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Predictors of Fire Disaster and Its Prevention Among Traders of Ultra-Modern Markets in Port Harcourt Metropolis of Rivers State

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ABSTRACT **Original Research Article**

This study investigated the predictors of fire disaster and its prevention among traders of ultra-modern markets in Port Harcourt Metropolis, Rivers State. The Study adopted the correlational survey research design, with a population of 3,373 from selected ultra-modern market traders and a sample size of 393 respondents, using the Taro Yamene formula and 10% attrition. The instrument for data collection was a structured questionnaire titled: "Determinants of fire Disaster and the prevention Questionnaire (DFDPQ)" with a reliability coefficient of 0.91, the findings of the study gave response to the research questions and hypotheses. Analysis was done with the aid of the Statistical Product for Service Solution version 25.0, using regression analysis at 0.05. The findings of the study revealed that Electrical Hazards and Negligence, are among the major determinants of Fire disaster, in ultra-modern markets. It was concluded that routine awareness campaign, sensitization and fire safety training should be carried out to improve knowledge of fire safety in all markets, thereby reducing fire disaster. The study recommended that a continuous enlightenment campaign on fire safety be carried out, to increase fire safety knowledge among traders in the markets.

Keywords: Determinants, Fire Disaster, Fire Accident, Fire Safety Practices, Ultra-Modern Market, Traders.

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Introduction

Fire disasters are one important danger in the human environment, as fire accidents having a significant occurrence and high socioeconomic losses and destruction to affected populations all around the world. Report by World Health Organization (2004) it is stated that more than 300,000 lives lost every year due to fire and ranked the fourth leading cause of unintentional injuries in world after road traffic accidents falls and drowning. Over 95% of deaths and burn injuries due to fire occur in low- and middle-income countries (LMICs), where the mortality rates is almost six times greater than the one reported from high income countries (World Health Organization, 2004). Similarly, Noah et al. According to Tanjung et al. (2017), the mortality in Europe due to fire is on average 8 per million population every year and many others are hospitalized. As reported in the World Fire Statistics Report No. 23, Australia, Bulgaria, and Israel observed some of highest population-adjusted fire rates (International Association of Fire and Rescue Services, 2018). One-third of all fires reported in 2016 across the United States, the equivalent of 1,342,000 fire-related deaths and 3,390 fire-related case mortality (International Association of Fire and Rescue Services, 2018). According to Hindustan India Risk Survey 2017, there were 18,450 fire accidents causing injuries (1,193) and deaths (17,700) in India in 2015 (Jha et al., 2017). Africa has also witnessed many fire outbreaks, partly as a result of poor preparation and less public awareness programmes especially in commercial places like

open markets (Ilori, 2017). Nigeria has also suffered significant losses related to fires. Experts from the Federal Fire Service (FFS, 2022) revealed that there were 147 fire deaths in Nigeria in 2020 and about 2,835 fire incidents across the country; while more recently, public properties worth are said to have lost over N3 trillion to fire accidents in South-Western Nigeria during the month of January-December 2021. The recurrence of fire debacles is a serious hindrance to public monetary turn of events, particularly against the setting of proceeding with expansion as well as other socioeconomic difficulties. Over the last few years, incidences of fire outbreaks have been reported to result in over N6 trillion ($ 15 billion) in economic losses across Nigeria and some cities like Lagos, Ibadan, Kano and Port Harcourt have suffered heavily as a consequence (Izuoba, 2017). Alao et al. Fire was also recognized by (2021) as a very serious risk to the security of residences, production facilities, employees and businesses.

Several factors could contribute to fire disasters in market place such as: electrical hazards (electrical spark due to wrong electrical connections, overloading of electrical sockets, failing to switch off electrical sockets and appliances after usage and fluctuating electrical power supply), flammable materials/liquids (fuel storage, chemicals, thinner), lack of fire safety knowledge, arson, Negligence (smoking, use of generator, cooking, children play with fire, naked flame), etc.

A range of human actions and in-actions could lead to fire disasters, many due to electrical hazards. Katende (2015), in Obasa et al. (2020), established the utilization of below standard electrical materials as well as defective electrical appliances as a significant contributor to fire catastrophes on commercial structures. In line with this, John (2014), described that the Grenfell Tower in London was reported to have been engulfed in flames in 2017 and went on to become one of the deadliest structural fires in UK history. The fire originated in a faulty fridge on the fourth floor and quickly swept up the outside of the building, killing 72 people, destroying 151 homes and injuring more than 70 others. This case shows that electrical faults and faulty appliances can quickly turn into disastrous fires, especially in high-density residential buildings.

A major challenge that often traders and shop owners face is their limited understanding of fire safety practices. This ignorance may shore up horrible practices, such as the negligent use of pressing irons, random burning of waste materials with no control mechanism for flammable materials, or the absence of units or committees to direct fire safety measures in and outsides market environments. As stated by the International Federation of Red Cross (IFRC, 2000), community awareness can lessen the vulnerability of a population to certain hazards as individuals who are better able to adopt appropriate mitigation and emergency responses. In a survey carried out in the West African sub-region, patrons with no cigarette smoking experience found grounds for fire outbreaks and attributed about 75% of these to cigarette smoking, 15% to ignorance and another 10% to accident (Abu, 2013 as cited in Kaiko, 2016). In the same way, Nigeria ranked first in fire deaths out of 188 countries according to World Life Expectancy Report (2016). The high mortality observed may not only be due to prevalence of the fire incident but also poor awareness and sensitization on aspects of fire prevention, evacuation and methods for escaping (Adekunle et al., 2020).

Another major factor that leads to fire disasters is negligence. It is defined as an action or failure to act when you do not sufficiently attend to a situation or fulfill a duty or responsive task correctly and timely, resulting in negative consequences such as accidents, injuries, loss of property, pain. For the purpose of this study, negligence encompasses smoking, use of generators in close proximity to flammable liquids, unsafe cooking practices, children playing with fire, open flames and litter burning. Ilori (2017) also observed that negligence is a result of different events which include improper handling and exposure to harmful chemicals in laboratory experiments, careless disposing of cigarette butts, negligent use of gas cookers among others. Similarly, Alade et al. According to Jadhav et al. (2019), the reckless usage of ignitable materials, such as candles in schools dormitories, hostels and houses, combustible artwork paints and ornamental items in workplaces, classrooms and hostel rooms may be a consider fires. Fires are also known to be caused from smoking and improper disposal of butts. According to Abu (2013, as cited in Kaiko, 2016) smoking represented a large percentage of fires at markets, representing almost 75% of fire incidents in some West African countries i.e. Ghana and Nigeria.

Also, the occurrence of arson is another factor attributing towards the rampant occurrences of fire outbreaks. Arson means willfully maliciously setting fire by a person or persons to another's real or personal property. Tolofari (2010) simply defined arson as the planned fire consciously induced on a private or public property, often driven by an act of protest against, revenge against, dissent from and/or dissatisfaction with an institution or government. The author also noted instances of fire incidents in public establishments and even private secondary schools in Ilorin that were linked to people who deliberately set their environment on fire as part of the protest or for wanton destruction. Similarly, Shibutse et al. According to (2014), it is possible that fires set on public facilities represent political or psychological motivation, drug use, substance [9] abuse and psychological distress. These overt acts of vandalism reveal that arson can be an ever-present hazard for both public and private property; instantaneously addressing the absence of safety structures around institutions in Ilorin.

From the forgoing, it is evident that Rivers State which is the Treasure base of the nation and Port Harcourt the capital city is not immune to this calamitous event ravaging the world

and nation's commerce sector. Records and reports has shown the several market fires that has occurred, and so many citizens has been victim of this monster. It is also worthy of mention that this fire disasters in the market are caused by human activity or inactivity, hence it is preventable by applying and observing fire safety practices within and around the market. It is on this premise that the study investigates the determinants of fire disaster and the prevention among traders of ultra-modern markets in Port Harcourt Metropolis of Rivers State.

The study sought to provide answers to the following research questions:

1. What is the relationship between electrical hazards and fire Disaster in ultra-modern market in Port Harcourt Metropolis of Rivers State?
2. What is the relationship between fire safety knowledge and fire Disaster in ultra-modern market in Port Harcourt Metropolis of Rivers State?
3. What is the relationship between negligence and fire Disaster in ultra-modern market in Port Harcourt Metropolis of Rivers State?
4. What is the relationship between arson and fire Disaster in ultra-modern market in Port Harcourt Metropolis of Rivers State?
5. What is the relationship between availability of tools/machinery and fire prevention in ultra-modern market in Port Harcourt Metropolis of Rivers State?
6. What is the relationship between compliance with available fire safety laws/regulations and fire prevention in ultra-modern market in Port Harcourt Metropolis of Rivers State?
7. What is the relationship between enforcement of fire safety laws and regulations by market authority and other relevant institutions and fire prevention in ultra-modern market in Port Harcourt Metropolis of Rivers State?

Hypotheses

The following hypotheses postulated were tested at 0.05 level of significance:

1. Electrical hazard does not constitute a significant predictor of fire Disaster in ultra-modern market in Port Harcourt Metropolis of Rivers State.
2. Fire safety knowledge does not constitute a significant predictor of fire Disaster in ultra-modern market in Port Harcourt Metropolis of Rivers State.
3. Negligence does not constitute a significant predictor of and fire Disaster in ultra-modern market in Port Harcourt Metropolis of Rivers State.
4. Arson does not constitute a significant predictor of fire Disaster in ultra-modern market in Port Harcourt Metropolis of Rivers State.
5. Availability of tools/machinery does not constitute a significant predictor of fire prevention in ultra-modern market in Port Harcourt Metropolis of Rivers State.
6. Compliance with available fire safety does not constitute a significant predictor of laws/regulations and fire prevention in ultra-modern market in Port Harcourt Metropolis.
7. Enforcement of fire safety laws and regulations does not constitute a significant predictor of fire prevention in ultra-modern market in Port Harcourt Metropolis of Rivers State

Methodology

The correlational survey research design was adopted in this study since the study used a representative sample of the entire population of the traders and shop owners to enable the researcher systematically to collect, analyse and interpret data to describe the determinants of fire disaster and the prevention in ultramodern market in Port Harcourt Metropolis of Rivers State. The study population comprised 3,373 registered traders of the designated ultramodern markets within the Port Harcourt Metropolis in Rivers State. Three (3) ultramodern markets were selected and used for the investigation. The overall population of the selected ultramodern marketplaces was 3,373 traders. (New-layout=800, Mile1=1500, Rumumasi=1236) (Source: LGA Market Committee) The study used a sample size of 393 respondents, based on the Taro Yamene formula at 10% attrition rate. $n = N/(1+N(e)^2)$. Where: n = sample size, N = Population of Study, e = error margin. The study used a multi-stage sampling approach. Firstly, a cluster sampling technique was employed where the selected ultramodern marketplaces were grouped into 2 clusters based on proximity and location (LGA). In the second stage, simple random sampling technique was employed to select at least one market from each of the clusters formed. The third stage, simple random sampling technique was employed to choose the respondents from each of the 3 ultramodern market in the specified cluster. The instrument for data collection was a structured questionnaire titled: "Determinants of fire Disaster and the prevention Questionnaire (DFDPQ)" with reliability coefficient of 0.91, the findings of the study offered response to the research questions and hypotheses. Statistical analysis was performed using the Statistical Product for Service Solution version 25.0, employing regression analysis at 0.05 level.

Results

The results of the study were presented blow:

Table 1: Regression analysis on relationship between electrical hazards and fire Disaster in ultra-modern market in Port Harcourt Metropolis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	Decision
1	.93	.87	.87	.90	1.36	Very High relationship

(Source: Field data)

Table 1 showed the relationship between electrical hazards and fire Disaster in ultra-modern market in Port Harcourt Metropolis. The result of the study showed that there was a very high positive relationship between electrical hazards and fire Disaster (r = 0.93). The result further showed that electrical hazards contributed 87.1% of the variance in fire Disasters (R^2 = 0.871). Therefore, the relationship between electrical hazards and fire Disaster in ultra-modern market in Port Harcourt Metropolis of Rivers State was very high.

Table 2: Regression analysis on relationship between fire safety knowledge and fire Disaster in ultra-modern market in Port Harcourt Metropolis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	Decision
1	-.91	.82	.82	.82	1.15	Very High relationship

(Source: Field data)

Table 2 showed the relationship between fire safety knowledge and fire Disaster in ultra-modern market in Port Harcourt Metropolis. The result of the study showed that there was a very high negative relationship between fire safety knowledge and fire Disaster (r = -0.91). The result further showed that fire safety knowledge contributed 82.3% of the variance in fire Disasters (R^2 = 0.823). Therefore, the relationship between fire safety knowledge and fire Disaster in ultra-modern market in Port Harcourt Metropolis of Rivers State was very high.

Table 3: Regression analysis on relationship between negligence and fire Disaster in ultra-modern market in Port Harcourt Metropolis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	Decision
1	.95	.90	.90	.78	1.32	Very High relationship

(Source: Field data)

Table 3 showed the relationship between negligence and fire Disaster in ultra-modern market in Port Harcourt Metropolis. The result of the study showed that there was a very high positive relationship between negligence and fire Disaster (r = 0.95). The result further showed that negligence contributed 90.3% of the variance in fire Disasters (R^2 = 0.903). Therefore, the relationship between negligence and fire Disaster in ultra-modern market in Port Harcourt Metropolis of Rivers State was very high.

Table 4: Regression analysis on relationship between arson and fire Disaster in ultra-modern market in Port Harcourt Metropolis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	Decision
1	.95	.90	.90	.78	1.32	Very High relationship

(Source: Field data)

Table 4 showed the relationship between arson and fire Disaster in ultra-modern market in Port Harcourt Metropolis. The result of the study showed that there was a very high positive relationship between arson and fire Disaster (r = 0.95). The result further showed that arson contributed 90.3% of the variance in fire Disasters (R^2 = 0.903). Therefore, the relationship between arson and fire Disaster in ultra-modern market in Port Harcourt Metropolis of Rivers State was very high.

Table 5: Regression analysis on relationship between availability of tools/machinery and fire prevention in ultra-modern market in Port Harcourt Metropolis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	Decision
1	.97	.93	.93	.63	1.17	Very High relationship

(Source: Field data)

Table 5 showed the relationship between availability of tools/machinery and fire prevention in ultra-modern market in Port Harcourt Metropolis. The result of the study showed that there was a very high positive relationship between availability of tools/machinery and fire prevention (r = 0.97). The result further showed that availability of tools/machinery contributed 93.5% of the variance in fire prevention (R^2 = 0.935). Therefore, the relationship between availability of tools/machinery and fire prevention in ultra-modern market in Port Harcourt Metropolis of Rivers State was very high.

Table 6: Regression analysis on relationship between available fire safety laws/regulations and fire prevention in ultra-modern market in Port Harcourt Metropolis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	Decision
1	.99	.98	.98	.25	1.21	Very High relationship

(Source: Field data)

Table 6 showed the relationship between available fire safety laws/regulations and fire prevention in ultra-modern market in Port Harcourt Metropolis. The result of the study showed that there was a very high positive relationship available fire safety laws/regulations and fire prevention (r = 0.99). The result further showed that available fire safety laws/regulations contributed 98.6% of the variance in fire prevention (R^2 = 0.986). Therefore, the relationship between available fire safety laws/regulations and fire prevention in ultra-modern market in Port Harcourt Metropolis of Rivers State was very high.

Table 7: Regression analysis on relationship between enforcement of fire safety laws and fire prevention in ultra-modern market in Port Harcourt Metropolis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	Decision
1	.97	.94	.94	.50	1.31	Very High relationship

(Source: Field data)

Table 7 showed the relationship between enforcement of fire safety laws and fire prevention in ultra-modern market in Port Harcourt Metropolis. The result of the study showed that there was a very high positive relationship enforcement of fire safety laws and fire prevention (r = 0.97). The result further showed that effective enforcement of fire safety laws contributed 94.4% of the variance in fire prevention (R^2 = 0.944). Therefore, the relationship between enforcement of fire safety laws and fire prevention in ultra-modern market in Port Harcourt Metropolis of Rivers State was very high.

Hypotheses

Table 8: Regression analysis on electrical hazard as a significant predictor of fire Disaster in ultra-modern market in Port Harcourt Metropolis

Model		Sum of Squares	Df	Mean Square	F	Sig.	Decision
1	Regression	1929.25	1	1929.25	2369.86	.00*	Rejected
	Residual	285.74	356	.81			
	Total	2215.00[d]	357				

*Significant, p<0.05 (Source: Field data)

Table 8 presents the Regression analysis on electrical hazard as significant predictor of fire Disaster in ultramodern market in Port Harcourt Metropolis. The outcomes of the study demonstrated that there was a significant association between the electrical dangers and fire Disaster [f(1,356) = 2369.86, p<0.05]. Hence, the null hypothesis which suggested that there is no significant relationship between electrical dangers is not a significant predictor of fire disaster in ultramodern market in Port Harcourt Metropolis of Rivers State was rejected.

Table 9: Regression analysis on fire safety knowledge as significant predictor of fire Disaster in ultra-modern market in Port Harcourt Metropolis

Model		Sum of Squares	Df	Mean Square	F	Sig.	Decision
1	Regression	1822.73	1	1822.73	1630.99	.00*	H_o Rejected
	Residual	392.26	356	1.11			
	Total	2215.00[d]	357				

*Significant, p<0.05 (Source: Field data)

The regression study on fire safety knowledge as significant predictor of fire Disaster in ultramodern market in Port Harcourt Metropolis was shown in table 9. The findings of the study demonstrated that there was a significant link between fire safety knowledge and fire Disaster [f(1, 356) = 1630.99, p < 0.05]. Hence, the null hypothesis which stated that fire safety knowledge is not a significant predictor of fire safety knowledge and fire Disaster in ultramodern market in Port Harcourt Metropolis of Rivers State was rejected.

Table 10: Regression analysis on negligence significant predictor of Disaster in ultra-modern market in Port Harcourt Metropolis

Model		Sum of Squares	Df	Mean Square	F	Sig.	Decision
1	Regression	2000.84	1	2000.84	3279.44	.00*	H_o Rejected
	Residual	214.15	356	.61			
	Total	2215.00[d]	357				

*Significant, p<0.05 (Source: Field data)

Table 10 presented the regression analysis on negligence as significant predictor of fire Disaster in ultramodern market in Port Harcourt Metropolis. The study findings demonstrated that there was substantial link between negligence and fire Disaster [f (1,356) = 3279.44, p<0.05]. Hence, the null hypothesis that negligence is not a significant predictor of fire disaster in ultramodern market in Port Harcourt Metropolis of Rivers State was rejected.

Table 11: Regression analysis on arson is not a significant predictor of fire Disaster in ultra-modern market in Port Harcourt Metropolis

Model		Sum of Squares	df	Mean Square	F	Sig.	Decision
1	Regression	2071.23	1	2071.23	5056.87	.00*	H_o Rejected
	Residual	143.76	356	.41			
	Total	2215.00[d]	357				

*Significant, p<0.05 (Source: Field data)

Table 11: Regression Analysis on the link between arson and fire Disaster in ultramodern market in Port Harcourt Metropolis. The study found that there was a significant link between arson and fire Disaster [f(1,356) = 5056.87, p<0.05]. Thus, the null hypothesis that arson is not a significant predictor of fire Disaster in ultramodern market in Port Harcourt Metropolis of Rivers State was rejected.

Table 12: Regression analysis on availability of tools/machinery as significant predictor of fire prevention in ultra-modern market in Port Harcourt Metropolis

Model		Sum of Squares	df	Mean Square	F	Sig.	Decision
1	Regression	1544.20	1	1544.20	6947.60	.00*	H_o Rejected
	Residual	78.01	356	.22			
	Total	1622.21[d]	357				

*Significant, p<0.05 (Source: Field data)

Table 12 Regression investigation of availability of tools/machinery significant predictor of fire prevention in ultramodern market in Port Harcourt Metropolis. The study results demonstrated a significant link between availability of tools/machinery and fire prevention [f(1,356) = 6947.60, p<0.05]. Thus, the null hypothesis that availability of tools/machinery is not a significant predictor fire prevention in Port Harcourt Metropolis of Rivers State was rejected.

Table 13: Regression analysis on compliance with available fire safety laws/regulations as significant predictor of fire prevention in ultra-modern market in Port Harcourt Metropolis

Model		Sum of Squares	df	Mean Square	F	Sig.	Decision
1	Regression	1600.06	1	1600.06	25359.82	.00*	H_o Rejected
	Residual	22.14	356	.06			
	Total	1622.21[d]	357				

*Significant, p<0.05 (Source: Field data)

Table 13 Regression Analysis on Compliance to Available Fire Safety Laws/Regulations as significant predictor of Fire Prevention in Ultramodern Market in Port Harcourt Metropolis. The outcomes of the study showed a significant association between compliance of available fire safety laws/regulations and fire prevention [f(1,356) = 25359.82, p<0.05]. Thus, the null hypothesis which states that compliance with available fire safety laws/regulations is not significant predictor of fire prevention in Port Harcourt Metropolis of Rivers State was rejected.

Table 14: Regression analysis on enforcement of fire safety laws/regulations as significant predictor of fire prevention in ultra-modern market in Port Harcourt Metropolis

Model		Sum of Squares	Df	Mean Square	F	Sig.	Decision
1	Regression	758.04	1	758.04	2929.45	.00*	H_o Rejected
	Residual	44.76	173	.25			
	Total	802.80[d]	174				

*Significant, p<0.05 (Source: Field data)

Table 14 revealed the regression analysis on the relationship between enforcement of fire safety laws and regulations and fire prevention in ultra-modern market in Port Harcourt Metropolis. The findings of the study revealed that there was a significant relationship between enforcement of fire safety laws and regulations and fire prevention [f(1,356) = 2929.45, p<0.05]. Therefore, the null hypothesis which stated that enforcement of fire safety laws and regulations is not a significant predictor of fire prevention in Port Harcourt Metropolis of Rivers State was rejected.

Discussion of Findings

The findings of the study were discussed below:

This finding suggests that electrical installations, devices and usage constitute significant sources of fire hazards in the markets. The dangers of fire related to electricity stem from illegal or improper connections, overloaded circuits, burnt out fuses and circuits, unbalanced electrical loads, current fluctuations at the moment when you need it most (taking off the appliance) causing old aging wiring or short circuit in addition to electric arc or sparking. This can cause overheating of these materials, eventually causing them to catch fire and start a fire. This result is similar to previous studies. By way of example, Twum-Barima (2014) in his study came out with the situation in Zambia where more than 80% of fire disaster`s causes within markets were due to electrical hazards. Similarly, Ayobami et al. (2016) investigated one of the causes and features of market fires in Nigeria focusing on Lagos State regarding the area of influence, type and cause and found that majority (79.8%) are due to power surge. The results also confirm the findings of Momoh (2018) that states electrical installations, overloading of electrical sockets and efforts by some shop occupants to rectify electric fault or appliances are the major causes of fires in markets as found out in their study carried out in Ibadan, Oyo State. The homogeneity of the study populations and similarity in design employed may explain these similarities in findings to other studies.

The results of Table 2 indicated that there was a very strong negative relationship between fire safety knowledge and fire disaster (r = -0.91) in ultra-modern markets in Port Harcourt Metropolis. It should therefore, be emphasized that more efforts in public enlightenment, training and education of traders in the State on how to prevent fire disasters in commercial markets as some findings revealed less knowledge on fire safety among their respondents. Most traders are unable to contain fire outbreaks from rising as they don't practice the measures required mainly due to lack of knowledge about basic fire safety techniques. Hence, enhancing awareness about fire safety will assist traders to identify fire danger and the proper steps to be taken in case a fire breaks out. Prevention is never one of the least effective methods in firefighting and knowledge acquisition is basic to correct prevention. Results are in line with the study of Oladokun et al. Ibadan, Southwest Nigeria (2014) found that most of the traders had inadequate knowledge on fire disaster prevention because they were not adequately and timely trained nor adequately informed. These findings also corroborate with the results found by Nuruddeen et al. (2018) who defined fire safety practices as a set of actions to minimize the ignition sources and other potential risks within public buildings such as schools and markets. The finding in the present study is similar to those obtained from earlier research (29-35), possibly due to a homogeneous population as well as similarities in the research design.

As shown in Table 3, the results indicated a very high positive correlation of negligence and fire disasters (r =.95) for ultra-modern markets in Port Harcourt Metropolis. This study shows that persistence of neglecting possible hazards and lack of timely satisfactory performance by those involved in market environment plays a significant role in causing fire disasters. Other features of negligence include misusing electrical appliances, careless throwing away of cigarette stubs, poor fuel storage, permitting children to play with matches, using contaminated kerosene that could produce excessive flares when ignited and gas cookers or stove left unattended as well as lack of maintenance and repair of already-installed fire protection systems. The results further underscore the need for market occupants to be aware of the fire risks and express a readiness to take appropriate measures at an early stage whenever potential fire hazards are 209019present. The findings corroborate those of Simpson (2010), who worked in Kumasi in Ghana, where negligent treatment of naked flames, including kerosene stoves, gas cookers, coal pots, firewood as well as candles and light cigarettes and lit mosquito coils were partly responsible for market fires. These results also confirm Alao et al (2020) as properties that were neglected, which were not properly maintained are many of the causes of fire disaster in public facilities in Nigeria the consistency of our findings with the previous studies could be due to 1) similarity in the study population and 2) research design.

The findings of this study in Table 4 showed a relationship between arson and fire Disaster (r = 0.95), in ultra-modern market in Port Harcourt Metropolis. The findings of this study is in harmony with several other studies. The findings of this study authenticates that the heinous crime of arson carried out with malicious intent and act is been used by various groups and individuals to achieve a selfish gain by causing fire disaster in the market. This is influenced by cultism and rival gangs, animosity for the target victim, to force tenants out of a building, to fraudulently collect insurance policy benefits, to rebuild the entire market by government, engineered either politically or psychologically through the use of drugs and hard substances. The findings of this study verifies that of Makanjuola et al. (2016) whose study in South-Western Nigeria, showed that some causes of fire in buildings are willful act to force tenants out, fraudulently collect insurance benefit amongst other factors.

The findings of this study authenticates that of Adenkule et al. (2020) whose study quipped that Arson fires are acts of willful vandalism, pyromania, spite, or revenge, it can as well be arson-for-profit. It further expressed that the increasing proportion of all arson fires are motivated by spite or arson-for-profit. However, to control this menace, it's to ensure fire safety measures by the installation of fire alarm and other devices that can detect fires early and to established security system to carry out and maintain out-of-hours inspection within and around the market. This will deter arsonists to carry out such mischievous acts in the markets. The similarity found between the previous study and the present one could be attributed to the homogeneity of the study population and similarity in the research design adopted in the different studies.

The findings of this study in Table 5 showed that there was a very high positive relationship between availability of tools/machinery and fire prevention (r = 0.97), in ultra-modern market in Port Harcourt Metropolis. The findings of this study drives further to buttress the need for appropriate and effective tools/machinery in all established market and other public facilities in Rivers state and the nation at large. It advanced emphasis that there can't be any reasonable success in the fight against fire disaster if there are no adequate and appropriate tools and machinery to achieve the goal. This is because the provision of smoke & heat detectors, fire and emergency alarms, fire and emergency lights, water sprinklers, fire extinguishers, water hydrants with attached hose, fire blanket, fire and emergency exits, etc. will reduce and control occurrences of fire in the market. The finding of this study validates several other findings from different studies. The findings of this study corroborates that of Kaiko et al. (2016) whose study in Zambia exposed that firefighting equipment are lacking in many markets visited during the study in Zambian markets, hence the mass destruction of properties to fire accident, therefore posited that, installation of fire safety equipment in market places be done to protect both market infrastructure and lives. This findings of this study is in harmony with the study of Rathnayake et al. (2020) whose study in Sri Lanka showed that the absence of fire safety tools/machinery has given rise to so many fire outbreaks, accentuating that prevention/control of fire outbreak can be achieved by attending to the identified inadequacy in firefighting services and lack of proper equipment. This similarity found between the previous study and the present one could be attributed to the homogeneity of the study population and similarity in the research design adopted in the different studies.

The findings of this study in Table 6 showed that there was a very high positive relationship between available fire safety laws/regulations and fire prevention (r = 0.99), in ultra-modern market in Port Harcourt Metropolis. The finding of this study brings to the fore the need to comply with available fire safety laws and regulations to achieve fire disaster prevention in the markets and in all commercial premises. The high relationship established in the finding of this study call for proactive steps in ensuring all aspects of building design such as architectural, structural, electrical and mechanical designs should adhere to safety codes and regulations to succeed in fire disaster prevention. The findings of this study confirms that of Mulikat et al. (2012) whose study in Nigeria, showed that lack of strict compliance to existing environmental protection and fire safety rules/regulations, is the reason for property destruction by fire, pollution of the ecosystem and destruction of lives across the Nation Nigeria. The findings of this study ratifies Ogbonna et al. (2015) whose study in Port Harcourt, showed that there is manifest ignorance displayed towards compliance of fire safety laws suggesting management are not creating awareness on the need of compliance to fire safety laws and regulations. This similarity found between the previous study and the present one could be attributed to the homogeneity of the study population and similarity in the research design adopted in the different studies.

The findings of this study in Table 7 showed that there was a very high positive relationship between enforcement of fire safety laws and fire prevention (r = 0.97), in ultra-modern market in Port Harcourt Metropolis. The finding of this study established the need for prompt and consistent enforcement of all existing and relevant safety laws and regulations to achieve fire disaster prevention in all markets, public premises etc. via routine monitoring of the commercial premises and activities of traders by legally designated person(s) responsible for fire safety and to punish offenders. Again, there is need to make certain, all basic fire safety measures for the premises and ensure that all fire protection equipment is kept in good working condition. The prompt enforcement of availably relevant fire safety regulations by relevant authority of the market and agencies of government is of essence in achieving significant fire safety both in the market and in all sections of the society. The finding of this study bolster the views of Ogbonna et al. (2015) whose study titled "Fire safety preparedness in workplaces in Port Harcourt, Nigeria", acknowledged that fire safety laws exist but decried the complacency displayed by responsible officers to ensure strict implementation. The finding of this study buttresses the relevance of Mubita et al. (2020) whose study in Zambia, conveyed that there was no effective monitoring of the existing fire safety regulations and their implementation, to ensure compliance in the markets. Hence reiterated that there should be an organized and harmonious team for enforcement by the market management and the local authorities. This similarity found between the previous study and the present one could be attributed to the homogeneity of the study population and similarity in the research design adopted in the different studies.

Conclusion

Based on the findings of the study, it was concluded that Electrical Hazards, lack of fire safety knowledge,

Negligence, Arson, lack of fire safety tools/machinery, lack of fire safety laws and enforcement of fire safety laws have very strong positive relationship with fire disaster, whereas fire safety knowledge is one of key preventive tool, as it has very strong positive relationship with fire disaster prevention among traders of ultra-modern markets in Port Harcourt Metropolis of Rivers State.

Recommendations

The following recommendations were made based on the findings of the study:

1. Electricity Distribution Company –PHCN in collaboration with the market committee and traders association should carry out routine check to ascertain and validate the electrical wiring, installation and gadgets and identify a qualified and available electrician(s) to be used in the market at all times to prevent interference and maintain standard.
2. The Rivers state Fire Service in collaboration with the market committee and traders associations should organize regular educational seminar and training programs on fire safety practices, for the traders to acquire knowledge on the causes and prevention of fire disaster in order to prevent and control fire outbreak.
3. The Market committee in collaboration with traders association should tasked all traders to take precaution measures to prevent fire occurrence by setting up fire safety committee to enforce all fire safety laws and regulations.
4. Market committee in collaboration with traders association should ensure that trained and adequately equipped security and fire brigade are assigned to protect the markets at nights since the most of the fire outbreaks happen at the night times.
5. State government through the State fire service should ensure the installation of automatic fire alarms, sprinklers, fire extinguishers and other firefighting machinery in good condition at various location within the market and establish a fire brigade station at each large market.
6. The State Fire Service in collaboration with market committee and traders association should carry out a sensitization on all traders on available and applicable fire safety laws in the market and punishment on defaulters.
7. The market committee in alliance with the traders association should approve a penalty to be enforce by an established fire safety task committee on defaulters to serve as a deterrent.

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