



Evaluation of Fire Safety Awareness Among Secondary Schools In Ibarapa East Local Government Of Oyo State

¹Fawole T.G, ²Ibikunle O.A, ³Olayanju A.B, ⁴Olaniyi, O. A and ⁵Oladosu, O. M
^{1,2,3,4} Civil Engineering Department, AdeseunOgundoyin Polytechnic, Eruwa, Oyo State Nigeria
⁵Architectural Technology Department, AdeseunOgundoyin Polytechnic, Eruwa, Oyo State Nigeria

ABSTRACT

Fire is a rapid chemical reaction that releases great quantities of heat. It is a chemical reaction that always involves the oxidation of some fuel which is a generic term that refers to anything that can burn (e.g. many gases, many liquids, paper, wood, cloth, plastic and many other materials). It causes significant damage to lives and properties, lead to injuries, and even result in loss of life. Therefore, it is essential to assess the level of fire safety knowledge and preparedness among secondary schools in this region. This evaluation aims to identify strengths and weaknesses in fire safety practices, examine the effectiveness of existing fire safety measures and policies, and recommend strategies to enhance fire safety awareness within the schools. By improving fire safety awareness in secondary schools, we can create a secure learning environment for students and promote a culture of preparedness and response to fire emergencies.

Keywords: Fire, chemical, injury, safety, strategy, emergency

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I. INTRODUCTION

The issue of fire safety awareness in schools has become a pressing concern in recent times. It is important for schools to implement appropriate safety measures to ensure the safety of students and staff in the event of a fire. The lives and properties of adolescent amidst the people is perennially menaced by fire accident which may emerge as a result of either negligence, irresponsibility or inefficient product. In order to minimize the risk of life, injury and property damages, the science of preventing and mitigating undesirable fire outbreak which is also known as fire safety must be entrenched in residential buildings {Kobe's et al.2010, minglo 1998, lo et al. 2000}. Awareness is a very crucial safety recipe that could resist fire fortuity amidst adolescent. Fire awareness is the ability of being trained to prevent fire, treat fire and respond to fire emergency. leungard chow {2016} wrote that fire accident occurs in residential building due to poor electrical wiring, problem with electric meter installation which could lead to leakage and overload of electricity, lack of proper evacuation path and exit route and extreme combustible building materials. Students in boarding school and day engaged in cooking using gas and some other combustible materials. Incident of fire had claimed a lot of lives especially the adolescents. It will be a great service to humanity if works are done to stem this menace.

The general object of this study will examine the Evaluation of fire safety awareness as a tool of reducing the cause of fire outbreak in Ibarapa East local Government, Oyo state. While the following are specific objective are:

Objectives:

1. To assess the level of fire safety knowledge among secondary school students in the region.
2. To evaluate the availability and adequacy of fire safety equipment and facilities in secondary schools in the region.
3. To assess the level of training and preparedness of teachers and staff in case of fire incidents.
4. To identify the challenges faced by secondary schools in ensuring fire safety and propose possible solutions.
5. To raise awareness and promote fire safety education among secondary schools in the region.

RESEARCH QUESTIONS

1. How does fire safety awareness help people in the society?
2. What is the most important prevention giving to people in case of fire safety among the adolescents in the city?
3. What are the impacts that fire safety has utilize among the adolescent in the state, city and local government?

RESEARCH HYPOTHESIS

H₀: There's no association between adolescent attitude towards fire outbreak.

H₁: There is association between adolescent attitude towards fire outbreak.

PREVIOUS WORK

{Guaspari et al.2012} noted that fire safety in building has become an increasingly critical issues especially during emergencies, such as fire earthquakes and terrorist attacks, in this circumstance's occupant behavior is one of the most critical determinants of occupant's safety corroborated by {Kobe's et al.2010}.

It is pertinent to discover that the problem associated with most residential houses, classes and workshops around the world constitute abundant threat to live and properties, with more than three hundred thousand {300,000} people killed by fire yearly as noted by {Jonsson et al.2017}. In China, Xin and huang {2013} who happened to be s researcher also stated that residential building constitutes about 39.7% of all building fire causing direct damage to properties worth about \$USD48,936,330. about 347 civilian injuries and 853 civilian death annually in china. several solutions have been provided to alleviate the threat of fire amidst adolescent such as fire hazard education, fire intervention and regulation, building regulations and fire presentations. Fire safety in the building is an aspect of fire safety management with the purpose of fire disaster prevention in order to reduce the fire risk to an acceptable level, this has to do with the installation of passive and active measures to ensure that the risk to life, destruction of properties and its effect on the environment is minimize {FEMA,2007}.

In his effort to review various literature on fire safety Adeyemi A. (2015) wrote, managing school fires means taking action in three areas. The first is emergency planning. The second is education for staff, students, and families about what actions to take in case of fire. The third step is ensuring the school building is kept fire-safe. Through education, disaster management concepts can be cultivated in students, enabling them to establish proper perception of incident. Therefore, their incident response capability societies such as families can be improved. Schools and students need to build resilience to emergencies and be prepared to reduce their consequences, both to ensure that effectiveness response and also that the education continues as quickly and efficiently.

A recent systematic review of human behavior under building emergencies {Lin et al.2020} shows that emergency evacuation was the primary behavior and have been researched extensively since the 1950s and especially after the world trade center {WTC} attack in 2001 {Gershon et al.2012}. Hassan (1999) concluded that the safety of occupants in building should be the main concern for all professionals' bodies involved in both design and construction of buildings. Nevertheless, the design and safety in buildings will not be enough if adequate preparation is not put in place by the occupant and users of constructed facilities.

According to Abdel Gawad and Abdullahi {2009} an emergency evacuation can be understood as movement of people from hazardous area to safe destination for the estimation time dependent features of an emergency evacuation {Kobe's et al.2010}.

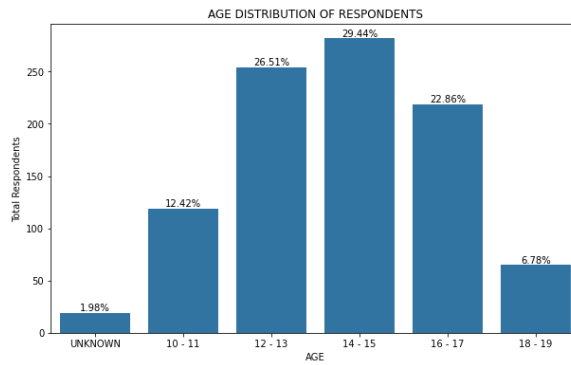
Adolescent behavior is considered in terms of two main categories of processes {1} The prevacation period and {2} The movement period. the second phase {i.e., movement period} has been widely studied focusing mainly on occupants' primary goal in building emergencies, that is how to arrive at targeted destinations safely in the shortest possible time and way finding is the primary human behavior that occurs {viler et al.2014}. the fire evacuation period time from the beginning of fire to the moment when a person decides to attend to evacuate the building {fishy and Proulx 2001} and it has been described as the delay time because it lasts from a second to hour which can significantly affect total evacuation time or efficiency {Lin et al.2020: Kobe's et al.2010}.

DATA COLLECTION AND ANALYSIS

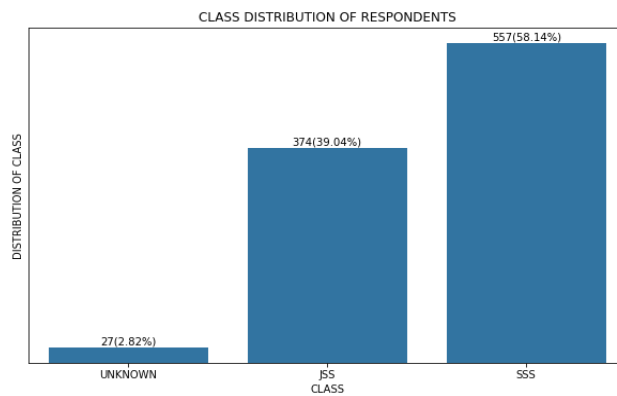
The evaluation work was done using a wellstructured self-administered was strategically distributed among secondary schools students in two major Towns of the region, Eruwa and Lanlate Towns. 1000 questionnaires were distributed among students of 16 public and private secondary schools in Ibarapa East Local Government of Oyo State. Various descriptive and inference were carried out on the data collected using this questionnaire method.

The analysis of the project was carried out using python programming Language and Chi-Square method.

Sex distribution of respondent



From Figure 1, shows that 1.98% of the respondent didn't specify their age, most of the respondents falls within age 14 and 15 with a total of 29.4% of the total respondents, 26.51% of the respondent are between age 12 and 13. Also, 22.86% of the respondents are between age 16 – 17, then 12.42% of the respondents are between age 10 and 11, while 6.78% are between age 18 to 19.



From Figure 2 above, shows that 557 of the respondents which is about 58.14% of the Total respondents are in Senior Secondary class while 374 (i.e 39.04%) of them are in Junior Secondary Class.

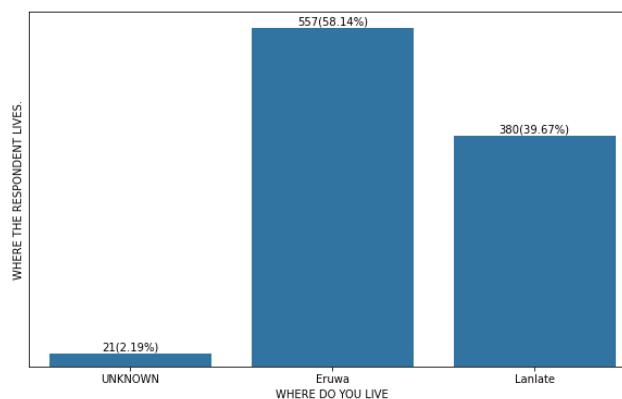
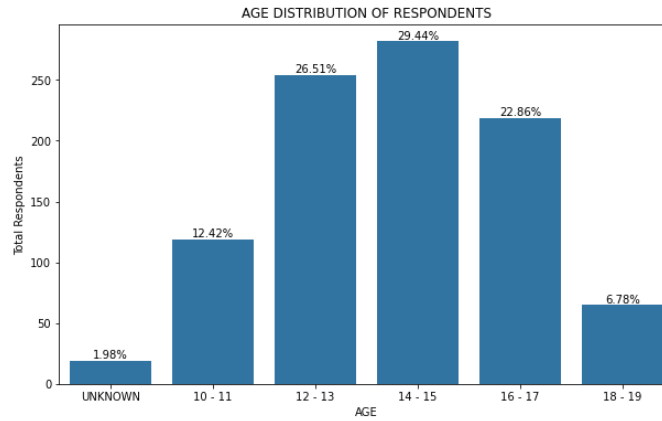
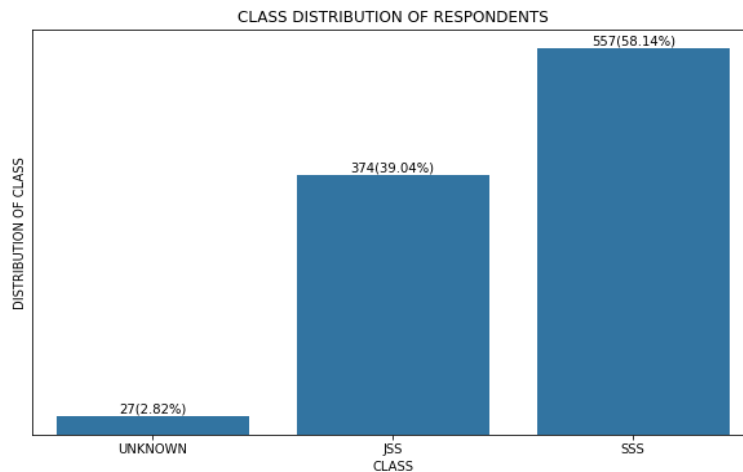


Figure 3 above shows that from the 958 respondents, 557(58.14%) of them lives at Eruwa while 380(39.67%) of them lives at Lanlate.



From Figure 4, it shows that 1.98% of the respondent didn't specify their age, most of the respondents falls within age 14 and 15 with a total of 29.4% of the total respondents, 26.51% of the respondent are between age 12 and 13. Also, 22.86% of the respondents are between age 16 – 17, then 12.42% of the respondents are between age 10 and 11, while 6.78% are between age 18 to 19.



From Figure 5 above, it shows that 557 of the respondents which is about 58.14% of the Total respondents are in Senior Secondary class while 374 (i.e 39.04%) of them are in Junior Secondary Class.

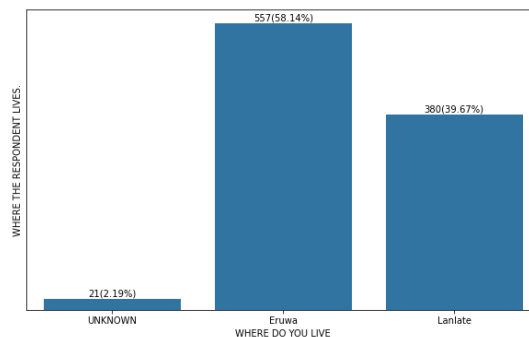


Figure 6 above shows that from the 958 respondents, 557(58.14%) of them lives at Eruwa while 380(39.67%) of them lives at Lanlate.

HYPOTHESIS TESTING

H₀: There's no association between adolescent attitude towards fire outbreak.

H₁: There is association between adolescent attitude towards fire outbreak.

Chi-square test of independence will be carried out on this research question to know if there's relationship between adolescent attitude and fire outbreak.

The below contingency table was computed from responses collected respondents.

ANALYSIS OF THE RESEARCH QUESTIONS

Using 95% level of Confidence i.e $\alpha = 0.05$

Decision rule: Reject H_0 if $p\text{-value} < \alpha$

Carrying out this test, the below result was obtained:

```
In [250]: stat,p,dof,expected = chi2_contingency(df2)
alpha = 0.05
print(f'Statistics = {stat}')
print(f'***100')
print(f'Degree of Freedom is {dof}')
print(f'***100')
print(f'P-value is {p}')
if p < 0.05:
    print(f'p-value is {p} reject H0')
else:
    print(f'p-value is {p}, do not reject H0')

Statistics = 823.4134721880741
-----
Degree of Freedom is 36
-----
P-value is 1.2978654423381694e-149
p-value is 1.2978654423381694e-149 reject H0
```

From the result obtained above the p-value of the test is 1.2978654423381694e-149.

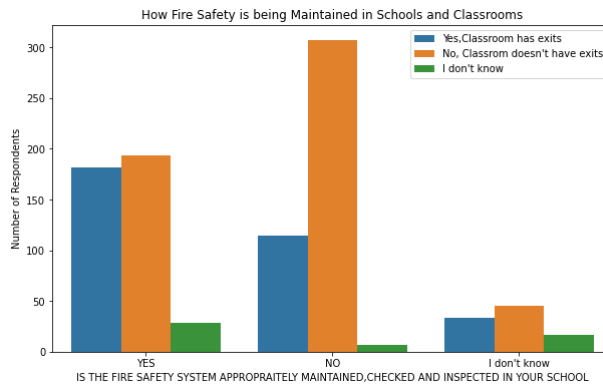
Decision: Since $p\text{-value} < \alpha$ i.e $1.2978654423381694e-149 < 0.05$, we therefore reject the Null hypothesis and conclude that there is an association between the adolescence attitude towards fire outbreak.

RESEARCH QUESTION

IS THE FIRE SAFETY SYSTEM APPROPRAITELY MAINTAINED, CHECKED, AND INSPECTED IN YOUR SCHOOL, AND DOES CLASSROOM HAS EXITS?

From the research Question above, we have:

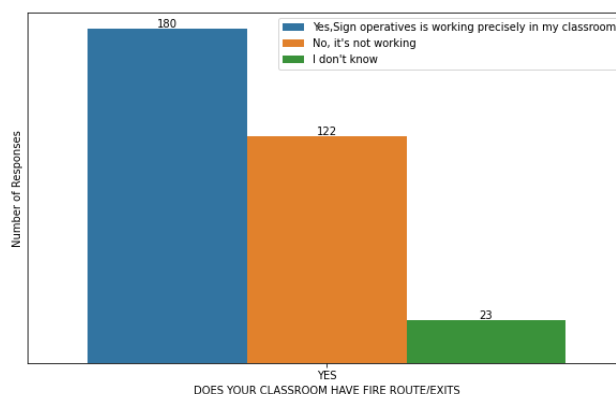
IS THE FIRE SAFETY SYSTEM APPROPRAITELY MAINTAINED, CHECKED, AND INSPECTED IN YOUR SCHOOL	DOES YOUR CLASSROOM HAVE FIRE ROUTE/EXITS	Responses
YES	YES	182
	NO	194
	I DON'T KNOW	28
NO	YES	114
	NO	307
	I DON'T KNOW	7
I DON'T KNOW	YES	33
	NO	45
	I DON'T KNOW	17



From the result above, out of those who says that fire safety system is appropriately maintained and inspected in their School, most of them doesn't have fire route/exits in their classroom, while very few of them don't know if their classroom has fire route/exits, also we can see that out of those who said that the Fire safety system are not properly maintained, checked and inspected in their school, most of them does not have fire route/exits in their classroom, while very few of them don't know if their classroom has fire route/exits. The plot also shows that

out of the whole respondents those who doesn't know if their school safety system is appropriately maintained and Inspected in their School are few.

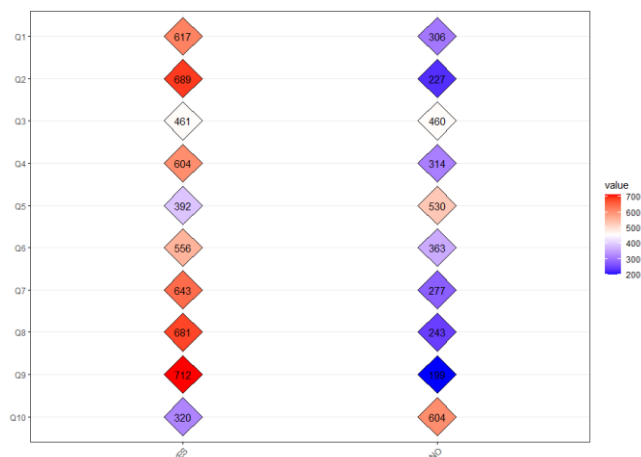
RESEARCH QUESTION: RESPONDENT WHOSE CLASS ROOM HAS SIGN OPERATIVE



The figure above shows that out of those whose Classroom have fire Route/Exits, 180 of them says that the Sign operatives are currently working in their Classroom, while 122 of them says that the sign Operatives are not current in their own classrooms precisely, from these we can see that although, it's impressive that most of the sign operatives are working but the proportion of those that aren't working is also large. The proportion of those who don't know are few, compared to those who know.

SECTION C

QUESTION	YES	NO	Total	Yes%	No%	Total%
Q1: DO YOU KNOW FIRE PRODUCES POISONOUS GAS	617	306	923	66.84724	33.15276	100
Q2: HAVE YOU BEEN TAUGHT THE FIRE PREVENTION AND PROTECTION IN YOUR SCHOOL	689	227	916	75.21834	24.78166	100
Q3: DO YOU KNOW ABOUT DIFFERENT TYPES OF FIRE EXTINGUISHER	461	460	921	50.05429	49.94571	100
Q4: HAVE YOU BEEN TAUGHT HOW TO CONTROL FIRE IN YOUR SCHOOL	604	314	918	65.79521	34.20479	100
Q5: DO YOU KNOW THE FIVE CLASSIFICATIONS OF FIRE	392	530	922	42.51627	57.48373	100
Q6: DO YOU KNOW THE CAUSE OF ELECTRICAL FIRE OUTBREAK	556	363	919	60.50054	39.49946	100
Q7: DO YOU KNOW THAT FIRE HEAT CAN SCORCH YOUR LUNGS	643	277	920	69.8913	30.1087	100
Q8: DO YOU KNOW THAT FIRE SMOKES CAN MAKE YOU DROWSY	681	243	924	73.7013	26.2987	100
Q9: DO YOU KNOW THAT FIRE PRODUCES BLACK SMOKES THAT MAKE YOU SIGHTLESS	712	199	911	78.15587	21.84413	100
Q10: DO YOU KNOW ABOUT FIRE TRIANGLE AND ITS COMPONENT	320	604	924	34.63203	65.36797	100



From the result obtained from respondent, it shows that 66.8% of them are aware that Fire Produces poisonous gas while 33.2% are not aware. Also, out of 916 respondents, 689(75.2%) have been taught how to prevent and protect fire in their school, while the remaining 227 (24.7%) have not been taught.

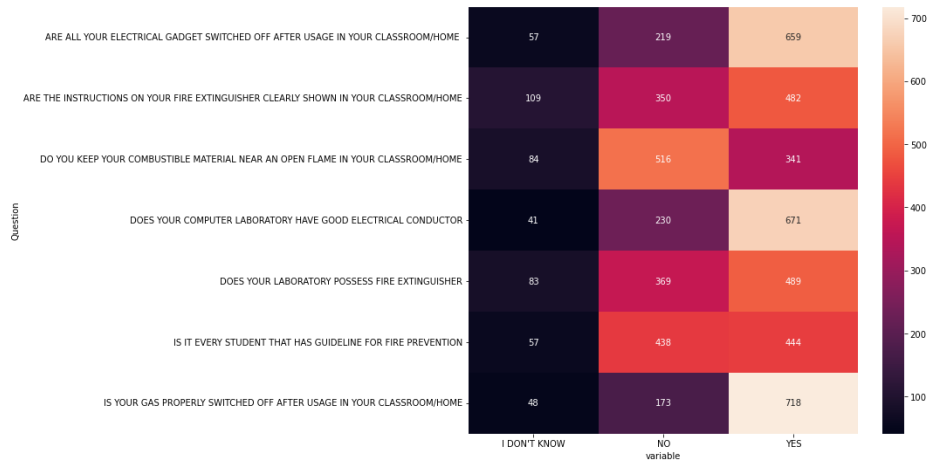
The table and plot above also shows that 50.1% of adolescence knows about the different types of fire extinguisher while 49.9% of them doesn't know. Out of 918 adolescence 604(65.8%) of them have been taught how to control fire in their School, while 314(34.2%) have not been taught.

The table and plot above also shows 42.5%(392) of the respondent knows the five classification of fire while 57.5%(530) doesn't know the classification of fire, also 60.5%(556) of the respondent knows the cause of electrical fire outbreak while 39.5%(363) does not know the cause of electrical outbreak.

The table and plot above shows that out of 920 respondent, 643(69.9%) of them are aware that fire heat can scorch the lungs, while 277(30.1%) of them aren't aware that fire heat can scorch the lungs. Also from the table, more than 70% of the respondent knows that Fire smokes can make you drowsy.

The table also shows that about 78% of the respondent know that fire produces black smokes that make you sightless, while about 65% of the respondent don't know about fire Triangle and its component.

Question	YES	NO	IDON'T KNOW	Total	Yes%	No%	I dont know%
IS IT EVERY STUDENT THAT HAS GUIDELINE FOR FIRE PREVENTION	444	438	57	939	47.3	46.6	6.1
DOES YOUR LABORATORY POSSESS FIRE EXTINGUISHER	489	369	83	941	52.0	39.2	8.8
ARE ALL YOUR ELECTRICAL GADGET SWITCHED OFF AFTER USAGE IN YOUR CLASSROOM/HOME	659	219	57	935	70.5	23.4	6.1
DO YOU KEEP YOUR COMBUSTIBLE MATERIAL NEAR AN OPEN FLAME IN YOUR CLASSROOM/HOME	341	516	84	941	36.2	54.8	8.9
DOES YOUR COMPUTER LABORATORY HAVE GOOD ELECTRICAL CONDUCTOR	671	230	41	942	71.2	24.4	4.4
IS YOUR GAS PROPERLY SWITCHED OFF AFTER USAGE IN YOUR CLASSROOM/HOME	718	173	48	939	76.5	18.4	5.1
ARE THE INSTRUCTIONS ON YOUR FIRE EXTINGUISHER CLEARLY SHOWN IN YOUR CLASSROOM/HOME	482	350	109	941	51.2	37.2	11.6



From the result obtained from the table and chart above, more of the respondents says that every student in their classroom has guideline for fire prevention. Also, about 52% of the respondents says that their Laboratory possess fire extinguisher, about 70% of the respondents also says that their electrical gadget is always switched off after use in their Classroom/Home.

We also obtained from the result that 54.8% of the respondents does not keep combustible materials near an open flame in their classroom and/Home. The result also shows that 71.2% of the respondents says that their computer laboratory has good conductor.

II. CONCLUSION

With the increased reoccurrence of fire outbreak, fire safety knowledge has become Paramount. But with the recent research and various surveys carried out on the youth and adolescent of Ibarapa east local government (Eruwa, Lanlate).

It shows that most youth and adolescent do not have the basic knowledge about firesafety precautions.

This brings about the conclusion that fire safety awareness program should be organized for youths and adolescent as they take up more percentage of the total population. But this can only be done through the joint cooperation of the government (federal and state level) various Non-governmental organization dealing with fire hazards, fire safety department, institutions of knowledge down to our various homes.

With the development of various fire hazards and fighting program, the youth would be better equipped with knowledge and skills to handle a fire occurrence or who to call if it is beyond control, thereby saving lives and property

III. RECOMMENDATIONS

Government should provide fire awareness programs to the populace especially the adolescents, youth and women and ensure enforcement of the following in schools:

- All schools should make combustible materials distanced from open flame.
- All school laboratory should be adequately equipped with fire extinguisher.
- Instruct Heads of schools to see that all electrical gadgets are properly switched off after usage in both class room/hostel.
- All school laboratory should be adequately facilitated with good electrical conductor and appliances.
- Fire safety system equipments should be perennially inspected.
- Every school management should always make provision for fire route / exist in all the classes.
- The school management should constantly provide adequate guideline of fire prevention to the student.
- Teachers and guardians should possess necessary skills and knowledge on fire emergencies.

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