



Towards Effective Management of Fire Emergency and Risk Reduction in Public and Private Secondary Schools in Kwara State, Nigeria: Is There Emergency Preparedness Plan

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This work was carried out in collaboration between both authors. Author AEI wrote the protocol, performed the general research tasks and prepared the manuscript. Author BAS supervised the progress of the study. Both authors read and approved the final manuscript.

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ABSTRACT

Emergency preparedness plan is a written manual that identifies and provides detailed understanding of what to be done or put in place, assign who to do what and direct actions on how to carry out certain responsibilities in an emergency like fire outbreak for peace and tranquility in secondary schools. This study examined emergency preparedness plan availability in public and private secondary schools in Kwara State, Nigeria towards effective management of fire emergency and risk reduction. The objectives were to assess emergency preparedness plan availability in secondary schools, and using Kendall's w-statistics to justify the responses. Eighteen (18) public and private secondary schools were sampled through multi-stage sampling technique. From the sampled schools, 13 principals, 143 teachers and 557 students were randomly sampled.

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Data were collected through interviews and questionnaires. The results were evaluated using frequency charts and Kendall's coefficient of concordance (w). The findings revealed that no secondary school has emergency preparedness plan. Results also showed that secondary schools do not have safety committee(s) that will oversee school safety affairs against fire and other disasters. Kendall's analysis revealed a low (.131) degree of agreement amongst the respondents on emergency preparedness plan availability. The null hypothesis (H_0) tested at $\alpha = .05$ level of significance was rejected since $Z_{(-2)} < -Z_{(-1.645)}$ (i.e. $-2 < -1.645$) and P -value of .0228 < .05. Hence, the research hypothesis (H_1) was accepted. It was concluded that secondary schools in Kwara State have no fire or any disaster/emergency preparedness plan and are not safe in the event of fire occurrence. The study recommends that the State's Ministry of Education and Human Capital Development in collaboration with State Fire Service Headquarters, State Emergency Management Agency, school principals' representative and other stakeholders should develop an agreeable emergency preparedness plan (manual) for secondary schools in the states subject to annual reviews and amendments.

Keywords: *Fire emergency; emergency preparedness plan; Kendall's w-statistics; Kwara State; secondary schools.*

1. INTRODUCTION

The recent greatest threat to learning environment, its occupants and contents is fire disaster. It starts in most cases without early warning or any sign. Fire-outbreaks in learning institutions in Nigeria and other parts of the world are grossly increasing every year. The situation are specifically nerve-racking in public and private secondary schools (PPSSs) due to its continuance without ceasing [1]. Fire incidents in Nigeria are common phenomenon [2], with enormous contributions, amplifying toll of death and property loss among students and staff in secondary schools [1].

In tackling fire related issues among other disasters in secondary schools, it is required of schools to have a written emergency action plan, thus, Emergency Preparedness Plan (EPP) for the safety of lives and properties. Emergency preparedness plans generally are frameworks that activate actions, improve response times and direct actions on human and material resources towards management of disaster and its victims in a school plant [3]. Fire EPP according to Ongori [4] is a written manual procedure for preparedness and response to fire emergencies. It identifies actions that should be taken by the occupants and building management in the event of fire occurrence or similar emergency. The manual covers fire prevention, evacuation, emergency response as well as provision of detailed step-by-step procedures and activities to forestall continuous fire outbreaks in secondary schools [4].

Generally, fire EPP helps in providing school users general knowledge on various dangers of fires. It gives a clearer picture of actions, needed to tackle and avert fire incidence particularly at the initial stage before escalating beyond capacity of first respondents (i.e. school users). It also explains, assigns and direct activities on fire safety communication and management in a school. Buttressing this, Agyekum et al. [5] maintained that there is a need to initiate prudent actions, coupled with well-planned procedures to provide the much needed help and assistance for occupants of a school to reach places of safety inside or outside the building raged with fire. In other words, the need for fire emergency preparedness plan in schools.

Scarneo et al. [3], EPP is needed to reduce the likelihood of disaster occurrence or destructiveness. Akalemeaku [6] remarked, EPP creates a considerable reduction of destruction done to school buildings during fire outbreaks since a clear picture of safety guide and preparedness are outlined in a framework. In the same vein, United Nation International Strategies for Disaster Reduction UNISDR [7] maintained that schools are required to implement disaster/emergency preparedness plans so as to prepare learners and educators on response mechanism before, during and after disaster strike.

Guy, the Director of Health and Education, International Financial Corporation IFC [8] posits that, planning for natural disasters and emergencies are key measures that every educational institution must consider, regardless of its size or location. In developing EPP, Lang

[9] argued that the followings 5 key elements must be considered and addressed before, during and after the plan creation. The elements are; know the risks and prioritize hazards affecting the school; the plan should be a product of an inclusive team instead of a single individual or group. Others are, make critical information about the school threats quickly accessible and concise; update alert and response procedures with clear and easily understandable language, and lastly test the plan workability to determine needs for improvement and perhaps personnel changes are reflected in the plan(s).

Afedzie and McEntire [10] in a study titled "Rethinking disasters by design" advocated the state of knowledge regarding emergency preparedness, response and recovery issues to be inculcated in learners as this will help in broadening learners' horizon on safety. In executing this, the Government of Kenya [11], Sillah [12], and Ndirangu et al. [13] posited that disaster/emergency preparedness plan should be designed and presented in manner that is easy to grasp and child friendly. Sillah [12] added, disaster managers for example can use cartoons, road shows and songs to raise awareness amongst children on how to react in response to any disaster, particularly fire disaster. By so doing, this will help in reducing disaster anxiety among children in schools [14], and homes as children would return home with information about preparing for disasters [15]. This trickles down knowledge and practicability to parents and other neighbours on developing appropriate resources against fire or any hazard at home.

Akalemeaku [6], Nakitto and Lett [16], Wanaina [17] and Gichuru [18] lamented, despite the importance of EPP such as increasing the level of preparedness and mitigation against fire disasters in a school plant, yet, most schools lack emergency plan. Among them, Nakitto and Lett [16] found out that 84% of the schools in Uganda had no fire safety plans. Gichuru [18] concluded that most secondary schools in Kenya are not prepared for fire disaster management because they lack fire alert procedures. Gichuru [18] added, for schools that has the framework, rehearsing the framework is lagged. Of which, reviewing and rehearsing of fire alert procedures in secondary schools is indispensable for it decisive step-by-step procedures that should take place for the management of disaster events [3].

Akalemeaku [6] used chi-square to analyze fire emergency readiness of University of Nigeria Enugu main campus property, the results revealed absence of EPP for fire incidents in the University. Anyanwu et al. [19] used Kendall's coefficient of concordance to evaluate fire safety management in University of Port Harcourt, Nigeria. Their findings pointed that the university is not prepared for fire disasters because it lack fire emergency plan. The study also showed low implementation and practice of fire safety policy in higher institution of learning in Nigeria. Supporting this, Pathak [20] findings revealed that Nigeria lack adequate and effective implementation of disaster management plans and policies at the state, local and rural level despite institutionalization of National Emergency Management Agency (NEMA) and drafting of a well-developed disaster management frameworks and policies at the national level.

Ilori et al. [1] conducted a research on causes of fire disasters in public and private secondary schools in Ilorin metropolis, Nigeria. The study confirmed that secondary schools in Kwara State has experienced fire disasters over years. The study through cause-and-effect-analysis revealed bush/waste burning, arson, electrical fault/wiring, and drugs (including alcohol and smoking) as the primary cause of fire incidence in PPSSs in the area. In a similar study, Ilori et al. [21] in physical infrastructure safety status in managing fire disaster in secondary schools in Ilorin metropolis, Nigeria, used Kendall's concordance coefficient (*w*) statistics to analyzed data collected from their respondents. The study concluded that physical facilities specifically classrooms and laboratories in PPSSs in the metropolis are not safe for teaching and learning process in the face of fire disaster due to grilled windows, inwardly opening system of doors among others.

Ilori et al. [1] submitted that there are few incidence of fire outbreaks in secondary schools in the state but the emerging destruction and loss from these incidents are in millions of naira. Despite few incidence of fire outbreaks, loss and damages associated with these incidents, secondary schools in Kwara State seems to lack fire safety plan and other laid down disaster safety frameworks for the safety of lives and properties of school users. Per observation, school users lack safety guide and response mechanism such as evacuation responsibility and movement of extinguishing materials towards fire source at its initial stage before

escalating beyond their capacity or on-jet of the State Fire Service personnel.

Pathak and Ahmad [22] argued, for disaster risk reduction to be successful, disaster management communication must be trickled down to the lower levels of government and educational institutions. Per observation, there is existence of disaster management frameworks communication gap in secondary schools in Kwara State. To date, no published fire or any disaster safety manual or document from the state government seems available in secondary schools to prevent and/or mitigate fatalities among school users despite the state government succor to disaster victims and schools is considerably flawless. To tackle the above problems, there is need to investigate emergency preparedness plan availability in public and private secondary schools in Kwara State towards effective management of fire emergency and risk reduction.

2. MATERIALS AND METHODS

2.1 Research Approach and Sample Collection

The study was an explorative study of EPP availability in secondary schools in Kwara State. Due to PPSSs variability, the population of PPSSs in Ilorin metropolis were used to represent secondary schools in the state. Selection of Ilorin metropolis was partly due to availability of information on school fires, its composition of highest number of PPSSs and fire incidents in the state. Choosing the metropolis was also due to the recent influx of people to the city as a result of various search for socioeconomic needs, convenient environment for family settlement, and insecurity from herdsmen/farmers crisis in the neighbouring states. All these factors primed the increased secondary schools students' enrollment. Challenges from the influx includes inappropriate use of appliances at houses closed to schools, political violence among others hence, exposing school users to fire incidents as well as endangering their lives and property.

Multi-stage sampling technique was used to sample 18 secondary schools. Bartlett et al. [23] sample size determination table under .05 precision was used to sample 370 persons. Three hundred and forty-three (343) persons added for attrition put overall sample size to 713 participants from which 13 were interviewed. For

the remaining 700 participants, Goel [24] proportionate probabilistic procedure was used to justify the 143 teachers and 557 students that were administered questionnaire. Data were collected from the schools through mixed method strategy. Qualitative data were collected through schedule interviews with 13 school principals from the 18 PPSSs randomly sampled. Questions that entailed safety committee(s) availability in the schools sampled as well as availability of EPP in and outside these schools were sought from the principals. Quantitative data were obtained through structured questionnaire with five options rated on 5-1 points scale (Strongly Agree: 5 points to Strongly Disagree: 1 point).

2.2 Data Analysis

2.2.1 Questionnaire, interview and Kendall's (w) statistics

Based on the explorative nature of this study, the researchers analyzed the findings from questionnaire and interviews through descriptive analysis (frequency chart). The respondents' level of agreement on the questionnaire findings were measured using Kendall's (W) statistics. Kendall's coefficient of concordance (W) is a non-parametric statistic, used as a measure of agreement among several (m) judges who are assessing a given set of n objects [25]. It results (W-statistics) range from zero depicting no agreement to unity which shows complete agreement among the respondents [26]. Intermediate values of W signify low or high degree of agreement between judges. It was computed by Equation 1–3 [27,21].

$$W = \frac{12 \sum (R_i - \bar{R})^2}{m^2 n (n^2 - 1)} \quad (1)$$

Where, *W* = Kendall's coefficient of concordance, *R_i* = the total rank or rating given to *i* question by the respondents (*j*) and is denoted by Equation (2). \bar{R} = the mean value of the total ranks by respondents and is given by Equation (3), *m* = the total number of respondents, and *n* = the total number of questions.

$$R_i = \sum_{j=1}^m r_{ij} \quad (2)$$

And the mean value of the total ranks (\bar{R}) is given in Equation (3) as:

$$\bar{R} = \frac{1}{2} m (n + 1). \quad (3)$$

2.2.2 Hypothesis and correlation significance

Onenull hypothesis (H_0) and its research hypothesis (H_1) was formulated to further guide this study:

H_0 : There is no relationship between emergency preparedness plan and fire disaster effects (FDEs) in PPSSs in Kwara State ($H_0 : r = 0$).

H_1 : Emergency preparedness plan and fire disaster effects in PPSSs in Kwara State are negatively related ($H_1 : r < 0$).

To test the stated H_0 , questionnaire responses were grouped into “Correctly Answered” (EPP availability) and “Incorrectly Answered” (non-availability of EPP increases FDEs). Hence, ‘strongly agree and agree’ options in items 1, 2, 3 (refer Fig. 1) and 5 (refer Fig. 2) were considered the correct options while ‘disagree and strongly disagree’ were wrong options. In opposite, ‘disagree and strongly disagree’ in item 4 (refer Fig. 1) were the correct options as ‘strongly agree and agree in this case formed wrong options.

Similarly, the variables’ (EPP and FDEs) relationship was determined through Spearman’s rank correlation coefficient (r_s) formula used by Usman and Samaila [28]. For the relationship significance level, sample test statistic was computed by Eq. 4 and confirmed on the left-tailed test of standard normal distribution table at 5% level of significance α (alpha). Critical region and P -value for the sample test statistic were determined and compared with the α level to specify degree to which the data conform to the pattern predicted by the test. Decision rule set was; reject H_0 if $z < -z_{(0.05)}$ otherwise do not reject. Equation 4 was used since the parameters (items) were below 10 items [29].

$$z = r_s(N - 1)^{1/2} \quad \text{Zar [29]} \quad (4)$$

Where, z = calculated sample test statistic, r_s = Spearman’s rank correlation coefficient obtained, N = number of items (in this case 5 items), and 1 is constant value.

3. RESULTS

3.1 Evaluation of Emergency Preparedness Plan

Responses from questionnaire parameters on availability of emergency preparedness plan

were evaluated and discussed along interview results which were thematically presented. From the 700 questionnaires administered, 645 copies (92.14%) were found suitable for analysis and were therefore used for the analysis of this study.

3.1.1 Availability, implementation and effectiveness of emergency plan

Responses from the students and teachers are presented in Fig. 1. Results of interviews with principals on whether their schools and other secondary schools have EPP were transcribed and presented thematically. As per emergency/evacuation preparedness plan availability in the schools surveyed, 76.92% of the principals asserted “we don’t have such plan or document” while 23.08% said “EPP is available in our schools”. On whether other PPSSs have EPP, 53.85% of the principals acknowledged “I don’t know”, 38.46% opined “other schools would have it”, while 7.69% believed that “no secondary school has EPP, even if at all they have it, they may be having the wrong thing (document) because they are not specialist”.

3.1.2 Availability of safety committee

Fig. 2 presents responses of students/teachers category. From the figure it was shown that only 23.25% of the respondents agreed (agree and strongly agree) that there is safety committee in their schools. On the other side, 64.5% disagreed (disagree and strongly disagree) with those that agreed to availability of safety committee in their schools. Meanwhile, 12.25% of the respondents reserved their comments (responses) on safety committee in their schools as they neither agreed nor disagreed.

Furthermore, from the interviewees 61.54% of the principals asserted “we don’t have school safety committee” (refer Fig. 3). Out of these principals, 7.69% had road safety committee whilst 7.69% has security (maintenance) committee. On the other hand, 38.46% of the principals held firmly “Yes, we have school safety committee”.

3.2 Evaluation of Kendall’s Statistics for Emergency Preparedness Plan

Table 1 shows how Kendall’s statistic W was calculated. The total ranks or ratings (R_i) for EPP-1 from the frequency drawn was calculated using Equation 2:

$$R_i = (5 \times 100) + (4 \times 102) + (3 \times 83) + (2 \times 158) + (1 \times 202) = 1675$$

The mean value of the total ranks (\bar{R}) was evaluated using Equation 3 viz:

$$\bar{R} = 0.5 \times 645(5+1) = 1935 \text{ (same for all EPP-Q questions), and}$$

$$W = \frac{12 \times 544617}{645^2 \times 5(5^2 - 1)}$$

$$= \frac{6535404}{49923000} = .131$$

Substituting Equations 1-3 into values, the Kendall's coefficient of concordance (w) for questionnaire responses in Table 1 is .131. This result indicates a very low degree of agreement amongst respondents.

3.2.1 Hypothesis and significance of the correlation

Fig. 4 depicts scatter diagram of EPP and FDEs relationship. Table 2 presents statistical analysis of Spearman's rank correlation coefficient (r_s) between the two variables. The results revealed a perfect negative correlation ($r_s = -1$ with $R^2 = 1$).

Spearman's correlation coefficient:

$$r_s = 1 - \frac{6 \times 40}{5(5^2 - 1)} = -1$$

The corresponding calculated level of significance at $\alpha = .05$ is $z_{(-2)} < -z_{(-1.645)}$

i.e. $-2 < -1.645$ and $P\text{-value} = P(z < -2) = .0228$. The sample test statistic falls in the critical region and the $P\text{-value}$ of $.0228 < .05$ for α , indicating that the emergency preparedness plan and fire disaster effects relationship is statistically significant. Hence, the H_0 which assumed there is no relationship between EPP and FDEs was rejected. Therefore, the research hypothesis (H_1) that EPP and FDEs are negatively related is accepted.

4. DISCUSSION

4.1 Availability, Implementation and Effectiveness of Emergency Preparedness Plan

Secondary schools in Kwara State are direct subject under the Ministry of Education and Human Capacity Development (MOEHCD), secondary education division. The ministry is bound to do everything possible to prevent schools under its watch against fire and other disasters. Among the needful and facilities expected from the ministry are provision of feasible document, outlining responsibilities and action plan to counter specifically fire tragedy in a school plant (in other words fire emergency/evacuation preparedness plan).

In ensuring the safety of school environments in enhancing effective teaching/learning process without the fear of fire disasters and its resultant losses, secondary schools in the state are expected to possess copy or copies of EPP provided by the MOEHCD in collaboration with the State Fire Service Headquarters (SFSHs),

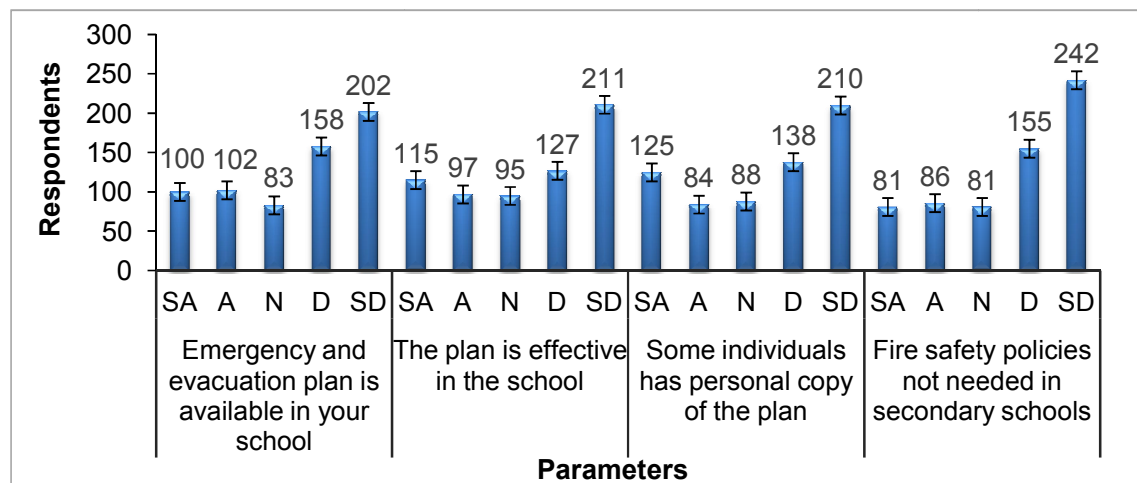


Fig. 1. Responses from questionnaire parameters on emergency preparedness plan

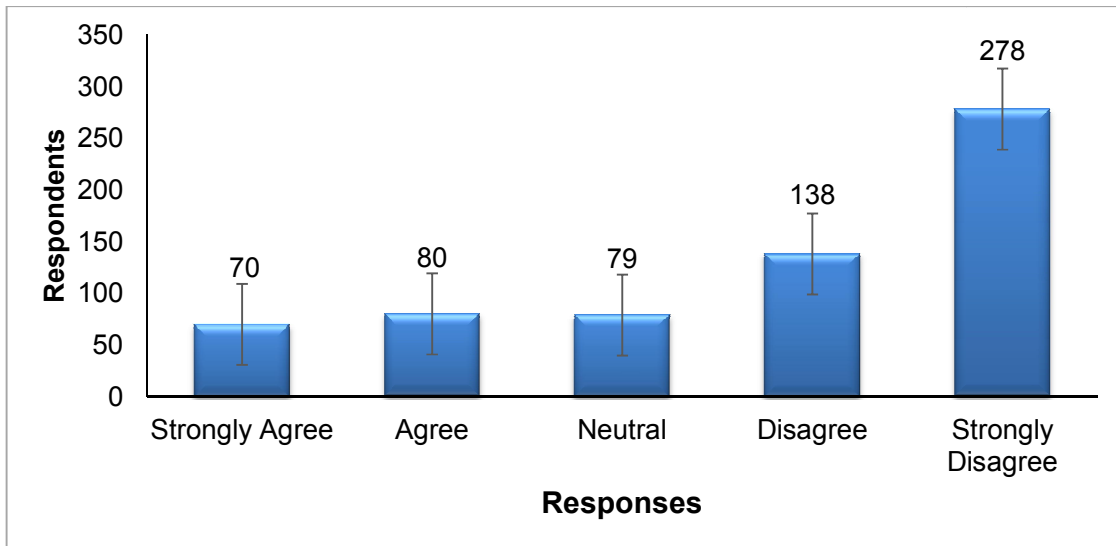


Fig. 2. Students and teachers responses on availability of safety committee

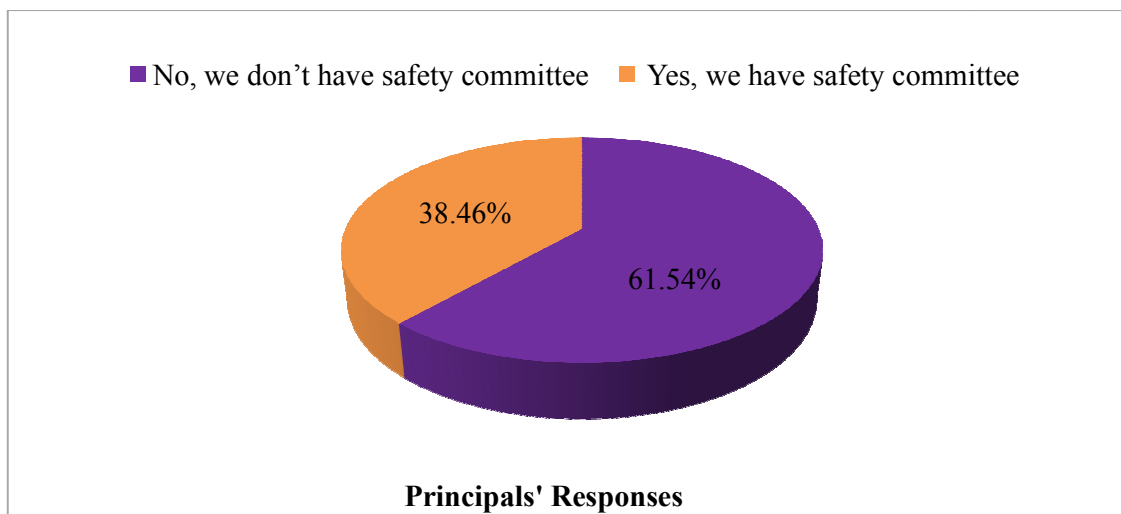


Fig. 3. Availability of safety committee from PPSSs principals

State Emergency Management Agency (SEMA) and other relevant safety management stakeholders within the state. Contrary to this expectation, it is evident from the results (refer Fig. 1 and interviews) that secondary schools do not have EPP. From the results, more than half (55.81%) of teachers/students respondents (Fig. 1) as well as 76.92% of the principals interviewed disputed availability of EPP in their schools. The teachers/students respondents (52.4%) further refuted effectiveness of emergency plan in their schools. Buttressing the respondents' resentment, one of the principals interviewed averred that no secondary schools has EPP let

alone being effective. Although, some of the principals (23.08%) and teachers/students respondents (31.32%) argued their schools has EPP, but when one of the researchers demanded for a copy none of these categories could present such document(s) or pamphlet(s).

Regarding whether some individuals in the schools has personal copy of EPP or any other written instructions describing action plan to ameliorate the consequence of fire, it was quite unfortunate that majority (53.95%) of the respondents reprovred no one has such. Lack of EPP in secondary schools is an evidence of

unpreparedness for fire disasters and its effects. Haply there is fire outbreaks, the consequence on property and lives of school users especially physically challenged students, teachers and others that may be difficult to manage in fire tragedy would be overwhelming. Considering the indispensability of EPP for identifying, assigning responsibilities and directing actions needed to

tackle fire incidents particularly at the inception, its provision for peace and tranquility in secondary schools is requisite. Therefore, the provision of an up-to-date school safety manual (EPP) from the concerned stakeholders will save schools from disruptive timetable and prolong holidays, losses, and destructiveness from emergent fires.

Table 1. Evaluation of Kendall's (w) statistic for respondents on availability of emergency preparedness plan

EPP-Q	m	N	R_i	\bar{R}	$(R_i - \bar{R})^2$
EPP-1	645	5	1675	1935	67600
EPP-2	645	5	1713	1935	49284
EPP-3	645	5	1711	1935	50176
EPP-4	645	5	1544	1935	152881
EPP-5	645	5	1461	1935	224676
Total				$\Sigma(R_i - \bar{R})^2 =$	544617

Kendall's (w) statistic = .131

Table 2. Spearman rank correlation coefficient for emergency preparedness plan and fire disaster effects (N=645)

EPP-Q	Correctly Answered	Rank(1)	Incorrectly Answered	Rank(2)	d(1-2)	d^2
EPP-1	202	4	360	2	2	4
EPP-2	212	2	338	4	-2	4
EPP-3	209	3	348	3	0	0
EPP-4	397	1	167	5	-4	16
EPP-5	150	5	416	1	4	16
Total						40

Spearman's correlation coefficient = -1

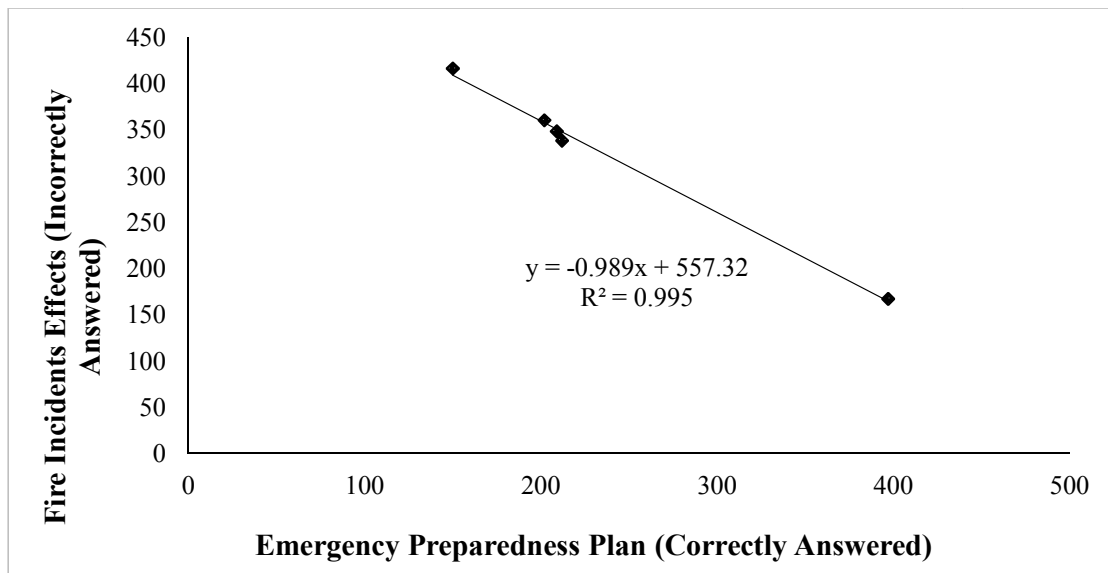


Fig. 4. Scatter-gram of emergency preparedness plan and fire disaster effects

Apart from challenges of lack of awareness and training on fire disasters preparedness noted in secondary schools in the state, another peculiar challenge previously documented by [19] and [20] is poor implementation and enforcement of safety policies. In this respect, necessity for the implementation of fire safety policy sought indicated that, 61.55% of the respondents (refer Fig. 1) supported and clamoured for fire safety policy implementation. The tenet about this was, it will eradicate unnecessary expenses incurred by the state government as well as mitigate psychological traumas from school fires on parents, students, teachers, and members of the community generally.

Per observation and literature, formulation of policy is easy and never a problem in Nigeria but effective implementation and enforcement is a problem that must be addressed to harmonize what such policy is meant for. Like Pathak [20] observed, Nigeria has a well-developed disaster management frameworks and policies at the national level but it lacks adequate and effective implementation at the state and local levels. For example, lack/poor implementation and enforcement of National Fire Safety Code of 2013 in Nigeria has increased and deepened the interest of all and sundry in educational sector hence, indiscriminate establishment of non-fire certified schools. Consequently, secondary schools have become money making ground for the establishers without considering and prioritizing safety of the school users.

Similarly, lack/poor implementation and enforcement of Fire Safety Code has also contributed to developers, school board/owners and principals' failure to submit requisite documents to the State Fire Service Headquarters for fire clearance, endorsement, and certification before and after construction of the proposed school building(s). For instance, during the interviews more than half (69%) of the school principals were not aware of any requirement or law that prescribed their schools to be fire certified by the State or Federal Fire Service Headquarters as the case may be.

Lack of emergency contingency plan in secondary schools in the region firmly made this study consent with findings of other researchers. For example, [16] who founded that 84% of schools in Uganda had no fire safety plans. Akalemeaku [6] and [19] who differently reported that University of Nigeria (Enugu campus) and University of Port Harcourt respectively are not

prepared for fire disasters because they lack fire emergency plan. The similarity in findings in this study and that of [6] and [19] in Nigeria on lack of fire emergency plan could partly be attributed to ineffectiveness of National Fire Safety Code of 2013 in the country. Based on the peculiarity of the Code, it could be used unanimously at all levels of education in Nigeria to prevent school fires. Hence, proponing the review and effective use of National Fire Safety Code 2013 of Nigeria to mitigate school fires maims on the victims.

4.1.1 Availability of school safety committee

Regarding school safety committee, it was disheartening that, in disaster/emergency situation specifically fire, secondary schools in the state would be devastated since there is no safety committee to oversee the school users' safety affairs. Deducing from Fig. 2, most (64.5%) of the respondents denounced the presence of safety committee in their schools. The reason for this could be referenced to poor knowledge on fire disasters preparedness demonstrated among secondary schools' teachers in the region. Per excellence, if there is awareness on how to prepare for fire and/or how it can be prevented, alarm on safety committee necessity in schools would have been raised amongst teachers during meetings, briefings and by virtue constituted by the school authority or management board.

Lending credence to the school safety committee availability denounced by 64.5% of teachers/students respondents, majority (61.54%) of the principals interviewed (refer Fig. 3) acknowledged absence of safety committee in their schools. As shown from the interviewees, only 38.46% of the principals affirmed availability of safety committee in their schools. Availability of school safety committee is important as people therein would be individuals trained on how to prevent and manage fire and other sister disasters such as flooding and epidemics which are peculiar in the region.

Based on the earlier established importance of school safety committee, state government needs to come up with strict policy that will compel all secondary schools to have safety committee(s). For instance, to implement the Ministry of Education's school safety standards in Kenya, creation of school safety committee is the first step and measure that must be put in place by every school [30,31]. Looking at this, such

template can be emulated, implemented and enforced in secondary schools in Kwara State and Nigeria as a whole to prevent losses incurred by schools from fire disasters and others.

4.2 Kendall's Statistics for Availability of Emergency Preparedness Plan

The unanimous 13.1% (low) level of agreement amongst the respondents shown by Kendall's analysis (refer Table 1) explains lack of emergency preparedness plan in public and private secondary schools in the state. Lack of emergency plan as well as safety committee in an academic environment like secondary school will expose schools to fire and cohort that may flashily wipeout lives and destroy property if nothing is done to prevent it from happening or abate it.

4.2.1 Hypothesis and the correlation significance

The results from the tests show that there exist a perfect negative significant relationship between emergency preparedness plan and fire disaster effects (refer Table 2 and Fig. 4). However, the results (i.e. sample test falls in the critical region and P -value less than .05 alpha) inconsistency with the H_0 provides sufficient evidence that against the H_0 . As per sample data, the rejection of H_0 implies that possession of EPP will prevent and avert fire disasters influences and consequences on lives and property in PPSSs and the failure will increase the effects of fires on school users. Based on this, there is need for the state government, relevant government ministries and agencies, and other safety management stakeholders to see into the importance of emergency preparedness plan, how it can be provided, implemented and enforced to reduce the traumatic effects of fire disasters.

5. CONCLUSION

Based on the findings on emergency preparedness plan availability towards effective management of fire emergency and risk reduction in public and private secondary schools in Kwara State, Nigeria, it was concluded that:

1. Secondary schools do not have fire or any disaster/emergency preparedness plan let

alone being effectively implemented, enforced and functional. No individual has personal copy of EPP for fire or any disaster.

2. Secondary Schools in the area do not anticipate fire and other emergency because schools do not have safety committee(s) to spectacle safety affairs of school users.
3. On the Kendall's w -statistic, there was a low (13.1%) degree of agreement between respondents on the availability of EPP.
4. Availability and effectively implemented EPP will reduce acute effects of fire disasters such as disruptive time table, prolong holidays, destructiveness and losses in secondary schools.

6. LIMITATIONS OF THE STUDY

The following limitations were confronted while taking this study:

1. Despite the fact that there was enough time to carry out this study, the researchers were unable to 100% retrieved the questionnaire administered. Nevertheless, a response rate of 92.14% suitable for analysis was achieved and used to justify the outcomes.
2. Due to tight schedules of most school principals, only 72.22% were able to be interviewed. Even at that, the female principals willing to participate in the study than their male counterparts.
3. This study did not focused, ascertained or revealed possible reason(s) for non-availability of EPP in secondary schools in Kwara State.

7. RECOMMENDATION

Consequent on the findings and conclusion drawn from this study, the followings were recommended:

1. Ministry of Education and Human Capital Development in collaboration with SFSHs, SEMA, representative of school principals and other stakeholders should develop an agreeable emergency preparedness plan (manual) for secondary schools in the state. The plan should be subject to reviews and amendments annually. Principals, teachers and other supporting

- staff should have personal copy of the plan.
2. The plan should be actively and effectively implemented with mock drills exercise mandate on every schools after reviewing.
 3. Every school should endeavour to have disaster management safety committee which should include principal, teachers, students and parents/community representatives.
 4. Major procedures particularly how to respond to or in fire distress should be pasted in safe and key readable zones around schools. The safety procedures should always be rehears to get schools users updated and acquainted.
 5. Since this study did not focused on or ascertained and revealed possible reason(s) whyschools did not possess EPP, further study could be conducted to leverage this gap.

CONSENT

As per international and university standard, written MOEHCD, Ilorin and School committee consent through the principals were collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Ilori AE, Sawa BA, Gobir AA. Application of cause-and-effect-analysis for evaluating causes of fire disasters in public and private secondary schools in Ilorin Metropolis, Nigeria. Archives of Current Research International. 2019a;19(2):1-11. DOI:<https://doi.org/10.9734/acri/2019/v19i230156>
2. Asari AA. Combating domestic fires. (Unpublished Annual Congress of the Nigerian Society of Engineers, Zaria Branch, Zaria); 2015.
3. Scarneo SE, Di Stefano LJ, Stearns RL, Register-Mihalik JK, Denegar CR, Casa DJ. Emergency action planning in secondary school athletics: A comprehensive evaluation of current adoption of best practice standards. Journal of Athletic Training. 2019;54(1):99-105.
4. Ongori ME. School-based factors influencing the implementation of fire safety standards in public secondary schools in Kenyena district, Kisii County (M.Ed Project, University of Nairobi, Kenya); 2014.
5. Agyekum K, Ayarkwa J, Opoku DJ. Fire safety awareness and management in multi-storey students' Hostels. Asian Journal of Applied Sciences. 2016;4(2): 329-338.
6. Akalemeaku OJ. An assessment of emergency preparedness of incidents for fire disaster in the University of Nigeria Enugu campus's property. Tropical Environment. 2012;11(15):187-199.
7. United Nation International Strategies for Disaster Reduction UNISDR. Disaster Risk Reduction: An instrument for achieving the millennium development goals. Advocacy kit for parliamentarians, p5. Switzerland. Geneva; 2010.
8. International Financial Corporation IFC. Disaster and Emergency Preparedness: Guidance for Schools, p10-16. Health and Education Department, World Bank Group, Washington; 2010. Available: www.ifc.org
9. Lang R. Emergency preparedness: 5 Steps to emergency preparedness for any disaster; 2017. Available:<https://www.facilitiesnet.com/emergencypreparedness/article/5-Steps-To-Emergency-Preparedness-For-Any-Disaster--17186>
10. Afedzie R, McEntire DA. Rethinking disasters by design. Disaster Prevention and Management. 2010;19(1):48-58.
11. Government of Kenya. Child friendly schools manual. Ministry of Education, Nairobi; 2010.
12. Sillah RM. A call to establish a child-centered disaster management framework in Zimbabwe. Jambá: Journal of Disaster Risk Studies. 2015;7(1):148. DOI:<http://dx.doi.org/10.4102/jamba.v7i1.148>
13. Ndirangu WP, Thinguri R, Chui MM. Physical facilities for holistic education: Lessons from secondary schools in Kiambu and Samburu counties, Kenya. Journal of Education and Practice. 2016;7(33):190-198. Available:www.iiste.org

14. Ronan KR, Johnston D, Daly M, and Fairley R. School children's risk perceptions and preparedness: A hazards education survey. *The Australasian Journal of Disaster and Trauma Studies* (Electronic Journal). 2001;1. Available:<http://www.massey.ac.nz/~trauma/issues/2001-1/ronan.htm>
15. Becker JS, Johnston DM, Paton D, Ronan K. Community resilience to earthquakes: Understanding how individuals make meaning of hazard information, and how this relates to preparing for hazards. *NZSEE Conference. 2009;Conference Paper No. 4.*
16. Nakitto M, Lett R. The preparedness of Ugandan schools for fires. *Injury Prevention. 2010;16(Suppl 1):A1–A289.* DOI:10.1136/IP.2010.029215.534
17. Wanaina WW. Factors influencing safety measures in secondary schools: A case of Kikuyu District, Kiambu County, (Published M.Ed. Project, University of Nairobi); 2012.
18. Gichuru JN. Fire disaster preparedness strategies in secondary schools in Nyeri central district, Kenya (M.Ed Project, University of Nairobi). (Online); 2013. Retrieved on 16th November 2017 Available:<http://erepository.uonbi.ac.ke/handle/11295/56498>
19. Anyanwu BO, Akaranta O, and Nwaogazie IL. Evaluation of fire safety management in a higher education institution: A case study of university of Port Harcourt. *Archives of Current Research International. 2016;4(4): 1-13.*
20. Pathak S. Utilising TVET as a tool to achieve disaster resilience among disaster prone countries: Cross countries analysis of experiences from Nigeria and Thailand. *African Perspectives on Disaster Risk Reduction. 2017;(1):16-21.* Available:<https://www.researchgate.net/publication/317512022>
21. Ilori AE, Sawa BA, Gobir AA, Yusuf RO, and Awotoye J. Physical infrastructure safety status in managing fire disaster in secondary schools in Ilorin metropolis, Nigeria. 1st FASMS Conference, Federal University of BirninKebbi, Nigeria. 2019b;Conference Paper No. 161. October, 21st – 24th
22. Pathak S, Ahmad MM. Role of government in flood disaster recovery for SMEs in Pathumthani province, Thailand. *Natural Hazards; 2018.* Available:<https://www.researchgate.net/publication/324970099>
23. Bartlett JE, Kotrlik JW, Higgins CC. Organizational research: Determining appropriate sample size in survey research. *Information Technology, Learning, and Performance Journal. 2001; 19(1):43-50.*
24. Goel B. Stratified sampling. Regional training course on sampling methods for producing core data items for agricultural and rural statistics, Jakarta, Indonesia (29 Sep-10 October). *Global Strategy for Agriculture and Rural Statistics, 1: Statistical Institute for Asia and the Pacific; 2014.* Available:http://www.unsiap.or.jp/e-learning/el_material/Agri/rap_Sampling_In_donesia/8_M2_Stratified%20Sampling.pdf
25. Legendre P. Coefficient of concordance. In: N. J. Salkind, (ed.) *Encyclopedia of Research Design, 1, 1776.* SAGE Publications, Inc., LosAngeles. 2010;164-169. ISBN: 9781412961271
26. Abere B, Nwaogazie IL, Akaranta O. Safety culture assessment of workers in a pipeline construction site in Nigeria. *International Journal of Health, Safety and Environments (IJHSE). 2017;3(3):35-47.* Available:https://archive.org/details/Abere_et_al
27. Ogbonna CI, Nwaogazie IL. Fire safety preparedness in workplaces in Port Harcourt, Nigeria. *International Research Journal of Public and Environmental Health. 2015;2(8):112-121.* DOI:<http://dx.doi.org/10.15739/irjpeh.028>
28. Usman A, Samaila M. An efficient alternative to the Spearman's rank correlation coefficient for tied observations. *Research Journal of Mathematics and Statistics. 2012;4(4):94-97.*
29. Zar JH. *Biostatistical Analysis* (4th Ed.). Upper Saddle River, New Jersey: Prentice Hall; 1999.
30. Government of Kenya. *Safety standards' manual for schools in Kenya, (1st Edition).* Ministry of Education, Government Printers, Nairobi; 2008.
31. Migiro AO. An assessment of the implementation of safety standards in

public secondary schools in Borabu district, Nyamira County, Kenya. (Published M. Ed dissertation, Department

of Educational Management, Policy and Curriculum Studies, School of Education, Kenyatta University); 2012.

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