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DISASTER PREPAREDNESS IN SECONDARY SCHOOLS IN RUIRU DIVISION, KIAMBU COUNTY, KENYA

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ABSTRACT

Objective: To establish common disasters, preparedness and management in secondary school in Ruiru Division, Kiambu County, Kenya.

Design: Descriptive cross-sectional study.

Subjects: Out of the target population a hundred and twenty (120) respondents were selected from the students, teachers and the support staff. Eighteen key informants snowballed gave information that augmented the study findings

Results: The respondents did not know how to use the first aid kit elements ($\chi^2 = 835.263$, $p = 0.000$, $df = 1$). Lack of knowledge on use of first aid elements was significantly high among the respondents which also reflected lack of skills to manage minor incidences ($\chi^2 = 835.1$, $P = 0.000$, $df = 1$). The respondents confessed the lack of preparedness for disasters in their schools ($\chi^2 = 840.8$, $P = 0.0$, $df = 2$).

Conclusions: The study was set to find out the Preparedness for disasters in Ruiru secondary with an aim of filling any gap that may be found by implementing strategies to improve preparedness for Ruiru people which should be the way to go everywhere and those in authority to avail the required resources for disaster management.

INTRODUCTION

Disaster is an overwhelming event that involves the destruction including injury and loss of lives and the affected cannot help themselves using their only resources. Disasters are an increasing global health concern with an average of one disaster per week requiring external and international assistance and they become common events that pose serious threats to public health. This emphasizes mankind's vulnerability to disasters and the necessity for preparedness at all levels. Recent disasters throughout the globe have shed new light on the vulnerability of life on earth (1).

The devastating disasters that afflicted numerous communities in 2004 and 2005 were the killings in Beslan, Russia, The Indian Ocean Tsunami, the earthquake in Pakistan, and the damaging hurricanes along the Gulf coast (2).

Kenya has experienced simple and complex disasters caused by drought, fires, floods, industrial accidents, the HIV/AIDS, traffic accidents, terrorist attacks, and collapse of buildings among others. Disasters constitute a real threat in every sphere of human development.

The causes of disasters can be divided into two distinct categories: those due to man-made hazards

and those due to natural hazards. Natural hazards are principally the result of geophysical interactions between atmosphere, hydrosphere and lithosphere. Any changes in these interactions may lead to changes in the normal frequency and cause disasters of high magnitude.

The types of natural hazards that can cause disasters are earthquakes, floods, drought, landslides, tropical storms and volcanoes among others. Man-made disasters are caused by the actions of human beings either directly or indirectly. These disasters include wildfires, accidental release of oils on land and in the sea, road accidents, bomb blast/violence, pollution especially in industrial accidents (3).

Disasters are low-probability events caused by the interaction of social processes and the physical environment. They compete for attention with priorities of daily living (4). The poor are more vulnerable to disasters than the rich because they live in unsafe areas such as flood plains, slopes of steep hillsides and river beds and their daily struggle to survive takes priority over investment in mitigating the impact of potential disaster events (5).

One of the serious and growing problems in the secondary school was the increase of disasters. Records showed an increase in the number of fires, rape, collapse of buildings, roof blown off by wind,

floods, drought and HIV / AIDS which was declared a national disaster in 1998 by the then President of Kenya.

The secondary school students were not in disaster free environments though certain life styles make some people more vulnerable to disasters than others. One family disregarded warnings about where and how they built their home which was destroyed in a disaster because the building collapsed whilst the other took precautionary measures leading to their home withstanding the impact of the disaster (6).

In 1999 natural catastrophes and man-made hazards claimed more than 105,000 lives across the globe and resulted in total loss of US \$ 100 billion (5). A disaster in a developed country could cause few deaths and destruction than a disaster of the same magnitude in a developing country simply because of the different life styles of the people in the two different countries.

A good disaster and emergency response is merely an extension of good routine, (Mutisya, 2004). It should go beyond immediate care given to an injured person (7). Systemic assessment of losses, social and economic impact of disasters and particularly mapping of risks are fundamental in understanding where to take action (8).

Disaster management is a planned, deliberate, organised, directed and visualised effort to mitigate, prepare for, respond to and recover from a disaster or emergency situation or its effect. Disaster preparedness involves an integrated combination of planning, training personnel qualification, drills, acquisition of equipments and standard certification (9).

Planning how personnel, equipment, and other resources are used to support incident management and emergency response activities. Plans provide mechanisms and systems for setting priorities, integrating multiple entities and functions, and ensuring that communications and other systems are available and integrated in support of a full spectrum of incident management requirements.

Records have shown an increase in the number of disasters in Kenyan Secondary Schools causing deaths and a lot of suffering. At Bombolulu high school, 26 girls perished in a fire inferno and hundreds of others got maimed. In Nyeri high school 4 prefects died in unexplained fire inferno in 1999, and in Kyanguli high school 68 students perished in a fire inferno leaving hundreds maimed (10).

Students of Gateway High School, (one of the sampled secondary school) salvaged whatever remained of their belongings after a fire gutted down their dormitories, though nobody was injured property worth thousands of shillings were destroyed by fire (11).

A disaster event in a Kenyan Secondary School would affect quite a population and destroy the

infrastructures like classrooms, roads, dormitories, sewer systems, lighting systems, water systems etc. The destruction might be so severe that recovery may take time or it may become inevitable depending on the economic powers of the managers and the associates of such a school. The school would also get stigmatised.

MATERIALS AND METHODS

Study area: The study was carried out in Ruiru Division of Thika District, in Central Province, Kenya (appendix i). The other Divisions of Thika District are: Thika municipality, Kakusi, Gatundu north, Gatundu south and Gatanga. Thika district is an administrative district located in the southern part of central province of Kenya (1°4' 60 S 37° 4' 60 E) Ruiru Division administratively was divided into two locations namely Ruiru and Juja.

The division had eight Secondary Schools. One of the schools was for boys; two for girls and five were mixed, (boys and girls) both gender in the same school. Four of these Secondary Schools were privately managed and the other four were Government managed.

Ruiru division had many industries and most of the industrial workers were from within the division, which is in the outskirts of Nairobi with most of its residents working in the capital city of Kenya.

Sample size determination: A sample is part of the target population that has been procedurally selected to present that particular population (Oso and Onen, 2005). To obtain a representative sample, the method recommended by Mugenda and Mugenda (1999) for social sciences, standard formula was used:

$$N = \frac{Z^2 Pq}{d^2}$$

Where,

N = sample size

Z = standard normal deviate (1.96) which corresponds to the 95% confidence interval.

p = 0.1 proportion of respondents with the desired characteristics

q = 0.9

d = degree of accuracy set at 0.05

$$N = \frac{1.96^2 \times 0.01 \times 0.09}{0.05^2} = 138$$

For proportional distribution from the eight (8) Secondary Schools, 138 participants were divided among the eight giving sixteen participants for each school which was then divided by three giving five for each sub group. A simple random sampling was used to get the equal number of teachers, students and support staff from each secondary school by having five (5) folded papers with yes and the rest with no,

depending on the number of teachers, students and the support staff in each Secondary School. A sample size of one hundred and twenty (120) was realised.

More information was gathered from six (6) secondary schools managers and sixteen (16) community representatives who were selected as key informants for an in-depth interview. Snowball sampling was applied to get the secondary school administrators while two (2) community

representatives were also selected from each Secondary School environs through snowball sampling to participate in this study.

RESULTS

SocioDemographic characteristics of the respondents
The general socio demographic characteristic of the respondents are shown in Table 1 below

Table 1
Sex, marital status and age of the respondents:

	Frequency	Percent	
sex	female	88	73.3
	male	32	26.7
	Total	120	100.0
Marital status	single	44	36.7
	married	76	63.3
	Total	120	100.0
Age	teenager	40	33.3
	adult	80	66.7
	Total	120	100.0

The demographic characteristic of the respondents included: level of education profession, age and sex and marital status as shown in the table above.

Respondents' education level: The level of knowledge was looked at, with the hope to establish whether

people of higher education had more knowledge on disaster management. The study had 29 (24.17%) graduates, 24 (20%) diploma holders and 20 (16.67%) certificate holders. The rest 40 (33.3%) were form two students.

Table 2
Participants level of education

	Primary	Educational level				Total
		students	certificate	diploma	degree	
student	0	40	0	0	0	40
teacher	0	0	0	16	24	40
support staff	7	0	20	8	5	40
Total (n)	7	40	20	24	29	120
Total (%)	5.8	33.33	16.67	20	24.17	

Common disasters in Ruiru Division: Objective one was investigating the common disasters in Ruiru division secondary schools with an aim of recommending strategic plan for disasters in secondary schools. Out of the 120 respondents, more than half 63 (53%) could

not name any of the disasters that had occurred in Ruiru Division within the last five years. whereas 35(29%) could name at least 3 and 22 (18%) named less than 3.

School disaster preparedness: Seventy five (62.5%) of the respondents rated their school disaster preparedness as poor, 37 (30.8%) rated their school disaster preparedness as good while 8 (6.7%) rated the preparedness as excellent (table 4.8). There was a statistically significant relationship between rating the schools' disaster preparedness as poor and the knowledge on disaster preparedness ($\chi^2 = 840.843$, $df=2$, $p = 0.0001$).

Table 3
Rating of School according to their disaster preparedness:

Rating	Observed N	Percent
poor	75	62.5
good	37	30.8
excellent	8	6.7
Total	120	100.0

Secondary School vulnerability to disasters: One hundred (83.3%) of the respondents cited mixed schools to be vulnerable while twenty (16.7%) of respondents thought that single gender schools were more vulnerable (table 4.10). The findings indicated that there was a significant relationship between the type of secondary school and vulnerability to disasters ($\chi^2 = 4.44$, $df = 1$, $p=0.035$).

Table 4

Knowledge of participants on vulnerability to disasters

Type of school	Frequency	Percent
Mixed secondary schools	100	83.3
Single gender secondary schools	20	16.7
Total	120	100%

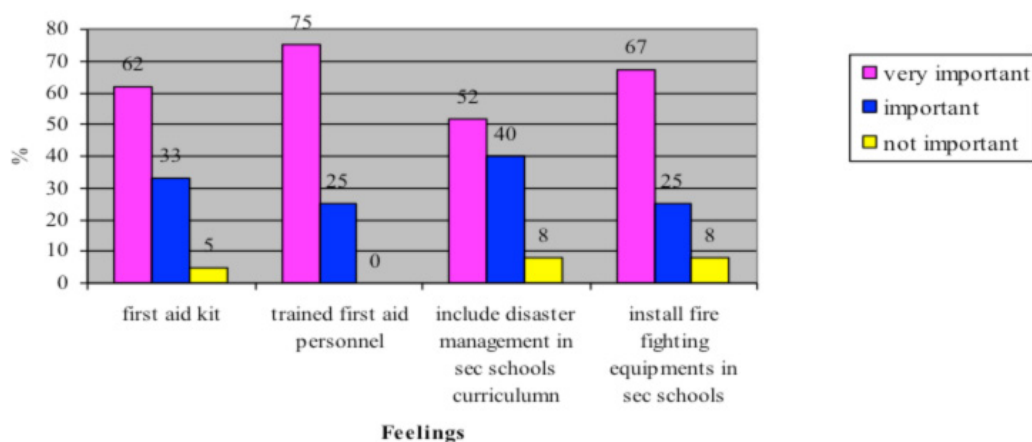
Out of the 120 respondents, only 9 (7.5%) were able to identify two of (sand, blankets, carbon dioxide) as fire fighting materials while 61 (50.8%) named only one of fire fighting materials and 50 (41.7%) could not name any.

Table 5

Knowledge of fire fighting equipments by participants

Equipment	Frequency	Percent
named sand and blankets	9	7.5
named blankets	61	50.8
named none	50	41.7
Total	120	100.0

Figure 1
Feelings towards disaster management



The figure above shows the feeling of the respondents in reference to disaster management where the majority indicated its importance if people are to be in safe environments with very few having the feeling of disaster management not important.

DISCUSSION

Disasters have been occurring in this division but due to lack of knowledge, the respondents could not remember them. This observation revealed that the respondents were vulnerable to future disasters. This calls for rapid measures to educate the Ruiru Secondary School community on disaster management.

An in-depth interview of a senior quality assurance and standards officer brought to light that, though there were measures to be undertaken to ensure health and safety in education institutions as per legal notice number 56 of 13th March 2001 (12).

There were no lessons taught on disaster management to Secondary School community in Ruiru Division. However despite first aid training being a basic component in disaster management and preparedness, 85% of the respondents was not trained.

This finding indicated the need to offer basic disaster management training in schools as a measure of creating awareness (13). They emphasised on disaster reduction initiatives to be rooted in schools and communities. However, an in-depth interview of secondary schools managers revealed that including disaster management in secondary schools would increase the work load to the students and the teaching staff who are already overwhelmed by the examinable subjects.

Majority of the respondents (62.5%) rated their schools' disaster preparedness as poor. The finding showed that the respondents who rated the state of disaster preparedness in their schools as poor were less likely to be knowledgeable on disaster preparedness ($\chi^2 = 840.843$, $df = 2$, $p = 0.0001$). This finding indicated that majority of the Ruiru Division Secondary Schools community were highly vulnerable to future disasters due to lack of the basic facilities to counteract disasters.

Majority of the respondents (94.2%) knew collapse of a building along Ronald Ngala Street was a disaster. This observation was supported by the finding that the relationship between knowledge about disaster preparedness and the knowledge of whether collapse of that building was a disaster was not statistically significant ($\chi^2 = 0.175$, $df = 1$, $p = 0.675$).

CONCLUSIONS

According to the study findings, 53% of the respondents could not name any of the common

disasters like fire, and road traffic accidents which had occurred in Ruiru Division within the last five years, 29% could name at least three while 18% named more than three. This observation was supported by the finding that the respondents who were knowledgeable about the common disasters were likely to be prepared against disasters ($\chi^2 = 571.482$, $df = 2$, $p = 0.0001$).

There were no lessons taught on disaster management to Secondary School community in Ruiru Division. Despite first aid training being a basic component in disaster management and preparedness, 85% of the respondents did not have this basic training. Respondents who had never used a first aid kit were less likely to have knowledge about disaster preparedness ($\chi^2 = 835.263$, $df = 1$, $p = 0.0001$). The study also revealed a number of respondents who cited location of a First Aid kit to be in a closed cabinet ($\chi^2 = 474.386$, $df = 1$, $p = 0.0001$). These were less likely to be knowledgeable about disaster preparedness and the schools lacked facilities to counteract disasters if they occurred.

More than half of the respondents (62.5%) rated their Secondary schools' disaster preparedness as poor. These respondents were less likely to be knowledgeable on disaster preparedness ($\chi^2 = 840.843$, $df = 2$, $p = 0.0001$). Majority 94.2% of the respondents (94.2%) knew the collapse of the building along Ronald Ngala Street was a disaster. This showed a positive relationship between knowledge about disaster and highlighting about disasters through proper information education and communication. This was supported statically by a chi result ($\chi^2 = 0.175$, $df = 1$, $p = 0.675$).

The findings also indicated lack of basic skills in managing the disaster victims. According to the study findings, the researcher rejected the null hypothesis and concluded that the respondents were less knowledgeable about disaster preparedness in Ruiru Division.

RECOMMENDATIONS

Since prevention is better than cure the researcher recommends that the involved parties come up with strategies for disaster management in secondary schools which can be applied in Ruiru and other schools in Kenya and worldwide. Everybody should be sensitized on disaster management from the government arms all the way down the grass root. This would be in line with the Hyogo framework for action 2005-2015 priority no. 5 which states that everybody should be prepared and ready to act for effective response at all levels.

The communities should be taught disaster management using community development fund (CDF). Everyone should have the necessary

knowledge and skills to be able to participate in disasters management which can occur at any time in any place.

The researcher also recommended that disaster management be included in the other institutions of higher learning which is supported by the hyogo framework for action priority no. one (1) which indicates that disaster risk reduction is made a priority by ensuring that the reduction is a national and a local priority with a strong institutional basis for implementation.

The researcher was in agreement with Minister of Education administrators recommendations' that all doors opens outward in all dormitories, windows to have grills, laboratories and kitchen to have fire fighting equipments, story buildings to have staircase as an escape routes, all food handlers to have varied medical certificates among others. This is supported by the hyogo framework for action no three3 which states that we should use knowledge innovation and education to build a culture of safety and resilience at all levels.

The researcher recommended that implementation of the safety measures, like having qualified personnel to carry out standard assessment of the schools and availability of other resources would be ideal if we are to implement the measures that would deal with the major challenge of implementing health and safety programs in schools.

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COMPETING INTERESTS

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

REFERENCES

1. Lloyd, F. (2005). Epidemiologic approaches to disaster reducing vulnerability: American journal of epidemiology. <http://aje.oxfordjournals.org/>
2. Nonny, S. H. (2006). Disaster relief: the Australasian Journal of disaster and trauma studies. (<http://www.org/ala/acrl/acrlpubs/crlnews/backissues2006/february06/disasterrelief.htm>).vol.67 No2).
3. Berz, G. A. (1991). Global Warming and the Insurance Industry: Nature and Resources UNESCO, VOL.27.
4. Mutsya, S. (2004). Disaster awareness magazine: Recurring response difficulties. Volume5; Nairobi Kenya: Pg 27.
5. Alcira, K. and Margaret, A. (2002). Managing disaster risk in emerging economies: World Bank. U.S.A.
6. Parker, R. S. (1992). Environmental management and urban vulnerability, World Bank discussion paper no. 168; Washington DC: 107-52.
7. Hurt, T. (1976). Elements of tort liability as applied to athletic injuries; journal of School health; XLVI.
8. Valancy, A. (2004). Disaster reduction in Africa: African journal; Nairobi, Kenya.
9. WHO. (1999). Community emergency preparedness: A manual for Disaster Managers and Policy makers: Geneva, Switzerland.
10. Lumbasio, E. (2004). Your guide to safety: Volume 8: Nairobi, Kenya.
11. Avuyefu, V. (2007). Students sent home as hostels burns down. One hundred and Sixty students of Gateway Secondary School sent home after their dormitory was destroyed by fire. Daily Nation page 8, column one: Nairobi Kenya.
12. Kosgey, H. (2001). Health and safety in education institutions: Ministry of Education Nairobi Kenya.
13. Achoka, J. and Maiyo, J. (2008). Educational Research and review vol. 3(3), PP. 154-161 May, <http://www.academicjournals.org/ERR> ISSN 1990-3839(C)