

THE IMPACT OF FIRE DRILLS ON FIRE FIGHTER PERFORMANCE



OUTLINE

1. Introduction and Background
2. Problem Statement
3. Aim and Objectives
4. Research Questions
5. Hypothesis
6. Research Methodology
7. Results and Discussion
8. Limitations
9. Conclusion
10. Recommendations
11. References



INTRODUCTION AND BACKGROUND

- Firefighting profession is one of the most physical, stressful and dangerous occupation in the world (Kales et al., 2007).
- Firefighting requires high level of aerobic fitness, anaerobic capacity, muscular strengths and endurance to perform strenuous muscular work.(Smith ,2019)
- Fire drills are set of exercises to help fire fighters to maintain skills and knowledge necessary to achieve mission of fire department.
- Strategically, fire drills help to build fire department emergency plans by providing an opportunity to question any assumption, deal with potentially difficult situations and evaluate available resources.(Wu & Jin , 2014)



PROBLEM STATEMENTS

- Firefighters are losing skills and knowledge because Fire Departments are not conducting fire drills subsequently, injuries and fatalities in the line of duty and poor services prevails.
- Burning injuries are amongst major public health problems, particularly in low and middle income countries (such as South Africa) where over 95% of all burn deaths occur (World Health Organization, 2023).
- Globally, fire-related burns alone account for over 300 000 deaths per year, with more deaths from scalds, electricity, chemical burns and other forms of burns (South African Department of Cooperate Governance, 2020).

AIM AND OBJECTIVES

AIM

- The research aims to investigate the reasons fire departments are not conducting drills leading to injuries on duty and poor service delivery.

OBJECTIVES

The specific objectives of this study were:

- To assess the current state of the fire drill training programme in South Africa.
- To train and evaluate the fire fighters performance through fire drill training programmers.

RESEARCH QUESTIONS

The following are the research questions:

- What is the current state of the fire drill training programme?
- What prohibit fire department to conduct fire drills?
- What is the best practice regarding fire drill assessment in South Africa?

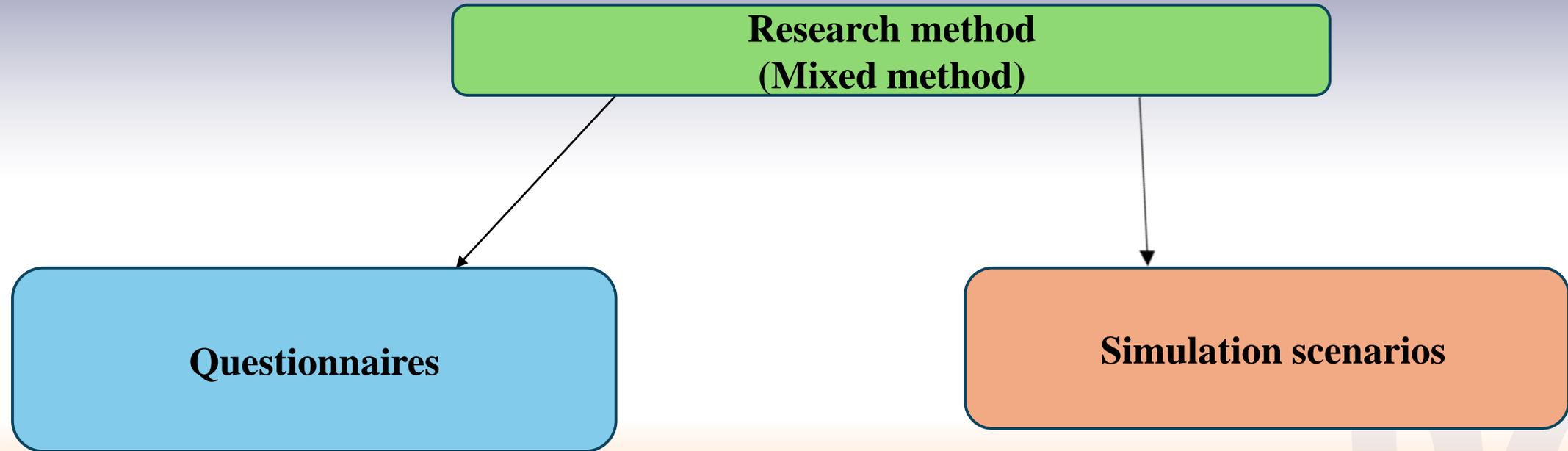


HYPOTHESIS

Each South African fire station needs an enforced policy, procedures and fire drill trainers in order to improve the performance of the daily duties of fire fighters.



RESEARCH METHODOLOGY



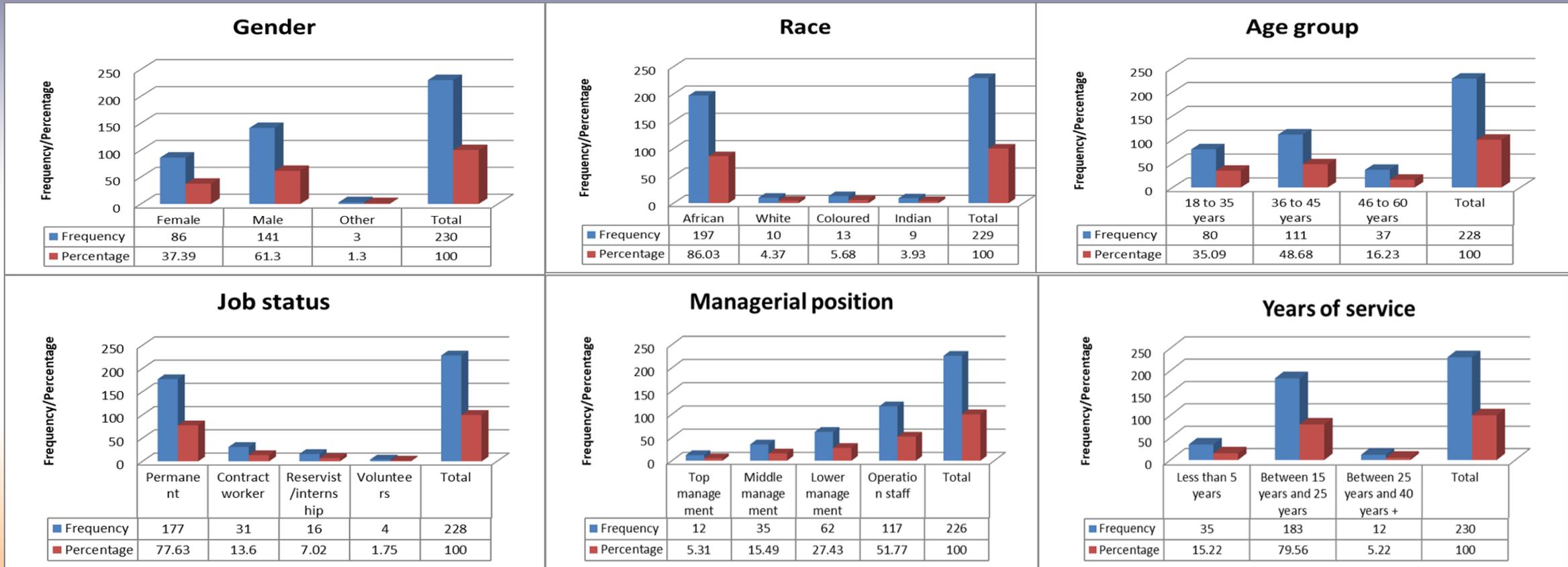
POPULATION AND SAMPLING



- The targeted population for this study: **260 participants**.
- In order to gather their opinions on the existing and upcoming practice, **230 questionnaires** were collected from various fire departments across Mpumalanga and Gauteng provinces.
- A scenario of fire drill simulation was executed at Boksburg training academy with 30 fire fighters.

RESULTS AND DISCUSSION

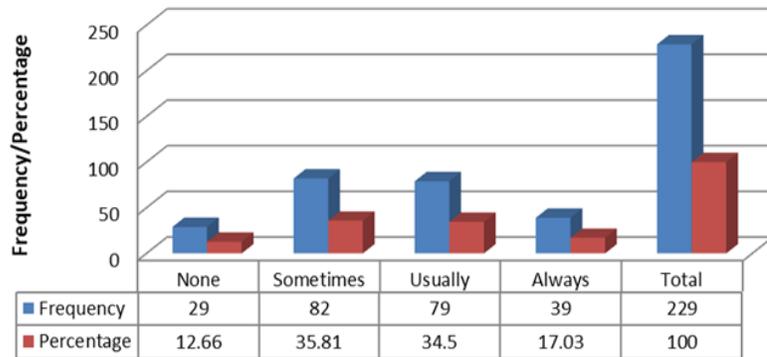
Biographical information



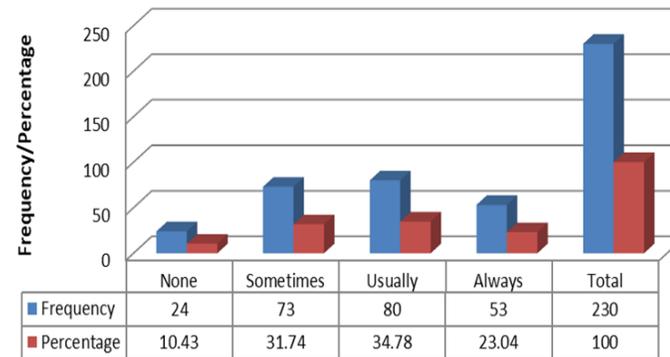
RESULTS AND DISCUSSION

RESEARCH QUESTION 1: What types of the fire drills are performed in fire department?

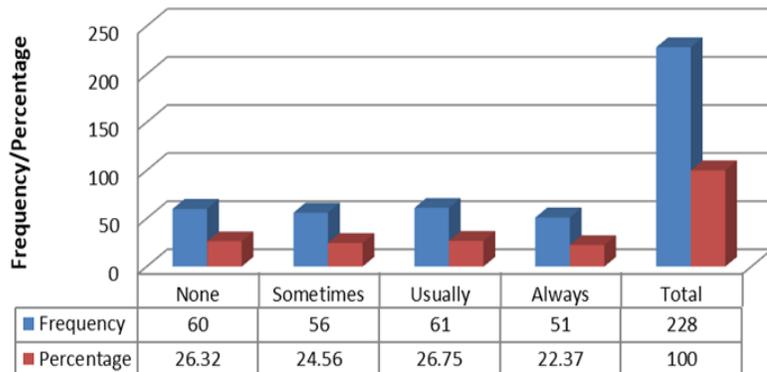
Performing wet fire drills



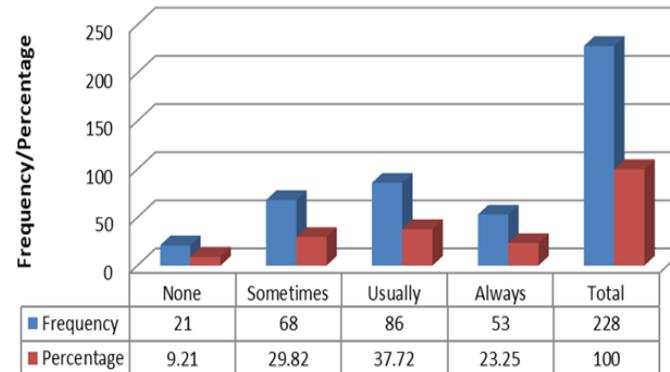
Performing dry hose drills



Performing hot fire drills

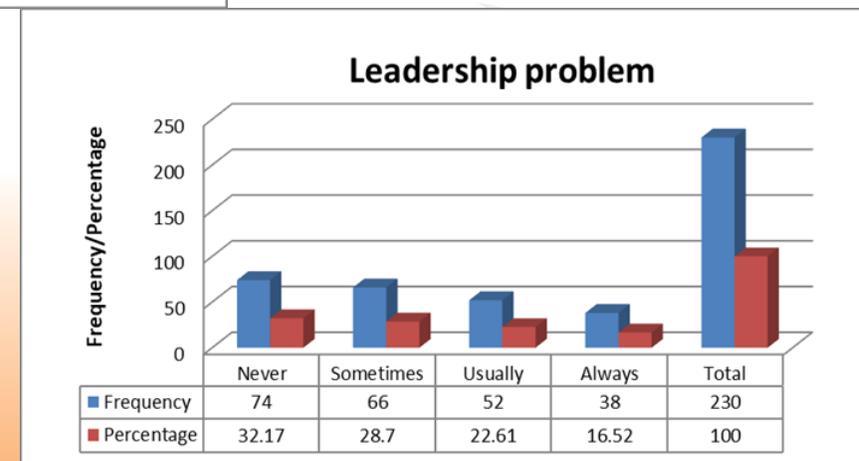
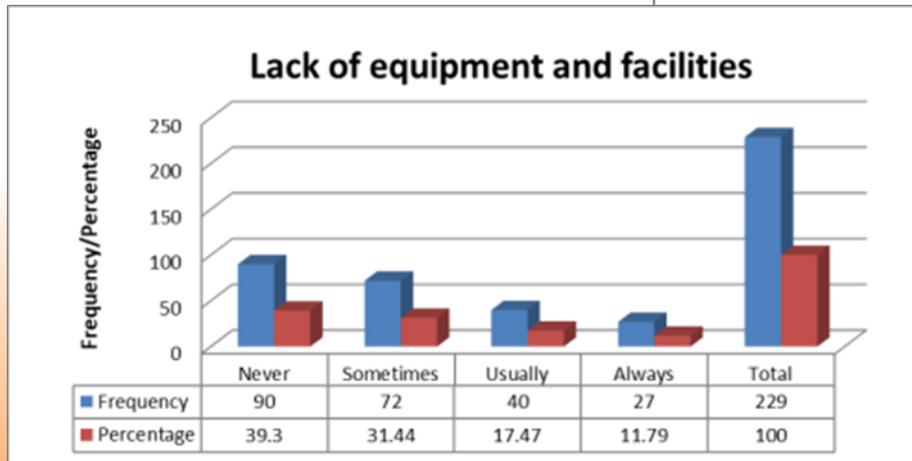
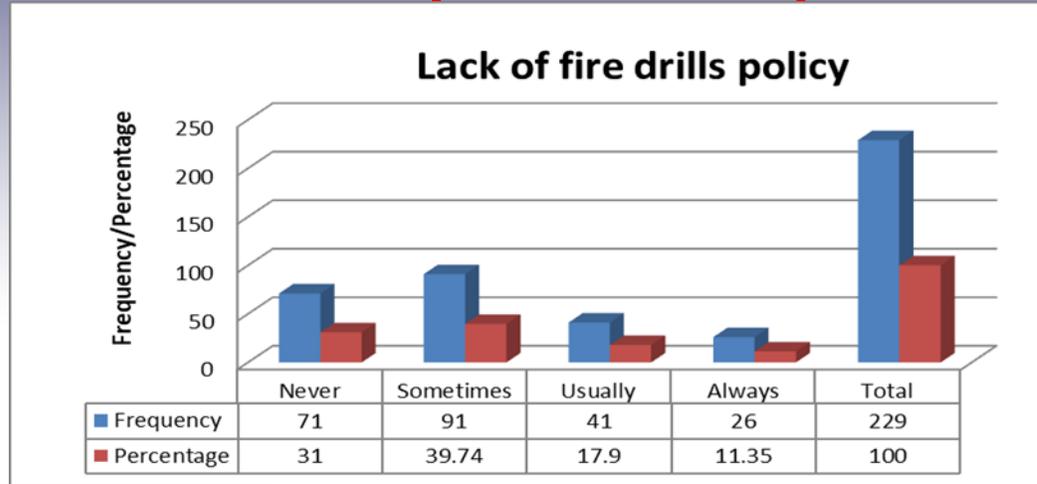


Performing rescue drills



RESULTS AND DISCUSSION

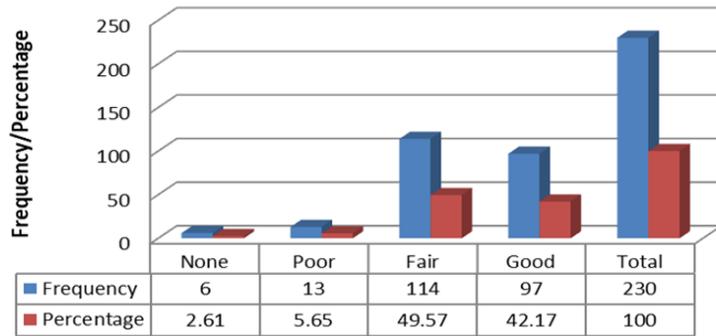
RESEARCH QUESTION 2: What do prevent fire department to conduct drills?



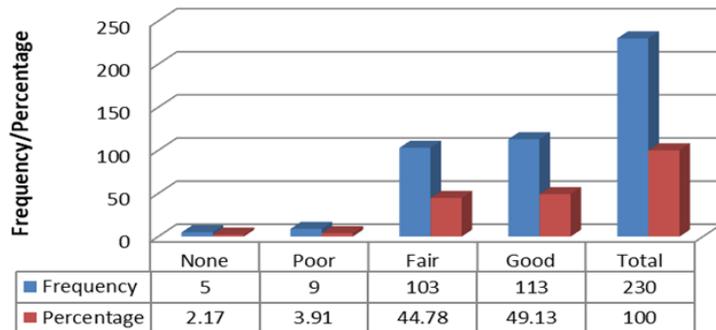
RESULTS AND DISCUSSION

RESEARCH QUESTION 3: What is the impact of fire drills on service delivery?

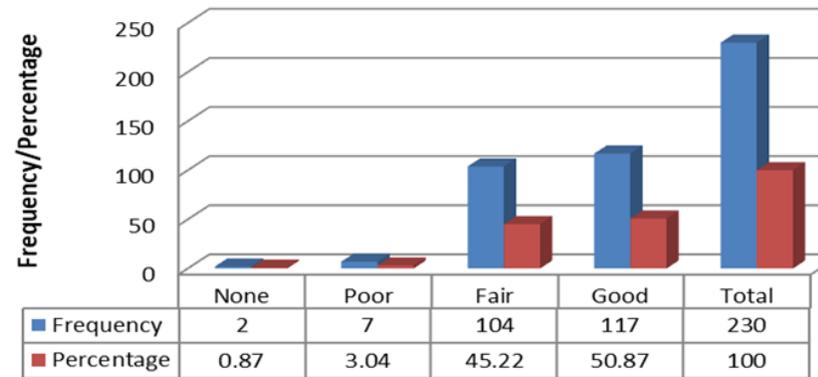
Improved physical capability



Improved job performance



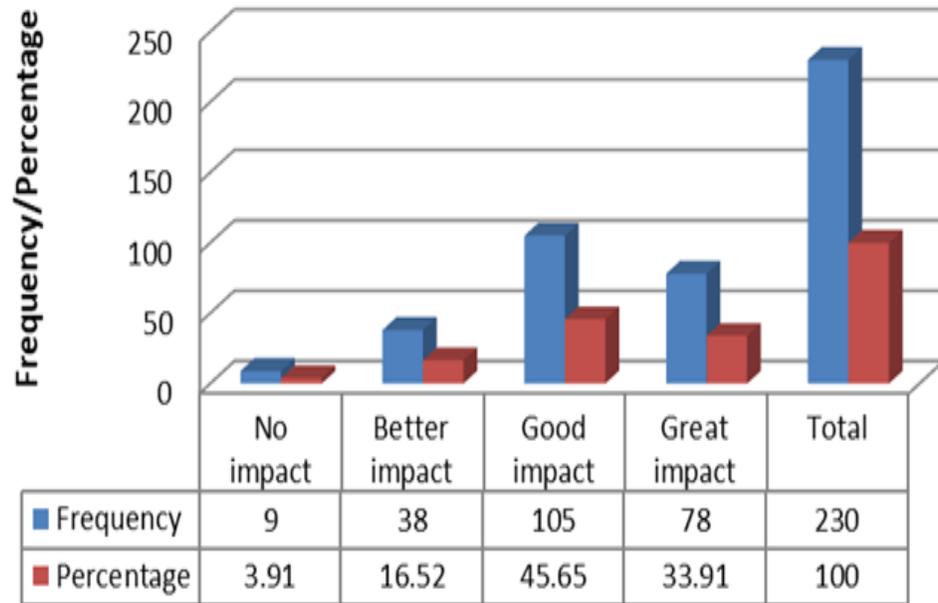
Better service delivery



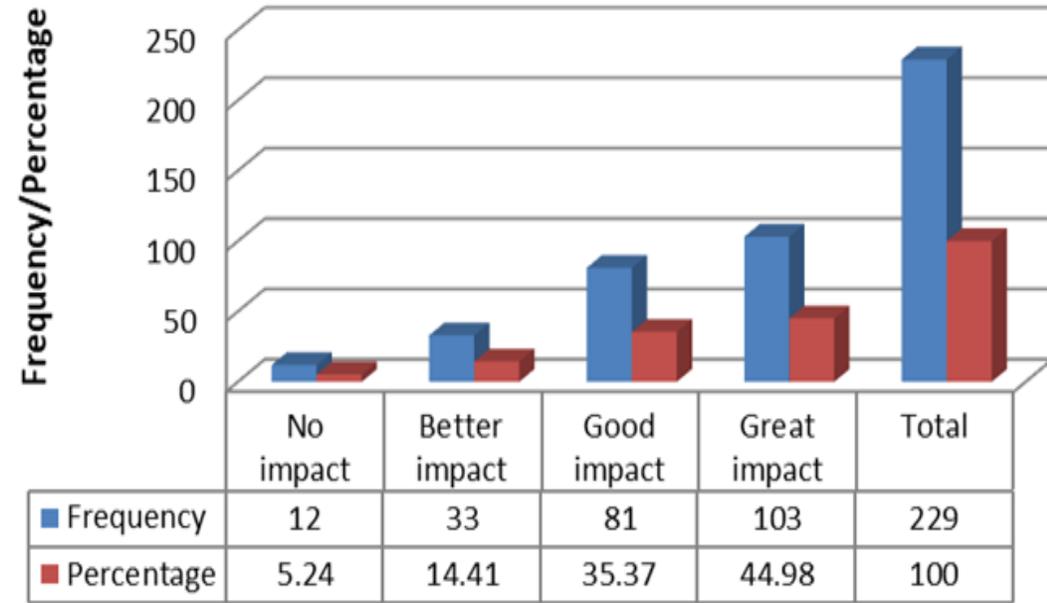
RESULTS AND DISCUSSION

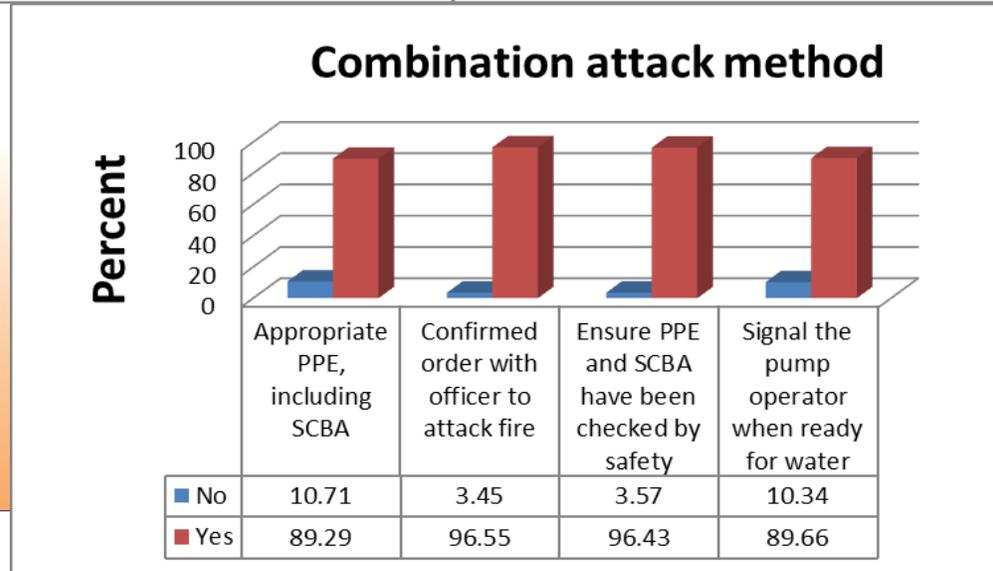
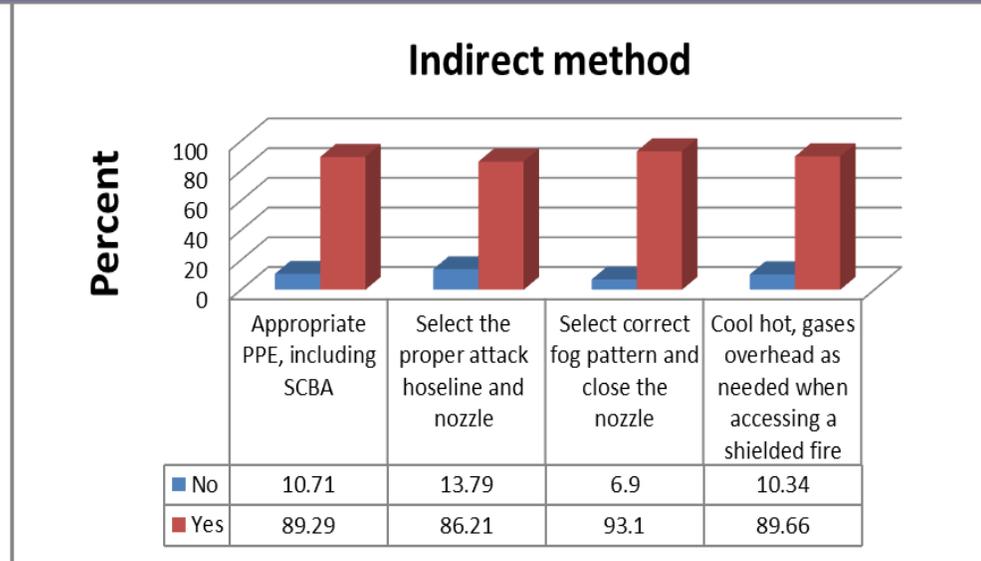
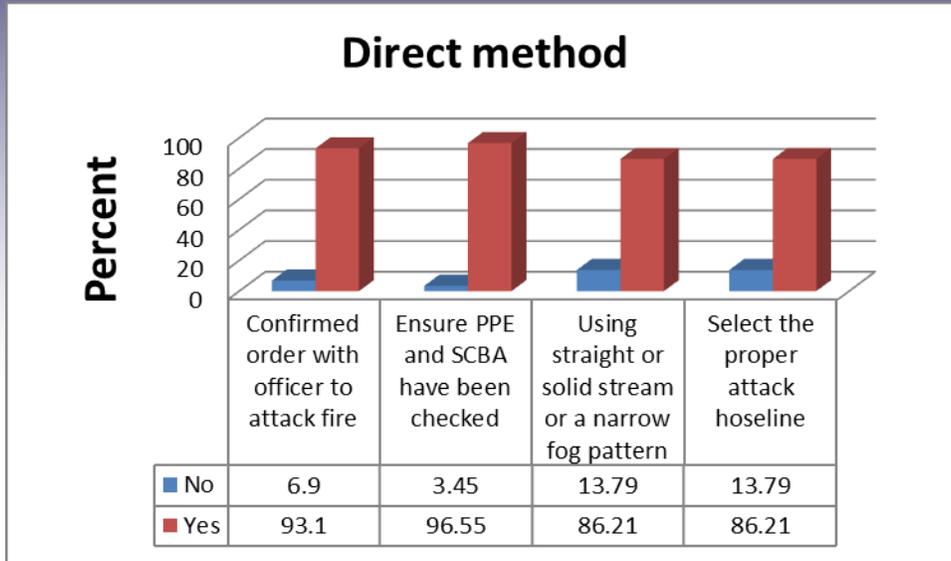
RESEARCH QUESTION 4: What are psychological effects of fire drills to personnel?

They improve one's confidence



They improve teamwork





SUMMARY OF DATA

Data were statistically analysed using the Statistical Package for the Social Sciences version 24. In section B (type of fire drills in the department), there was significant difference (**p-value = 0.021**) between gender performing rescue drills.

Further significant difference was also observed in section C (the impact of fire drills on service delivery) when comparing job status and improved job performance (**p-value = 0.015**).

Similar observation was noted in section D (psychological effects of drills to personnel) where the **p-value 0.013** matches significantly with Years of service in EMS and improved teamwork. Finally, in section E (what prevent fire department to conduct drills), there was significant difference between gender and lack of equipment and facilities (**p-value = 0.002**), this indicates that the fire drill training was significantly affected by the absence of equipment and facilities.

In conclusion, all the p-values were lower (**p-values < 0.05**), therefore there is a significant correlation between the compared parameters.

LIMITATIONS

- We only targeted fire personnel from Mpumalanga and Gauteng provinces to participate in the survey and the simulation of fire drill scenarios in order to share their knowledge.
- Despite having **230 respondents** who filled in the questionnaire, unfortunately all of them did not answer all the questions. Additionally, for the simulation of fire drill scenarios, this was done only once at Boksburg training academy (Ekurhuleni municipality) with **thirty (30) fire fighters (28 junior fire fighters and two fire officers)**.

CONCLUSION

- Fighting fires can be affected by the nature of the emergency response by carrying equipment upstairs in a high-rise, advancing charged hoses, breaking down doors, walls, ceilings, and roofs, raising ladders, working overhead with a pike pole or other equipment, rescuing victims, raising and lowering equipment or victims from high-rise windows via ropes, auto extrications, and carrying equipment long distance from the truck to a fire site (Koide, 2015).
- The fire drill training programmes must comply with the NFPA 1500 that is the “Standard on Fire Department Occupational Safety and Health, and Wellness Program”, which is an extension of SANS 10090 in compliance with the Occupational Health and Safety Act.
- The current study shows that in the Gauteng and Mpumalanga provinces there is a need for fire fighters to regularly conduct the fire drill training in their respective fire stations.

RECOMMENDATIONS

The legislation that governs the fire brigade service should consider the following items:

- Each fire service should develop a fire drill policy to promote safety drills and to create awareness programmes.
- Fire departments should develop well-maintained structures to record all fire drill performance.
- Fire departments should building long-term collaborative relationships with other institutions.
- Finally, appointing qualified and specialised fire drill experts in every fire station can be motivating and will result in the transfer of skills and knowledge to upcoming firefighters.

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THANK YOU VERY MUCH

