



PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
VOLUME 23 ISSUE 2 (2025), Page 424 – 438

HOSPITAL FIRE SAFETY MANAGEMENT COMPONENTS

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Abstract

Hospital fire safety is one of the many important elements of safety in hospitals. The fire safety management is vital to have a proper response to the fire. The research aims to study the hospital's fire safety management and determine the most important elements of this topic. The methodology used for this research is qualitative research using semi-structured interviews with four participants. The qualitative analysis used is thematic analysis was used to present the themes of the fire safety management using NVIVO software. The findings of this study provided 7 themes for the safety management.

Keywords: Fire Safety Management, Thematic Analysis, Hospital, Fire Safety, and NVIVO Software.

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INTRODUCTION

Hospitals are one of the most vital facilities in society as they hold many vulnerable people, the safety of the hospital structure and the occupants inside is an important aspect in the operation of the facility, hospital safety has many aspects to look at, fire safety is one of the important aspects in its safety. Many fire accidents have happened in hospitals around the world, which led to the investigation of why it happens and how to face this phenomenon, according to Liu et al. (2023), on July 13, 2021, at Al-Hussein Hospital, Iraq At least 92 people were killed and dozens wounded in a fire incident, on Sept. 9, 2021, A COVID-19 hospital, North Macedonia a fire incident killed 14 people, on Jan. 29, 2022, a state-run hospital, India a fire incident killed one COVID-19 patient. According to Jiang et al. (2014), On Dec.9th, 2011, more than 90 people died in a fire in India. According to Jaafar et al. (2021), between 2014 and 2015, 40% of fire-related deaths were caused by gas or smoke.

From these accidents and the casualties shown in old data, there must be actions done to minimize and prevent the number of fire incidents and casualties, that is where the terms of fire safety and fire safety management come into use, according to Ebekozien et al. (2021), Fire safety management is the process by which an officer is in control of policy, standards, instruments, details, and procedures to evaluate and monitor fire safety, as fire safety is the measures that are been taken to prevent or lessen the likelihood of fire during unintentional or deliberate fires. Which leads this research to investigate how these goals can be achieved.

LITERATURE REVIEW

Fire safety management is a measure that describes how a facility runs in terms of the policies, procedures, and tools used to prevent fires and boost credibility by promoting the health and safety of hospital buildings is called fire safety management (Agus Salim et al., 2023). Ebekozien et al. (2021), stated that fire safety management is the implementation of fire safety procedures, where a fire safety officer is in control of policies, criteria, data, and practices such as assessing and supervising fire safety. Multiple fire safety organizations have conducted research and implemented fire safety management, the goal of fire safety management is to lessen the possibility of property loss and human injury as a result of a structure fire (Sanni-Anibire & Hassanain, 2015).

There are three main goals for fire protection, prevent combustion of construction elements and objects is the first goal, which is done by Managing sources of ignition, the second goal is to monitor fire growth, which includes using heat, smoke, and flame indicators to find fires, finally to safeguard the vulnerable is the third goal, this entails informing the building's inhabitants (Sanni-Anibire & Hassanain, 2015). The hospital's capability to endure harmful conditions is influenced by several factors, including the building's position,

design specifications, components used, fire control and extinguishment, and interior finish. Understanding these factors is essential to making hospitals safe (Rahmani & Salem, 2018). Building fire protection can be approached from two different angles. Specifically, building design, operation, and management (Ebenehi et al., 2017). Chow (2001), Fire safety management's primary goals are to make sure that in the event of a fire of are all the required fire safety measures will be accessible, residents can employ the fire safety precautions, and people inside will be helped to flee to safety.

Ebenehi et al. (2017), stated that the aims of the fire safety management sections include maintaining fire safety measures and fire prevention, employee training, an emergency action plan, an assessment of building alternatives, and the fire safety management programs consist of examination, education and training, extinguishing fires, emergency service, evaluation of, fire probability, fire prevention, report and record keeping, and communication. Also, Pattnaik and Kumar (2019), provide a systems-based strategy for managing fire safety. It will involve the collaboration of six components that cover every aspect of safety, including building design, maintenance, safety gear, communication, choice-making, and safety culture.

RESEARCH METHODOLOGY

Qualitative approach will be used to conduct the research. The research will depend on conducting interviews with fire experts and specialists and gather the data from them.

For conducting this research, interviews with fire experts and specialists to investigate what is the most important component of fire safety management in hospitals. The strategy for this research will be a qualitative method strategy, the method contains the primary data approach (interview).

Primary data

The design of the interview questions will be dependent on the research objective, the questions will be open-ended to allow room for conversation in the interview and help both the interviewee and interviewer to ask and mention every detail that help fulfilling the research objective. The research questions will be divided into two parts, Part one: introductory questions, these will be asked to identify the interviewee's, Part two: key questions, will be used to obtain data related fire safety management.

ANALYSIS AND FINDING

The research aims to find the essential components of fire safety management. This leads to the use of thematic analysis for the data collected, NVIVO software was used for the analysis process from creating codes, themes, and to presenting the results. This section will present the data collected and the analysis method.

The data analysis will follow the thematic analysis six-phase method mentioned (Byrne, 2022). The interview has been conducted with four participants.

Interview Question Part One

This part represents the background information about the people who participated in the interview. Table 1 represents the background information of each individual.

Table 9: Interview participant personal information

Participant number	Workplace	Educational level	Years of experience	position
1	UKM Specialist Children's Hospital	Master	6-10	Hospital emergency manager
2	Pantai health group	Degree	11-15	Safety Officer for Health Group
3	Fire and Rescue Department of Malaysia	Ph.D.	20-25	Head of Fire Safety Approval
4	Hospital Cyberjaya	Degree	16-20	Hospital Fire Safety Officer

From Table 1 we can see that participant 1, 2, and 4 currently work in a hospital and are responsible for its safety, participant 3 currently works for the Malaysian National Fire and Rescue Department under the government. All participants have degrees, also all participants have 10+ years of experience except Participant 1 who has 6-10 years of experience.

Interview Question Part Two

This part focuses on fire safety management in the hospital, for this part, the interview questions and answers are put into NVIVO software to generate the codes. For this part, there were 7 themes.

Theme 1: Communication

This theme plays an important role in the process of early fighting of fire. Interview 4 states that alerting the hospital staff and then communicating with the fire station is a vital step in the process “First, you don't alert the whole hospital? No, we solve it first. Okay, if we cannot, then we alert the whole hospital. After that, we call the Fire Department.”

Theme 2: Complying with Design and Guidelines Standards.

This theme focused on the building structure design and laws. Compartment. Participants stated that hospitals must have compartments on their floors as it's a method for preventing the fire spread. Participant 3 stated “special

room compartment for the patient. They have to know the location, and they have to know the compartment that can protect the patient.”

Complying with standards. Participant 3 stated “The first, the most important is our legislation, our regulation. It must be firm at first. To regulate the people, we have our regulation.” While participant 1 stated “every staff in the hospital are trained about fire safety so then you can comply with their standard.” Enforcement of regulations. Participant 3 stated “Enforcement is very important. Yeah, and you need every facility to apply the laws. To apply the... The education needs to be applied.”

Fire lift. As part of the design complying with fire safety, Participant 1 stated “So in that case, the knowledge of the building design...the fire left, how many fire lift available in the building? How to activate the fire lift?” Participant 3 stated “That's why they need to have special education, special knowledge to evacuate the patient by using you call it escape back lift.”

Refuge area. Following up with the building design and structure, Participant 3 stated “In hospital building actually they have there, we call it a refuge area.” Also, participant 1 stated that “Where to put patient during search and rescue? Is there any, they call it refuge area?”

Accreditation and endorsement by the fire station. Participant 2 stated “Hospital need to establish Fire Safety Committee as per Fire Service Act 2020, hospital need to appoint Fire Safety Manager and Fire Safety Officer at every shift, and all of the above statement need to be registered and endorsed by nearest Fire Station.” In addition, participant 1 stated “At least, okay, in hospital you have accreditation. Every hospital you have accreditation.”

Proper documentation and recording. Every hospital must have documents on all its activity. Participant 3 stated “Thirdly, is to fire safety recording.” Also, participant 1 stated “Where is the evidence that you're doing once a year fire drill? Documentation.”

Reduce fire load. Participant 3 explained it as it lies under the prevention management of fire, he stated “In terms of the compliance to the regulation, our fire load in hospital building must be reduced”

The maintenance team checks and maintains areas. Participant 1 stated “so this maintenance, It's a team that to make sure the emergency bay Okay When you carry your patient down So that patient needs to go to emergency department or an emergency bay that you identify Okay.”

Theme 3: Control and Monitoring Room

Participant 1 stated “I will be in the fire control room. Okay. When emergency, I will be there. So everybody will go there. I will give them a brief. The firefighting team and also the search and rescue team will wait for my instructions.”

Theme 4: Training and Awareness

For the staff to be capable of executing effective rescue and firefighting there must be prior training.

Fire drill. Participant 4 stated “The last is the fire drill. So fire drill is a compulsory. Every year you must do one fire drill.”

Knowing the design of the fire safety for the building. Participant 1 stated “Whatever fire safety design of the building. You know it. I know.”

Monitoring of training. The participant mentioned this code as a continuous method of validating the training and having feedback on what to fix in the future, participant 1 stated “Do you have a proper monitoring of every training?”

Staff trained and educated on fire safety. Participant 3 stated “First, education, engineering, second, and enforcement. Isn't it? Yeah. We have to educate the people.” While also participant 4, stated “We have three steps for the fire program in the all the hospitals in Malaysia. First, the OKK training. The second is the awareness of the fire safety system. The third is a tabletop.” Participant 1 mentioned that every staff in the hospital must be trained “Every staff in the hospital are trained about fire safety.”

Theme 5: Defined Hospital Fire Structures and Planning

Every facility must have its structures and plan to respond to any incidents.

Fire prevention management. Participant 3 stated “Yeah, the most important thing is prevention management.”

A committee and a team. Participant 2 stated “Hospital need to establish Fire Safety Committee as per Fire Service Act 2020.” Also, participant 4 stated “The committee so the pengarah is a director, hospital director is a chairman in the committee fire safety.”

Fire safety structure. It is the layout of roles and responsibilities, participant 1 stated “this our structure is like this Uh, you have emergency manager you have uh safety officer and also you have historian Then for his program, Rescue Fire Fighting Team You have Search and Rescue team, etc.”

Policy. The hospital policy is the rules. Participant 4 stated “We have one policy so we call it internal disaster policy okay include the fire.”

Protocol. Defined as the specific actions for staff. Participant 1 stated “You need to know what is the role of the nurses, director of the hospital, corporate. There should be a protocol.”

Emergency response plan. Participant 1 stated “You need to have the Emergency Response Plan. Which involve all the stakeholders okay. So inside the emergency response plan, you have everything.”

Evacuation plan. Participant 3 stated that special education on hospital evacuation “In normal building, the people can freely evacuate, but in hospital, it's very critical. They need to have special education.”

Firefighting systems. Participant 4 stated that, they have different types of suppression systems “We have three systems here so wet system. That's for the common area. So in the server room, in the medical record room, we use the CO2 sprinkler. Then for the OT, we have a designated special sprinkler.”

Hospital management. Participant 1 stated “The hospital management, which is not a technical person. So in that case, the knowledge of the building design. So, that is one of the thing that it should be in a proper documentation so that they know.”

People management. Participant 3 stated that this management is directed to the process of evacuation “People management. How to evacuate the people?”

Theme 6: Defined Roles

This theme represents the various roles related to hospital fire safety.

Firefighting team and search and rescue team. This team task is after the occurrence of fire, participant 1 stated “The firefighting team and also the search and rescue team will wait for my instructions. When I deploy them, they will go.” Also, Participant 4 stated “EMR team, okay, supposed to be the first fire responder if any fire in the hospital.”

Plan for the staff to know their roles and duties. This code was mentioned by Participant 1 regarding the non-specialist staff, the participant stated “You need to know what is the role of the nurses and everyone, we need a proper plan.”

Emergency manager. Is the head of the emergency. Participant 2 stated “Hospital needs to appoint Fire Safety Manager.”

Evacuation officer. Is responsible for monitoring and ensuring the evacuation. Participant 1 stated “Will update the evacuation officer. How many persons reached the assembly point? And is there any person missing?”

Maintenance team. This team is responsible for pre-determined inspection and maintenance. Participant 1 stated that the hospital must have a maintenance team “also having the maintenance team.”

Sweeper. The person in charge is responsible for ensuring that every ward and space is evacuated. Participant 1 stated “The sweeper, we have so many ward, office. There will be a sweeper, has to make sure everybody evacuates.”

Traffic controller. Participant 1 stated “The traffic controller is those teams who control whoever that evacuates and route them to the assembly point.”

Historian. Participant 1 stated that the historian comes after the manager “So for emergency manager, you have Safety officer and you have a historian.”

Safety officer. Participant 2 stated that there must be a safety officer at every shift “Hospital need to appoint fire safety manager officer at every shift.”

Theme 7: Defined Responsibilities and Actions

This theme provides exact actions and decisions for the staff when a fire occurs.

Evacuation of patients. Evacuation of patients in hospitals is considered a very complex action, due to the complexity of the condition of the people inside. Participant 4 stated “the ward management to evacuate patients to the designated area” Also mentioned by Participant 3, is one of the types of evacuation “They implement, we call it a progressive evacuation, horizontal progressive evacuation. They cannot fully evacuate the patient in case of fire.”

Having codes to alert the hospital. Participant 4 stated “We respond first. If the fire cannot be dissolved, we connect code NOVA to activate hospital to aware about the fire. After that we call the Fire Department.”

The sweeper makes sure everyone has left. As mentioned in theme 6 on the sweeper role, it is considered vital as it ensures that no one is left behind.

Traffic staff control the evacuation of people. The reaction of people is unexpected and chaotic, this is why it is vital for ensuring the proper execution of the evacuation, same as mentioned in theme 6 on the role of traffic control.

DISCUSSION

The findings taken from the interviews will be discussed in context to the literature taken from international and local standards, books, and old research.

Interview Question Part Two

Seven themes were identified for this part; the findings are discussed below.

Theme 1: communication. As a part of the fire safety management the communication mentioned by the participant discussed informing the hospitals and the authorities of the fire incident. Ebenehi et al. (2017), stated that the fire safety management program consists of eight elements one is proper communication, also confirmed in the book made by Della-Giustina (2014), that the fire safety program must contain a written recommendation and procedures including the communication part. However, Agus Salim et al. (2023), expressed that most of the issues are due to the communication devices that are not reliable.

Theme 2: complying with design and guidelines standards. Researchers have discussed that the design of the hospital is vital to the protection of people, and it lies under the passive protection systems, Bakar (2006), found that passive fire protection is important in reducing fire risk, basic measures at the planning phase is vital. NHS England (2013), required that the fire safety manual have information on any compartmentation space.

Other hospital designs are related to the spaces that protect the patients. The University of Edinburgh (2023), stated that the fire plan must contain Temporary refuge areas and Lifts. The UBBL of 1984, mandates that

construction materials must possess the required level of fire resistance. Agus Salim et al. (2023), found in their research that Combustible materials and electrical problems were found to be the primary causes of fire occurrences in healthcare facilities.

When it comes to compliance with regulations and standards, Della-Giustina (2014), stated that the fire safety management program must ensure compliance with regulations and fire code. Also, Participants One and Two mentioned talks with the local authorities for extra validation. Abhishek Shastri et al. (2018), stated that hospital must conceive and regularly enforce a set of operational criteria and must never diverge from safety regulations outlined by governmental authorities. Continuing with complying with the standards and regulations, Participants One and Three mentioned that all their training and activity are documented. NHS England (2013), requires a manual that has documentation of practices and fire drills. Also, Chow (2001), stated that for efficient fire safety management, there must be a manual with has documentation.

Ensuring the proper functionality of the hospital fire systems and passive fire design, the hospital applies continuous maintenance, participant one stated that it is vital to provide continuous feedback on the state of design and compliance of the hospital. Nugroho et al. (2022), stated that all used equipment should also undergo routine maintenance, support, and testing.

Theme 3: control and monitoring room. Participants One and Two explained this theme as the process of fighting fire before and after any incident occurs, the participants mentioned that the hospital must have a room for the staff to monitor the hospital's operation and condition. Rahardjo and Prihanton (2020), stated that to ensure that the facility is always operational must be sufficient supervision performed. Nugroho et al. (2022), found one of the fire safety management is Monitoring, auditing, and review. Della-Giustina (2014), discussed in his book, that to achieve the goals of the fire safety management program there must be monitoring.

Theme 4: training and awareness. This theme represents activities for the staff in the hospital to engage in and knowledge related to fire safety and building, the participant has mentioned different activities for the staff and how they should be trained and educated on fire safety. Ebenehi et al. (2017), stated that to prevent fire-related damage, various actions must be taken, such as teaching staff, and practicing fire drills. In addition to that, Rahardjo and Prihanton (2020), found that regular fire drills are conducted to ensure that the facility is always operational. NHS England (2013), stated that all fire action plans must be routinely practiced, whether through table workouts, walkthroughs, fire drills, or other suitable methods.

Theme 5: defined hospital fire structures and planning. This theme is related to the hospital fire structures and plans to respond to any incidents. Kodur et al. (2020), stated that controlling the fuel accessible to ignition and utilizing suppression measures are the fundamental techniques for managing fire and its effects, also utilizing manual or automated fire prevention measures is the other efficient way to manage fire.

The NFPA 550 (2020), used a logic gate to explain fire safety, one of the objectives of fire safety is fire prevention. Also, fire prevention has been mentioned by research as one of the aims of fire safety management (Ebenehi et al. 2017; Nugroho et al. 2020). Della-Giustina (2014), stated in his book that fire prevention is one of the eight components of a fire safety management program, he stated that fire prevention includes Inspections and education, which aim to stop fire losses prior to their start. In addition to that, also Chow (2001), stated that fire prevention is one of the elements of the fire safety management program.

NHS England (2013), mentioned the teams that every hospital must have and considered the committee as a part of the fire structure of the hospital. Suhaili et al. (2020), in their study, found that hospital must have a fire safety committee.

The fire safety structure described by the participant is the layout of roles and responsibilities. NHS England (2013), states that it is important to clearly define the fire safety management structure, the structure includes roles such as trust board, chief executive, fire safety manager, etc. Also Della-Giustina (2014), the hospital must have a solid organizational structure and must include a thorough management program for fire safety. In addition, the 2021 IFC (2020), stated that the layout of the structure also must be freely accessible in the place of work for referencing and going over by employees.

The hospital policy is the rules and way fire safety activity must be done. Participant Four stated that his hospital has a policy for internal disasters. Agus Salim et al. (2023), found in their research that one of the common issues is related to fire safety management issues with policy.

The hospital protocol is defined as the steps for reacting to fire when it occurs, participant 1 stated that it is a defined role of each person. NHS England (2013), stated that fire safety protocols should cover a wide variety of themes and offer guidance and instructions, such as Preventing fires, Security, Maintaining fire gear, Protocols and preparing for emergencies. 2021 IFC (2020), states that there must be a plan follows the protocols for floor or building evacuation.

The participant mentioned the emergency plan as the plan for response which must be defined and detailed for all activities and components that must be done. 2021 IFC (2020), mentioned topics that must be implemented in any building to be able to fight the fire and prevent it, which includes Emergency planning and preparedness. Della-Giustina (2014), Planning for emergencies is crucial to preventing catastrophic, a well-thought-out emergency plan can make

the difference between minor incidents turning into major. The County Durham and Darlington Fire and Rescue Service (2023), in the United Kingdom, developed a fire emergency plan that consists of 21 areas of study, related to training, information, actions, communication, escape routes, assembly points, evacuation arrangements, overall control, firefighting, fire control panel, and contingency plan. NHS England (2013), stated that the emergency action plan especially is for the ward, department, and space, also, the guide recommends details such as plans of the property and details on the fire and safety systems, services, and environmental systems, as well as the hazardous items.

The participant has mentioned that evacuation is one of the first actions to be done when alerted of fire incidents in the hospital. Researchers have discussed that evacuation is one of the earliest actions when a fire starts, Liu et al. (2023), stated that immediately after a fire starts in a hospital, evacuation and firefighting efforts must be made. Sanni-Anibire & Hassanain (2015), stated that the evacuation system is the most crucial component of fire safety management of buildings. The University of Edinburgh (2023), stated that the evacuation plan will be either simultaneous, phased, or delayed and will be included in the fire warning system. Also, researchers have found some of the risks related to hospital fire safety are risks related to evacuation, Huang et al. (2019), stated some of the hospital risks are risks associated with evacuation, such as numerous evacuees and insufficient rooms in corridors for evacuation.

Regarding the firefighting systems, the participants have mentioned how vital these systems are, and how different types of systems they operate in their hospitals. Bakar (2006), stated that Fire Protection: Passive and Active are important in terms of reducing fire risk and hazard. However, researchers have found primary drivers of fire in hospital buildings. Agus Salim et al. (2023), found Insufficient automated firefighting tools and poor maintenance and management of firefighting tools are primary drivers of fire in hospitals. In addition, Abhishek Shastri et al. (2018), reviewed fire accidents and found that poor maintenance and management of firefighting equipment is one of the errors in fire incidents.

The hospital management needs to be educated and have proper knowledge of the building design and state to have an effective role in fire safety. Participant One has stated that the management people of the hospital must know about the safety design in the hospital. NHS England (2013), stated that fire safety management in hospitals must guarantee that the organization develops and distributes suitable guidance and has roles for the management to be involved in fire safety. Sanni-Anibire & Hassanain (2015), stated that there are issues related to the facility managers such as the facilities manager lacking a thorough understanding of the design and administration of fire safety systems.

Participant Three has mentioned there must be people management. Hamida & Hassanain (2019), have mentioned the staff must be aware of what to

anticipate from people during fire emergencies to create evacuation and housekeeping plans that are adequate. The County Durham and Darlington Fire and Rescue Service (2023), has developed a plan which contains action for staff to make sure the visitors are evacuated to the gathering location.

Theme 6: defined roles. The participants have mentioned various roles and teams they implement in their hospitals.

As mentioned by the participants, the hospital must have a rescue team, NHS England (2013), stated that the hospital fire structure must have defined roles, such as Fire Response Team Leader and Fire Response Teams.

Mentioned by Participant One that the non-fire safety staff must have a plan for their roles and actions. Researchers have found that hospital medical staff are one of the issues when facing fire due to their lack of knowledge of their roles. Ong and Suleiman (2015), stated that inadequate medical staff training is one of the issues in firefighting. Also, Ghanbari Kakavand et al. (2016), identified safety threats in hospitals such as insufficient staff education on the use of fire extinguishers.

The role of emergency manager is one of the most important roles in hospital fire safety. Various researchers have stated the importance of fire safety managers, Agus Salim et al. (2023), in hospitals one of the most important stakeholders is the managers. NHS England (2013), stated that the hospital structure for roles must have a fire safety manager. Ebenehi et al. (2017), state that fire safety managers must fulfil their obligations, such as Knowledge of fire safety measures, Risk analysis, and consult with the fire authority and get guidance.

As one of the most important elements in fire safety is the evacuation plan, participants have focused on having an evacuation officer, also, it has been mentioned by researchers. Goniewicz et al. (2020), stated that there must be a classification of individuals in charge of organizing staff (and patients) evacuations.

Another role required for the management to have is a maintenance team. From the literature, researchers have found that hospital fire safety must-have criteria and a team of maintenance, 2021 IFC (2020), states that the fire safety plan must include identification and assignment of persons in charge of maintenance of apparatus used to put out or contain fires. Della-Giustina (2014), stated that to achieve the goals of the fire safety management program one of the elements is maintenance practices, preventing the sources of fire, exploding, and other losses in addition. Moreover, Agus Salim et al. (2023), found that poor maintenance and management of firefighting tools are one of the primary drivers of fire in hospital buildings.

Moving to other roles mentioned by the participants that they apply in their hospitals are sweeper, traffic controller, historian, and safety officer. The

Centers for Disease Control and Prevention (2023), developed a fire emergency plan where each floor has a monitor whose tasks are to verify that every individual has left. Kodur et al. (2020), states that there must be control for those who may be subjected and their possessions to fire. The role of a historian is vital for providing overall monitoring and data of the hospital, Ebenehi et al. (2017), found that the fire safety management program must contain Report and record keeping, also keep a record of all fire permits. Agus Salim et al. (2023) and Ghanbari Kakavand et al. (2016), found one of the reasons for preventing the enhancement of fire safety is the absence of records related to fire safety. The last role mentioned by the participants is the safety officer, the participants stated that this officer is responsible for monitoring the safety in the hospital during his shift. Ebekozi et al. (2021), stated that the fire safety officer is in control of policies, criteria, data, and practices.

Theme 7: defined responsibilities and actions. This theme provides the staff not with their titles but with the exact actions and decisions, the County Durham and Darlington Fire and Rescue Service (2023), stated that the staff have the required level of training for fire evacuation. 2021 IFC. (2020), also stated that the plan must provide the exact processes for evacuating patients who need to be restrained or contained, as well as any necessary post-evacuation protection.

Participant Four has mentioned that his hospital uses codes to alert when a fire occurs, University of Edinburgh (2023), stated that when having an automatic alerting system, the first alert is silent and must be inspected within a certain time frame before simultaneous or phased evacuation is put into action. Finally, the action of the sweeper and traffic controller which has been mentioned in theme 6 discussion gave us what the researchers and standards found on these roles.

CONCLUSION

This research aims to find a method to minimize the fire incident outcome, by studying the fire safety management components of hospitals. The research has contributed to the topic of hospital fire safety using a qualitative research method by using open-ended interview questions. This study helped in providing data on the components of fire safety management for hospitals. The findings of this study can provide the concerned parties with this topic of having actual data on hospital fire safety management.

The objective to investigate the fire safety management components, two methods have been used, collecting data from previous research and standards and conducting interviews with fire safety specialists. The outcome of the data collected from the interviews and the analysis chapter of the data taken from the interviews provided us with seven themes for the fire action plan such as (1) communication (2) complying with design and guidelines standards (3)

control and monitoring room (4) training and awareness (5) defined hospital fire structures and planning (6) defined roles (7) defined responsibilities and actions.

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Received: 6th July 2024. Accepted: 9th December 2024