EMPLOYEE PERSPECTIVES ON FIRE SAFETY AT WORKPLACES IN INDIA: AN EMPIRICAL STUDY

Glorita S. Fernandes*; Dr. C. F. Mulimani**

*Ph.D. Research Scholar,
Department of Studies in Criminology and Forensic Science,
Karnatak University, Pavate Nagar, Dharwad, Karnataka, INDIA
Email id: fernandesglorita10@gmail.com.

**Associate Professor (Retd.) and Research Guide,
Department of Criminology and Forensic Science,
Karnatak Science College, Dharwad, Karnataka, INDIA

ABSTRACT

Fires in India account for the loss of property and lives as seen in examples of the AMRI Hospital Fire in Kolkata, Kamala mills fires at Mumbai, Carlton Tower fire in Bengaluru, etc. Hence, it is important to prepare strategies for minimizing fire incidents when possible, example workplaces. In this regard, this research study was undertaken to assess the present status of knowledge regarding fire safety practices at the Indian workplace. The assessment will help in initiation of better action strategies towards fire risk management and mitigation. In this study, employee perspectives regarding fire safety and awareness at workplaces were collected and analysed. This paper provides information about workplace fire safety protocols, preparedness of employees to handle emergency and personal coping strategies when faced with workplace fires. The study found that while most employees were aware of personal safety procedures; the awareness regarding usage of fire safety aids was lacking. Ultimately, workplace safety procedures need to be enhanced in certain cases to effectively combat and deal with future fire incidents.

KEYWORDS: *Fire safety; Workplace fire safety; Risk management; Fire investigation.*

1. INTRODUCTION:

If the phrase "*Prevention is better than Cure*" is applied to the field of fire safety and research, then safety and prevention of incidents should be our utmost priority. However, it can be noted that not all fires can be prevented. Fire incidents in India and globally contribute to widespread loss of property, financial resources and loss of lives yearly(Denett, 1980). While India does not witness as many arson cases as the United States of America, it still prevails annually (Cote, 2004). According to annual statistics published by the National Crime Record Bureau, India, the rate of arson crimes to the total number of IPC crimes[1] in India ranges between 0.3 to 0.4 yearly (National Crime Records Bureau, 2015, 2018).

India also witnesses a number of cases involving forest fires every year. In this regard, it is important to make concerted efforts to reduce the number of fires occurring at the community level as regarded by T. McGee in the context of mitigation of forest fire incidents in Canadian scenario (McGee, 2011). In the society, incidents involving fires should be adequately investigated, causes determined and responsibility ascertained. V.M. Ta *et al* stated that it is important to engage the public in order to achieve this goal by equipping them with knowledge on safety practices and awareness of risky behaviour leading to fires (Ta et al., 2006).

While fire code regulations for buildings and structures exist in all countries, it is important to review their efficacy periodically and the suggestions for amendments, if required (Icove et al, 2018). Through news reports and fact checkers, it can be observed that many fires in India have resulted from illegal and unofficial constructions, resulting in loss of resources, finance and lives in different states of the country. These contemporary structures are constructed on existing floor plans flouting conventional norms, fire regulations and need to be continuously monitored as they pose maximum risk to fire safety initiatives (Economic and Political Weekly, 2020; Times News Network, 2019). There is a need for research to better understand the loopholes existing in the current scenario and assist risk management (Nic Daeid & Gabriel, 2015). This research paper provides an insight of practices towards fire safety in India, especially workplaces.

This research study aimed to gather employee perspectives towards fire safety protocols, fire saving techniques and equipment to handle emergencies at the workplace. It was conducted to uncover the preparedness of individuals and concerned authorities towards dealing with fire incidents. This study was an online survey-based research, conducted via Google platform. The two objectives of the study were: (1) To decipher employee perception towards workplace fire safety and management; and (2) To assess employee awareness about fire safety and firefighting equipment.

2. MATERIALS AND METHODS:

2.1 Design of study: Questions for the study were framed on the basis of three criteria: namely (i) personal experience with fires, (ii) fire safety at the workplace, (iii) awareness about firefighting equipment at the workplace; viz. Fire alarms and fire extinguishers. The questionnaire was prepared with these criteria and responses were collected after standardization of the questionnaire.

2.2 Data collection: Primary data collection was collected through the online questionnaire. The questionnaire was administered in online mode only via Google platform as a Form. The link was sent via different social media accounts viz. WhatsApp, Gmail and LinkedIn in order to obtain diversity in sampling. Every respondent was made aware of the objectives of the study and individual consent was obtained before filling in the survey.

2.2.1 Sampling and Sample size: A total of 50 samples were collected using random probability technique. Organizations for data collection ranged from schools, universities, private companies, personal businesses and government institutes. The criteria for sample selection are mentioned below:

(a) Inclusion criteria: Any employed individual in India with more than one year working experience in an organization was considered. The working experience of the person was considered in order to account for employees being aware of infrastructure and working of the organization.

(b) Exclusion criteria: All non-working persons and persons with less than one year work experience were excluded from the study.

3. Observations and Analysis:

It was seen that more than half the respondents have never dealt with fire incidents at home or in the workplace. As illustrated in **Figure 3.1**, a total of 76% (38/50) people have never faced a fire in daily life while from **Figure 3.2**, it can be seen that out of all the respondents, 56% (28/50) individuals were not aware that fires can be fraudulently started i.e. arson fires for personal profit and gain. 44% (22/50) respondents were aware of arson fires. When asked about the individual role in the event of noticing a fire outbreak, only one individual stated to ignore the fire till it got out of control. The rest of the individuals (i.e. 98%) agreed with the option of sounding the fire alarm of the building while exiting it during a fire outbreak. In the event of personal clothing catching on fire, it was seen that 96% (48/50) individuals were aware of the "Stop, Drop and Roll" concept for extinguishing the flames; however 4% were of the opinion to obtain help first.
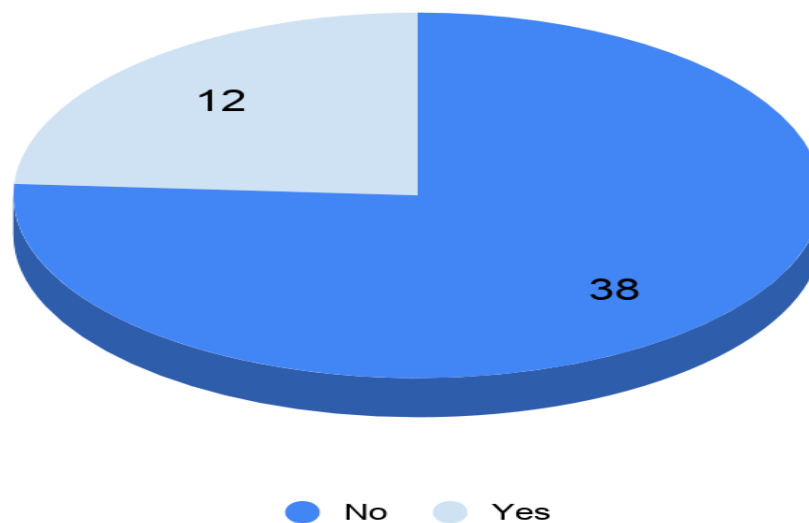
Experience with fire incidents

Figure 3.1: Personal experience with encountering fire incidents either in the workplace or home.

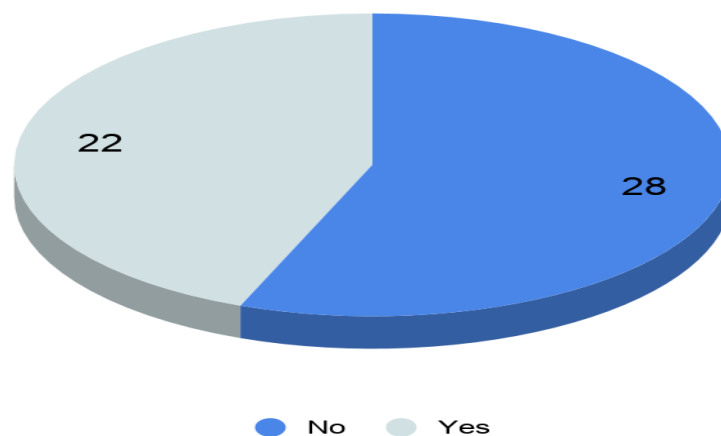**Awareness of fires started deliberately for personal gain**

Figure 3.2: Awareness of fire-setting for fraudulent gains.

In the case of awareness about elements required to be present in sufficient quantity for setting a fire, it was seen that the majority of individuals know that fuel, oxygen and ignition are necessary for fire setting. This is illustrated in **Figure 3.3**, where 88% (44/50) respondents were aware of the required conditions, while 12% (06/50) were unaware and chose the wrong options for the question. Also, they would use the staircase instead of the elevator during a fire evacuation plan. This study found that 58% (29/50) of public opinion agreed that fire extinguishers should be used only by trained personnel while 42% (21/50) disagreed with the same as illustrated in **Figure 3.4**. Furthermore, most people participated in mock fire drills when organized in their buildings and societies. When asked about personally knowing to use a fire extinguisher, 56% (28/50) of the respondents replied positively while 44% (22/50) replied negatively as shown in **Figure 3.5**. However, it was interesting to note the different ways of learning amongst the individuals as discussed later in the discussion section.
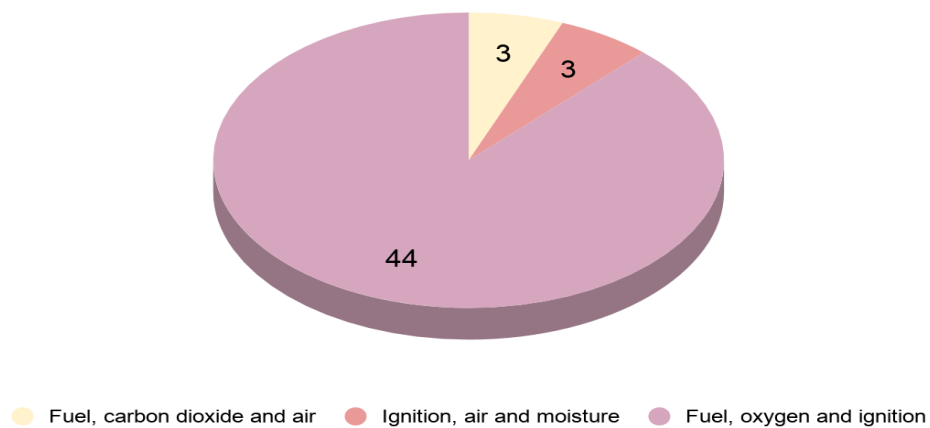
Awareness on elements needed to start fire

Fuel, carbon dioxide and air ● Ignition, air and moisture ● Fuel, oxygen and ignition

Figure 3.3: Awareness about the requirements to start a fire.

Opinion on fire extinguishers being operated by trained personnel

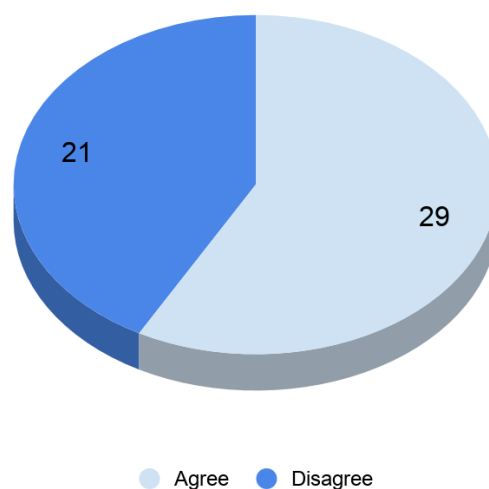● Agree ● Disagree

Figure 3.4: Opinions on fire extinguishers usage by trained personnel only.

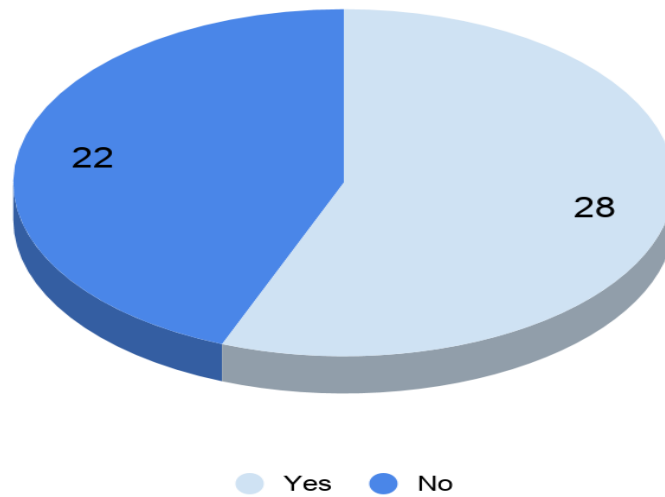**Knowledge to personally use a fire extinguisher**

Yes ● No

Figure 3.5: Personal knowledge in using a fire extinguisher.

In terms of perceptions towards firefighting equipment and fire safety products, it was seen that the majority of respondents (i.e. 72%) feel that fire alarms should be tested once a month, which was the correct choice and is shown in **Figure 3.6**. However, 24% of the individuals felt they should be tested annually, while 4% of the individuals felt that fire alarms needed to be tested once in two years. This shows that a total of 28% of the respondents were unaware about maintenance of fire alarms. In the case of different classes of fire and types of extinguishers based on fuel material, 98% of the respondents seemed aware.

Awareness of fire alarm testing
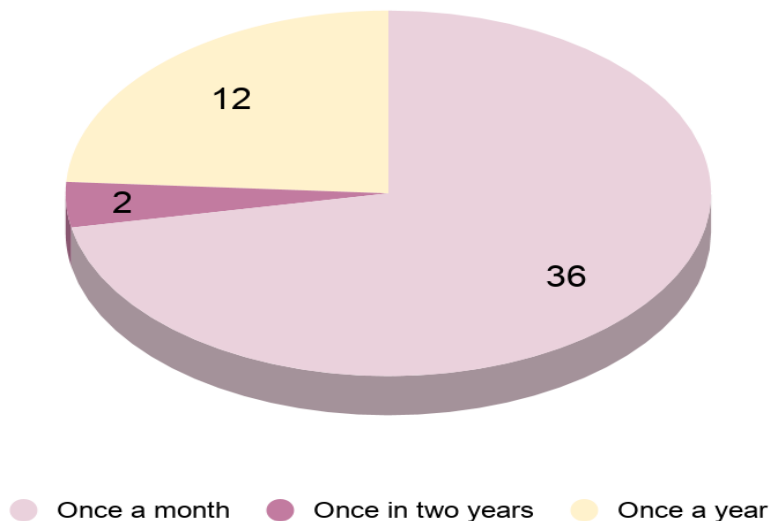

● Once a month ● Once in two years ● Once a year

Figure 3.6: Awareness of fire alarm maintenance.

Regarding fire safety procedures and codes at the workplace, 80% (40/50) of the individuals were aware of fire codes at the workplace while 20% (10/50) individuals were not aware. Amongst the individuals aware of fire safety codes at the workplace, 87.5% (35/40) said that the fire safety code was followed while 12.5% (05/40) said that the code was not followed.

When asked about the existence of a workplace fire evacuation plan in case of emergencies, 82% respondents stated affirmative while 18% replied in the negative as shown in **Figure 3.7**. This provides information that fire evacuation plans are not mandatorily followed by all workplaces. Also, it was observed that 84% (42/50) of the individuals were aware of designated fire exits at the workplace while 16% (08/50) were not. Of those individuals aware, 83% (35/42) said there existed separate fire exits in the building while 17% (07/42) said there were no separate fire exits in the building. As illustrated in **Figure 3.8**, 82% (41/50) of the individuals attested to fire extinguishers being serviced regularly at the workplace while 18% (09/50) individuals said that workplace fire extinguishers were not maintained properly.
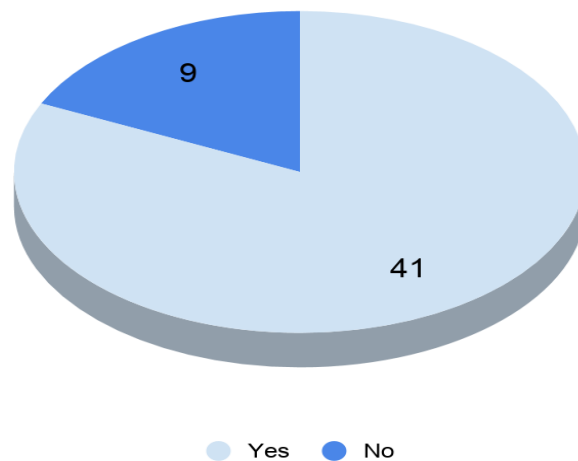
Existence of workplace fire safety evacuation plan

Figure 3.7: Workplaces having an emergency evacuation plan.

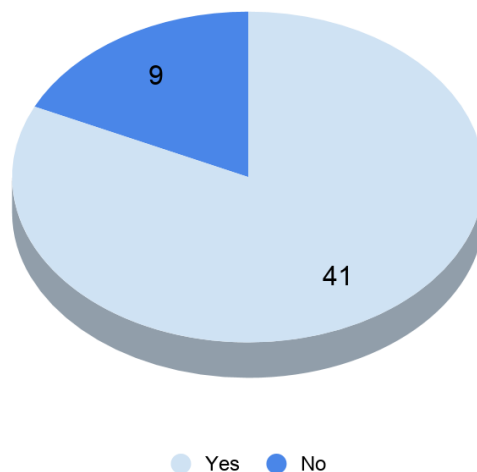**Whether fire extinguishers at your workplace are serviced regularly**

Figure 3.8: Regular maintenance of fire extinguishers at the workplace.

4. RESULTS AND DISCUSSION:

In the first instance, it was seen that most people in the study had not encountered fire incidents in their life. Given this scenario, in the event of the fire, there would be a psychological strain on the individual coping mechanism on how to deal with the fire if not trained or informed about safety techniques before the occurrence of such an event as stated by H.S. Baum (Baum, 2001).

The first objective of the study was to evaluate employee perception towards workplace fire safety and management. This was fully achieved in this study as different opinions were obtained. In regards to fire incident response at the workplace, individuals whose workplaces did not have a evacuation plan for emergencies opined that personal coping strategies included: (a) call and inform the fire department, (b) ask for help, (c) use the stairs or doorway to escape from the building and (d) climb out of the building. It was noted that few of the respondents were unaware of risks involved in fire incidents and suggested that they would (a) brainstorm for ideas at that moment of the fire, (b) try to find safe rooms to stay in like a bathroom, in the event of an emergency. Some respondents said that this study helped them to realize the importance of preparedness and hence, would engage with their management to put an emergency action plan in place.

The second objective of the study was to assess awareness about fire safety and firefighting equipment. This was studied as Crawford and McGee highlighted the need for fire safety awareness at the community level to better tackle and mitigate fire accidents(Crawford, 2002; McGee, 2011). In this aspect, questions were related to fire alarms and fire extinguishers as often encountered in the workplace. Although respondents had a good knowledge of fire alarms, their use and maintenance; the same was not in the case of fire extinguishers. Thus, it has been suggested that individual awareness of different types of fire extinguishers and fire safety devices, their maintenance and practical training for using portable extinguishers should be increased. The research concluded that respondents knew how to use a fire extinguisher; however, the methods of learning drastically varied amongst individuals. While about 15 respondents had received formal training on using a fire extinguisher at the college or university and workplace safety drill programs; the other respondents self-learned to use the fire extinguisher by: (a) watch videos online and YouTube, (b) read books on fire safety devices and manuals, (c) read the instruction label on the extinguisher, (d) watch fire extinguishers being used in varied TV series and (e) rely on common sense.

This study also gathered individual opinions regarding incorporating awareness campaigns and knowledge programs into educational curriculum. All the 50 respondents of the study opined that fire safety training or awareness should be provided to students in educational institutions, which can be a skill they learn for life. While education might lead to developing awareness there is no research that exists to support the assumption that imparting knowledge regarding fire safety may lead to change the behaviour of individuals as stated by V. Hwang *et al* and S.M. McCaffrey(Hwang et al., 2006; McCaffrey, 2004).

5. CONCLUSION:

On collation of data gathered, it was found that personal understanding regarding fire safety still needs to be addressed on a bigger platform and communities need to take a more proactive role in fire safety awareness. The public still needs to be more aware about fire safety practices at an individual level to adopt better practices in the future. There is also need for organizing educational events on topics of fire safety and management and campaigns for societal awareness in the event of a fire. However, these events should be targeted to appropriate audiences and not necessarily, school children. Fire investigation needs to be strengthened and educational information on fire safety practices needs to be delivered to students. Fire fighting department officials should share their knowledge on using fire

extinguishers to the general public through training and demonstration workshops which can be held at the levels of the organization, institution, workplace, residential society, etc. They should highlight the use of fire and smoke detection alarms and fire escape plans in case of emergency situations.

7. Declaration of Interest: This paper is the original work of the authors and has not been influenced inappropriately by any financial or personal relationships. The study does not have any conflict of interest and hence, no declarations of interest have been made.

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