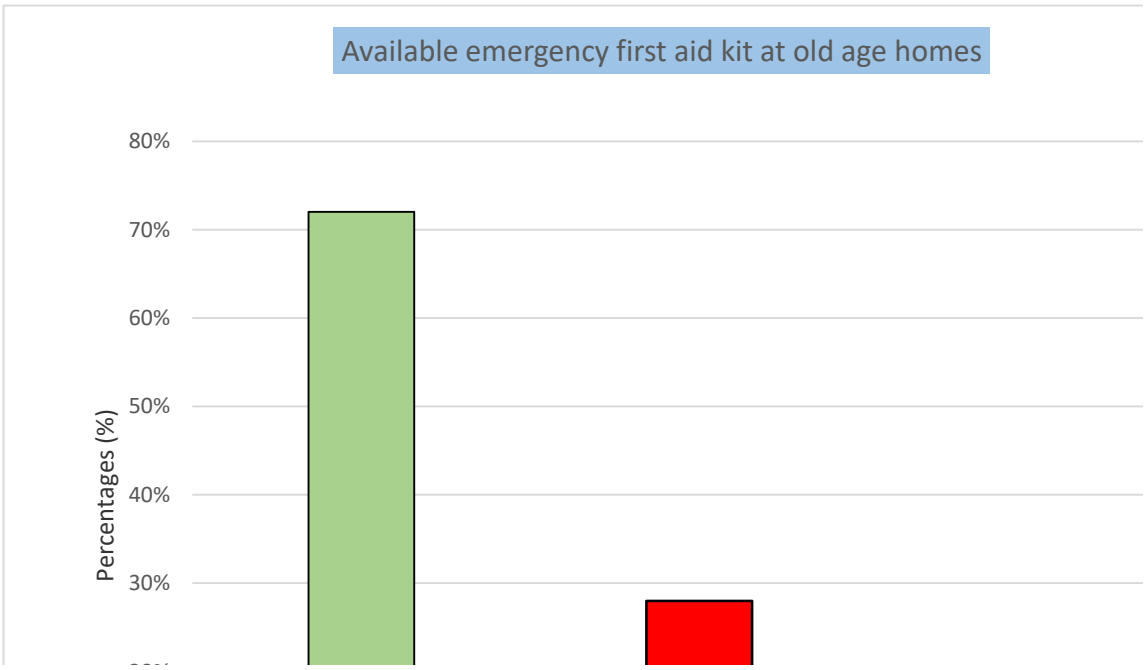

Figure B 4: Available emergency first aid kit at old age homes

First aid kits at old age homes are necessary for the treatment of ailments and injuries that may occur in the building. First aid kit use can assist to lessen the risk of infections and the seriousness of the injuries. Figure B8, elaborate that 0% of the respondents disagree with the use of the first aid kid at old age homes. Majority of old age homes have an emergency first aid kit that was advocated by 72% of respondents, but some of the first kits are not filled with the required components and equipment. If the first aid kit is empty, caregivers will be unable to provide immediate attention to individuals to minimise injuries and infections.

Some the old age homes care givers store their first aid kits at management offices and they are locked inside the lockers. In case of injuries, it is only the manager that is accessing the first aid kit and that will expose the injured individuals at risk by not being attended immediately. Other old age homes had indicated that first aid boxes were not fully equipped due to lack of information also awareness on material supply.

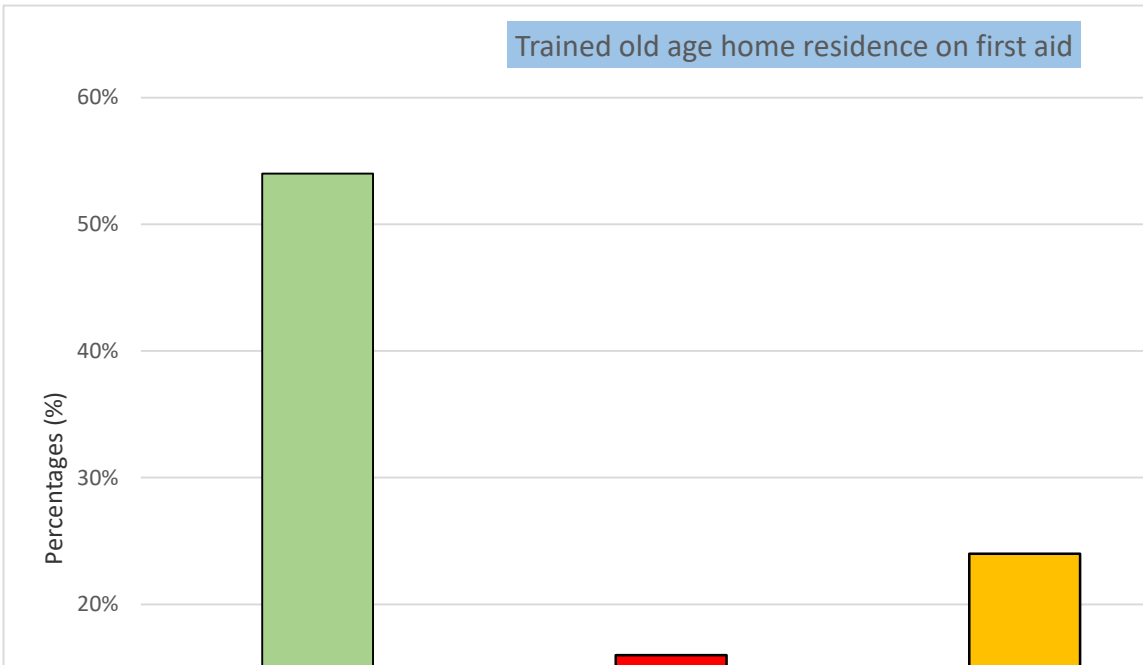

Figure B 5: Trained old age home residence on first aid

First aid training at old age homes is prominent for everyone to save lives and reduce casualties during the disasters and accidents. First aid training capacitates old age home residents and employees to assist each other in case of emergencies such as injuries, stroke, car accidents, burns, poisoning, severe bleeding and cessation of breathing. Figure B11, indicates that only 24% of the respondents were not trained in the first aid at old age homes. The majority of residence at old age homes indicated that they attended training as supported by 54% of the respondents. Hence, most of the trained individuals have been trained for more than five years back and they never attended refresher training. The refresher training on first aid has to be done continuously to capacitate individuals. Most of the old age homes representatives indicated that they did not have information in place regarding service providers that provide training, also indicated the budgetary constraints for training, awareness and education. However, some of the old age homes have appointed nurses from the local clinics as their first aiders instead of appointing one of the employees or permanent capable residents due to lack of knowledge and information. Consequently, some respondents indicated that they were not aware that they must appoint employees.

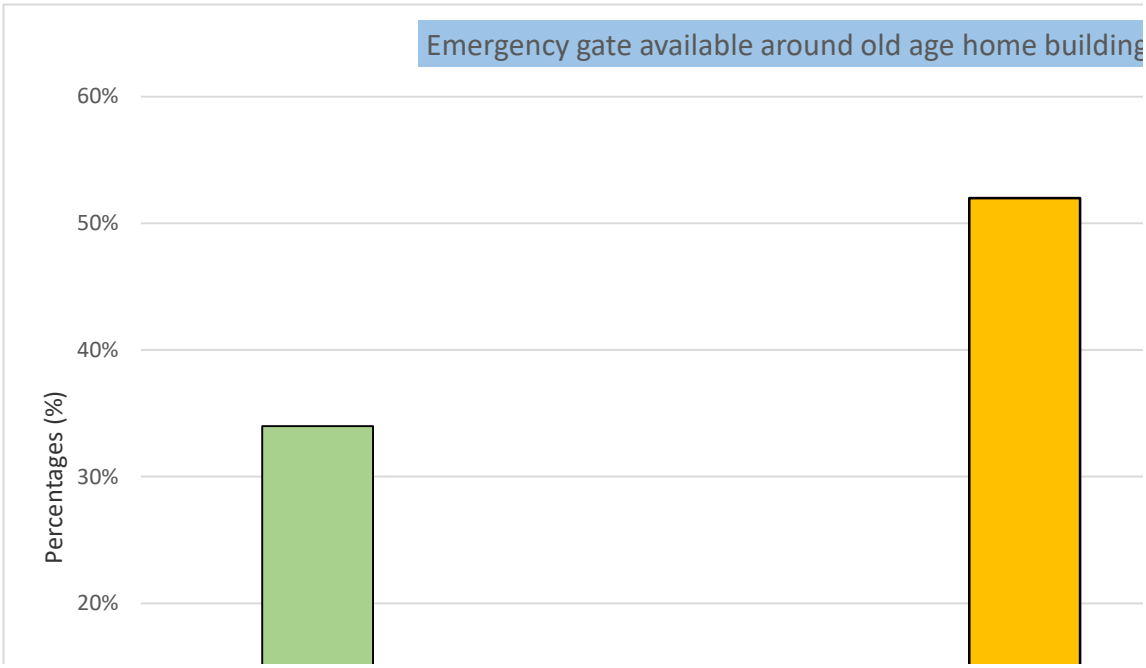

Figure B 6: Emergency gate available around old age home buildings

Emergency gates around the old age home building are prominent to provide a clear, safe way to evacuate a building in case of disasters and or crisis. Fire brigade and police may use the emergency gate to access the old age home in case of disasters. Figure B6, elaborate that majority of the respondents disagree with the allocation of the emergency gate at old age homes as it is shown by 52% of respondents. The study revealed that minority of old age homes understood the significance of emergency gate as indicated by only 34% of the respondents as they were under the impression that one gate can also be used for emergency escape. One of the respondents has indicated that he/she is aware of the importance of the emergency gates, Some of the respondents indicated that accesses to an emergency gate is available, but always locked for safety purposes and the keys are easily accessible by the first responders.

Other issues involving injury, safety and risks at old age homes

Additional information on injury, safety and risks provided by respondents at old age homes:

- Free training for first aid for a non-profit organisation such as old age homes.
- Less number of wheelchairs available at old age homes.
- Rely on unpaid government ambulances for emergency transportation.
- Automatic wheelchairs are expensive and needed to encourage older people mobility.
- Unattended water on the surface can cause injuries to the people.
- All factors that may cause injuries at old age homes are monitored.
- There is little knowledge of Occupational Health and Safety of old age home management.
- There is smaller number of caregivers employed in the old age organisations and it also affects the effectiveness of the services provided to older people.
- Minimal attention is given to older people by caregivers as they have a lot of responsibilities.

According to the literature from Royal Society for the Prevention of Accidents (2019), over half of all fatal accidents suffered by people over 65 are due to a fall and even small falls can cause serious injuries, loss of mobility and independence. The literature reveals that there is a need for old age homes to prepare older people for emergencies and ensure that older people get reasonable support from caregivers. The collected and interpreted data on injuries, safety and risks suggests that more affords to need to be done in order to prepare old age homes for emergencies and make the environment suitable to vulnerable older people taking into considerations their weaknesses.

Old age homes are commonplace for numerous unintended injuries and not on purpose while other injuries result from negligence, lack of ability to prevent them and accidentally. Unsafe conditions, environment areas normally the leading source of injuries and risks. Injuries and risks encountered by older people at old age homes required emergency preparedness. These measures are meant to minimise the potential risks, injuries as well as promoting safe environment, destructions and promoting personal safety checks and home safety checks.

Section C: Emergency preparedness at old age homes

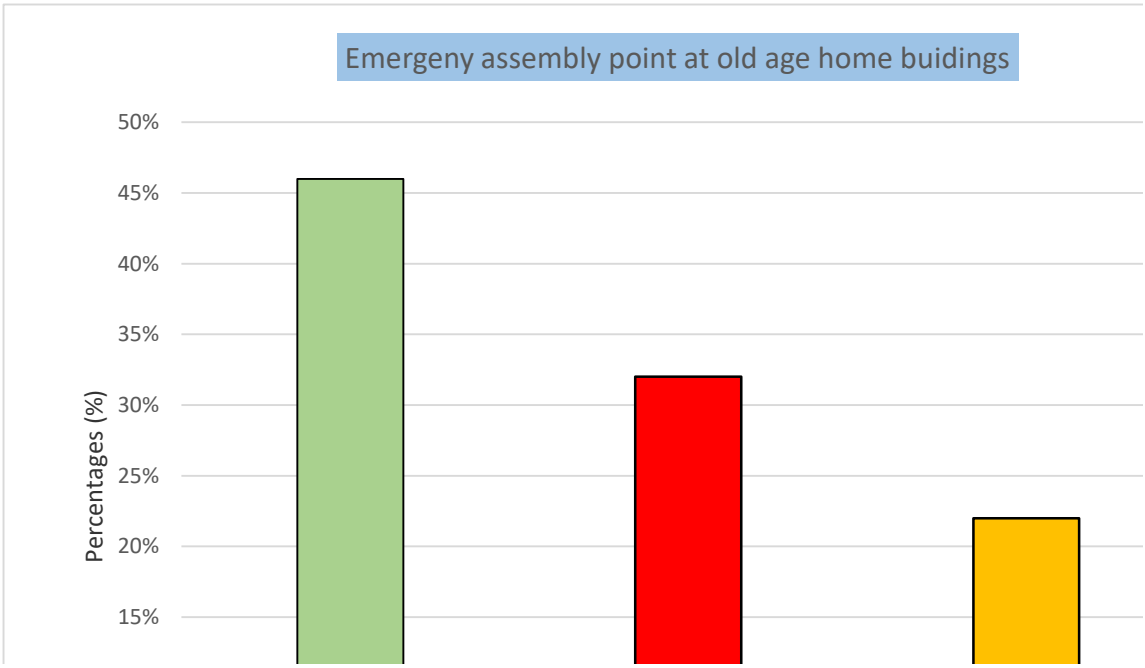

Figure C 1: Emergency assembly point at old age home buildings

It is prominent for old age home buildings to identify and reserve safe emergency assembly point outside the building for an effective, efficient and orderly escape during an emergency. Figure C1, indicate that 22% of the respondents elaborate that the assembly point at their old age homes is not effective and reasonable. Majority of old age homes supports the importance of emergency assembly point as elaborated by 46% of the respondents. Most of the old age homes have dedicated assembly points,

but some of the residences are not aware of the importance of the emergency assembly point. However, some of the dedicated emergency point areas are used as visitors parking and the areas are not marked as an emergency assembly point. Other emergency assembly points have limited space that cannot provide adequate space for individuals to assemble. Unmarked assembly point will confuse visitors and residents during emergency evacuation and can cause unsafe conditions such as stampede. Some old age homes properly displayed signage that indicates the location and direction of the assembly point.

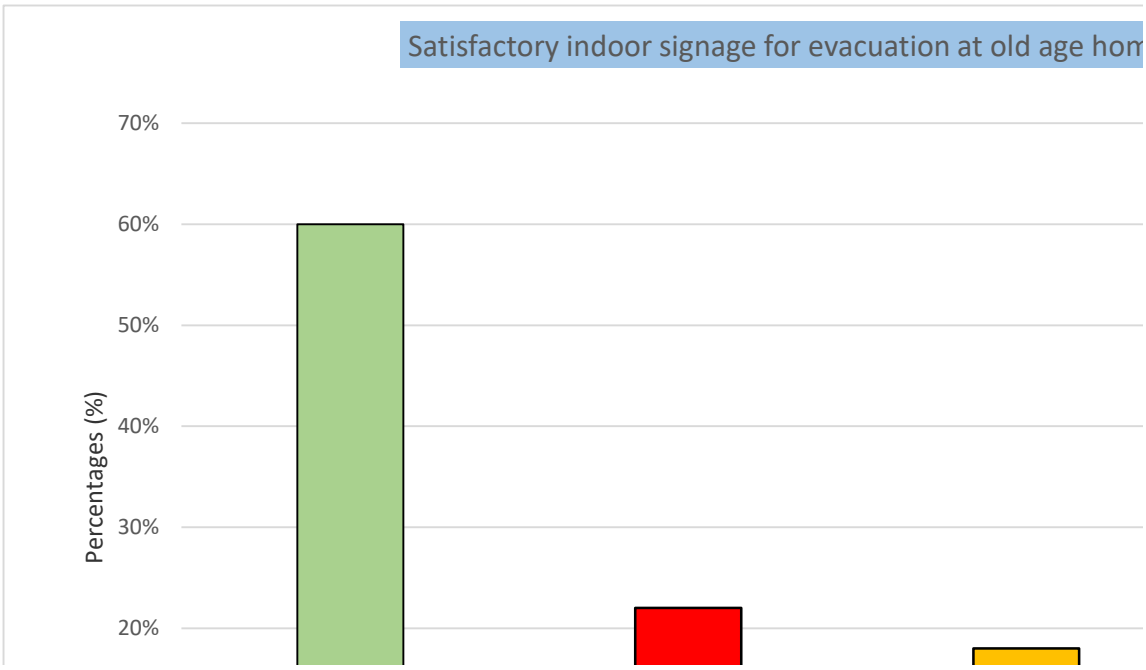

Figure C 2: Satisfactory indoor signage for evacuation at old age homes

It is important to have indoor signage that leads occupants to different directions during an evacuation in case of emergencies at old age homes. Figure C2, indicates that 18% of the respondents do not realise the importance of indoor signage for emergency evacuation. Majority of the respondents comprehended the display of indoor signage for evacuation purposes at old age homes as it is encouraged by 60% of the respondents. In some old age homes, the indoor displayed signage indicates directions from inside the building to the emergency assembly points using different routes. Other old age

home buildings have signage that is not linked to emergency assembly point due to inadequate knowledge.

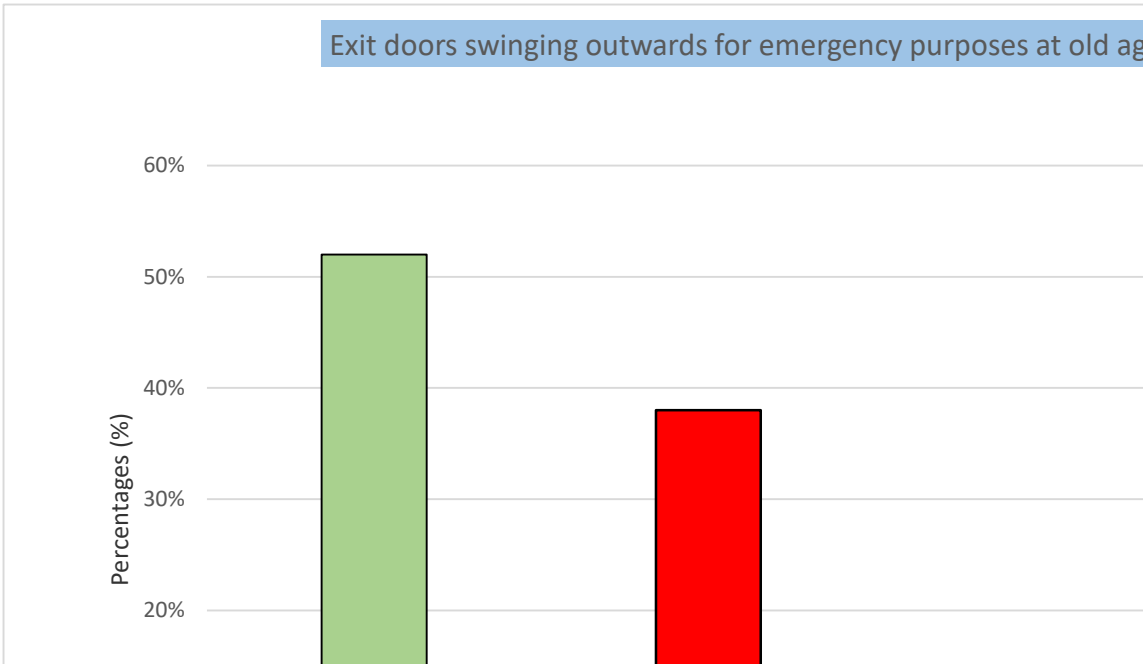

Figure C 3: Exit doors swinging outwards for emergency purposes at old age homes

Exit doors at old age home buildings are ought to be installed in such a way that they swing outwards to allow easy movements for evacuation purpose during emergencies. Figure C3, indicates that only 10% of the respondents indicated that the emergency exit doors at their old age homes swing inside. The majority of the respondents valued the above matter as it is stimulated by 52% of the respondents that noticed the importance of opening the emergency doors by swinging outside. Hence, some of the respondents suggested exchanging the existing doors that swing outside while other respondents indicated that they have many doors that are used for emergency purposes.

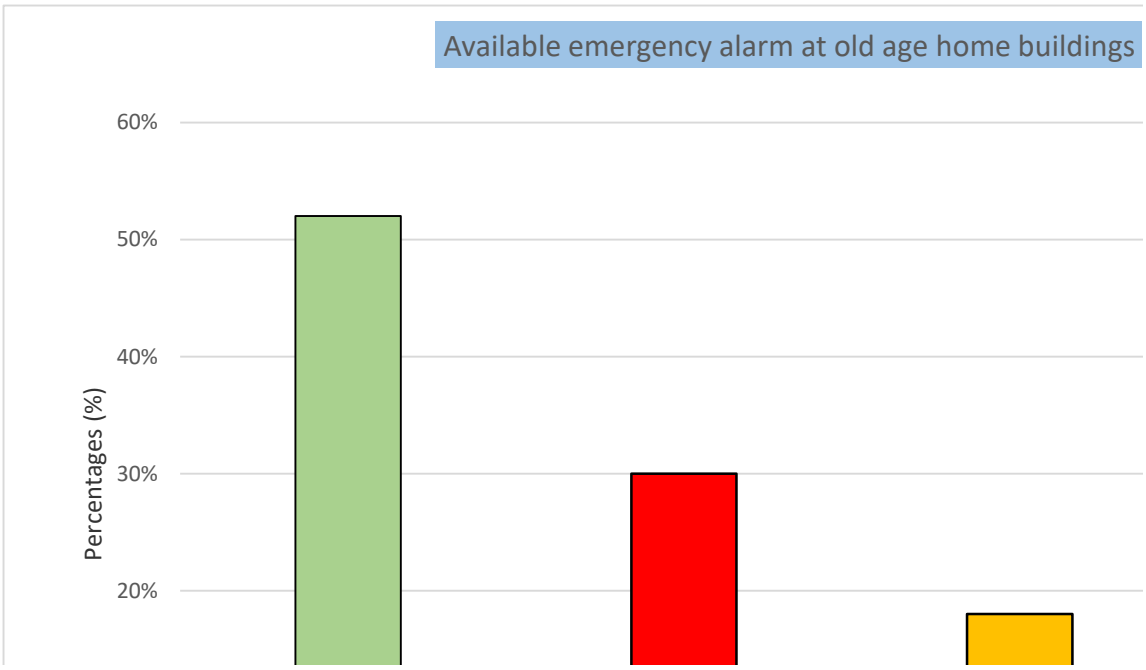

Figure C 4: Available emergency alarm at old age home buildings

Installation of emergency alarm systems at old age home institutions is crucial to warn occupants of any emergencies so they can safely evacuate the premises safely. Figure C4, indicates that the minority of the respondents did not install emergency alarm at their old age homes. Majority of the respondents promoted the utilisation of emergency alarms at old age homes as it is supported by 52 % of the respondents. Thus, some respondents indicated that they have installed emergency alarm in every house while others have installed emergency alarms in all the bedrooms of older people. Some respondents indicated that they have only one emergency alarm that is utilised by emergency coordinators while minority of the respondents do not have any alarm system at their old age homes.

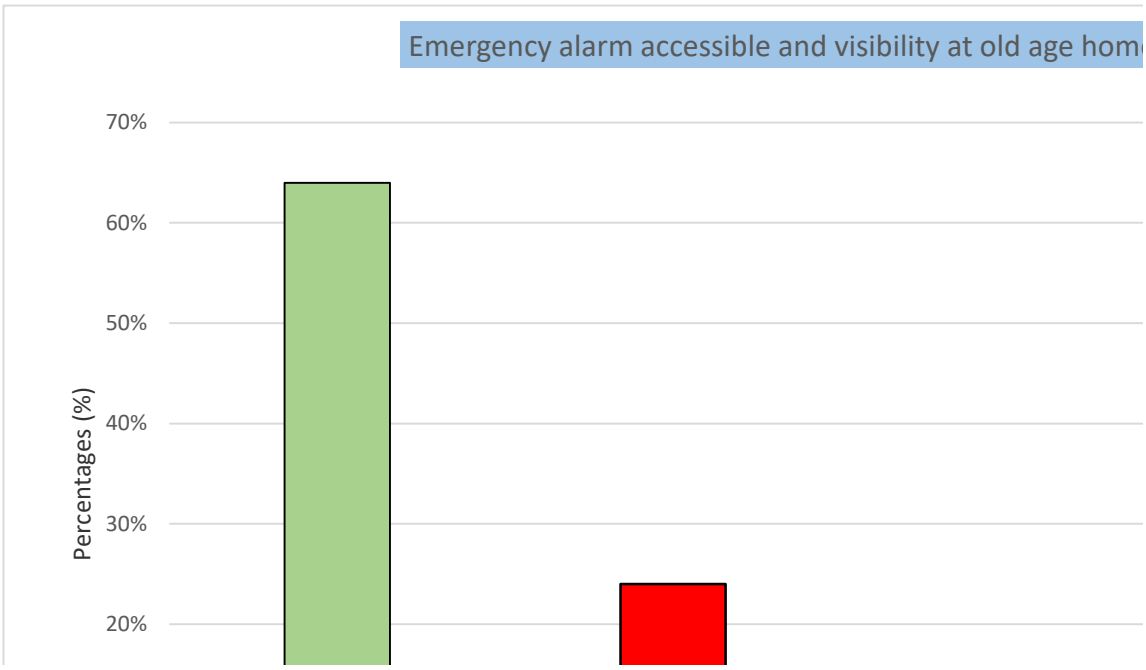

Figure C 5: Emergency alarm accessible and visibility at old age homes

The installed emergency alarm at old age home institutions must be visible and accessible to the public for activation during emergencies. Figure C5, determines that only 12% of the respondents elaborate that emergency alarms are not easily accessible and visible at their old age homes. Majority of the respondents promoted the easy accessibility and visibility of emergency alarm to all at old age homes as it is encouraged by 64 % of the respondents. Other respondents indicated that the alarm system is situated in open areas such as reception, but there is no signage to indicate the location of the alarm systems. This implies that not everyone can easily notice and activate the alarm in case of emergencies. The majority of the old age homes indicated that they have no alarm system in place, they use cell phones in case of emergencies, while others showed that they have an alarm system that is effectively used by individuals at old age homes.

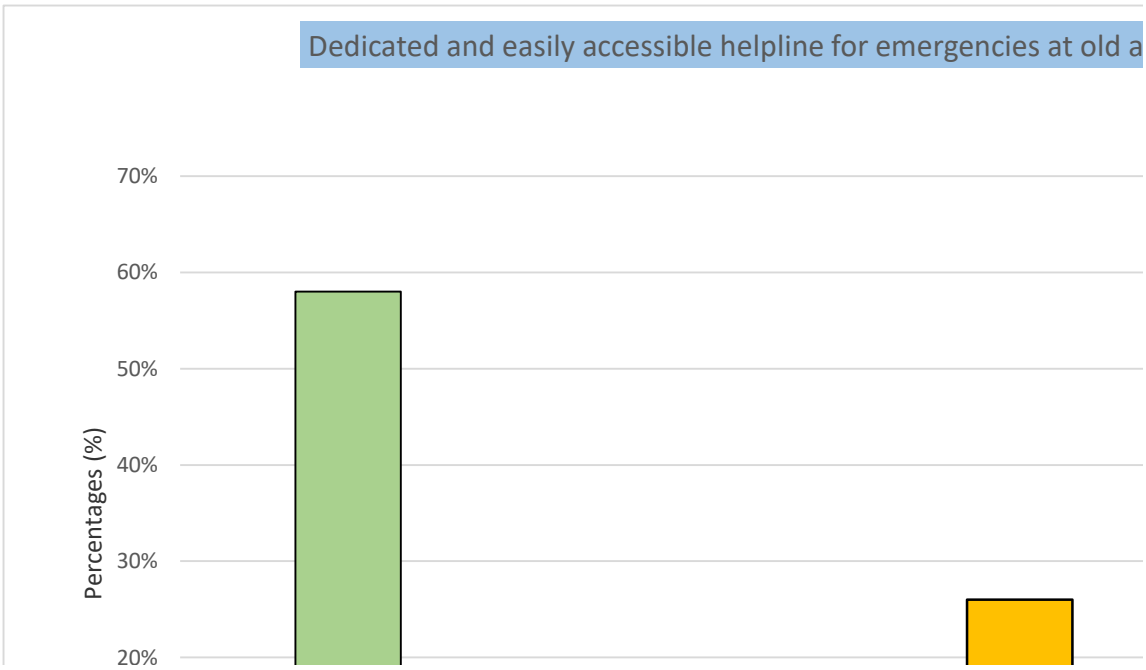

Figure C 6: Dedicated and easily accessible helpline for emergencies at old age homes

It is important for old age home organisations to have a dedicated and easily accessible helpline that assist people to communicate in case of emergencies at old age homes. Figure C6 realizes that 26% of the respondents indicated that they have no emergency helpline at old age homes Majority of the respondents coincided with the emergency helpline use at old age homes as it is encouraged by 58 % of the respondents. A variety of old age homes use their reception as emergency helpline but are operating only for eight hours during the day. While other old age homes indicated that they have dedicated helpline operating for twenty-four hours and seven days a week. Other respondents indicated that they don't have dedicated helplines to assist in case of emergencies.

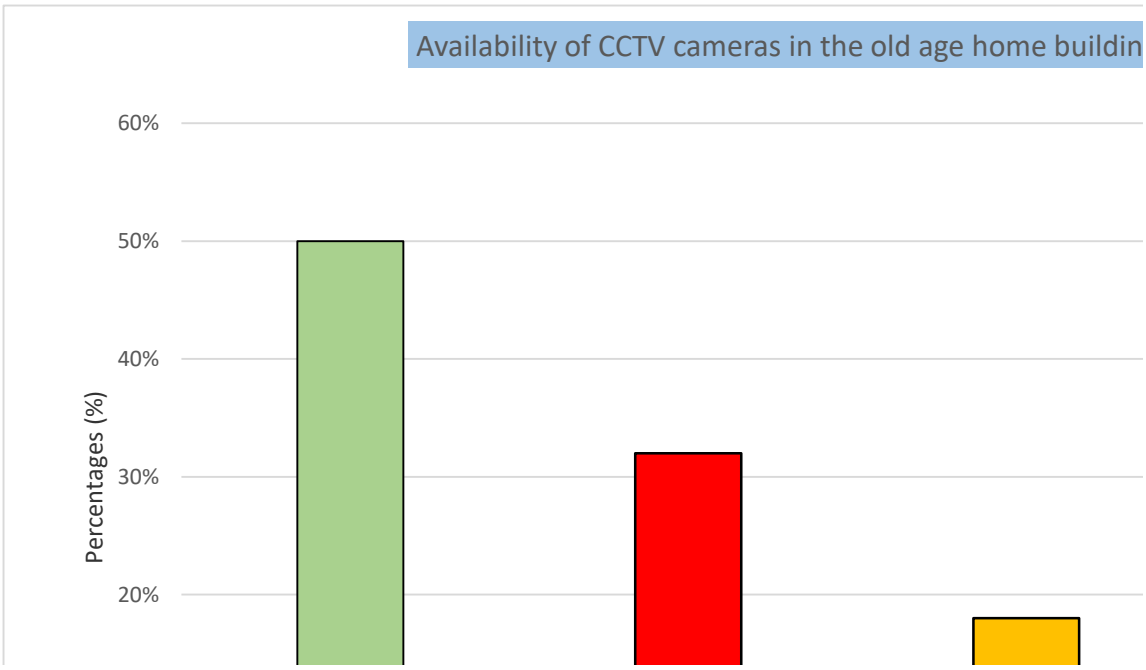

Figure C 7: Availability of CCTV cameras in the old age home buildings

CCTV cameras are important as they assist in resolving any case history by recording voices and movements. Not only that but they can protect assets, individuals, assist in monitoring the productivity of employees and promote work ethics. Installation of CCTV cameras at old age home institutions is crucial and beneficial during emergency situations. Graph C6, indicates that only 32% of the respondents disagree with the availability of CCTV cameras at old age homes. Majority of the respondents encouraged the availability of CCTV cameras at old age homes as it is supported by 50% of the respondents. Most of the respondents elaborated that installation of the CCTV cameras is costly as the system requires computer system and the appointment of the personnel for monitoring. Other respondents indicated that they have effective CCTV cameras that are linked to the management cellphones for easy monitoring . A number of respondents indicated that they are not having the CCTV cameras but rely on physical security for monitoring and alarm systems.

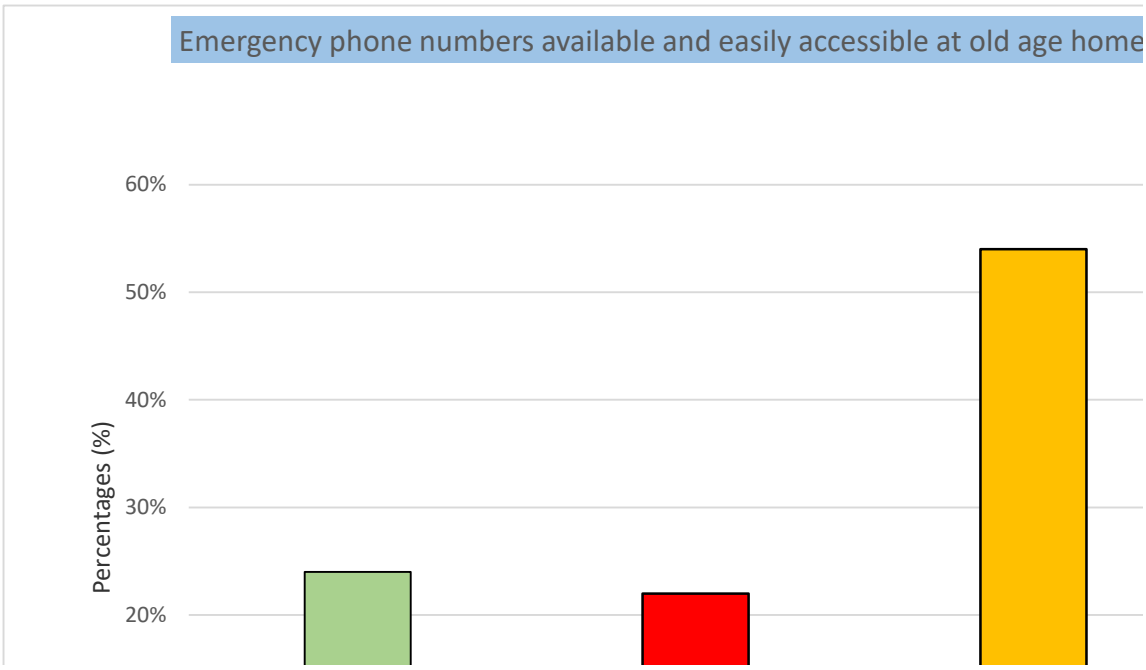

Figure C 8: Emergency phone numbers available and easily accessible at old age homes

Emergency phone numbers at old age homes are ought to be displayed at an easily accessible point to ensure that every individual can access them without enquiring to any person in order to make calls in case of emergencies. Figure C19, reveals that 54% of the respondents disagree with the emergency phone numbers availability and easy accessibility at old age homes. A minority of the respondents showed an understanding of displaying emergency numbers as promoted by only 24% of the respondents. Other responded indicated that most of the emergency numbers are not toll-free and not accessible if someone has no airtime. Various respondents indicated that emergency telephones are written in the emergency list in the manager's office. Other respondents indicated that they have emergency telephone numbers not displayed on the wall, but they are on the cellphone speed dial.

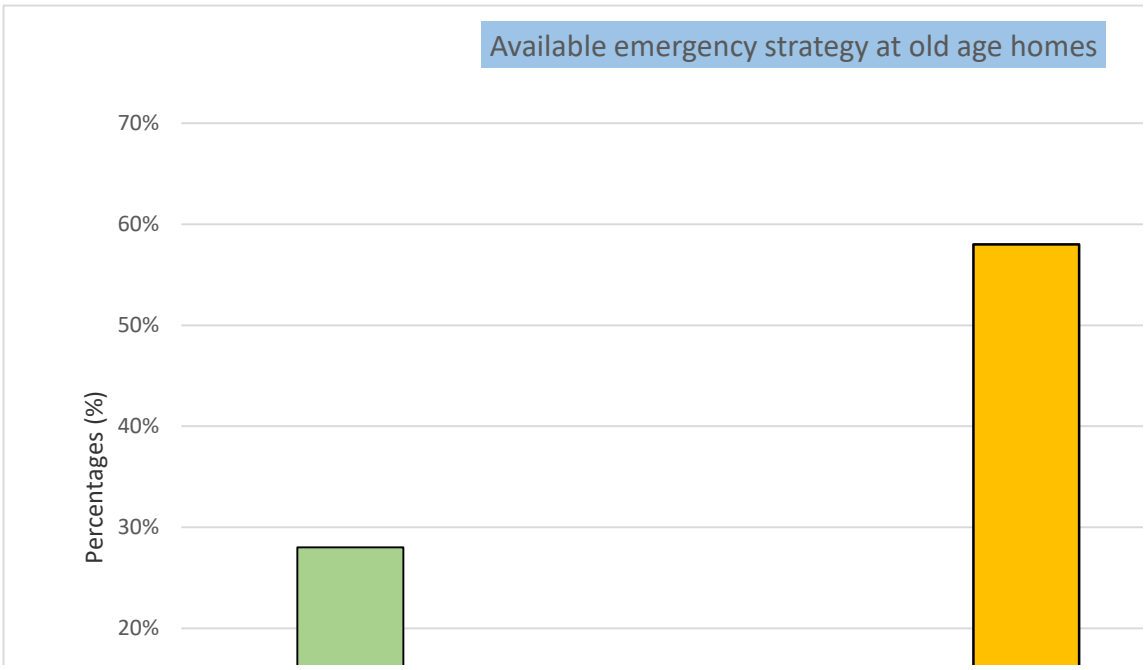

Figure C 9: Available emergency strategy at old age homes

It is eminent to have an emergency strategy in place at old age home institutions to plan for the unforeseen, assist with emergency response strategies, mitigation procedures and allocation of available resources. Figure C9, explains that 58% of the respondents disagree with the availability of emergency strategy at old age homes. The minority of the respondents agreed to have an emergency strategy as promoted by 28% of the respondents. Most of the respondents elaborated that they have integrated the emergency strategy with the emergency preparedness plan while other respondents indicated that they are not aware of the difference between the emergency strategy and the emergency plan.

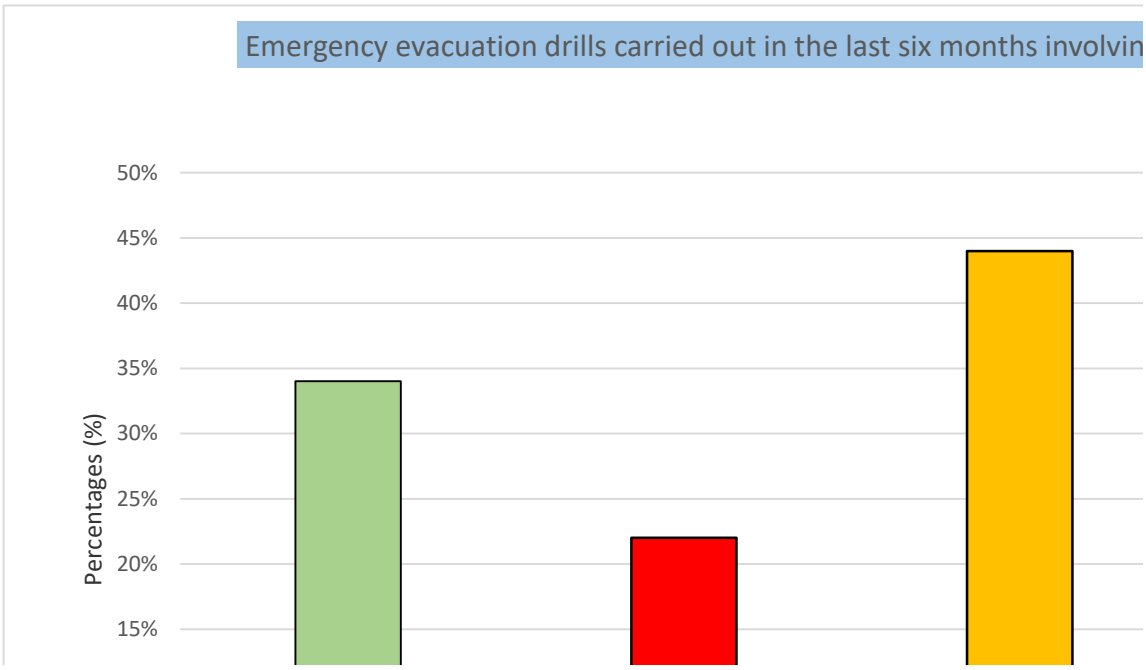

Figure C 10: Emergency evacuation drills carried out in the last six months involving older people

It is valuable to conduct emergency drills that involve older people at old age homes every six months to practice with older people and employees on approaches to be utilised to evacuate the building during emergencies. Figure C9, divulges that 44% of the respondents disagree with the six-month emergency drills with older people at old age homes. Most of the respondents supported the emergency drills that involve older people as it is validated by 34% of the respondents at minority. Most of the respondents did not support the emergency drills that are conducted by stakeholders every six months. The respondents indicated that most stakeholders are unable to coordinate and manage emergency drills every six months. A selection of respondent indicated that they managed to have minor drills that are insufficient without other stakeholders, though it seems to have less impact on emergency preparedness for older people. Other respondents elaborated that they never had any drill with older people or other stakeholders because they lack knowledge and information regarding emergency drills.

Other issues involving emergency preparedness at old age homes.

Additional information on emergency preparedness provided by respondents at old age homes:

- Respondents indicated that disaster management and stakeholder emergency preparedness drills must be conducted frequently.
- Training and awareness campaigns provided by the government at old age homes regularly.
- A few older people are unable to read and hear so they are facing a challenge of understanding the emergency alarm warning.
- In some old age homes, the emergency exit doors are not available.
- There is no officials and management at old age home that understands emergency preparedness policies and procedures.
- Several old age homes are unable to afford their own car that will be available to transport older people at any time of the day.
- Fire services and disaster management telephones numbers are not for free, it means someone needs to have airtime to report incidents.
- Some respondents indicated that they are experiencing cell phone network challenge.

The collected and interpreted data indicates that old age homes are experiencing various challenges in case of emergency preparedness for older people. There are highlighted challenges that involve required emergency information and lack of strategic planning documents. It is significant to furnish information for emergency preparedness before incident occurs. Providing information in advance to older people at old age homes will promote safety and minimise risks.. All the emergency evacuation plans, fire safety plans are obliged to be displayed, communicated to the individuals for easy implementation during emergencies. Capacity building training and drill exercises always bear better results during the time of emergencies. It is imperative for old age homes institutions to ensure that emergency drills and training are always executed effectively.

Section D: Fire safety at old age homes

Figure D 1: Fire extinguisher at old age home buildings

Installation of fire extinguishers at old age home institutions is crucial to extinguish small fires, minimise burn injuries, limit pollution, protect the environment save lives and property. Figure D1, ascertains that only 16% of the respondents disagree with the availability of fire extinguishers at old age homes. Majority of the respondents understand the importance of the availability of fire extinguishers at old age homes. Thus, it is coincided by 62% of the respondents that indicated that they have installed fire extinguishers at their old age homes. The other respondents indicated that they have installed insufficient number of fire extinguishers in their buildings due to lack of knowledge of the required number. However, some respondents indicated that they only have fire extinguishers in the cooking area.

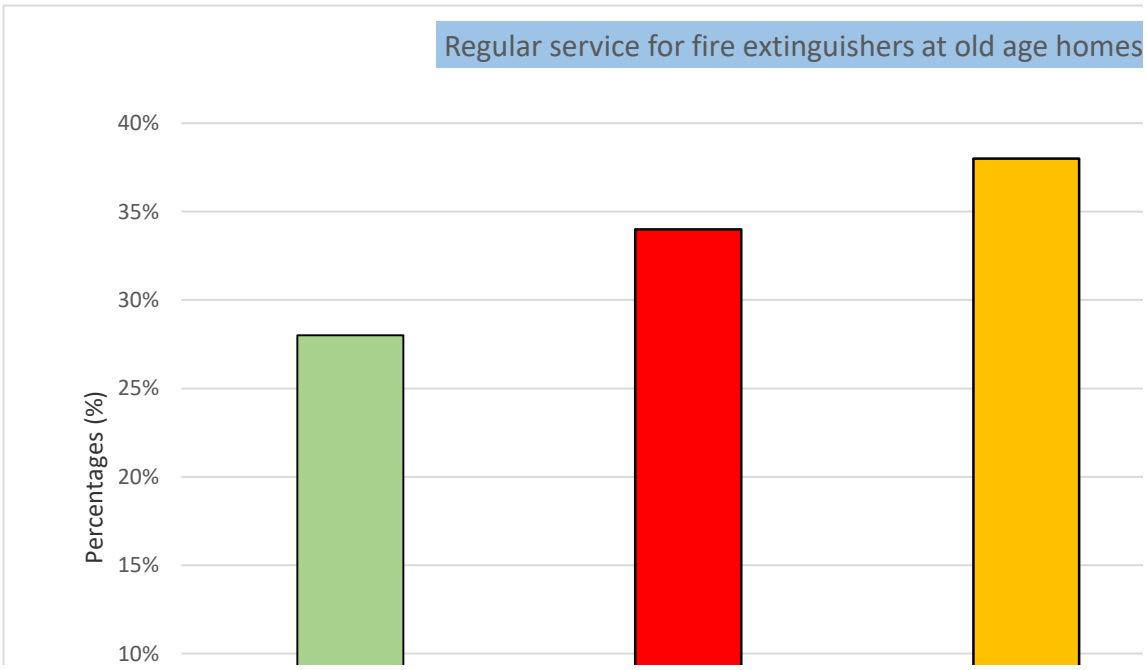

Figure D 2: Regular service for fire extinguishers at old age homes

It is crucial that the installed fire extinguishers at old age home institutions be serviced regularly. This is to ensure that they are in good order, to check expiry dates and monitoring of the compressed gas pressure. Figure D2, illustrate that only 38% of the respondents showed that fire extinguishers at old age homes are not regularly serviced. Other respondents valued importance of regular service of fire extinguishers at old age homes. Thus, it is advocated by 28% of the respondents that elaborated that they service the fire extinguishers every year. Various respondents indicated that they have agreement with service providers to service fire extinguishers every year. While other respondents indicated that they have since received fire extinguishers as donations and they do not have money to service them.

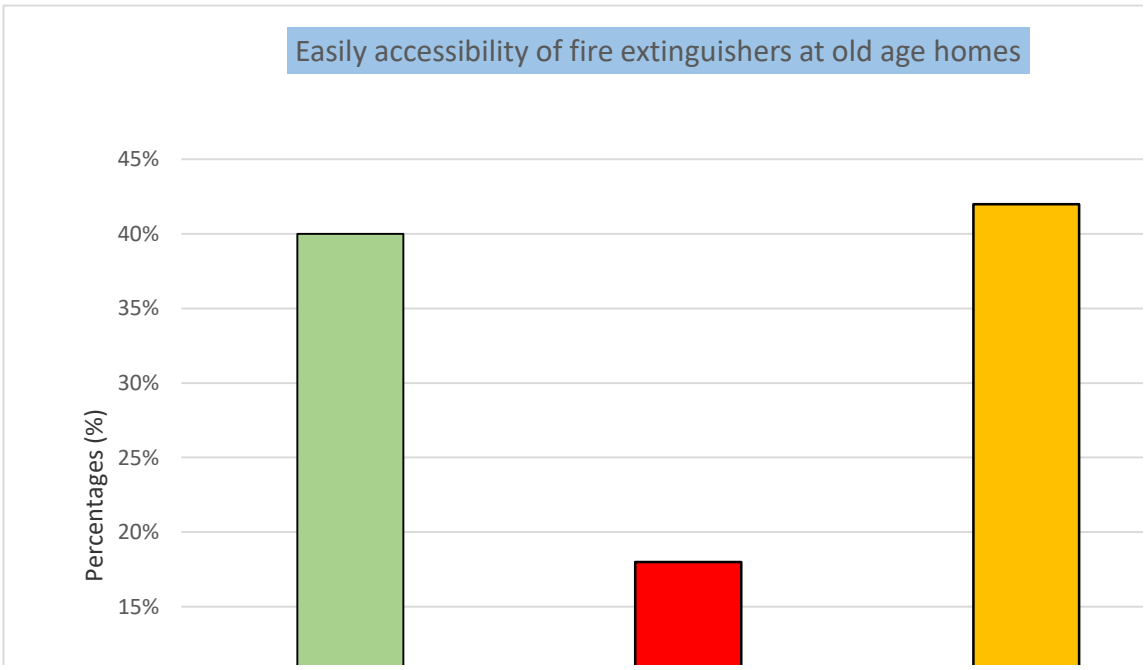

Figure D 3: Easily accessibility of fire extinguishers at old age homes

It is vital that the installed fire extinguishers at old age home be easily accessible to the users. They must be easy to crap position and the travel distance to the fire extinguisher should be minimal to lessen the risks in the event of fire. Figure D3, demonstrate that only 42% of the respondents disagree with the easily accessible fire extinguishers at old age homes. Respondents have supported the easy accessibility of fire extinguishers at old age homes as it is indicated by 40% of the respondents.

Majority of the respondents indicated that the fire extinguishers are not easily accessible as they are locked in the offices for safety purposes while other fire extinguishers are kept in the storerooms and inside the kitchen units. In cases of fire emergencies individuals will struggle to access the extinguishers and will put everyone at risk. Majority of the respondents indicated that all the available fire extinguishers are mounted on the wall as advised by service providers.

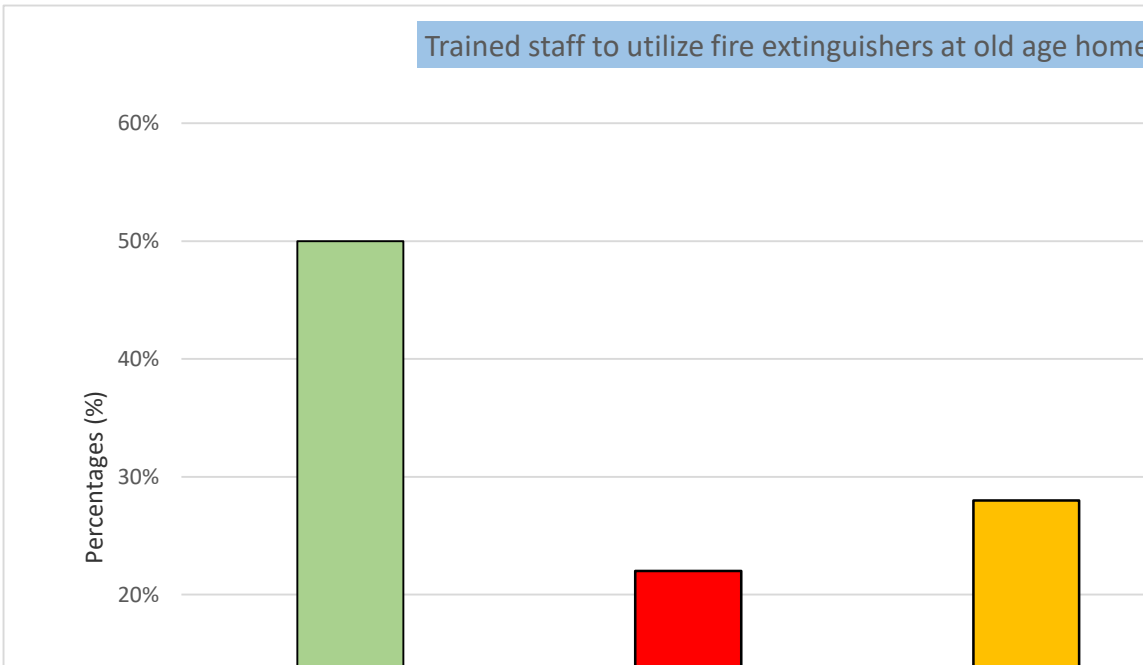

Figure D 4: Trained staff to utilise fire extinguishers at old age homes

Provision of effective training to individuals at old age home on fire extinguishers is essential to improve fire safety. On the other hand, this can give individuals more confidence to effectively use extinguishers. Figure D4, reveals that 54% of the respondents did not train their staff members on the use of fire extinguishers at old age homes. Nevertheless, some of the respondents encouraged the training of staff members on fire extinguishers at old age homes as it is demonstrated by 42% of the respondents that undergone training.

Most significantly, the respondents indicated that fire safety training is expensive. They are experiencing shortage of funds. Despite this, the respondents acknowledge that they have a challenge with individuals that are unable to utilise fire extinguishers, though they only manage to train some individuals. The training that they received it was once-off and no refresher training attended due to budget constraints.

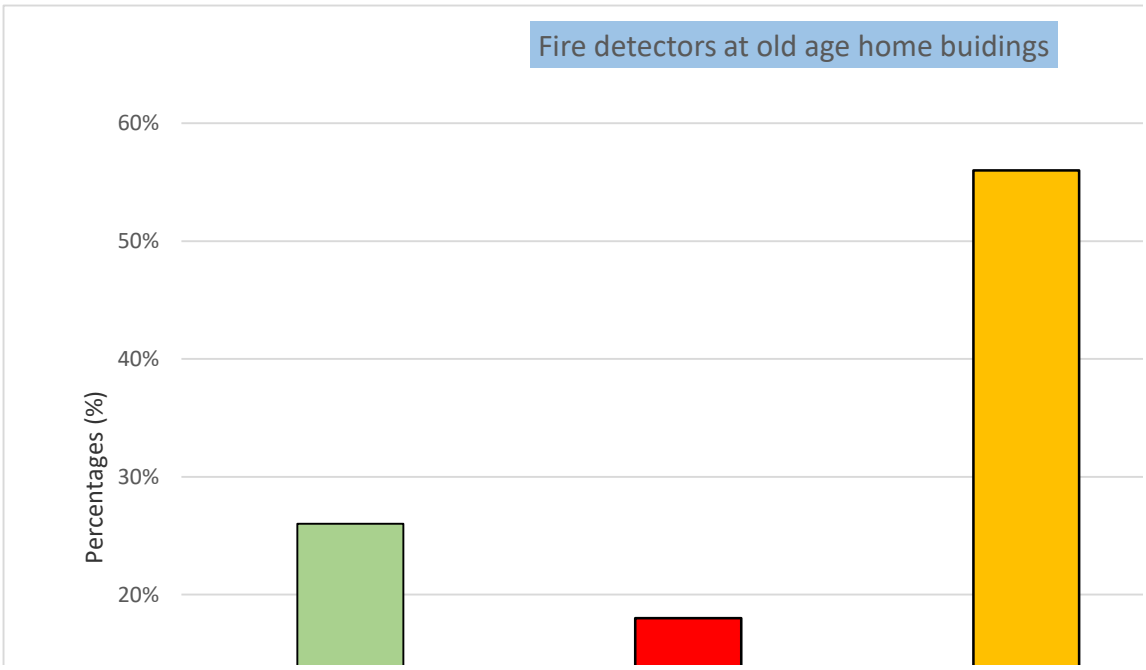

Figure D 5: Fire detectors at old age home buildings

Fire detectors at old age home buildings are valuable and advantageous as they have a smoke alarm device that detects smoke in the air. Therefore, alert against the potential fire, they can warn individuals before smoke inhalation and save lives. Figure D5, assent that 56% of the respondents disagree with the availability of fire detectors at old age home buildings. Furthermore, other respondents promoted the availability of fire detectors at old age homes as it is proven by 26% of the respondents.

The respondents explained that they were not aware of the fire detectors. While others have installed the fire detectors but were dysfunctional. Majority of the respondents elaborated that they did not install fire detectors because they think they are expensive. Some respondents have highlighted that they installed fire detectors and they are effective as they detect smoke and alert the residence for immediate intervention.

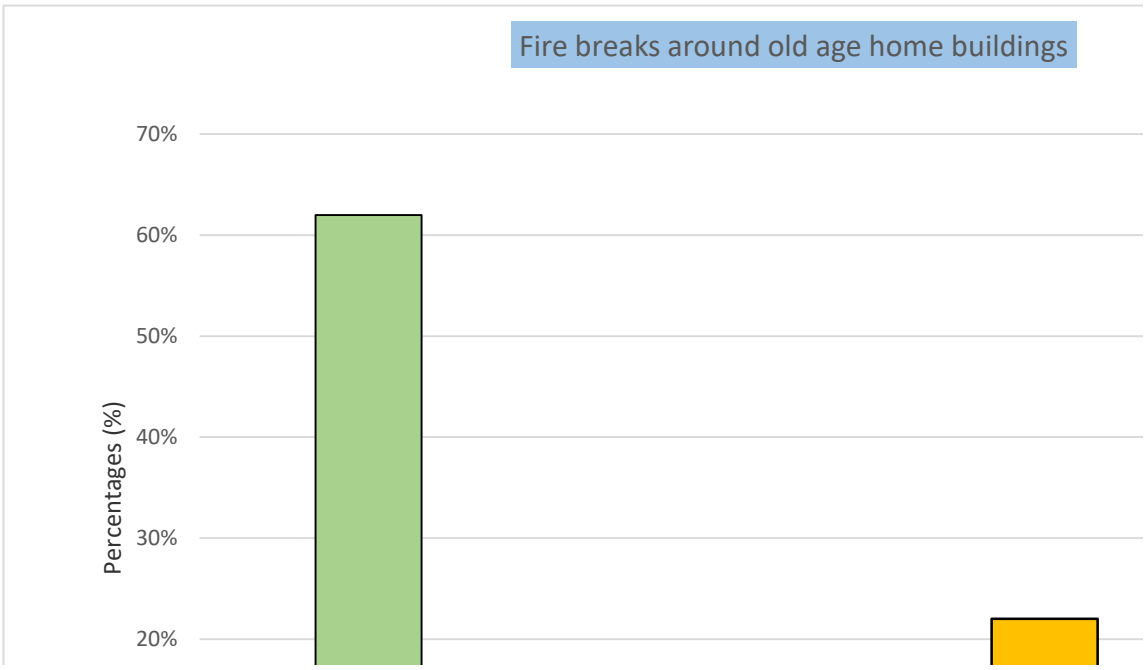

Figure D 6: Fire breaks around old age home buildings

Provision of fire breaks around old age home buildings is prominent, strategic as they control and contain small fires from spreading from one area to another. Figure D6, illustrate that 22% of the respondents that disagree with the provision of fire breaks around the old age home buildings. Majority of the respondents promoted the provision of fire breaks around at old age homes as it is shown by 62% of the respondents. Most of the respondents indicated that they provide fire breaks as they clean the yard frequently while others indicated that pavements around the building act as a fire break that prevents the fire from spreading to other nearby buildings.

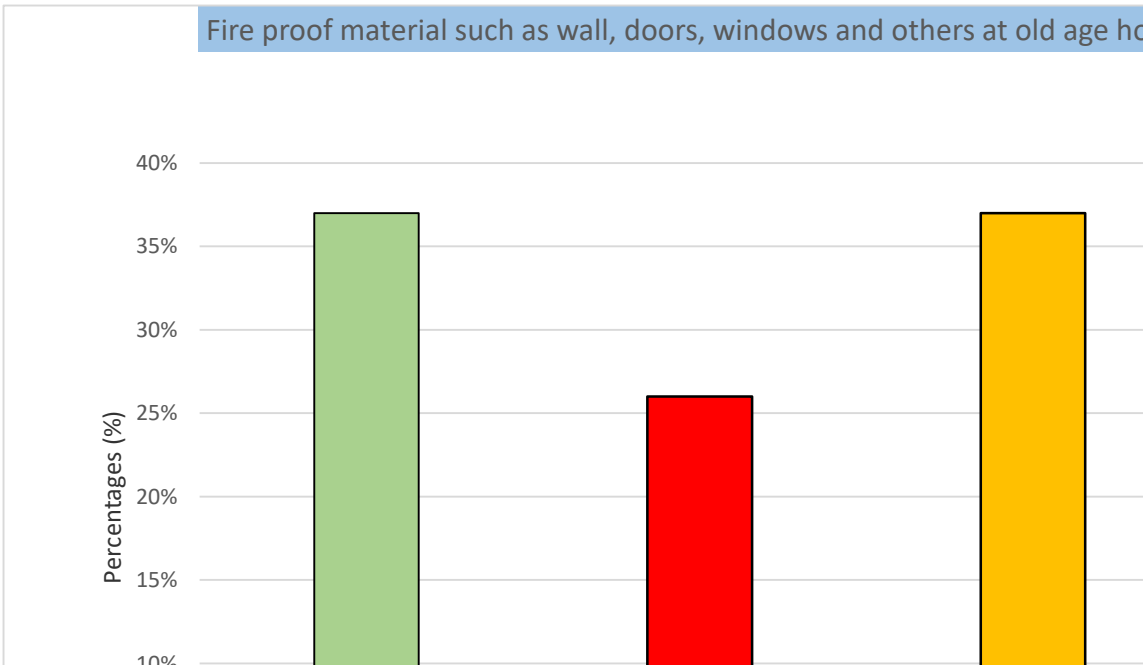

Figure D 7: Fireproof material such as wall, doors, windows and others at old age home building

Availability of fireproof material such as wall, doors, windows and others around old age home buildings are essential. Fireproof material minimise the spread of fire by taking longtime to affect structures and due to non-combustibility. Figure D7, indicates that only 26% of the respondents disagree with the availability of fireproof material around the old age home buildings. Furthermore, some of the respondents supported fireproof material at old age homes as it is demonstrated by 37% of the respondents. Majority of the respondents shown that they were not aware that there is fireproof material that can be used to minimise the spread of fire. The respondents explained that the use of fireproof material during the construction of new building and replacement of the existing material for renovations will be expensive for old age homes.

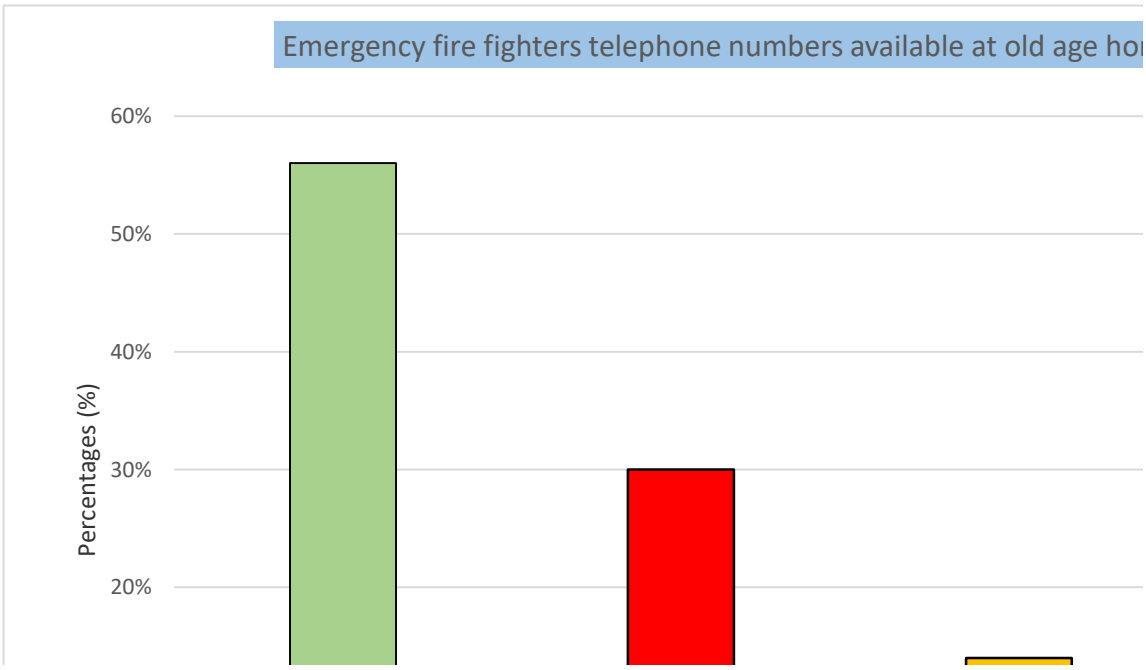

Figure D 8: Emergency firefighters telephone numbers available at old age home buildings

Availability of emergency firefighters telephone numbers at old age home is significant to allow everyone in the building to call firefighters in case of fire emergencies. Figure D8, reveals that 30% of the respondents disagree with the availability of emergency firefighters' numbers at old age home buildings. Some of the respondents understood the availability of emergency firefighters at old age homes as it is determined by 56% of the respondents. Majority of the respondents indicated that they have emergency contact details list displayed at reception wall while others indicated that they are displayed in the management office. It was only minority of the respondents explained that they don't have emergency contact details specifically for fire services, but they have SAPS contact details that connect them to the municipal fire service.

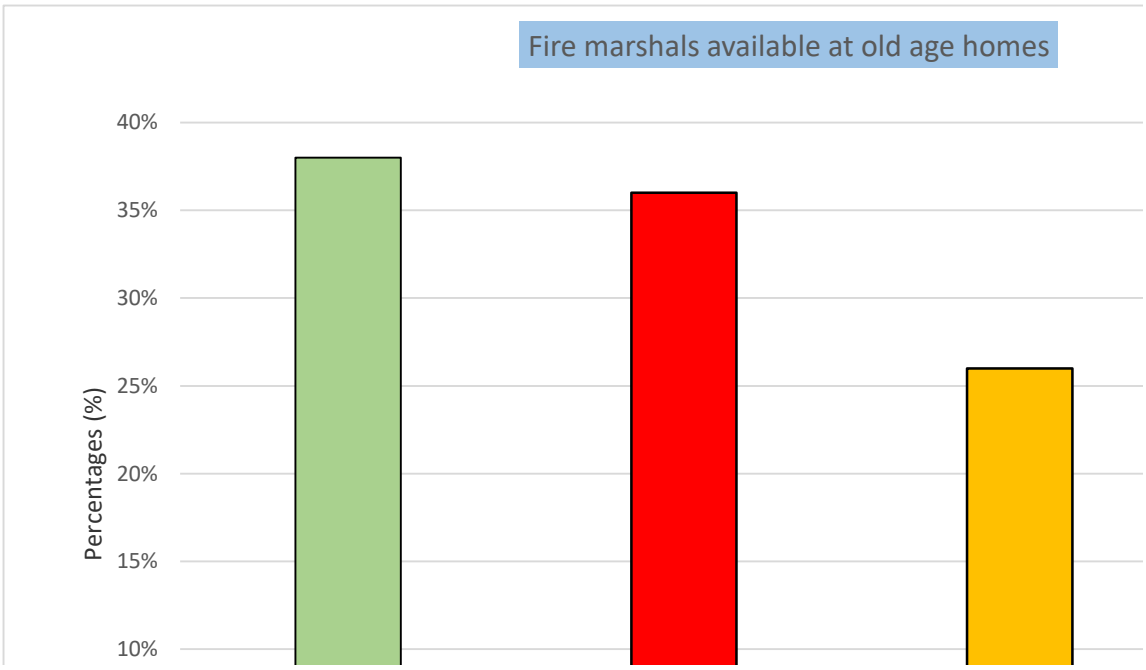

Figure D 9: Fire marshals available at old age homes

Availability of fire marshals at old age home buildings is important to assist in extinguishing small fires safely. They can also investigate the origins of fire in the building and the surroundings. Figure D9, suggests that 26% of the respondents disagree with the availability of fire marshals at old age home buildings. Majority of the respondents corroborated with the availability of fire marshals at old age homes as it is authenticated by 38% of the respondents. Few respondents indicated that caregivers are appointed as fire marshals. They are operating on a shift system, while others elaborated that they have appointed cleaners to work as fire marshals during the fire emergencies. Other respondents specified that fire marshals are not appointed at their old age homes due to lack of knowledge.

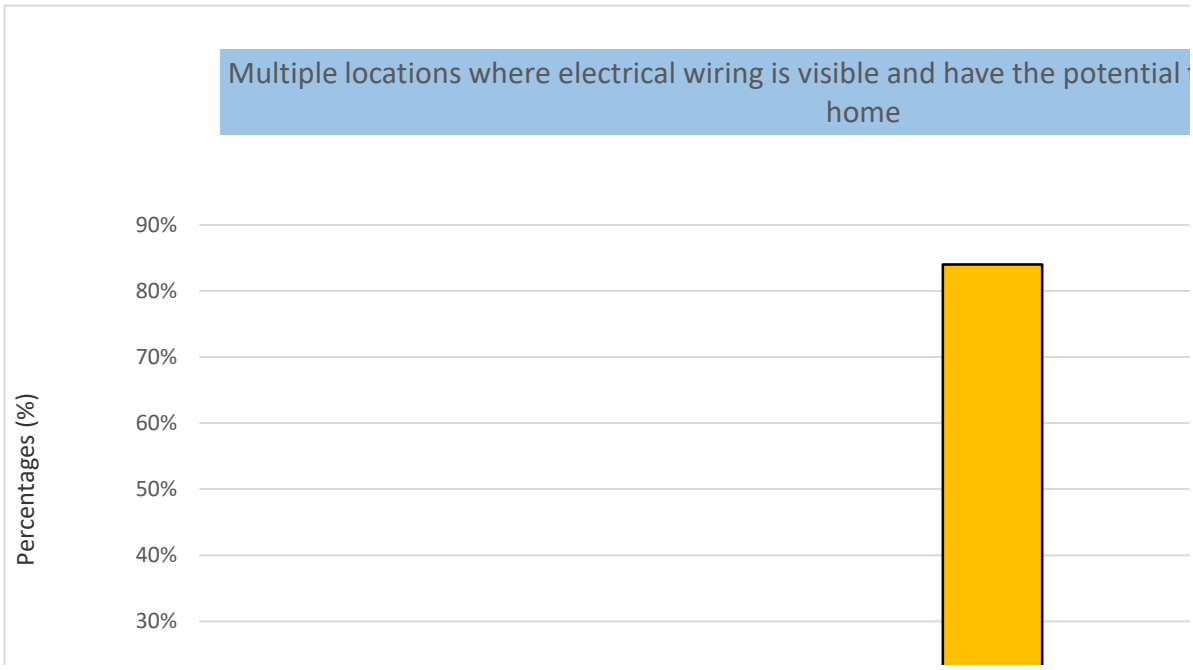

Figure D 10: Multiple locations where electrical wiring is visible and have the potential to cause fires at old age home residents

Visible electrical wiring at multiple locations at old aged homes can cause fires at old age homes. It is important that visible wiring is eliminated at old age homes to reduce fire risks. Figure D10, elaborate that majority of the respondents did not notice any electrical wiring at old age home buildings as shown by 84%. None of the respondents supported the visibility of electrical wiring at old age homes issue as it is corroborated by no records of respondents. Most of the respondent's records suggest that most of the old age homes are safe from electrical hazards as indicated by protected electrical wires that pose danger to individuals

Other issues involving fire risks at old age homes

Additional information on fire risks elaborated by respondents:

- Few respondents elaborated a lack of knowledge on fire resistance material by old age home management and employees.
- Unsafe electric sockets are covered, and fire extinguishers are easily accessible was mentioned by other respondents.
- Training for fire extinguishers is not benefiting older people as they are no longer active and easily forget.
- Telephone numbers for emergency fire services of the municipality is not a toll-free service.
- A few respondents did not know about the fire detectors
- Other respondents elaborated a lack of knowledge on fire safety training institutions and the costs of training
- Fire drills are conducted at old age homes but without the involvement of emergency first responder's stakeholders from the government.
- Electrical fire safety awareness is important for old age residence, employees and visitors.
- Causes of fires are old age homes were mostly not known while other respondents suspect that fires start from the cooking areas.

It is vital for older people age at old age homes to be familiar with fire safety exit emergency doors of their building and always remember to call fire brigade services for assistance. Fire extinguishers should properly utilised by competent individuals for effective results, and to manage or minimise fires. Individuals at old age homes are ought to always remember the safe way of vacating the building in case of fire disasters to reduce the injuries, stampede and death cases.

5.3 Conclusion

In this chapter, the assessment of fire safety and emergency preparedness at old age homes was analysed based on the respondent's information gathered. The researcher presented authentic, reliable data logically to determine the trends, and relationships between literature reviewed.

(a) Conditions of fire safety

This study revealed that 56% of the old age homes did not have fire detectors. According to studies conducted from 2007 to 2011, three of every five home fire deaths resulted from fires at homes that are not having smoke alarms or smoke alarms are not working (Shaver, 2017). Other study reports reveal that, out of the 89 old age homes that were inspected, 27 were in the process of upgrade and installation the necessary safety equipment, 28 did not comply at all, four homes closed down and seven homes were classified for other usage due to non-compliance (Ekurhuleni Metro, 2014).

The data collected from this study support the literature as most of the old age homes visited during the study have not installed smoke alarms to detect fire around their buildings. Installation of fire safety equipment such as fire detectors at old age homes is a challenge.

(b) Level of awareness on fire safety and emergency preparedness

The study revealed that most of the old age homes at Polokwane are experiencing a challenge in executing emergency fire drills while others had emergency drills without relevant stakeholders for emergency preparedness.

The literature reviewed indicated that one retirement community village on the Isle in Venice, Fla, has taken preparedness to extraordinary lengths (Graham, 2012). Each year, it evacuates more than 10 percent of independent living residents by bus to a site 145 miles away to learn how to deal with unexpected events (Graham, 2012). The old homes had not addressed the need for adequate staff evacuation during emergencies; 15 didn’t detail how patients’ needs for items such as feeding tubes, ventilators or oxygen would be handled (Graham, 2012). Both studies have elaborated on the

challenge of stakeholder involvement and inadequate staff as a challenge to achieve effective emergency drills. The study concludes that there is a deficiency in stakeholders' involvement and support for effective emergency preparedness drill at old age homes.

This study discovered that most of the old age homes are not having emergency strategies in place for guidance. According to a study conducted in 2013 for the Fukushima nuclear disaster, there was a high mortality rate due to initial evacuation, suggesting that evacuation of older people was not done through the best lifesaving strategy (Gilmour and Kami, 2013). The literature also reveals that lack of strategic plans such as evacuation plans and emergency plans at old age homes leads to increased death cases. The study concludes that development and implementation of emergency strategic plans at old age homes are deficient .

Emergency strategic plans assist in planning for emergency fire drills as part of awareness for old age home safety. One of the studies highlighted the importance of home fire safety education and fire prevention efforts geared towards older adults cover multiple aspects plan, the importance of alarms, proper installation and care of smoke alarms, adequate setting of hot water heater temperatures and safe cooking practices (Carlee et al, 2014). The study concluded that older adults' lack of home fire safety preparedness is an underreported health hazard (Carlee et al, 2014).

Gerges, Mayouf, Moore and Rumley (2016), conducted a study in high rise residential building to identify the challenges and the factors that affect occupants' decisions during an emergency. The study revealed that occupants have limited knowledge and skills on how to deal with fire emergencies (Gerges et al, 2016). The study discovered that occupants tend to ignore the fire alarm and usually, they investigate if it is true or false (Gerges et al, 2016). The study concludes that fire safety awareness and education at old age homes are neglected.

(c) Causing factors leading to fire disasters at old age homes

According to the data collected from this study, most of the respondents indicated that most of the causes of fires at old age homes are not known. In 2018 it was also reported that a unit was burnt down at Moffatt view Old Age home and it was unclear what lead to the fire (Southern courier, 2018). The study again realises that electrical wiring of the old age homes was safe and had a lesser chance of contributing to the causes of fire. The study concluded that there is still a challenge and complications in identifying the causes of fires at old age homes.

Chapter 6: Recommendations and Conclusion

6.1. Introduction

This chapter elaborates on the recommendation and conclusion made by the researcher based on the research findings, to minimise fire risks and enhance emergency preparedness at old age homes.

6.2. Recommendations

The research findings indicated that there is a gab that needs to be addressed in reducing the fire risks at old age homes. The researcher presents recommended remedial actions that can be implemented to resolve the identified research problem.

6.2.1. Disaster Risk assessment

The researcher has realised that most of the respondents at old age homes are not conducting disaster risk assessments at their old age homes. Therefore, the researcher recommends that old age homeowners and property owners conduct risk assessment regularly on their buildings to identify the potential hazards, classify, analyse the risks and also propose risk mitigation practices.

6.2.2. Disaster management planning for older people

The researcher has noticed that older people are the source of information in their families, government, and the community in emergency scenarios. They have long life experience, exposure to disaster preparedness in their individual previous involvement and decision making. It is important for all stakeholders to involve older people in planning for emergencies and decision making to allow older people to build their resilience. Old age homes must be encouraged to develop and implement disaster management plans with relevant stakeholders to give guidance on emergency preparedness.

6.2.3. Emergency evacuation plan

The research findings of the study can conclude that the old age homes emergency evacuation plans are not in place. Therefore, it is recommended that old age home

buildings should develop an emergency evacuation plan, that shows the emergency escape routes, evacuation directions, emergency assembly point, contact details of emergency coordinator and also indicating the safest emergency exits from the building. The evacuation plan should be in the simplest manners of diagram and be displayed at place that can be accessed by every individual.

6.2.4. Emergency simulation drills

Most of the respondents have indicated that they are not getting emergency drills exercises every six months. Nevertheless, old age home institutions and relevant stakeholders. Stakeholders are required to conduct emergency drills to capacitate other stakeholders and individuals to practice evacuation procedures in preparation for fire and other disasters. The simulation drills ought to be conducted every six months for effective preparation and stakeholder involvement as guided by relevant legislation.

6.2.5. Training

Most of the respondents have agreed to the importance of training staff on the use of fire extinguishers. However, the researcher recommends training of new staff at old age home on home safety tips, emergency preparedness, fire safety. Protection must form part of the induction process of new residents and staff members at old age homes. The training should involve fire safety, fire protection, personal safety and emergency preparedness for older people.

6.2.6. Firefighting equipment and material

The respondents were concerned about the budget limitations for old age homes. Despite this, old age homes are restricted to perform some activities. Therefore, it is recommended that all old-age home institutions should allocate budget to purchase, utilise firefighting equipment and material such as fire extinguishers, fire sprinklers, fire detection system, fire hydrants, fire blankets, hose reels and sand buckets. All the fire safety equipment must be kept in a strategic visible position with signage for effective use during emergencies. The use of fire-resistant material such as doors, windows, paint and roof should be encouraged at old age homes for building and renovations purposes.

6.2.7. Building codes regulations

Conversely, a few respondents have indicated that they are restricted by the type of structures to practice safety measures such as identifying the emergency assembly point. However, building codes regulations are ought to be considered for old age home structure for new building, renovations and repairs of the existing structures to demarcate appropriate places for safety measures. The landowners and municipal land planning must ensure that the laws are reinforced.

6.2.8. Emergency conduct details

Several respondents at old age homes elaborated that they are not having emergency phone numbers in place. On the other hand, it is recommended that first responders stakeholders such as EMS, SAPS, Disaster management, fire services and rescue have to ensure that they allocate a toll-free number to the old age home for emergency purposes and easy accessibility.

6.2.9. Fire-resistant material

The researcher discovered that minority of the respondents utilised fire resistance material at their old age home. It is recommended that there should be awareness on the use of fire-resistant material that is inflammable with low thermal such as doors, paints, windows and tiles that are utilised for construction of new building to minimise the spread of fire.

6.2.10. Fire detection and alarm system

The researcher has identified a need for awareness on fire detection and alarm systems technology that will assist old age homes with early revelations of fires. Early response can save the lives of every persone. A special alarm detection system that accommodates older people are encouraged to be installed and properly maintained at old age homes. The study has shown that only a few old age homes have installed fire detection and alarm systems.

6.2.11. Disaster management ethical considerations

The researcher has identified the importance of practicing good ethics during the study. On the other hand, the researcher recommends that disaster management training on ethics, and humanitarian relief rights awareness be provided to individuals, including

older people. This will aid them in learning more on fair allocation of resources, incident management, evacuation procedures, medical health relief protocols during fire and other disastrous conditions.

6.2.12. Integration of emergency stakeholder plans

Stakeholders emergency plans are obliged to be integrated and be aligned for effective use during the emergency. The researcher has identified during the study that there are various emergency plans with different approaches at old age homes. In addition, it is therefore recommended that all the stakeholders develop emergency plans that are aligned and integrated with other relevant stakeholder's plans for effective use during emergencies.

6.2.13. Fire safety awareness campaigns

Arbon (2012) has highlighted the importance of awareness campaigns in older people's lives and indicated that awareness campaigns are underdeveloped. The researcher thus, encourages old age home organisations and relevant stakeholders such as Eskom, municipal fire services, EMS and SAPS to conduct awareness campaigns with older people to make them aware of home safety tips. Stakeholders are obligated to ensure that the budget for special awareness campaigns that involve older people's special needs.

6.2.14. Fire safety research

The researcher has noted the importance of conducting a study on fire safety at old age homes. It is recommended that other researchers conduct researchers to gather information on the current situation, upgrade the policies and legislations that affect older peoples' safety. Researchers and other academics are compelled to capitalise on fire safety to precisely support fire services to upgrade procedures intended to reduce fire risks, promote fire safety, protection of properties and the environment.

6.3. Conclusion

Fire incidents have been identified as a common risk by most communities of Polokwane Municipality. The research problem for this study has been identified from

the Polokwane Municipality Disaster Management Plan on the risk assessment profile report of the financial year 2016/2017. The study aimed to investigate the condition of fire safety and emergency preparedness at old age homes. Study assumptions of the study were that older people residing in old age homes are more vulnerable to fire disasters than the older people living with the entire family structures and older people react slowly to emergency situations. Lastly, old age home institutions are not practicing emergency evacuation drills for older people emergency preparedness and fire safety precautions measures are not undertaken.

In achieving the research objectives, the mixed method of study was implemented through qualitative and quantitative data collection methods in a single study. The researcher incorporated both qualitative and quantitative methods for data collection and data analysis to achieve more results.

The outcome of the study highlighted minimum knowledge on evacuation plans, fire safety knowledge and lack of emergency strategic plans at old age homes. The conditions can be improved by providing effective training, education and awareness to capacitate old age home residents and staff members.

Disaster Management Act 57 of 2002 and Disaster Management Framework of 2005, enabler 2 focuses on education, training, public awareness and research. This legislation promotes a culture of risk avoidance among stakeholders by capacitating role players through integrated education, training and public awareness programmes informed by scientific research. Most importantly, fire safety and emergency preparedness effective training and awareness assist to capacitate individuals to recognise fire safety risks, enable them to realise the greatest safe practices and expectations.

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Annexure A: Research Questionnaire

University of Free State

P O Box 339

Bloemfontein

9300

South Africa

Date: ……

Attention: Respondent

Old Age Home

RE: THE ASSESSMENT OF FIRE SAFETY AND EMERGENCY PREPAREDNESS AT OLD AGE HOMES POLOKWANE MUNICIPALITY AREA, LIMPOPO PROVINCE

Your Old Age home has been selected to participate in this study and your positive contribution towards the study is very important. You are kindly requested to complete this questionnaire to assist the researcher in achieving the research goal.

The responses that you provide will be kept strictly confidential. No names, ID numbers, contact details and physical address will be completed on the questionnaire. All the information you provide will be consolidated together will all the participants in Old Age Homes to give the overall delineation. The information will be utilised for the purpose of the study only. Please feel free to divulge all the required information and utilise the opportunity to learn and experience research activities.

Your corporation in this matter is valuable and greatly appreciated.

Best Regards

_____

Masinge Granny

DIMTEC Student: 2016334019

Research questionnaire: the assessment of fire safety and emergency preparedness at Old Age Homes in Polokwane Municipality area, Limpopo Province

By

Masinge Granny Malope

Student number: 2016334019

Research Questionnaire

Institution: University of Free State, DIMTEC

Supervisor: Ms Mariëtte Joubert

Year: 2019

Department of Agriculture: DiMTEC

Research questionnaire: the assessment of fire safety and emergency preparedness at Old Age Homes, Polokwane Municipality area, Limpopo Province.

Questionnaire Instructions:

- Please respond to all questions
- Field workers are available to give clarity where you don't understand
- No payment will be given to responders
- Please provide the required answer to the asked question
- The involvement in the study is done voluntarily
- All the information provided is strictly confidential

Official use only	
Questionnaire number	
Date submitted	

Please tick a cross (x) in the appropriate block.

SECTION A: GENERAL INFORMATION

A1.Gender of the respondent:

(1) Male	
(2) Female	

A2. Age of the respondent:

(1) 16-26	
(2) 27-36	
(3) 37-46	
(4) 47-56	
(5) 57-66	
(6) Over 67	

A3. Marital status of the respondent:

(1) Single	
(2) Married	
(3) Divorced	

A4.Race group of the respondent:

(1)Black	
(2) White	

(3) Indian	
(4) Other (please specify)	

A5. Old age home residence

(1) Residing at the old age home	
(2) Day visit at old age home	
(3) Employee at the old age home	

A6. Staying at old age home

(1) less than 2 years	
(2) 2-4 years	
(3) 4 -6 years	
(4) 6-8 years	
(5) 8-10 years	

SECTION B: INJURY SAFETY AND RISKS ASSESSMENT AT OLD AGE HOMES

B1	There is an established Health and Safety Committee at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
B2	The safety committee frequently have regular meetings at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
B3	There is health and safety policy available at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
B4	There is emergency response plan available at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
B5	There is emergency communication response plan at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
B6	There is appointed health and safety officer at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
B7	The contact details of the health and safety officer available at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
B8	There is emergency first aid kid available at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
B9	The first aid kid is easily available at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
B10	The emergency first aid kid is fully equipped	Strongly disagree	1	2	3	4	5	Strongly agree
B11	The old age home residence are trained on first aid	Strongly disagree	1	2	3	4	5	Strongly agree
B12	Is the training for old age home residence conducted regularly	Strongly disagree	1	2	3	4	5	Strongly agree

B13	There is appointed first aiders at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
B14	Frequent training for first aiders at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
B15	There is appointed first responders at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
B16	There are caregivers for emergencies at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
B17	There is emergency transport available for older people at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
B18	The emergency transport is easily available all the time at old age home	Strongly disagree	1	2	3	4	5	Strongly ag 2
B19	There are emergency equipment's such as wheel chairs that are readily available in case of emergencies at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
B20	Properly ventilated old age home building	Strongly disagree	1	2	3	4	5	Strongly agree
B21	Indoors floor surface are level and unobstructed at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
B22	There is non-slippery floors at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
B23	Stairs provided on non-slip surfaces at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
B24	Emergency gate available gates around old age home building	Strongly disagree	1	2	3	4	5	Strongly agree

B25	Emergency gates are easily accessible and easy to open widely outside	Strongly disagree	1	2	3	4	5	Strongly agree

B26. Are there other issues on injury safety and risks at the Old age home? Please elaborate……..

……..…….

……

SECTION C: EMERGENCY PREPAREDNESS ASSESSMENT AT OLD AGE HOMES

C1	There is emergency assembly point at old age home building	Strongly disagree	1	2	3	4	5	Strongly agree
C2	The emergency assembly point is easily accessible at old age home building	Strongly disagree	1	2	3	4	5	Strongly agree
C3	There is satisfactory indoor signage for evacuation at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
C4	Transparent glass doors are marked so they are easily visible at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
C5	The exit doors swing outward for emergency purposes at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
C6	There is evacuation plan for people with disability at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
C7	There are staff members assigned to assist people with disability at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
C8	There is proper signage available for people with disability for evacuation at	Strongly disagree	1	2	3	4	5	Strongly agree

	old age home							
C9	There is emergency alarm available at old age home building	Strongly disagree	1	2	3	4	5	Strongly agree
C10	Emergency alarm easily accessible and visible old age home building	Strongly disagree	1	2	3	4	5	Strongly agree
C11	There is a dedicated and easily accessible helpline for emergency purposes at old age home building	Strongly disagree	1	2	3	4	5	Strongly agree
C12	There is satisfactory and reasonable security measures to prevent unauthorized access to the old age home building	Strongly disagree	1	2	3	4	5	Strongly agree
C13	There is functional lighting in dark locations at old age home building	Strongly disagree	1	2	3	4	5	Strongly agree
C14	There are CCTV camera's at old age home building	Strongly disagree	1	2	3	4	5	Strongly agree
C15	There is physical security at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
C16	Emergency protocol posters displayed in languages other than English at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
C17	There are emergency coordinators assigned for evacuation procedures at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
C18	Emergency and assembly point attendance register readily available at		1	2	3	4	5	Strongly agree

	old age home							
C19	Emergency phone numbers available and easily visible at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
C20	Unlocked emergency exit doors at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
C21	Emergency strategy available at old age home		1	2	3	4	5	Strongly agree
C22	Emergency evacuation fire drills have been carried out in the last six months involving older people at old age homes		1	2	3	4	5	Strongly agree

C23. Are there other issues on emergency preparedness at the Old age home? Please elaborate…….

……..

……...

SECTION D: FIRE SAFETY RISK ASSESSMENT AT OLD AGE HOMES

D1	There are Fire extinguishers at old age home building	Strongly disagree	1	2	3	4	5	Strongly agree
D2	The fire extinguishers at old age home are regularly serviced	Strongly disagree	1	2	3	4	5	Strongly agree
D3	Fire extinguishers are easily accessible at old age home building	Strongly disagree	1	2	3	4	5	Strongly agree
D4	Fire extinguishers are mounted on the wall at old age home building	Strongly disagree	1	2	3	4	5	Strongly agree

D5	There are staff trained to utilised fire extinguishers at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
D6	There are fire detectors at old age home building	Strongly disagree	1	2	3	4	5	Strongly agree
D7	There are fire breaks around old age home building	Strongly disagree	1	2	3	4	5	Strongly agree
D8	Fireproof material such as wall, doors, windows and others are installed at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
D9	The building is equipped with fire prevention equipment's such as fire blankets	Strongly disagree	1	2	3	4	5	Strongly agree
D10	There are fire hydrants at old age home building	Strongly disagree	1	2	3	4	5	Strongly agree
D11	The fire hydrants are easily accessible at old age home building	Strongly disagree	1	2	3	4	5	Strongly agree
D12	Emergency fire fighters' numbers are available at old age home building	Strongly disagree	1	2	3	4	5	Strongly agree
D13	Emergency fire fighters telephone numbers are easily accessible to everyone in the building	Strongly disagree	1	2	3	4	5	Strongly agree
D14	Fire marshals available at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
D15	Exposed or damaged electrical cords at old age home building	Strongly disagree	1	2	3	4	5	Strongly agree
D16	There are adequate reflective lights and	Strongly	1	2	3	4	5	Strongly

	illuminated signage at old age home	disagree						agree
D17	Unsafe electrical sockets covered with plugs or safety covers at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
D18	High voltage electrical outlets have enough warning signs to prevent accidental injuries at old age home	Strongly disagree	1	2	3	4	5	Strongly agree
D19	There are multiple locations where electrical wiring is visible and may cause fires at old age home	Strongly disagree	1	2	3	4	5	Strongly agree

D20. Are there other issues on fire safety risks at the Old age home? Please elaborate……

……

……

THE END OF A QUESTINAIRE

THANK YOU FOR PARTICIPATION

Annexure B: Research Consent Form

Research Consent Form to Participate in a Research Study

Study Tittle: the assessment of fire safety and emergency preparedness at Old Age Homes,

Polokwane Municipality area, Limpopo Province

Investigator: Masinge Granny Malope

Student number: 2016334019

Research Consent Form

University of Free State, DIMTEC

RESEARCH CONSENT FORM

INTRODUCTION

You have been selected to participate in the research study concerning the assessment of fire safety and emergency preparedness at Old Age Homes, Polokwane Municipality area at Limpopo Province. The population of the study is ascertained by Old Age Home residents and staff members that are affected by the fire disasters. Research population will be 10 Old Age Homes around Polokwane. The focus will be on the people that reside in the Old Age Homes, the employees of the Old Age Homes such as security officers, administrators, and the cleaners. Therefore you have been selected as a possible participant in this research study.

You are therefore requested to read this document and ask for clarity where you do not understand before agreeing and signing the consent form.

THE AIM OF THE STUDY

The aim of the study is to investigate the condition of fire safety and emergency preparedness at Old Age Homes in order to analyze the factors contributing to fire disasters and make recommendation actions to improve the current conditions.

THE SIGNIFICANT OF THE STUDY

The study is important as it measures and evaluates the safety and emergency preparedness in case of fire disasters for older people at Old Age Homes in Polokwane municipality area. The Old Age Homes are non–governmental organizations and also forms part of the Disaster Management advisory forum of the municipality. They participate in the disaster risk assessment and the preparation of the disaster management plans. The risks faced by the Old Age Homes in the Polokwane municipality area must be incorporated in the municipality disaster management plan.

The study will assist in highlighting the risks and hazard identification at an organizational level and the information will be communicated during the advisory forums and IDP consultation meetings for preparations of disaster management plans as advised by the Disaster Management Act 57 of 2002 section 52.The study is also important as it aims to implement the Sendai Framework for Disaster Risk Reduction (2015-2030) objectives that is aiming at the substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries.

To attain the expected outcome, the following goal must be pursued: Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience (Sendai Framework, 2015-2030).

The outcomes of the research report will contribute to the preparedness, prevention and mitigation process to minimize and eliminate the fire disaster risk exposed to older people at Old Age Homes. The study will also assist to improve the safety measures and emergency preparedness practices at the Old Age Homes. Contributions made to the study will assist as awareness to the Old Age Homes residents and staff members, families, NGO's and government officials that support older people.

RIGHT TO PARTICIPATE

The decision to participate in this study is entirely voluntarily. You may decline to take part in the study at any time without affecting your association with the investigator of this study. Your decision to decline or withdraw will not disadvantage the study

Before deciding to participate in the research study, participants have the right to be aware with the following:

- The right to give the correct and reliable information to the investigator.
- The right to know the importance of participation
- The right to benefits of participating
- The right to know the importance of the study
- The right to know how the information will be kept safe and confidential
- The right to know whom to contact with questions and concerns
- The right to take your time in completing the questionnaire
- The right to keep a copy of this consent form
- The right to decline or withdraw at any time of the study
- The right not to answer any single question, as well as to withdraw completely from answering the research questionnaire at any point during the process

PAYMENTS OR REMUNERATION

The participation in this study is done voluntarily and no payments will be made to any participants.

CONFIDENTIALITY

The study will not be gathering or preserving any information about your identity.

The records of this study will be kept strictly confidential. Research records will be kept in a locked file and all electronic information will be coded and secured using a password protecting file. The report will not contain any information that would make it possible to recognize you.

RIGHT TO ASK QUESTIONS AND REPORT CONCERNS

You have the right to ask questions about this research study and to have those questions answered by me before, during or after the research. If you have any further questions about the study, at any time feel free to contact me, Masinge Granny Malope at gmmoela@gmail.com or by telephone at 073 144 7600. If you have any concerns about your rights as a research participant that has not been answered by the investigators, you may contact me on the above details.

CONSENT

Your signature below indicates that you have decided to volunteer as a research participant for this study and that you have read and understood the information provided above. You will be given a signed and dated copy of this form to keep, along with any other printed material deemed necessary by the study investigation.

Participant:	**Investigator:**
Name:	Name:
Institution:	Institution:
Email:	Email:
Telephone:	Telephone:
Signature:……Date……..…	Signature:……..Date:……..

Annexure C: Ethical Certificate

UNIVERSITY OF THE FREE STATE
UNIVERSITEIT VAN DIE VRYSTAAT
YUNIVESITHI YA FREISTATA

UFS·UV
NATURAL AND AGRICULTURAL SCIENCES
NATUUR- EN LANDBOUWETENSKAPPE

Faculty of Natural and Agricultural Sciences

10-Oct-2018

Dear **Ms Granny Masinge**

Ethics Clearance: **The assessment of fire safety and emergency preparedness at old age homes in Polokwane Municipality area,Limpopo Province**

Principal Investigator: **Ms Granny Masinge**

Department: **DiMTEC Department (Bloemfontein Campus)**

APPLICATION APPROVED

This letter confirms that a research proposal with tracking number: **UFS-HSD2018/0298** and title: **'The assessment of fire safety and emergency preparedness at old age homes in Polokwane Municipality area,Limpopo Province'** was given ethical clearance by the Ethics Committee.

Your ethical clearance number, to be used in all correspondence is: **UFS-HSD2018/0298**

Please ensure that the Ethics Committee is notified should any substantive change(s) be made, for whatever reason, during the research process. This includes changes in investigators. Please also ensure that a brief report is submitted to the Ethics Committee on completion of the research.
The purpose of this report is to indicate whether or not the research was conducted successfully, if any aspects could not be completed, or if any problems arose that the Ethics Committee should be aware of.

Note:

1. This clearance is valid from the date on this letter to the time of completion of data collection.
2. Progress reports should be submitted annually unless otherwise specified.

Yours Sincerely

Dr. Karen Ehlers
Chairperson: Ethics Committee
Faculty of Natural and Agricultural Sciences

Natural and Agricultural Sciences Research Ethics Committee
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