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FIRE DISASTER PREPAREDNESS AMONG STUDENTS IN KENYA MEDICAL TRAINING COLLEGES IN EASTERN KENYA

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FIRE DISASTER PREPAREDNESS AMONG STUDENTS IN KENYA MEDICAL TRAINING COLLEGES IN EASTERN KENYA

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Abstract

Purpose: The major objective of the study was to determine the status of fire preparedness among students at Kenya Medical Training College.

Methodology: This was a descriptive cross-sectional study design. The study populations were 1st and 4th year students in Machakos and Embu KMTCs. A sample size of 336 students was selected randomly in both campuses while stratified random sampling technique was used to sample students from departments and classes in each College. Data was collected using pre-tested questionnaires, focus group discussions and key informant interviews. All the data collected was entered into Statistical Package for Social Sciences (SPSS) version 20 and analysis done using descriptive and inferential statistics.

Findings: Students were aware of the types of disasters which could affect them while in the college with 181 (54%) of the respondents knew the possible fire risk sources in the rooms. Majority 218 (64.9%) did not know the college fire safety policy guidelines, while (72%) stated that they were vulnerable to fire disaster. Majority 329(98%) said fire drills as safety measures were never practiced in these colleges. There was no significant association between students' age, gender, religion, and year of study and fire disaster preparedness ($p>0.05$).

Unique contribution to theory, practice and policy: There is need for the institutional fire policy to ensure students are trained of students on fire safety after admission. The data generated can be used by KMTC management through conducting periodic fire drills to keep students well prepared on fire preparedness and post their telephone numbers for the nearest firefighting equipment on the college notice boards, classrooms and in hostels.

Key words: *Keya Medical Training College, fire disaster preparedness, safety measures.*

1.0 INTRODUCTION

Disaster preparedness is one of the important elements in disaster risk reduction, and it encompasses community awareness, readiness to render appropriateness response and quick recovery (Ejeta et al, 2015). Fire disasters in secondary schools and tertiary institutions are among the known man-made disasters globally with the most devastating events that have been known to cost life and properties (Xin and Huang 2013). Worldwide, several incidences of fire have reported (Xin and Huang 2013). For example, apart from loss of life, fire disaster has been associated with prevalence of diseases that have been reported to contribute about 1% of the total global disease burden (Leistikow et al., 2000; Kihila, 2017). One of the commonest devastating effects caused by fire in buildings as observe by several studies include the collapse of World Trade Centre (Kihila, 2017), the fire disaster in Sweden that occurred in 1998 killing 63 people (Cassuto and Tarnow, 2003). Fire disaster in buildings is one of the commonest recognized man-made disasters with the most devastating events that cost life and properties (Xin and Huang 2013).

In Africa, incidences of fire are frequently common. For example, in 2001 fire gutted a girls' school in Nigeria where 23 students perished after the dormitory they were sleeping was locked and fortified with iron grill (Ndetu and Kaluyu, 2016). In 2008, 19 girls and 2 adults died after Budo School caught fire in Uganda (Ndetu and Kaluyu, 2016). It was later discovered that the hostel they were sleeping was locked from outside. Several studies on fire disaster have observed that Tanzanian secondary schools for the last ten years have increase significantly (Kahwa, 2009; Nyagawa, 2018). The worst fire incidence to occur in Tanzania was when 45 girls died as a result of fire outbreaks in Shauritanga secondary school in Kilimanjaro (Nyagawa, 2016).

In Kenya for example, several fire incidences have been experienced where lives and properties has been lost. For instance, in 1998 dormitory fire killed 26 students at Bombolulu Girls School in Coast province (Kahwa, 2009). In 2001, 67 boys in a night inferno at Kyanguli school in Machakos County. The dormitory doors had been locked causing a stampede at door-step. In 2012, 8 girls died in a dormitory at Asumbi Girls Bording Primary school in Homa Bay County. In fortunately, the fire could not be put out since the school did not have firefighting equipment (Ndetu and Kaluyu, 2016). This demonstrate the unpreparedness for fire disasters among schools and that many schools do not have firefighting equipment and still the studenta and staff are not trained in dealing with fire disasters(Ndetu and Kaluyu, 2016).

In order to reduce the frequency of fire in schools catastrophic especially on human loss, knowledge on the level of preparedness can enlighten the disaster management process leading to knowledgeable plans and decisions. On the other hand, lack of disaster preparedness as it has been reported in some categories of disaster such as floods and landslides (Miceli et al., 2008), hurricanes (Howe, 2011), earthquakes (Srinivas and Nakagawa, 2008) and fires (Kukali and Kabuka 2009) can result in negative economic and social consequences (Wilson et al., 2007). The aim of this study was to determine fire disaster preparedness among students in Kenya Medical Training Colleges in Eastern Kenya region. In the recent past, many sporadic fires out breaks have affected secondary schools in Kenya but no study conducted to determine the state of fire disaster preparedness among students at the KMTC.

1.1 Statement of the problem

Most institutions in Kenya have no capacity to handle emergencies like fire. Fire outbreaks in institutions are a public concern because of the increase incidences, injuries and deaths of students not to mention the destruction of properties. Without fire preparedness, institutions will continue to lose lives, property and learning time. Despite the concerted efforts by the Government of Kenya and other non-governmental organizations in creating disaster awareness and preparedness, Kenya still experiences a number of man-made disasters in various institutions of learning. For example, several fatal incidences have brought an urgent need for the government and the public to take action and deal with the problem fire outbreaks in our learning institutions. Some of these disasters include the fire outbreak in Kyanguli secondary school in Machakos where 58 students perished in a night inferno. Effort by the government of Kenya to formulate the national disaster management policy to emphasize proactive and preventive strategies in addressing disaster situations seem not bearing fruits. Such occurrence calls for institutions to be adequately equipped to deal with disasters. However, despite measures taken by institutions, fire disaster still occurs. It is therefore important for the management of these institutions to foster disaster management strategy to either eliminate or reduce fire disaster threats. The purpose of this study was to determine the level of fire disaster preparedness among students at the Kenya Medical Training College campuses.

2.0 METHODOLOGY

2.1 Study design

The study used a descriptive cross-sectional design, with mixed method approach (both quantitative and qualitative data) to elicit information from the target study population. Quantitative data was collected through semi-structured questionnaires with closed and open-ended questions, while qualitative data was captured through the Focus Group Discussions (FGDs) and Key Informant Information (KIIs). Qualitative data was used to complement and enrich findings obtained from quantitative data.

2.2 Population, Sample size and sampling method

The target population from which the sample was selected was all Kenya Medical Training Colleges Campuses in Eastern Kenya region which are four in number were purposively selected. The study sample was determined by the modified Fischer's formula as cited in Mugenda and Mugenda, 1999, such that $n = Z^2 pq/d^2$

Where: n = the desired sample size, (if the target population is $> 10,000$)

$Z = 1.96$, (the standard normal deviation/ distribution at 95% confidence level)

$q = 1 - p$

d = precision estimate at 5% (0.05), which is margin of error.

$P = 0.5$ (Since past studies on these subjects were unknown, 50% was used to determine the proportionate sample size under study), thus, Substituting these figures in the above formula:

$$n = \frac{(1.96)^2(0.5)(0.5)}{(0.05)^2} = 384$$

Since the target population was $< 10,000$, the sample size was modified using the following formula:

$$nf = \underline{\underline{n}}$$

$$1+ (n/N)$$

Where n_f = the desired sample size when population is < 10,000

n = the desired sample size when population is > 10,000

N = the estimated total population size under study, (in this study, it was 1503 students).

Therefore $n_f = 384$

$$1+ (384/1503) = 1.26$$

Thus, $384/1.26 = 305$

To cover for non-responses, 10% Of the sample size n was added, thus, n = calculated sample size + ($305 * 10\% = 31$), Thus, the actual total estimated sample size (n) used = $305 + 31 = 336$. Student population in each college, divided by total student population, times calculated sample size (n), gave the probability proportionate sample per college as shown in Table 1. Students in the two institutions under study were first stratified according to their classes (1-4th year) in each department as shown in Table 1. Then students were selected from each class using simple random sampling to select the total number of participants' proportion calculated for each institution.

Table 1: Sampling frame

College	Student population per college	Student percentage sample	Proportionate Sample size per college, based on 'n'	Number of classes in each college	No of students per class
Machakos kmtc	648	43%	$(43/100)*336 = 144$	13	11
Embu kmtc	855	57%	$(57/100)*336 = 192$	16	12
Total	1503	100%	336		

Data analysis and presentation

The raw data was coded, entered into the computer and analyzed by use of descriptive and inferential statistics. The collected data was also sorted, cleaned and analyzed using Excel computer package and SPSS version 17.0 software. Analysis of data through descriptive statistics such as tables and bar charts was done while inferential statistics was done using chi-square to determine the significance of the association/relationship between various independent variables and the state of fire disaster preparedness among the students. Difference between the parameters of estimate were assumed to be statistically significant at $p < 0.05$.

3.0 RESULTS

3.1 Social demographic Characteristics

The social demographic characteristics of respondents are presented in Table 2. A total of 336 students participated in the study including four (4) focus group discussions (FGDs) and two (2) key informants (KIIs). Of these students 175(52%) were females while males accounted for 161(48%). Majority 323(96% of the respondents were christians, with Muslims accounting for

10(3%) of the respondents, while other religions had only 3(1%) response rate. The modal age of the students was those between 21-23 years, which had 177(52.7%), followed by age group 18-20 at 117(34.8%) while 27 years and above had the least number of respondents at 7(2.1%). The respondents in first year to third year were equal 104 (31.0%) each, where else those in fourth year were only 7 (7.0 %) since they were only one class from the nursing department.

Table 2: Socio- demographic Characteristics and fire disaster preparedness

Socio-demographic factors	variables	Rating overall fire disaster preparedness			Total	χ^2 statistic	P-value
		Poorly prepared	fairly prepared	well prepared			
Age (in years)	18-20	34	73	9	116	6.864	0.738
	21-23	60	108	8	176		
	24-26	11	23	1	35		
	27 and above	2	7	0	9		
	Total	107	211	18	336		
Gender	Male	53	100	7	160	0.711	0.710
	Female	54	111	11	176		
	Total	107	211	18	336		
Religion	Muslim	7	5	0	12	10.461	0.107
	Christian	100	204	17	321		
	Others	0	2	1	3		
	Total	107	211	18	336		
Year of study	1st Year	32	61	7	100	5.652	0.463
	2nd Year	45	86	6	137		
	3rd Year	15	46	4	65		
	4th Year	15	18	1	34		
	Total	107	211	18	336		

When Overall fire disaster preparedness was rated based on various age brackets, those aged 18-20 years, were 116 as shown in Table 2. Out of this, 34(29.3%) were found to be poorly prepared, 73(62.9%) were fairly prepared, with only 9(7.8%) being well prepared. Respondents who were aged 21-23 years, were 176 where 60(34.1%) were poorly prepared, 108(61.4%) were fairly prepared, while only 8(4.5%) were well prepared. Those at ages 24-26 were 35, where 11(31.4%) were poorly prepared, 23(65.7%) were fairly prepared, while 1(2.9%) were well prepared. Respondents aged 27 and above were 9, where 2(2.2%) were poorly prepared, 7(77.8%) were fairly prepared, while none was well prepared. According to gender, 160(47.6%) were males. Out of this, 53(33.1%) were poorly prepared, 100(62.5%) were fairly prepared, while only 7(4.4%) were well prepared. Females were 176 (52.4%), where 54(30.7%) were poorly prepared, 111(63.1%) were fairly prepared, while only 11(6.3%) were well prepared

Similarly, in terms of religion, Muslims were 12 and out of this number, 7(58.3%) were found to be poorly prepared, 5(41.7%) were fairly prepared, while none was found to be well prepared as indicated in Table 2. Christians were 321, out of which 100(31.2%) were found to be poorly prepared, 204(63.6%) were fairly prepared while only 17(5.3%) were found to be well prepared. Those who fell under other religions were 3, where 2(66.7%) were fairly prepared, with 33.3%) were well prepared. Basing on year of study, first years were 100, out of this, 32 (32%) were poorly prepared, 61 (61%) were found to be fairly prepared, with only 7 (7%) being well prepared. Second years were 137, where 45(32.8%) were found to be poorly prepared, 86(62.8%) were fairly prepared, while only 6(4.4%) were found to be well prepared. The third year participants were 65, where 15(23.1%) were poorly prepared, 46(70.8%) were found to be fairly prepared, while 4(6.2%) were well prepared. Forth year students were 34, where 15(44.1%) were found to be poorly prepared, 18(52.9%) were fairly prepared, while only 1(2.9%) were found to be well prepared.

Students' age, gender, religion, and year of study did not have any association with the overall fire disaster preparedness where they indicated P- values of (P=0.738), (P=0.710), (P=0.107) and (P=0.463) respectively as shown in Table 2. Similar themes were also reflected during the FGDs and KIIs in which some participants stated: "I do not think age has any influence when it comes to fire disaster preparedness, it all depends on whether one has had past exposure to fire outbreak"; "Any of the sex can prevent or respond effectively to a fire outbreak provided they do not panic"; "This(disasters) is a matter of a physical event on earth and has nothing to do with one's faith" and "Year of study do not have any influence, it all depends on one's past experience and if he or she was trained on fire safety guidelines in the college".

Fire disaster preparedness at the study institutions

An assessment of fire disaster preparedness among students in the two KMTCs in eastern Kenya region was done by rating and coding various responses. The total possible scores from the tested specific objectives in the study added up to 23 scores. These scores were equally apportioned in to the three states of preparedness using the Likert scale. The scale was as follows; poorly prepared: 0-7 (where the maximum score was below 50%) scores was coded 1, fairly prepared: 8-15 (whose maximum score converts to above 50%) scores was coded 2 and well prepared: 16-23 (Whose score translated to between 70% and 100%) scores were coded 3. Out of the 336 participants, majority 211(62.8%) of the respondents were fairly prepared, 107(31.8%) poorly prepared and minority 18(5.4%) of the respondents were found to be well prepared on fire disaster preparedness.

Table 3: Awareness of possible types of disasters that can affect the college

Response		Frequency				Total
		Yes	No			
Past experience of a disaster	n=336	121	215			336
	%	36	64			100
Type of disaster experienced in previous school	n=155	Fire break	Students' unrest	Disease out break	Others	Total
	n	71	48	33	3	155
	%	45.8	31	21.3	1.9	100
Occurance of a disaster in college	n	Yes	No			Total
	%	30	306			336
		9	91			100
Types of disasters which affected the college in the past	n=336	Fire outbreak	Students' unrest	Disease out break		
	n	12	8	2		
	%	54.5	36.4	9.1		
						22
						100

As to the possible types of disasters, majority 215 (64%) said they had not experienced any kind of a disaster while 121(36%) of the respondents stated that they had experienced a disaster while in their previous schools as shown in Table 3. Similarly, just a few of the participants in both FGDs and KIIs reported that they had experienced a disaster while in their previous schools. Out of those who had experienced a disaster in their previous school, a large number 71 (45.8%) of them said they had experienced fire outbreak at their previous schools. This fact was supported in the FGDs and KIIs; where majority of the participants said they had experienced fire incidences in their previous schools. This meant fire outbreak was the most likely disaster which could strike the colleges; meaning with this past experience, only those few students with past fire outbreak experience are likely to demonstrate a certain degree of preparedness.

In the same study as indicated in Table 3, most 306(91%) of the respondents said that none of the disasters had occurred in their current college, with 30(9%) saying that some types of disasters had occurred in their college. This fact was also confirmed in the FGDs and KIIs, where just a few of the participants narrated that a few disaster incidences had occurred in their colleges. On types of disasters which had affected their college in the past, 12(54.5%) of the

students said fire outbreak was the most disaster that had affected the college. In all the FGDs and KIIs, participants ranked fire outbreak as the common disaster incidence which had occurred in their colleges. This means with this experience, students are expected to be well prepared to respond to any fire incidence.

Table 4: Knowledge on fire safety policy guidelines

		knowledge on fire safety policy guidelines (n=336)		Total
		Yes	No	
Fire safety policy	n	118	218	336
	%	35.1	64.9	100
Induction on fire safety preparedness	n	68	268	336
	%	20.2	79.8	100
Presence of fire response team	n	75	261	336
	%	22.3	77.7	100
College exit plan	n	156	180	336
	%	46.4	53.6	100
College evacuation plan	n	81	255	336
	%	24	76	100
Fire agents to call (fire brigades, police and Red Cross)	n	74	262	336
	%	22	78	100
Fire agents telephone numbers	n	18	318	336
	%	5.4	94.6	100
Emergency escape routes	n	121	215	336
	%	36	64	100
Fire assembly points	n	155	181	336
	%	46.4	53.6	100
Importance of fire assembly point	n	202	134	336
	%	60.1	39.9	100

On whether there are fire safety policy guidelines with the college management, more than half of the students 218(64.9%) were not aware of availability of fire safety policy guidelines in their college as shown in Table 4. This fact was also confirmed during the FGDs and KIIs, where comments like “*I have never seen or heard of any fire safety policy guidelines since I joined this college*”; “*I only see those fire equipment in our hostels, but I do not know how to use them*”; “*have not heard anybody mention such a thing as a fire exit plan in this college and this is my third year*” were noted during the discussions. Most 202(60.1%) of the respondents were knowledgeable on the importance of fire drills by saying that fire drills were to prepare people in case of real fire outbreak. However, some of them did not know their importance,

with 19 (5.7%) saying it is just a requirement by the college. During FGD, one participant said, "I even do not know what it is and how it is done".

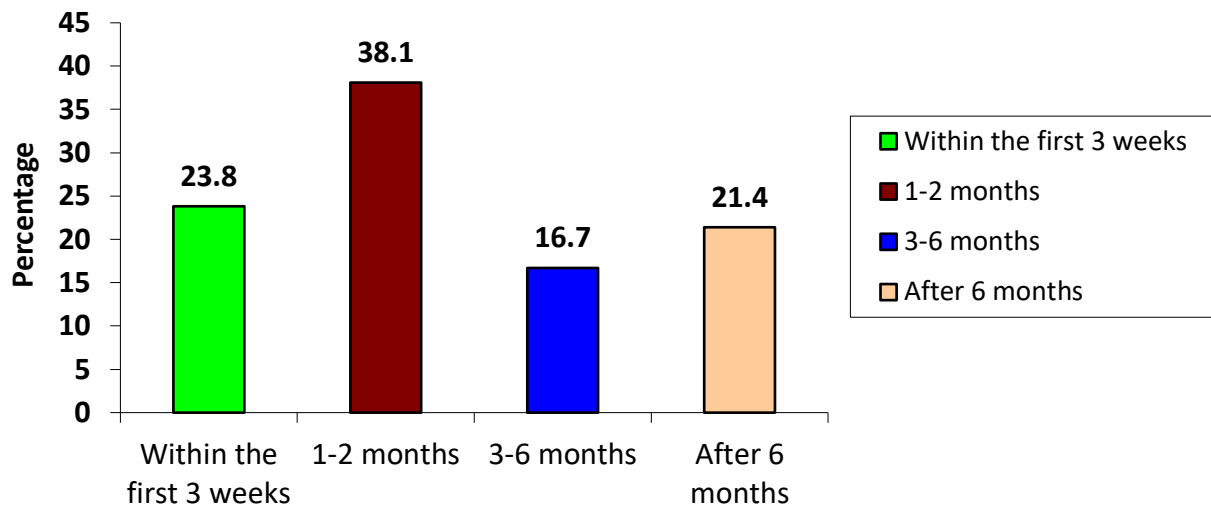


Figure 1: Duration of fire safety preparedness induction/ training after admission

Figure 1 shows that 80(23.8%) of the students inducted on fire safety preparedness were trained within the first 3 weeks, 128(38.1%) within the first 1-2 months, 56 (16.7%) within 3-6 months and 72(21.4%) within 6 months after joining college.

Table 5: Students' level of competency in the use of fire-fighting equipment

Type of firefighting equipment	Competency in the use of firefighting equipment									
	Not at all	%	Low	%	Average	%	Above average	%	High	%
Fire extinguishers	107	31.8	64	19.0	59	17.6	35	10.4	71	21.1
Manual fire alarm bell	143	42.6	48	14.3	57	17	33	9.8	55	9.8
Water sprinklers	86	25.6	63	18.8	57	17.0	56	16.7	74	22.0
Buckets with sand	56	16.7	114	34.0	42	12.5	41	12.2	83	24.7

On the rating of competency in the use of various firefighting equipment, the respondents were asked to rate their competence in the use of fire-fighting equipment (fire extinguishers, manual fire alarm bells, water sprinklers and sand buckets) using the following scale; no competence at all, low, average, above average and high level of competence as shown in Table 5. Although fire extinguishers were the most firefighting equipment in hostels, Majority 107(31.8%) of the respondents stated that they had no competency at all. Competence in the use of other firefighting equipment was below average rating as follows; manual fire alarm bells 191 (56.9%), Water sprinklers 149(44.4%) and sand buckets 170(50.7%) of the respondents. Similarly, most participants during FDGs and KIIs indicated that they did not have any competency in the use of almost all the firefighting equipment.

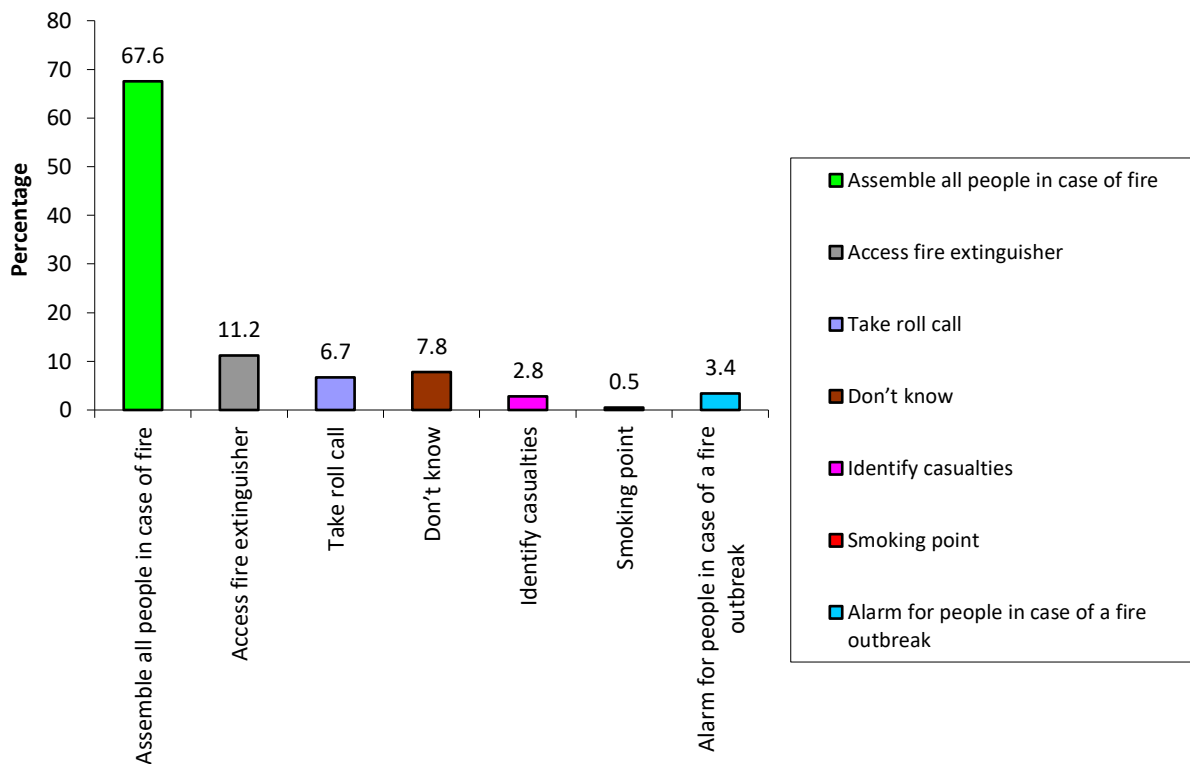


Figure 2: Knowledge on the use of fire assembly points

Figure 2 indicates that majority 227(67.6%) of the respondents knew the use of fire assembly points by saying that fire assembly points were meant for people to assemble in case of fire. During FDGs, majority of the participants indicated good knowledge of the use of fire assembly points as well.

DISCUSSION, CONCLUSION AND RECOMMENDATION

Discussion

Fire outbreaks are common in schools globally and no country has been spared from the problem. It is therefore paramount for policies and strict monitoring of institutions and schools

to have firefighting equipment installed in buildings including conducting regular fire drills so as to effectively manage the disaster when fire breaks. The current study observed that there was no significant association between age, gender, religion and year of study and the overall fire disaster preparedness. However, this contrasts a similar study conducted in Canada where socio-demographic characteristics such as age, gender and educational level had some association on a person's fire disaster preparedness (Macfadgen, 2007). This could be due to variation in exposure, where Canada being a developed country, the respondents there could be more exposed and knowledgeable on fire safety aspects as compared to Kenya where this study was conducted. However, the current agrees with an observation in Western Kenya that observed the level of education is an important factor in fire preparedness among those with university degree (Nasimiyu et al., 2017).

In this study, we observed that over 90% of the respondents were fairly and poorly prepared on fire preparedness. This outcome agrees with findings in Kisumu Kenya which observed poor fire knowledge preparedness (Kevu, 2015). This shows that the institutions state of preparedness is wanting and the outbreak of fire could lead to loss of lives and destruction of properties. There is urgent need for institutions to acquire and install firefighting equipment since the provision of fire safety support resources contributes to most fire disaster preparedness. This low level of fire preparedness can be attributed to lack of awareness campaigns in the institutions and the surrounding communities. This requires members concern to be exposed to fire safety campaigns through the media and training.

In the current study, (54.5%) of the respondents were aware that fire outbreak was the most likely disaster which could affect them. This observation was supported by a study in California which showed that increase awareness improves fire disaster preparedness (Sutton and Tierney, 2006). However, less than half of the respondents had experienced fire outbreak at their previous schools. This means many of the students who did not have past fire outbreak experience may be reluctant to take precautions in preventing occurrence of fire in their college. More than half of respondent said there had been incidences of fire outbreaks in their college. This finding agrees with a study conducted in Kenya which showed that fire was the most disaster which had affected learning institutions in Kenya in the past 25 (Ayonga, 2010).

The study found out that 54% of the respondents were knowledgeable of the fire risk sources in their rooms. This is similar to a study conducted by Perry and Lindell (2003), who observed that when many occupants are conscious and knowledgeable of fire risk sources around them; this tends to lower the chances of fire starting in their rooms. Although 98% of the respondents said none of those fire risk sources had caused fire in their rooms, a participant during FGDs express fear that with risky behaviors of some their colleagues, there were high chances of fire outbreak in the rooms.

In the current study, 64.9% of the respondents did not know about the fire safety policy guidelines provided in the college. This statistic came out during FGDs and KII discussions where majority confessed that they had no idea of the fire policy guidelines. These findings were supported by a study conducted by Vos et al., (2009), at Lowin; Belgium who found out those students had very low knowledge on their institution's fire safety policies and procedures which plays an important role in guiding occupants in a building to ensure fire safety and security. Lack of knowledge of the college's fire safety guidelines was also demonstrated by

Allen (2006), in his study at Philippines where he found out that students in the learning institutions had very little knowledge on available fire management policies and procedures put in place to enhance their fire disaster preparedness.

On the same study, 79.8% of the respondents reported that they were not trained on fire disaster management when they joined the college. This is similar to findings in a study conducted by Sabramaniam (2004), which observed that students were not being trained on fire disaster preparedness as soon as they reported to their institutions. Similar findings were observed in the study conducted by Baaack ST (2011), at Texas Nursing School which showed that fire emergency preparedness training was rarely offered in many learning institutions. Therefore, delay in fire safety training can easily undermine the full capacity of students to respond well during fire emergency events. Thus, it is paramount for students to be trained immediately they join various institutions of learning in order to empower them to prevent and/ or respond to any fire incidence. Overall, the study observed that the students had inadequate knowledge of all the provided procedures in the fire safety policy guidelines.

Even though 67.6% of the respondents knew the use of fire assembly points, the remaining percentage of 32.4% of those who do not know is a big number and these percentage could be in danger should there be fire outbreak in their hostels because they do not know where to assemble for safety. The study found that majority of the respondents knew that the key to the hostel main door was kept by one of the students, with 24.1% not knowing who keeps the key. This is very risk because in an event that there is fire emergency, the student may not know where to obtain the key, and this may lead to students death which could be avoided if the door was not locked or if they all knew who keeps the key. The study revealed that 96.1% of the respondents knew the main firefighting equipment were fire extinguishers, while 50% knew sand buckets were also provided. However, 31.8% of the respondents indicated that they did not know how to use them. This would defeat the whole purpose of providing the when students are not trained on how to use them. This finding is supported by a similar study conducted by Akussah and Fosu (2001) in Ghana which revealed that, in many of the schools, students had not been trained on the use of firefighting equipment including fire extinguishers

When people perceive that they are vulnerable to a danger, they tend to be alert always, and this raises their degree of preparedness. The study found out the respondents' perception of vulnerability differed, with 72% saying they were vulnerable to disasters, and 28% being in a state of denial that they were vulnerable. This finding concurred with a study conducted by Moghaddam et al., (2014) at a Nursing Training College at Florida, U.S.A which revealed that students' perception on fire disaster and knowledge on how to prevent and respond to fire outbreaks differed depending on their previous experiences with fire out breaks, on their level of education, and training acquired. This negative attitude and ignorance could make students not to take any preventive precautions against fire disaster incidences. The study also found out that 53.8% of the respondents perceived fire outbreak to be the most possible disaster which could occur in the college. This means this percentage of respondents could be more conscious and prepared to prevent and respond to fire outbreak. The study established that 50% of the respondents rated both tempering with electric wires and cooking in rooms as the highest possible causes of fire outbreaks, while 64.3% rated arson to be the least disaster which could occur in the college. This concurred with a study conducted by Lindell and Perry (2003) who found out that the main sources of fire risks in students' rooms included tempering with electric

wires, smoker's materials, naked flames such as candles, cooking gas and hot processes like iron boxes.

Competency in the use of firefighting equipment is vital in order to achieve proper fire disaster preparedness. However, this study found that many students did not have competency in the use of many of the firefighting equipment. This finding agrees with a study conducted by Ayonga (2016) who found out that students were not practicing fire response measures such as drills in schools in which firefighting equipment were used. This meant that in case of any fire outbreak, students would be helpless even though various firefighting equipment had been provided by the management. Therefore, periodical mock drills and evacuation drills should frequently be exercised in all the learning institutions in collaboration with the concerned authorities, such as Red Cross, police and Fire brigades. This would help in making the practice of fire disaster response more successful, and minimize loss of life and property in case of a fire emergency.

Fire disaster preparedness procedures assessed included students' involvement in drills, evacuation procedures and exit plans. The study established that 97.3% of the respondents had not been involved in any fire drill since they joined the college. This meant they were not aware of the evacuation procedures or exit plan. Also 98% said that fire drills were never performed in the college, while 73.5% said the hostels did not have emergency exit doors. The study also found that 54% of the respondents said that the hostel main door could not easily open from inside. Thus, the study established that, students were not practicing fire safety procedures, which is contrary to the requirements of fire safety policy. A similar finding was established by Izumi and Shaw (2012) at learning institutions at Geneva, Switzerland, where practice of fire response procedures were never done, or were done after long period. The finding was also supported by a study conducted by Kipngeno (2009) in schools at Turkana which established that few secondary school students knew the importance of fire drills and that fire safety measures were rarely performed in the schools. This is dangerous because in case of a fire outbreak, the students may be stranded and may lead to loss of life and fire injuries.

Conclusion

The study concludes that socio-demographic characteristics did not have any influence on fire disaster preparedness. Students in KMTCs were generally aware of various types of disasters which could affect them when in the college. Many students in these colleges knew the possible fire risk sources in the rooms, many did not know the college fire safety policy guidelines, and fire safety measures were rarely practiced in these colleges. Many students perceived that they were vulnerable to fire disaster and rated tempering with electricity wires and cooking in rooms as risks with high possibility of causing fire. Fire safety measures were decimally practiced in these colleges, and students did not know the official firefighting agents around the college, nor their telephone numbers. The state of fire disaster preparedness among the students in the two KMTCs in Eastern Kenya region was found to be fair.

Recommendations

In order to improve on fire disaster preparedness among the students, the institution management should ensure that students are inducted on fire safety measures immediately they are admitted in college. Periodic fire safety trainings should also be conducted to update the students on fire safety measures and to improve their attitude towards preparedness to fire. Periodic fire drills should be introduced to keep students well prepared on fire preparedness. Copies of the college fire safety policy guidelines should be available to all students. The management in these colleges should orientate students to the nearby firefighting agents and post their telephone numbers on the college notice boards, classrooms and in hostels.

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