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FIRE INCIDENTS IN HEALTHCARE ORGANIZATIONS: READINESS, RESPONSE AND PREPAREDNESS

Hospital Administration

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ABSTRACT

Health facilities are well prepared to grapple with external disruptions, but internal hazards are more crucial and may necessitate immediate evacuation. The study was aimed to determine causative factors of fire incidents occurred and their impact in premier multispecialty tertiary level hospital of North India. A total of 408 fire incidents occurred in the institute over last one decade with an average of 40 fire incidents per annum. More than two third of fire incidents were due to electrical causes. Horticulture causes were the second major cause (25% incidents), mostly during summer months. To have a better knowhow about occurrence of such fire incidents, assessment of risks factors, regular fire drill exercises and training program will provide knowledge, skills, and practice to protect patients, staff and facility in the face of virtually any emergency.

KEYWORDS

Healthcare, Fire incidents, Preparedness, Drills

INTRODUCTION:

Healthcare institutions are vulnerable to disruption from events such as earthquakes, fires, and floods, and damage incurred can endanger the lives of patients in the hospital (WHO, 2008). In this type of scenario hospital staff have primary responsibility for the hospitalized patients' safety, since patients are neither fit to respond to such a disaster, nor do they know how to respond (Cybulski, 2003).

Fire in the hospitals is generally man-made disaster (Cavallini, 2003). Hospitals use many electrical equipment, medical gases and inflammable liquids often together at the single point of use. Worldwide 21 major hospital fires had occurred in which 1334 persons lost their lives (Sanni, 2015; Sharma, 2019). Recently, about 90 lost their lives in one of fire incident in an Indian hospital (HT, 2011). It is said that at least 40% of the occupants should be trained enough for conducting proper evacuation, and in the operation of systems and equipment, and other fire safety provisions in the building (National Building Code, 2005). Generally, hospital buildings are distinct from other buildings as patients are not well versed and have to rely on healthcare staff during such disasters (Sharma, 2014).

The intention of the study is to evaluate the types of fire incidents which occurred in last ten years in one of the premier tertiary level multispecialty teaching hospital of North India. The study is also aimed to determine the causative factors fire incidents and their impact on healthcare facilities and thereby to develop policy guidelines relevant to prevention activities.

PGIMER fire control system:

The institute is one of the premier multispecialty tertiary level 1948 bedded teaching hospital distributed in main Nehru Hospital (NH) and associated advanced centres. The institute has in place a robust firefighting and fire prevention system. The institute has six fire control rooms in each of the advanced centres working in coordination with central fire control room in NH and are equipped with advanced firefighting equipment, Self Containing Breathing Apparatus (SCBA), Fire proximity suit, Public Address system etc. Smoke detectors, fire extinguishers, Manual Call Point (MCP), hydrants/risers, hose reels have been placed at appropriate areas in the building. Instruction/Guidelines boards (in the form of Do's and Don'ts), emergency fire control numbers and signage have displayed at different places for the awareness of the staff and public. The institute has one of the advanced water mist based fire tender equipped water capacity (600L) and Aqueous Film Forming Foam (AFFF, 100L). High rising buildings are checked periodically for fire escape routes and are kept clear all the time. Fire hydrants, water sprinklers are installed at strategic locations with constant water flow to mitigate any exigency. Firefighting officers always alert to meet any such exigency and ensures strict compliance to statutory and regulatory guidelines. Regular drills are done to ensure that staff is fully aware of what actions to take in the event of a fire or fire alarm actuating. Engineering department has been made accountable to monitor general maintenance and building/refurbishment work and regular maintenance of all the electric gadgets/cables and timely audits of electric wirings to mitigate short circuit fires.

RESULTS:

This study was conducted to investigate the trend of fire incidents in the institute during a 10-year period (2008-2017). The findings of the study had been grouped into three main parts: building part (wards/ICU/OT), parking areas or commuting area, horticulture area and other areas; to emphasise upon areas where fire incidents occur frequently.

A total of 408 fire incidents occurred in the institute over last one decade. Out of the total, maximum incidents were reported in 2017 (58 fire incidents), while least (24 fire incidents) were reported in 2012 with an average of 40 fire incidents per annum. Though, incidence rates were almost constant over the years, yet, a dip was noted from 2011 to 2013.

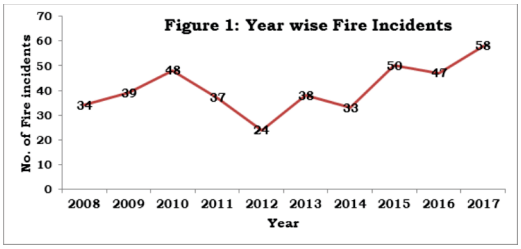
Amongst the causative factors, it had been observed that 60% fire incidents were electrical related and had resulted from old and poor wiring, overloading of electrical circuits, continuous running of heating appliances etc. Horticulture causes were the second major cause and was found in 25%; were caused due to due to grass / cigarette/bidi fires (Table 1, Figure-1). It was also established that most of the horticulture related fires occurred in the summer months of May to August, whereas electrical fires had got no such seasonal variations (Figure-2). A few of incidents were related to vehicular fires (3%) and other fire incidents (12%) were related to chemical, stationery, wastes, laundry etc.

Table 1: Causes of fire incidents

Year	Electrical	Horticulture	Vehicular	others	Total
2008	22	5	0	7	**34**
2009	25	12	0	2	**39**
2010	24	14	0	10	**48**
2011	21	8	4	4	**37**
2012	16	5	0	3	**24**
2013	25	6	2	5	**38**
2014	19	12	0	2	**33**

2015	24	23	1	2	**50**
2016	25	18	2	2	**47**
2017	43	5	0	10	**58**
	244	**108**	**9**	**47**	**408**

As mentioned that institute has a robust firefighting system in place, hence, an early response was always there to curb any fire incident, still, the result of these outbreaks led to destruction of goods and infrastructure whose costs run into thousands of Indian rupees.



DISCUSSION:

Healthcare organisations are one of such complex work environments where stakeholders (patients and attendants) are usually not well acquainted with the hospital premises and are often dependent on healthcare staff. Any sort of disruptive challenge presents a unique set of challenges for healthcare organisations and put an increased stress on health facilities which traditionally operate beyond their full capacity (Schultz, 2005). Among all hazards, subjected to the safety issues, fires are one of the most important potential hazards which should be given due notice (AORN, 2005). Besides, safety issues fires are also has an ethical and legal issue, since any damage caused by fire incidents invites not only legal actions but also costs a lot to pay for damages, blood money (restitution), costs of personnel disability due to injuries, and reproviding damaged equipment (Mahdinia, 2011). Fire safety encompasses the combination of or coordination of some activities or programs to avert destruction (Nadzim, 2014). The study of Yarmohammadian, 2016 has stated that in place sound firefighting management based on scientific principles is always the key to prevent fires and its impacts. Pickard asserted that fire safety strategy for a specific building requires management policies and procedures for the strategy to function effectively (Pickard, 1994). Fire safety strategy should be a continuing process such that fire safety systems are regularly checked and maintained.

There are certain building bylaws which have been laid down to specify the minimum standards for constructed structures with the objectives to protect public health, safety, and general welfare. Fire safety can be achieved by strictly implementing these standards for example, type of materials to be used, provision of fire extinguishers, installation of fire and smoke detectors and fire alarms, and provision of emergency fire exits. The provisions have to be there for fire hydrants at strategic locations, electrical wiring system, proper use and handling of combustible materials, installation of fire hydrants, and widening of roads for easy access to fire services (NDMA, 2016).

Fire safety training is another important aspect but it is often overlooked. Making fire safety a priority and to ensure that employees know what to do when such crisis strikes, healthcare organisations may minimise losses and potentially save valuable lives. Fire drills are methods of testing and practicing the fire safety procedures proactively and prehand for evacuation from buildings during fires or other unexpected emergencies. During drills (usually smoke detectors or fire alarms) sounds and building is vacated as some actual incident had happened. Generally, fire drills are aimed to calculate the time it takes for evacuation and problems incurred during evacuation procedures are identified to be remedied.

Drills are also helpful in knowing and establishing evacuation routes, to ensure that people exit the building in the quickest and safest way possible, are familiar of fire exit plan and get assembled at designated areas in a timely fashion. These drills also help in evaluating and testing the effectiveness of escape routes and to ensure that fire alarms and equipment are in working condition and emergency exits routes are not obstructed. Fire drills provide an opportunity to firefighting teams to demonstrate and understand that they can perform their duties safely and efficiently and minimize the panic among healthcare staff and customers during crisis situations (Sharma, 2013; NDMA, 2016).

CONCLUSION:

Risk reduction strategies can improve safety, but will never eliminate the potential. While no one expects an emergency or disaster situation to occur but these situations can and do occur without warning and these training program will provide with the knowledge, skills, and practice to protect patients, staff and facility in the face of virtually any emergency.

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