



# The Level of Disaster Preparedness in Public Secondary Schools in Nairobi County, Kenya

**Saleri Abigael Malemba <sup>a</sup>, Maurice Manyonge Pepela <sup>a\*</sup> and Moses Akali <sup>b</sup>**

<sup>a</sup> *Department of Emergency Management Studies, Masinde Muliro University of Science and Technology, P.O. Box 190 – 50100, Kakamega, Kenya.*

<sup>b</sup> *Department of Disaster Management and Sustainable Development, Masinde Muliro University of Science and Technology, P.O. Box 190 – 50100, Kakamega, Kenya.*

## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## **ABSTRACT**

Increase in disaster incidences have been witnessed in secondary schools in recent years, its frequency and impact hampering education process. For instance, besides loss of lives, and injuries, school properties have been damaged and closing and often with children having to leave school for long periods in recovery period. Continued occurrence and magnitude of disaster have prompted international organizations especially the United Nations agencies and other countries to come up with best practice models of institutions including training on disaster and disaster risk management. Despite the concerted efforts by the government of Kenya and other stakeholders in emphasizing preparedness, Kenya still experiences various disasters in schools. Majority of students in secondary schools are exposed to mishaps and accidents daily in schools. School authorities, parents and even students are jolted into actions only when a fatality or injury has

\*Corresponding author: E-mail: pmourice@gmail.com;

occurred and this affects the response and mitigation level of these disasters and thus the need of the study. The general objective of the study is to assess disaster preparedness and safety standards in public secondary schools of Nairobi County, Kenya. The study sought to establish the level of disaster preparedness in public secondary schools in Nairobi County. The study adopted a descriptive research design. Target population of the study was 73 from which 13 schools were selected using random sampling. Data was collected using questionnaires, interview schedules, focus group discussions and observation checklist. From the findings, 10.16% (n=39) of the total population determining that schools conduct most frequent training, 13.02% (n=50) of the total population responded training programs are done frequently. 28.65 (n=110) of students indicated trainings on fire safety facilities are done less frequently. The findings revealed a lack of training and inadequate community awareness on disaster preparedness and safety standards. The study concluded that the schools were insufficiently prepared for disasters and most of the physical infrastructures were considered unsafe. The study recommended regular inspection of school infrastructure, safety training by qualified by qualified personnel and taking into consideration the ability and capacity of different schools when settings standards for disaster preparedness and safety.

*Keywords: Disaster; practice model; preparedness; secondary school; students.*

## 1. INTRODUCTION

The education process has been hampered due to disaster occurrences resulting to human loss and injuries, social upheavals, school property damage and closing and often with children having to leave school for long periods in recovery period [1]. All over the world there has been an upward trend in the number of school children dying or getting injured in school violence, disasters and emergencies that could have been avoided if safety policies were strictly adhered to [2]. However, the effect and the magnitude of the disasters vary from one country to another. This is attributed to the fact that the level of disaster preparedness differs among different nations with the developed countries having minimized the magnitude of disasters and the developing countries feeling the brunt of disaster when it occurs due to lack of preparedness (Ozmen, 2006).

Nairobi is among the leading counties in Kenya with regard to secondary school disasters (Kimathi, 2011). In 2008 a form three student at Upper hill school in Nairobi died in a fire believed to have been sparked by students' unrest in the institution [3]. The postelection violence of 2007/2008 adversely affected the learning process in Nairobi especially in the informal settlements as Mathare and Kibera where some were totally destroyed and learners and teachers displaced [4]. The more recent case was the Moi Girls Nairobi dormitory fire in September 2017 where 10 students were burnt to death. The accident was blamed on poor design of the dormitories with no routes for exit in case of

emergencies. One of the dormitories at the Highway Secondary School in Nairobi's South B is set on fire. Twelve casualties rushed to the Kenyatta National Hospital following the incident. The parents said it was time schools across the country install surveillance cameras to arrest rampant cases of arsons and that, the upsurge in arson incidents was a clear indication that indiscipline students were determined to cause havoc in schools.

Federal Emergency Management Agency (FEMA) [5] noted that for effectiveness of the effectiveness of the disaster preparedness, the schools needed to have guide maps designating planned evacuation routs, assembly areas, fire extinguishers, first aid station and well communicated evacuation alarm information which most of Nairobi schools lacks (Mwangi, 2008).

## 2. METHODOLOGY

### 2.1 Research Design

The study adapted a descriptive research design. The design was deemed fit for the study as it has the advantage of exploring the factors affecting disaster preparedness in secondary schools in Nairobi County. This due to its ability to summarize the statistics by showing responses to all possible questionnaire items that lead to identifying needed changes (Bryman, 2008). Descriptive survey studies are concerned primarily with determining "what is" (Mutai, 2000). Therefore, descriptive survey design can yield important information about a phenomenon.

Surveys are excellent vehicles for collecting original data for the purpose of studying attitudes, orientations and opinions of a very large population. Descriptive survey design is the most appropriate when the purpose of the study is to create a detailed description of a phenomenon [6].

## 2.2 Study Area

The study was carried out in Nairobi County which is the capital city of Kenya. Nairobi County is one of the 47 counties in the republic of Kenya. It borders Kiambu County to the North and West, Kajiado to the South and Machakos to the East (NCIDP, 2014). Nairobi 29 County is situated at 1°09'S 36°39'E and 1°27'S 37°06'E and occupies 696 square kilometers (270 sq mi). It has a population of 4,000,000 people (Nairobi City-data, 2010).

## 2.3 Sampling Methods and Data Collection

The study population comprised all the public secondary schools in Nairobi County. According to the County Director of Education, Nairobi County, Statistics section (2019), there are 73 public secondary schools in Nairobi County. The study targeted principals of the schools, teachers, students and ministry officials (Quality assurance and standards officers). In addition, Nairobi County government department of Disaster Management, Fire department, Kenya Red – Cross, St. Johns Ambulance, board of

management, Parent association and Officer commanding station were also part of the study population.

The study used simple random sampling to select students and teachers purposive sampling technique was used to select key informants from ministry of education, Kenya Red Cross, St. Johns Ambulance and Director of Emergency Services Nairobi County and principals of the public secondary schools. In simple random sampling technique, the researcher makes an identification of the groups in the population while selecting from each group [7].

Data collection is the process of gathering qualitative and quantitative information for analysis purposes in research, (Bogdan & Biklen, 2007). Both Primary data and secondary data was collected. The study used a mixed approach where both quantitative and qualitative data were used to address the research questions.

## 3. RESULTS AND DISCUSSION

### 3.1 Types of Disasters that Public Secondary Schools Face

The study sought to establish the types of disasters that public secondary school face, the respondents were asked to indicate common types of disasters that they face in the schools. The information from the respondents was collected through the questionnaire and the findings were as indicated in Fig. 1.

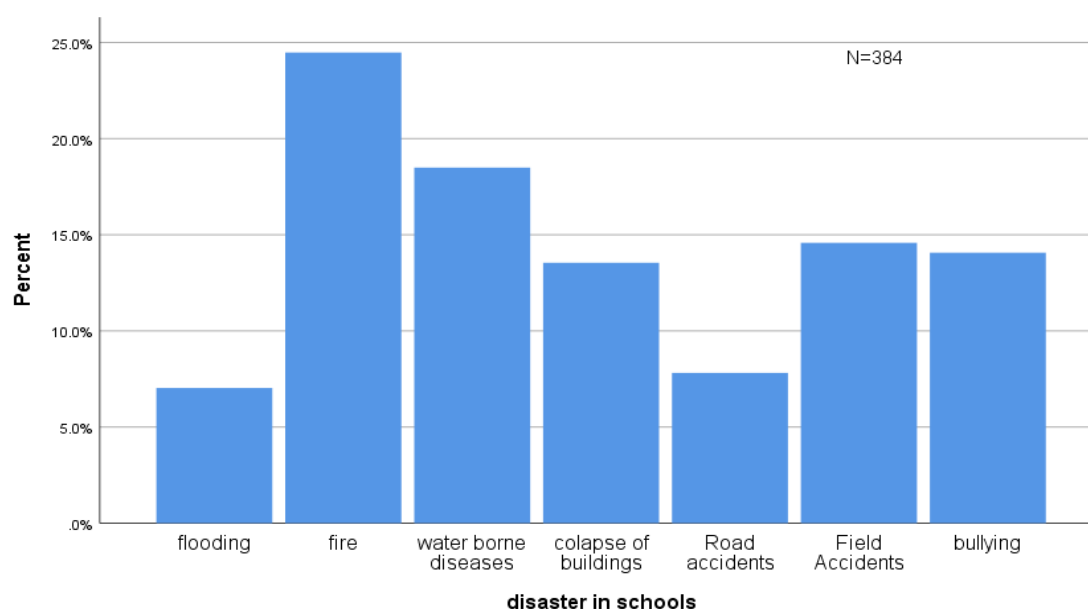


Fig. 1. Types of disaster that institutions are vulnerable to

To establish the type of disaster the institution is vulnerable to, the respondents were asked about previous disasters. Fig. 1 shows the types of disasters which most of secondary school experienced previously or any time. According to findings, fire is the most experienced disaster in schools with a 94 (24.5%) frequency occurrence, water borne diseases 71 (18%), field accidents 56 (14.6%) bullying 54 (14.1%) collapse of buildings 52 (13.5%) and road accidents 30 (7.8%). Flooding has the least occurrence in schools with 27 (7.0%). The chi square analysis ( $X^2 = 56.276, p < .01$ ) indicated a high level of significance. Based on the data, the institutions are highly vulnerable to fire. This was in agreement with all the key informants who informed this study that most school are very vulnerable to fire disasters. All the FGDs were in agreement that fire and water borne diseases are the two major disasters that schools in Nairobi county face. The increasing frequency of fire disasters in educational institutions is causing loss of lives, enormous destruction of property and disrupting education programs [8]. The findings correspond with information from interview schedules where one of the officials from Kenya red cross noted that most of the disasters they respond to in public secondary schools in Nairobi County are fire related.

### 3.2 Respondents Disaster Experience in the Institution

The study further determined the respondents experience in the institutions, the respondents were asked to indicate if they experience any disaster in the school, the findings were as indicated in Fig. 2.

The respondents were asked if their schools experience any kind of disaster. Fig. 2 shows the opinions of students on whether their schools experience any kind of disasters. Findings indicates that 70% of the participants agreed that their schools experienced some kind of disaster. On the other hand, only 30% of study participants argued that their schools did not experience any kind of disaster. Accordingly, the study establishes that most of schools involved in the study experienced disaster.

### 3.3 Schools Emergency Evacuation Plans

The study sought to find out if there are emergency evacuation plans in public secondary schools in Nairobi County, the respondents were asked to indicate if there were emergency evacuation plans that were put in place. The findings are as shown in Fig. 3.

To determine if schools involved in the study had emergency response plans, the respondents were asked if the schools did have an evacuation plan in place in case of a disaster. Fig. 3 reveal that 29% of students agreed that their schools did have evacuation plan, 71% revealed that their schools did not have plans for emergency evacuations. Accordingly, the study found that most schools involved in the study have evacuation plan for disaster preparedness. This is similar to Mwenga, (2011) who found that most schools did not have site plans that included building layouts and evacuation routes to be used in the case of a natural disaster hence concluding that many schools still were not adequately prepared in the event of a natural disaster.

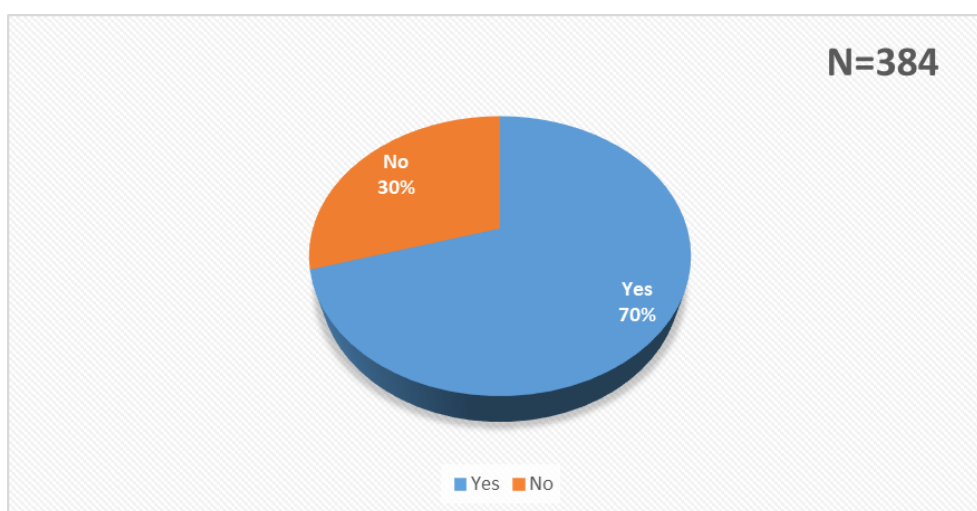
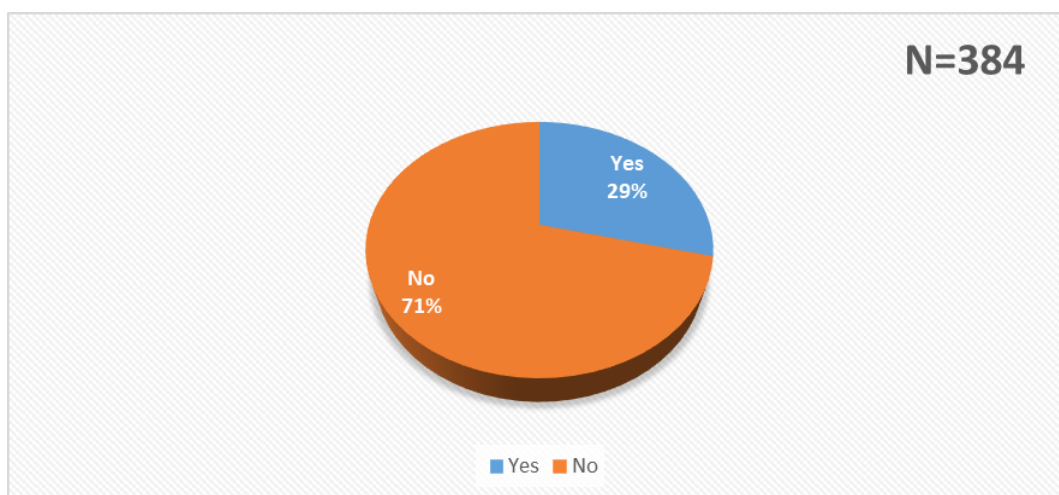


Fig. 2. Respondents on disaster experience in the institution



**Fig. 3. Schools emergency evacuation plans**

### 3.4 How Often Institutions Carry Out Emergency Drills for Disaster Preparedness

To establish how often public secondary schools, carry out emergency drills for disaster preparedness, the respondents were asked about emergency drills.

The question aimed to establish the preparedness and response of students in case of a disaster. Table 1 shows the frequency at which the schools involved in the study conducted emergency drill. Findings indicates that most schools do not conduct emergency drills (61.46%); 20.31% of students suggests that their schools conduct emergency drills yearly; 12.24% suggests that their schools conducted emergency drill after every six months; while 5.99% conduct emergency drills termly.

These findings are similar to those of Gichuru, [8]. They indicated lack of fire drills, lack of disaster preparedness plans and First Aid Kits, lack of basic capacities to respond to disasters. From the interviews, one of the officials from St Johns ambulance revealed that they encourage schools and institutions to conduct drills in an effort to ensure preparedness and efficient response to disasters.

### 3.5 Training Programs on the Use of Fire Safety Equipment

The respondents were asked on the frequency of training programs on the use of fire safety equipment. This was to establish the frequency of training programs on fire safety equipment.

When asked on training programs on the use of fire safety facilities in the institution, as shown in Table 2, 10.16% (n=39) of the total population determining that schools conduct most frequent training. 13.02% (n=50) of the total population responded training programs are done frequently. 28.65 (n=110) of students indicated trainings on fire safety facilities are done less frequently. The highest percentage (48.17%) revealed that the trainings are never done. The researcher observed that only a few schools had fire extinguishers which can be used to fight small fires before they spread. Schools had few control measures in place in case of a disaster, such as pre-determined evacuation routes, clear definitions of evacuation areas, and pre-determined assembly points outside the school premises [9]. Observations and interviews revealed that most of the respondents had little knowledge on the use of safety equipment. For instance, one of the fire department officials said “Some schools have fire safety equipment like fire extinguishers yet very few members of the school community know how to use them.”

### 3.6 Students Attended Training on Disaster Safety

Table 3 shows the disaster safety training attendance by respondents. It was aimed to establish if the student had attended any training on disaster safety.

Table 3 indicates that only 14.32% (n=55) of the total population have attended disaster safety training. 85.68% (n=329) revealed they never attended training on disaster safety. This represented majority of the population. The

researcher observed that the respondents had inadequate knowledge on disaster preparedness and safety standards in schools. This corresponds with Gatua's [10] findings where most of the research participants lacked adequate knowledge on safety standard manual for schools and were yet to receive adequate training on disaster preparedness and safety.

Ayonga [11] in his study on "An Investigation of Fire Emergency Preparedness in Kenyan Schools: A Case Study of Public Secondary Schools in Nairobi" proposed that teaching staff, workers and students be trained in Fire Emergency response. This is after findings indicating that even though most schools had the Fire Fighting Equipment, they are not adequately prepared for Fire Emergencies due to lack of proper training of teachers, staff and students and inaccessibility of these equipment. The

interviewed official from department of disaster management made a similar suggestion which is to train staff and students in disaster preparedness and response.

### 3.7 Community Awareness Sessions on Disaster Safety

The study sought to determine if the schools had community awareness sessions on disaster safety. Table 4 has the students' responses on community awareness sessions on disaster safety.

As shown by Table 4, 25.26% (n=97) of the participants had community awareness sessions on disaster safety. 74.74% (n=287) of the participants indicated they didn't have community awareness sessions on disaster safety.

**Table 1. How often school institution carries out emergency drills for disaster preparedness**

	Frequency	Percent	Cumulative Percent
Termly	23	5.99	5.99
After every six months	47	12.24	18.24
Yearly	78	20.31	38.54
Not at all	236	61.46	100
<b>Total</b>	<b>384</b>	<b>100.0</b>	

**Table 2. Training programs on the use of fire safety facilities**

	Frequency	Percent	Cumulative Percent
Most Frequently	39	10.16	10.16
Frequently	50	13.02	23.18
Less frequently	110	28.65	51.83
Not at all	185	48.17	100
<b>Total</b>	<b>384</b>	<b>100.0</b>	

**Table 3. Students attended training on disaster safety**

	Frequency	Percent	Cumulative Percent
Yes	55	14.32	14.32
No	329	85.68	100
<b>Total</b>	<b>384</b>	<b>100.0</b>	

(Filled Data,2023)

**Table 4. Community awareness sessions on disaster safety**

	Percent	Cumulative Percent	Frequency
Yes	97	25.26	25.26
No	287	74.74	100
<b>Total</b>	<b>384</b>	<b>100.0</b>	

(Filled Data,2023)

Omari et al. [12] recognised the significance of staff awareness on safety through the findings which indicated a significant relationship between principals' staff awareness and management of disaster. Their study went on to recommended further frequent sensitization on disaster management to ensure teachers are well aware of its importance in preventing disasters so as to promote learning and avoid loss of lives. One of the Officer Commanding Station suggested that community awareness sessions should be encouraged and be done regularly as the community are the first responders to emergencies.

### 3.8 Rate of Preparedness of Schools in Response to Disasters

To establish how prepared public secondary schools in Nairobi county are to respond to disasters, the respondents gave their rating on their schools' preparedness in response to disasters. The findings are as shown in Table 5.

The question aimed to investigate the level of preparedness of schools involved in the study based on the perception and opinions of the students. Table 5 indicate that 26.3% (n=101) didn't know the rate of preparedness of their school's response to disasters. 54.16% (n=208) gave their rating as low; 16.15% suggests that rate was moderate while only 3.39% felt that the rate was high. This corresponds with the researcher's observation which indicated that many schools did not have clear communication strategies to use during an emergency. This was

because they had no specific plans that outlined their key roles and responsibilities during an emergency. Furthermore, some schools had no first aid kits, while others had a few basic first aid kits that were not well stocked with essential drugs, and some of the drugs expired. Therefore, they could not be used to help students suffering from minor injuries [13].

### 3.9 Availability of Plans for Disaster Emergency Response

To determine the schools plans for disaster emergency response, the researcher asked the respondents if the plans were available. Table 6 shows the findings.

The question aimed to investigate if schools involved in the study had plans in place for disaster emergency response. Findings indicates that 79.95% (n=307) of students revealed that schools lacked plans for disaster emergency response. While only 20.2% (n=77) argued there were plans in place disaster emergency response. Schools had few control measures in place in case of a disaster, such as pre-determined evacuation routes, clear definitions of evacuation areas, and pre-determined assembly points outside the school premises. Kukali [9], noted that schools lacked clearly defined roles among teachers, students, and support staff during an emergency. The researcher noted that most of the interviewed head teachers, teachers, board of management and parent's association did not have contacts of the emergency responders.

**Table 5. Rate of preparedness of schools in response to disasters**

	Frequency	Percent	Cumulative Percent
Highly	13	3.39	3.39
Moderately	62	16.15	19.54
Low	208	54.16	73.70
I don't know	101	26.30	100
<b>Total</b>	<b>384</b>	<b>100.0</b>	

(Field Data,2023)

**Table 6. Availability of plans for disaster emergency response**

	Frequency	Percent	Cumulative Percent
Yes	77	20.05	20.05
No	307	79.95	100.0
Total	384	100.0	

(Field Data, 2023)



#### 4. CONCLUSION

The study sought to establish the level of disaster preparedness in public secondary schools in Nairobi County. Major findings indicated that schools are highly vulnerable to fire related incidences compared to other disasters. The respondents admitted to their schools having experienced a disaster. The study found that most schools involved in the study have evacuation plan for disaster preparedness. Majorly, emergency drills are never done, Students had not attended training on used of fire safety facilities and community awareness sessions are never done. While most of the respondents admitted that schools did not have plans for disaster emergency response, they recognized the importance of disaster planning for safety in schools.

#### 5. RECOMMENDATION

From the findings, the study recommends that learning institutions should have qualified personnel carrying standards assessment and ensure the availability of resources for effective disaster preparedness. secondly, movements such as scouting and girl guides association should be effectively trained on safety and disaster preparedness and be allowed to regularly engage other students on the same. Thirdly, the study recommends that every learning institution should have an emergency preparedness plan that should be very comprehensive taking into account all hazards that schools face and school community should be trained and emergency drills carried out often.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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