

Strategies to Raise Awareness on Fire Disaster Preparedness to Enhance Fire Safety in Secondary Schools in Kilimanjaro Region, Tanzania

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Abstract - This study was conducted to determine strategies through which awareness on fire disaster preparedness is raised among students and teachers to enhance fire safety in secondary schools in Kilimanjaro region, Tanzania. This study was guided by Rasmussen's Risk Management Framework (1997). This study employed a convergent design under mixed methods research approach. The participants involved in this study were head of schools, teachers, students in public and private secondary schools; District Education Officers, and District Fire Officers. Furthermore, stratified sampling was used to obtain the research sample. This study used questionnaires, observation guide, interview guides and document analysis guide to collect data which were then analyzed descriptively and thematically. The findings revealed that training was the major strategy used to raise awareness on fire disaster preparedness; aspects of fire safety were integrated into the Ordinary Level secondary education syllabi. Additionally, meetings and clubs are avenues which were fairly used to raise students' and teachers' awareness on fire disaster preparedness. However, other strategies like using posters, television educative programs or news, resource materials, fire safety drills, and school fire safety inspection feedback were rarely used to raise students' and teachers' awareness on fire disaster preparedness. The study concluded that secondary schools had not embraced the diversity of strategies that can be used to raise students' and teachers' awareness on fire disaster preparedness and recommended inter alia, that comprehensive fire disaster management topics be incorporated in the Ordinary Level secondary education syllabi.

Keywords: Fire Disaster, Preparedness, Awareness, Fire Safety

I. INTRODUCTION

A disaster is an adverse event that overwhelms an individual's, an organization's, or jurisdiction's capacity to respond (Haddow, Bullock & Coppola, 2017). A school fire disaster is an extreme disruption of its functioning associated with devastating damage to property and injury or death to school community members caused by rapid, persistent fire releasing heat, smoke, light and flame in a way that exceeds the ability of the affected school to cope with the emergency situation by using its own resources. According to Nyagawa (2017) who investigated the immediate causes of fire disasters

in boarding secondary schools in Tanzania, fire disasters electrical faults, indiscipline and riots among students, the use of kerosene lamps and candles to study during the night. These findings concur with findings of another study conducted in Nigeria by Ilori, A. E., Sawa, B. A., & Gobir, A. A. (2020) who revealed that the major causes of fire disasters in public and private secondary in Ilorini Metropolis were poor bush or waste burning, electrical faults or wiring problems and arsons. In Iran, Rezabeigi, D. E., Nekoei-Moghadam, M., Daneshi, S., Khanjani, N., & Kiarsi, M. (2020) reveal that the main causes of fire disasters in Iranian schools were the use of non-standard kerosene heaters (38.7%), and faulty electrical wiring (35.4%). Other causes were defects in the central heating system (4.8%), welding, laboratory fire, exposure of inflammable material to gas heaters (6.4%) and unknown (65.5%). Surprisingly though, these findings reveal that majority of causes of school fire disasters in Iranian are unknown. Generally, common causes of school fire disasters are evident across different countries.

The prevalence of fire disasters in schools has shuttered the sense of school safety thus drawing considerable researchers' attention all over the world. Studies show that school community members have inadequate knowledge on fire disaster management at school. Awareness on fire disasters refers to the level at which people are informed about fire disasters. According to Coppola (2015), awareness is the first step in educating the people about hazards and risks in correcting feelings of apathy toward preparedness. Subsequently, the process of raising awareness involves more than simply telling people what causes for example, fire disasters but also entails informing them on how fire disasters affect them and why they are at risk.

School fire disasters may result to injury or death, especially to students, and loss of school property which often require huge amount of money to rebuild. Other intangible effects include disruption of education and increased perceptions of insecurity which further inflict emotional distress on students (Jonsson, Lundqvist, Gell, & Andersson, 2014). In Nigeria,

Yuba (2020) reports of a government girls' secondary school in Kaduna whose dormitories were razed by fire leaving all students' mattresses and provision stuff burnt completely. In Kenya, the occurrence of school fire disasters has also had a devastating impact on educational institutions. For example, a wave of arson attacks across the country in the year 2016 left more than 100 schools burnt down (Igunza, 2016). In the year 2021, 180 students in Sangiti secondary school located in Kilimanjaro region, Tanzania survived an inferno after four girls' dormitories were torched by fire (Global Publishers, 2021). In the same year, secondary school fire disasters occurred in Morogoro, Geita, Kagera, and Bagamoyo regions. These examples, attest that school fire disasters are prevalent in many countries.

Despite the prevalence of fire disasters in Tanzania secondary schools, studies show that students and teachers in these institutions have inadequate awareness on fire disaster management which inter alia, entails preparedness. For instance, a study conducted by Nestory (2017) revealed that secondary school teachers had inadequate knowledge on fire disaster preparedness. However, efforts have been put by different education stakeholders to raise students' and staff awareness on fire disasters in secondary schools. For instance, the Ministry of Education and Vocational Training currently, the Ministry of Education Science and Technology issued the Education Circular Number 4 of 2011 insisting school leaders to conduct regular training on fire safety (MoEVT, 2011). Issuing the circular confirms that initiatives to raise students' and staff awareness on fire disasters in secondary schools are made by the Tanzania government.

II. STATEMENT OF THE PROBLEM

Raising students' and staff awareness on fire disasters is a key to reducing the consequences associated with such menace in secondary schools like destruction of school properties, loss of life, physical injury and psychological harm. Tanzanian government, through the Ministry of Education Science and Technology and the Fire and Rescue Force among other stakeholders have had a significant role in curbing the situation through efforts to raise awareness on fire disasters in schools. For instance, the fire and rescue force has been conducting training on fire safety management in these institutions. While most studies conducted in Tanzania for example, Nyagawa (2017); Nestory (2017) and Amuli (2019) have resided in addressing training as an effort through which awareness on fire safety is raised in secondary schools, most of them have paid little attention to other ways through which awareness on fire disasters can be raised among students and teachers in secondary schools. The present study therefore, sought to determine more strategies employed to raise awareness specifically, on fire disaster preparedness among students and teachers in secondary schools in Kilimanjaro region.

III. THEORETICAL FRAMEWORK

This study was guided by Rasmussen's Risk Management Framework (1997). This theory proposes that systems are comprised of various hierarchical levels such as the government, regulators, company, company management, staff, and work, each of which contains actors, organizations or technologies, sharing responsibility for the production of safety. Even so, for a system to function efficiently and safely, decisions made at higher governmental, regulatory and managerial levels of a system should propagate down in form of laws, regulations, and policies, and be reflected in the decisions and actions occurring at the lower levels. Conversely, information at the lower levels regarding the system status needs to transfer up the hierarchy to inform the decisions and actions occurring at the higher levels. Without this so-called 'vertical integration', systems lose control of the hazardous processes that they are designed to control.

The strength of Rasmussen's risk management framework is depicted in its capacity to take the bigger picture hereof, of fire safety of secondary schools into account by identifying factors involved from within schools, as well as other interrelated bodies. This bigger picture can be useful for determining where corrective actions should be directed. The framework also enables educational managers to identify high-level factors relating to institutional, governmental, regulatory, and international practices that could be addressed to make lasting improvements to school fire safety. Moreover, the effects of dysfunctional integration, coordination, and communication within and between the education system levels can be depicted and therefore, addressed through safety recommendations. The weakness of this theoretical framework however, lies in the fact that actors in the education system like the head of schools cannot judge where the safety boundaries relevant to their activities lie, because the location of these boundaries depend on the decisions and activities of other people, at different times, in different parts and levels of the education system. For instance, at the school level, activities to enhance safety are directed from the management level, whose activities are also dictated by higher levels in the education system.

IV. REVIEW OF RELATED LITERATURE

Owing to the devastating effects of fire disasters, many studies acknowledge the fact that training is not only essential but also an effective strategy in raising awareness on fire disaster management at school where among other things, fire disaster preparedness is paramount. For example, a quasi-experimental study carried out in India by Jeyadeepa, Anju, Thomas, and Sumayya (2020) on the effectiveness of structured training programme on knowledge regarding disaster management among school teachers revealed that teachers' knowledge was less than average before training intervention and above average after. The training was considered effective in promoting knowledge of teachers on disaster management, thus making them more aware of the matter. It is worth noting that fire disaster preparedness is a

component of disaster management and therefore, it can be deduced from these findings that training is an effective way of raising teachers' awareness on fire disasters.

Another, quasi-experimental study that employed one group pre-test post-test design was conducted by Joshi, Sawane, and Jabade (2015) to assess the effectiveness of training manual on disaster management in terms of knowledge and self-expressed practices among secondary school teachers in selected secondary schools in Pune city, India. The study revealed that the provision of training manuals on disaster management was not only helpful in raising teachers' awareness on fire disasters but also was crucial in improving their self-practices in managing disasters at school. This present study not only inquired on training manuals but also on the use of other resource materials like library books on fire disaster management as a strategy to raise students' and teachers' awareness on fire disaster preparedness.

In the Philippines, Cabungcal (2016) conducted a descriptive study to evaluate the community media as mitigation tools in disaster management to verify the level of knowledge and awareness of students concerning disaster management. The study considered community media can serve as a basis for school-based disaster preparedness and response. Subsequently, the study revealed that the majority of students (79.2%) opined that television had the highest impact on their knowledge and behaviours on disaster management. Similarly, a study by Pinar (2017) which was conducted to determine the basic disaster consciousness and awareness level of secondary school students in Konya, Turkey revealed that media was among sources of their knowledge on disaster management. This study however, sought to determine if schools use television educative videos, programs, or news to raise students' awareness particularly on fire disaster preparedness.

In Ghana Apronti, Osamu, Otsuki and Kranjac-Berisavljevic (2015) conducted a study to explore the presence and nature of disaster risk reduction within the syllabi of the basic school system. Through syllabus content analysis and field research, it was realized that subjects like Integrated Science and Citizenship Education contained aspects of disaster risk reduction, fire safety being an important component. Again, these findings coincide with Paci-Green et, Verchetta, McFarlane, Iyer and Goyeneche (2019) global baseline survey findings on comprehensive school safety policy which revealed that at a global level, more than half of the responding countries (56%) included at least one module in risk reduction such as disaster risk reduction and resilience in the education curriculum. While fire disaster preparedness is part and parcel of disaster risk reduction, awareness raised in the classroom on practices such as extinguishing different types of fire with appropriate extinguishing equipment or agents and first aid is crucial during responding to fire outbreaks. Regarding the matter, the present study, sought to establish if aspects of fire safety related to fire disaster

preparedness are integrated into the Tanzania education curriculum (syllabi).

A study conducted by Apronti, Boakye-Danquah and Antwi (2018) in Ghana attests that clubs are part of the co-curricular media through which disaster risk reduction education is achieved. However, the study revealed that only 1 (5%) of public schools and 2 (10%) of private secondary schools had Red-Cross clubs. Red cross clubs are driven by the power of humanity with a primary goal of lifesaving where they involve activities related to helping people facing adversity like fire disasters. This current study in Tanzania sought to establish if secondary schools have active red-cross clubs since the state of activeness is crucial in indicating whether students and teachers are engaged in Red-cross club activities as they are significant in raising students' and teachers' awareness on fire disaster preparedness.

Regarding the need for training on fire disaster preparedness, the findings of a study by Dube, Ibrahim, and Orodho (2016) who examined disaster management and risk reduction strategies employed in public secondary schools in Mandera County, Kenya revealed that principals who were interviewed contended that relevant authorities should organize frequent workshops and seminars for school community members to train them on how to manage disasters as well as how to perform simple first aid to the injured. In addition, these school leaders suggested that school authorities should liaise with the organizations like the Red Cross to accomplish this initiative. This study sought to establish whether secondary schools had active Red-Cross clubs since the state of activeness greatly determines whether students or teachers are involved in red-cross activities. Again it is worth noting that activities like being trained on how to administer first aid are crucial red-cross club activities that are significant in raising students' awareness on how to extend such assistance in helping the needy experiencing adversity like fire disasters.

Although it is important to continuously raise the level of students' and staff fire safety awareness for example, through training for fire disaster preparedness, this has not been the case for many educational institutions where training for fire safety has often been given superficial attention. For instance, in Kenya, the findings of a study conducted by Kisurulia, Katiambo and Lutomia (2015) on an investigation into the state of disaster and safety preparedness in schools in 14 counties unveiled that only slightly above a half (52.1%) of the surveyed respondents indicated that they had received training in disaster management. However, it came out that the kind of training was only basic fire-fighting skills. Furthermore, the study revealed that although drills are considered key for disaster preparedness and management, only 18% of the respondents had attended drills in the last 12 months. These study findings concur with findings of several other studies carried out in Kenya for example, by Jonathan and Mbogo (2016), and Kimanthi, Thinguri, and Mugwe (2019). Again, a study conducted by Mugamu (2018) to explore on the level of preparedness of fire risks in schools in

South Africa revealed that schools did not practice fire emergency drills. This present study sought to determine if fire drills are conducted in secondary schools to enhance knowledge on fire safety as a way to raise students' and teachers' awareness on fire disaster preparedness, in Kilimanjaro region.

In Tanzania, descriptive research by Mfinanga (2016) was carried out to assess the status of emergency and disaster preparedness in boarding secondary schools in Singida Region. Remarkably, it was noted that there was no training on disaster management at the school level. Similarly, a study conducted by Amuli (2019) on the management of disasters in Tanzania's secondary schools revealed that head of schools attended short-term training for awareness creation against fire outbreaks in secondary schools. This study however aimed at determining other means through which awareness particularly on fire disaster preparedness is raised in secondary schools.

The reviewed empirical studies generally, unveil findings related to strategies employed in raising students' and teachers' awareness on fire disasters in secondary schools, thus making them prepared to respond to such adversity. While most of these studies have resided in shedding light on training on fire disaster management, there is little empirical evidence on other strategies to awareness on fire disasters among students and teachers in secondary schools like the use of posters, school meetings, library resource materials, television educative videos, programs or news, and syllabi. The novelty of the present study was therefore, based on embracing diversity of strategies through which students' and teachers' awareness on fire disaster preparedness is raised in secondary schools to enhance fire safety in these institutions.

V. RESEARCH METHODOLOGY

This study employed the mixed methods research approach. More specifically, the study employed the convergent research design where both qualitative and quantitative data were collected and analyzed concurrently, then results were merged, interpreted, and finally compared. The study targeted 225 public owned and 121 private secondary schools, 348 head of schools, 4746 secondary school teachers and 136,627 students, 7 District Education Officers and 4 District Fire Officers in Kilimanjaro region. Secondary schools were sampled through stratification and grouped into two strata based on their ownership (21 public secondary schools and 14 private secondary schools). Kilimanjaro region has 7 districts and therefore, 3 public secondary schools were selected in each district ($3 \times 7 = 21$) and 2 private secondary schools ($2 \times 7 = 14$) selected in each district. Furthermore, through

stratification based on gender, 2 male teachers and 2 female teachers (4 in total), were sampled from each of the selected schools thus making a teachers' sample size of 140 (4×35). Similarly, through stratification based on gender 3 male and 3 female students (6 in total) were sampled from each of the selected schools thus, making a students' sample size of 210 (6×35). It's worth noting that the 35 head of schools, 7 District Education Officers (DEOs) and 4 District Fire Officers (DFOs) were involved in this study based on the virtue of their positions. Therefore, the study targeted a targeted population sample size of 396 participants. However, 2 teachers and 2 students did not provide responses for this study which made the actual responses to be 392 and their corresponding actual response rate to be 98.9%. According to Baruch and Holtom (2008), 52.7% is the accepted response rate and therefore, the response rate of 98.9% can be considered an acceptable response rate.

This study employed questionnaires to collect data from the head of schools, teachers and students while interview guides were used to collect data from District Education Officer and District Fire Officers. An observation guide was used to gather data from surveyed schools and in a training on fire safety conducted by the fire and rescue force. Furthermore, a document analysis guide was used to gather data from the Chemistry and Biology ordinary level secondary education syllabi. The validity of research instruments (quantitative and qualitative) was enhanced through consultation with supervisors in the field of Educational Planning and Administration who shared their views with the researcher on how to improve the research instruments. The feedback from the pilot study was also essential in making necessary modifications on research instruments to ensure the validity of these tools. The reliability of questionnaires was established by using SPSS to obtain the Cronbach's Alpha coefficient where the reliability for questionnaires for head of schools, teachers and students were .82, .85, and .76 respectively. According to Leary (2018), a Cronbach's alpha which exceeds .70 is considered adequate reliability by most researchers. To ensure reliability of qualitative research instruments, the researcher focused on employing methodological strategies to ensure credibility (trustworthiness), transferability, dependability and confirmability of the findings. For example, in order to ensure credibility, the researcher employed a triangulation technique where data was gathered from more than one data source. Again, information obtained through interviews was transcribed verbatim.

VI. PRESENTATION AND DISCUSSION OF FINDINGS

Table 1 summarizes the responses on strategies to raise awareness on fire disaster preparedness in secondary schools.

Table 1: Responses on Strategies to Raise Awareness on Fire Disaster Preparedness in Secondary Schools (N = 381)

Statement	Respondents	SD		D		U		A		SA	
		f	%	f	%	f	%	F	%	f	%
Aspects of fire safety are incorporated in the education curriculum (syllabi)	HOSs					3	8.6	11	31.4	21	60
	Teachers	3	2.2	3	2.2	11	8.0	67	48.6	54	39.1
	Students	6	2.9	22	10.7	33	16.0	77	37.4	68	33.0
School has resource materials e.g. library books, brochures related with fire safety management	HOSs	23	67.6	6	17.6	4	11.8	1	2.9		
	Teachers	73	54.1	37	27.4	18	13.3	7	5.2		
	Students	99	47.6	64	30.8	26	12.5	14	6.7	5	2.4
School has an active scout club	HOSs	12	34.3			4	11.4	10	28.6	9	25.7
	Teachers	22	15.9	13	9.4	29	21.0	34	24.6	40	29.0
	Students	23	11.1	26	12.5	27	13.0	58	27.9	74	35.6
School has an active red-cross club	HOSs	24	70.6	5	14.7	2	5.9	2	5.9	1	2.9
	Teachers	78	56.9	34	24.8	16	11.7	6	4.4	3	2.2
	Students	84	40.4	79	38.0	28	13.5	13	6.3	4	1.9
Knowledgeable teachers demonstrate to other school members how to use fire-fighting equipment	HOSs	13	37.1	8	22.9	9	25.7	4	11.4	1	2.9
	Teachers	35	25.4	50	36.2	33	23.9	15	10.9	5	3.6
	Students	52	25.2	65	31.6	44	21.4	25	12.1	20	9.7
Posters with information on fire safety are put at school	HOSs	34	97.1	1	2.9						
	Teachers	136	98.6	2	1.4						
	Students	197	94.7			3	1.4	8	3.8		
Students watch educative videos, programs or news at school	HOSs	19	57.6	4	12.1	4	12.1	4	12.1	2	6.1
	Teachers	79	57.7	21	15.3	18	13.1	10	7.3	9	6.6
	Students	85	41.3	65	31.6	35	17.0	15	7.3	6	2.9
School meetings between students and teachers involve matters related to fire safety at school	HOSs					11	31.4	8	22.9	16	45.7
	Teachers	14	10.1	12	8.7	19	13.8	44	31.9	49	35.5
	Students	19	9.2	22	10.6	28	13.5	59	28.5	79	38.2
Fire safety drills are conducted at school to enhance knowledge on how to respond to a fire disaster	HOSs	35	100								
	Teachers	136	98.6	2	1.4						
	Students	197	96.1	5	2.4	3	1.5				

Source: Field data (2021).

Aspects of Fire Safety are Incorporated in Education Curriculum (Syllabi)

Table 1 shows that 3 (8.6%) of Head of Schools (HOSs) had an undecided opinion, 11 (31.4%) agreed and 21 (60%) strongly agreed. On the same matter, 3 (2.2%) strongly disagreed, 3 (2.2%) disagreed, 11 (8.0%) had an undecided opinion 67 (48.6%) agreed and 54 (39.1%) strongly agreed. 6 (2.9%) of students strongly disagreed, 22 (10.7%) disagreed, 33 (16.0%) had an undecided opinion, 77 (37.4%) agreed and 68 (33.0%) strongly agreed. These findings indicated that majority of head of schools (91.4%), teachers (87.7%) and students (70.4%) had affirmative opinions that fire safety aspects were integrated into the education curriculum (syllabi). This implied that students in particular, were equipped with related knowledge thus, raising their awareness *inter alia*, on fire disaster preparedness. Again, information

gathered through interviews with District Education Officers revealed that fire safety aspects for instance, administration of first aid and use of fire extinguishers were incorporated in Ordinary Level (O-Level) Secondary science subjects like biology and chemistry. For instance, a District Education Officer said that,

The syllabi especially for science subjects like Biology and Chemistry capture aspects of fire safety which I think help in raising students' awareness on fire disaster preparedness... They are taught on how to use portable fire extinguishers

Similarly, through document analysis it was noted that the O-Level Secondary Chemistry syllabus had Form one sub-topics on first aid, first aid kits and firefighting where students are required to be able to: classify types of fire according to

causes, identify different types of fire extinguishers used to extinguish different types of fire, state components needed to start a fire, classify fire extinguishers according to chemicals they contain, and extinguish small fires using the right types of fire extinguishers. Furthermore, the O-Level Secondary Biology syllabus had Form one sub-topic on first aid. These findings attested that the secondary education curriculum (syllabi) had integrated aspects of fire safety which are crucial for fire disaster preparedness. These findings coincide with Apronti et al. (2015) findings of a study conducted in Ghana which through syllabus content analysis and field research realized that subjects like Integrated Science and Citizenship education contained aspects of disaster risk reduction, fire safety being an important component.

School has Resource Materials such as Library Books Related to Fire Safety Management

Out of all head of schools, 23 (67.6%) strongly disagreed, 6 (17.6%) disagreed, 4 (11.8%) had an undecided opinion, and 1 (2.9%) agreed. On the same aspect 73 (54.1%) of teachers strongly disagreed, 37 (27.4%) disagreed, 18 (13.3%) had an undecided opinion and 7 (5.2%) agreed. 99 (44.6%) of students strongly disagreed, 64 (30.8%) disagreed, 26 (12.5%) had an undecided opinion, 14 (6.7%) agreed, and 5 (2.4%) strongly agreed. These findings indicate that majority of head of schools (85.2%), teachers (81.5%), and students (78.4%) expressed dissenting opinions thus, implying that to a great extent resource material such as library books related to fire safety management were not used to raise students' and teachers' awareness *inter alia* on fire disaster preparedness. Similarly, District Fire Officers pointed out that sometimes the fire and rescue force provided informative materials like brochures on fire safety to schools especially when they conduct training. Nonetheless, through participant observation in fire safety training conducted to students and teachers by the fire and rescue force, there was no evidence of such informative materials being provided to schools. While the use of resource materials like training manuals is significant in imparting knowledge on disaster management as it was revealed in the findings by Joshi et al. (2015), this present study findings generally revealed that resource materials on fire disaster management like library supplementary books, brochures, manuals or pamphlets were inadequately used as a way to raise the awareness of students and teachers on fire disaster preparedness.

School has Active Scout Club

Scout clubs have a crucial role in positively shaping the physical, intellectual, social, emotional development of young people by engaging them in activities that help them in dealing especially, with adversity like disasters. Concerning whether schools had active scout clubs, 12 (34.3%) strongly disagreed, 4 (11.4%) had an undecided opinion, 10 (28.6%) agreed and 9 (25.7%) strongly agreed. Furthermore, 22 (15.9%) of teachers strongly disagreed, 13 (9.4%) disagreed, 29 (21.0%) had an undecided opinion, 34 (24.6%) agreed and 40 (29.0%) strongly agreed. 23 (11.1%) of students strongly

disagreed, 26 (12.5%) disagreed, 27 (13.0%) had an undecided opinion, 55 (27.9%) agreed and 74 (35.6%) strongly agreed. These findings show that majority of head of schools (54.3%), teachers (53.6%) and students (63.5%) had affirmative opinions which implies that secondary schools had fairly active fire clubs. Nonetheless, the 2015 Education Circular Number 4 regarding reviving and strengthening scout clubs in schools and colleges insists that head of schools in cooperation with the Regional and District scout leadership should effectively oversee the establishment of scout clubs and strengthening them. In addition, the circular specifies that scout activities should not interfere with academic activities as indicated in the annual academic calendar. The circular also insists among other things that, students should be encouraged to join scout clubs regardless of their gender, and by abiding by the scout constitution (MoEVT, 2015). While scout clubs can be used to equip students with knowledge and skills to cope or deal with adversity thus, making them prepared menaces like fire disasters, these findings reveal that scout clubs were fairly active in secondary schools. These findings contravene Rasmussen's Risk Management Framework (1997) which when implied in this study posits that for fire safety to be realized in schools, decisions for example, in form of education circulars made at the governmental level through the Ministry of Education Science and Technology are propagated through other levels like the regional and district, down to school level where these decisions ought to be implemented and feedback be given by head of schools upwards the levels to inform further safety decisions in the higher levels..

Secondary School has Active Red-Cross Club

Twenty-four (70.6%) of head of schools strongly disagreed, 5 (14.7%) disagreed, 2 (5.9%) had an undecided opinion, 2 (5.9%) agreed and 1 (2.9%) strongly agreed. 78 (56.9%) of teachers strongly disagreed, 34 (24.8%) disagreed, 16 (11.7%) had an undecided opinion, 6 (4.4%) agreed, and 3 (2.2%) strongly agreed. 84 (40.4%) of students strongly disagreed, 79 (38.0%) disagreed, 28 (13.5%) had an undecided opinion, 13 (6.3%) agreed and 3 (2.2%) strongly agreed. Considering that red cross club activities in schools are centered on furthering humanity with a primary goal of life-saving for example, through being imparted with knowledge on first aid administration, members of red cross clubs are imparted with knowledge and skills which in turn raises their awareness on how to respond in helping victims facing adversity such as disasters in schools or elsewhere. The findings however, showed that the majority of head of schools (85.3%), teachers (81.7%), and students (78.4%) expressed dissenting opinions regarding the presence of active red-cross clubs in their schools. These findings therefore, implied that red cross clubs were to a great extent not used in raising students' and teachers' awareness on how to deal with adversity which *inter alia*, includes assisting victims for example, of fire disasters.

Knowledgeable Teachers Demonstrate to other School Members how to use Fire Fighting Equipment

Of all head of schools, 13 (37.1%) strongly disagreed, 8 (22.9%) disagreed, 9 (25.7%) had an undecided opinion, 4 (11.4%) agreed and 1 (2.9%) strongly agreed. Furthermore, 35 (25.4%) strongly disagreed, 50 (36.2%) disagreed, 33 (23.9%) had an undecided opinion, 15 (10.9%) agreed and 5 (3.6%) strongly agreed. These findings showed that the majority of head of schools (60%), teachers (61.6%), and students (56.8%) expressed dissenting opinions thus, indicating that knowledgeable teachers particularly those teaching science subjects like Chemistry of those who have received training on fire safety had not to a great extent been used to demonstrate to other school members how to use fire-fighting equipment. It's worth noting that, information gathered from District Fire Officers (DFOs) through interviews revealed that occasionally, the fire and rescue force invites representative students and teachers from several schools to jointly attend training on fire safety in a given venue out of school. The participants of such training, teachers, in particular, are then requested to share the knowledge they acquire to other school members. For instance, a District Fire Officer said that,

We sometimes organize training on fire safety and invite representatives from several schools to jointly attend the training... Both students and teachers participate but we request the teachers in particular, to share the knowledge and skills they receive to other students and teachers back at school

Similarly, it was noted through participant observation that teachers and students were trained on fire safety by the fire and rescue force and imparted with knowledge inter alia, on how to use fire extinguishers and fire blankets to put off fire. Despite this effort, the findings implied that teachers in particular, who are trained on fire safety do not convey to other school members the knowledge they receive through training on fire safety they attend out of school, despite being requested to do so by the fire and rescue force. Additionally, these findings imply that secondary schools made little initiatives are made by secondary schools to use resource persons available in their institutions such as knowledgeable or trained teachers to help raise other school community members' awareness on fire safety particularly, through demonstrating to them how to use fire-fighting equipment like fire-extinguishers and fire blankets.

Posters with Information on Fire Safety are put at School

As shown in Table 1, of all head of schools 34 (97.1%) strongly disagreed and 1 (2.9%) agreed. 136 (98.6%) of teachers strongly disagreed and 2 (1.4%) disagreed. 197 (94.7%) of students strongly disagreed and 3 (1.4%) had an undecided opinion and 8 (3.8%) agreed. These findings show that while all head of schools and teachers expressed dissenting opinions, similarly majority of students (94.7%) strongly disagreed. These findings suggest that majority of these respondents were unanimous in their views that posters with information on fire safety had not been put at school. Again, through interviews, the District Education Officers disagreed that posters with information on fire safety were

used at schools. They pointed out that, the only posters in secondary schools were related to COVID 19 pandemic. These findings imply that schools had not been using posters with information on fire safety to raise students' and teachers' awareness on fire safety management, where preparedness is part and parcel. Nonetheless, studies show that posters are crucial in imparting disaster management knowledge to students and teachers thus, raising their awareness on the matter. For instance, a study conducted by Ganpatrao (2014) revealed that although the association between teachers' knowledge and their practices in disaster management had moderately correlated, the study suggested that teachers should improve their knowledge and practices for example by using booklets, posters, brochures and charts and that schools authority should provide such materials to teachers.

Students Watch Television Educative Videos, Programs or News at School

Table 1 indicates that of all head of schools 19 (57.6%) strongly disagreed, 4 (12.1%) disagreed, 4 (12.1%) had undecided opinions, 4 (12.1) agreed and 2 (6.1%) strongly disagreed. Furthermore, 79 (57.7%) of teachers. 21 (15.3%) disagreed, 18 (13.1%) had an undecided opinion, 10 (7.3%) agreed and 9 (6.6%) strongly agreed. 85 (41.3%) of students strongly disagreed, 65 (31.6%) disagreed, 35 (17.0%) had an undecided opinion, 15 (7.3%) agreed and 6 (2.9%) strongly agreed. These findings showed that the majority of head of schools (69.7%), teachers (73.0%), and students (72.9%) expressed dissenting opinions, which further suggested that to a great extent students did not watch television videos, programs or news at schools. These findings coincided with information obtained through interviews with District Education Officers who pointed out that most public secondary schools did not have audio-visual devices like televisions to watch educative programs, videos or news as a way of raising students' awareness on fire safety. More specifically, while these interviewees pointed out that most private schools and only a few public schools, mainly boarding, had audio-visual devices like televisions, they further revealed that such devices were used essentially for entertainment purposes. Studies on disaster management however, show evidence of devices like televisions as being significant in not only raising students' and teachers' awareness on disaster management which includes preparedness but is also important in raising public awareness at large. For instance, Cabungcal (2016) study revealed that the majority of students revealed that television mass media had the highest impact on their knowledge and behaviours on disaster management.

School Meetings between Students and teachers Involve Matters related to Fire Safety at School

Data presented in Table 1 shows that out of all head of schools, 11 (31.4%) had an undecided opinion, 8 (22.9%) agreed and 16 (45.7%) strongly agreed. 14 (10.1%) of the teachers strongly disagreed, 12 (8.7%) disagreed, 19 (13.8%) had an undecided opinion, 44 (31.9%) agreed and 49 (35.5%)

strongly agreed. 19 (9.2%) of students strongly disagreed, 22 (10.6%) disagreed, 28 (13.5%) had an undecided opinion, 59 (28.5%) agreed and 79 (38.2%) strongly agreed. These findings showed that majority of head of schools (68.6%), teachers (67.4%), and students (66.7%) expressed affirmative opinions. Although meetings are important avenues where students can be informed on matters about fire safety issues which include practices or actions that foster fire disaster preparedness, these findings suggest that only to a fair extent did school meetings between students and teachers involve matters related to fire safety. School meetings between students and teachers such as school baraza can be used to inform students on the consequences of fire disasters, risky behaviours not to engage in, provide warning against hazardous actions, and to informing them of what to do when a fire disaster occurs. Such information is essential in raising students' awareness on fire disasters which can affect the way they perceive the menace and therefore, act in protective behaviour. Similarly, such information can significantly raise students' awareness in preparing for fire disasters, if they occur at school.

Fire Safety Drills are Conducted at School

As shown in Table 1, all head of schools disagreed; 136 (98.6%) of teachers strongly disagreed, 2 (1.4%) disagreed. Furthermore, 197 (96.1%) of students strongly disagreed, 5 (2.4%) disagreed and 3 (1.5%) had an undecided opinion. These findings showed that while all head of schools, all teachers and the majority of students (98.5%) expressed dissenting opinions, the findings further suggest that to a very great extent that regular fire safety drills were not conducted to enhance knowledge on how to respond to fire disasters in secondary schools. These findings were in concurrence with information obtained through interviews with District Fire Officers who revealed that fire safety drills had rarely or not been conducted at all in secondary schools. Regardless of their crucial role in raising students' and teachers' awareness particularly on how to respond to fire disasters, these findings imply that fire safety drills were generally, not conducted in secondary schools. While fire disaster preparedness is a component of disaster risk reduction, these findings concur with the study findings by Mugamu, (2018) in South Africa which discovered that schools did not have regular fire emergency drills.

The head of schools, teachers and students were presented with an open-ended question inquiring them to give other means apart from these in the close items through which awareness on fire disaster preparedness is raised in their schools. These respondents revealed that training on fire safety management conducted by the fire and rescue force had been used to raise students' and teachers' awareness on fire safety management at school. This information coincides with information gathered through interviews with District Education Officers who were all unanimous in their view that the fire and rescue force raises awareness on fire safety management not only to students and staff in schools but also

to the public at large through training. Again, these findings were confirmed through observation, where the researcher participated in training conducted by the fire and rescue force to raise students' and teachers' awareness on fire safety management at school. Furthermore, information obtained through interviews with District Fire Officers revealed that the fire and rescue force raises public awareness on fire safety management through radio and television programs. Again these findings concur with the study by Cabungcal (2016) which revealed that students rated radios second by 66.0% as mass media that has the highest impact on their knowledge and behaviours on disaster management; television being ranked first by 79.2% of the respondents, and newspapers and magazines ranked third by 58.5% of the respondents. Similarly, the present study findings coincide with the study by Pinar (2017) which discovered that students indicated that inter alia, media was a source of their knowledge on disaster management.

Additionally, the head of schools pointed out that meetings with the District Education Officers where matters on fire outbreaks are discussed raised their awareness on fire safety management at school since they are given directives on how to among other things, prevent and prepare for fire disasters. This information from head of schools coincided with that gathered through interviews with District Education Officers who pointed out that they often conduct meetings with head of schools which involve matters on how to deal with fire disasters at school by directing them on not only matters relating to implementing of prevention measures but also on strategies for fire disaster preparedness. These findings showed that such meetings involve agendas related to fire disaster management which in turn raises the head of schools' awareness on fire disaster preparedness. That is to say, meetings provide opportunities for head of schools in particular, to be more aware of what they are required of in ensuring school fire safety through implementing directives they receive from the District Education Officers who again receive directives from the Regional Education Officer. These findings can be associated with Rasmussen's Risk Management Framework (1997) which when implied in this study suggests that for fire safety in secondary schools to be enhanced, fire safety decisions in form of directives from the governmental level (Ministry of Education Science and Technology) which are disseminated downwards through several levels including the regional and district levels to secondary schools ought to be implemented by head of schools and implementation feedback should be given upwards to inform further fire safety decisions.

Moreover, 9 (28.7%) of head of schools revealed that their awareness on fire disaster preparedness was raised through school inspection feedback related to fire safety at school. These findings suggest that only a paltry of head of schools indicated that school inspection feedback raised their awareness on fire disaster preparedness at school. Nevertheless, these findings imply that school inspection feedback is a means through which the head of schools' and

teachers' awareness on fire safety particularly, on preparedness can be raised. On the one hand, inspection feedback provided for example, by the fire and rescue force or Quality Assurance Officers is aimed at informing head of schools and teachers in particular, on the weaknesses or challenges regarding fire safety that ought to address at school. On the other hand, inspection feedback insists head of schools and teachers to maintain the strengths schools have in terms of fostering school fire safety where fire disaster preparedness cannot be overemphasized.

VII. CONCLUSION

Generally, the findings revealed that secondary schools had not widely used different ways to raise students' and teachers' awareness on fire disasters preparedness. These findings therefore, implied that secondary schools had not embraced diversity in strategies that can be used to raise students' and teachers' awareness on fire disaster preparedness thus, affecting the state of school fire safety.

VIII. RECOMMENDATIONS

This study recommends that comprehensive disaster management topics be integrated into the Ordinary Level secondary education syllabi. While disaster preparedness is part and parcel of disaster management, integrating comprehensive fire disaster preparedness topics for example, in Geography subject syllabi might be helpful in raising the awareness of students in particular, on how to respond to fire disasters, if they occur at school. This study recommends that secondary schools to take initiatives to use resource persons with related knowledge on disaster management like how to extinguish fire by using portable fire extinguishers. Furthermore, this study recommends that televisions be used in secondary schools to expose and inform students about fire safety issues which can in turn make them more aware on how to respond to fire disasters at schools or elsewhere. In addition, this study recommends the use of resource material like supplementary library books, pamphlets and brochures related to fire safety management in schools as a strategy to make students and teachers more knowledgeable about fire disasters management especially in terms of prevention or mitigation, preparedness, response and recovery phases. This study also recommends that in cooperation with the fire and rescue force, schools should develop posters to be used to impart knowledge to students and teachers on fire disaster management which includes but is not limited to disaster preparedness practices, thus making them more aware of the safe actions to engage when a fire disaster occurs not to incur or avoid altogether the consequences associated such menace. Moreover, this study recommends that schools should perform regular fire safety drills to reinforce knowledge on safe practices through simulation of an actual fire disaster outbreak. Such exercises are crucial in proactively informing school community members of what to do and what to avoid during a fire disaster for example, on how to evacuate a building on fire, the evacuation routes to take or when and how help can be extended to casualties.

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