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Critical Success Factors for Implementing Fire Safety Management Plans in The Government Hospital Buildings

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ABSTRACT

Various researchers have conducted numerous studies on fire safety management plans [8], [32]. The importance of the plan for fire safety management can be clearly demonstrated. As an example, hospital staff at AMRI Hospital abandoned bedridden patients during the fire [38]. They did not help or warn patients to evacuate the hospital when the fire broke out. There were many patients who were unable to evacuate themselves during the fire, and they became part of the high casualty rate. A hospital source stated off the record that fire drills had not been conducted in the building for several years. Developing and implementing an effective fire safety program can have many benefits, such as preventing business interruptions, lowering property insurance premiums, promoting a safe work environment, and gaining and strengthening public trust, all of which directly impact a company's profitability. This paper identifies the critical success factors for implementing fire safety plans in Government hospital buildings due to the lack of research on this topic. The focus is on significant historical fire accidents in hospital buildings identified through a review of professional journals, investigative reports, news reports, and other sources. The methods used were observation, review of regulatory requirements, and other fire safety-related rules and regulations. The laws include the Uniform Building Code of 1984 (UBBL, 1984), the National Fire Protection Act 101 (NFPA 101), the Fire Services Act 1988 (Act 341), and the Malaysia Standard (MS). In addition, interviews were also conducted with government agencies, hospital management, and maintenance contractors for this purpose. It was found that hospital management and officials appeared to evaluate the fire safety management plan qualitatively. This was subjective and resulted in different aspects of fire safety in different hospitals. However, all the selected hospitals implemented the discussed fire safety management parameters at a satisfactory level. The main components of fire safety management plan in government hospitals were emergency management plan, fire safety training and drills, fire safety maintenance, fire safety rules, and fire safety management procedures. In summary, government agencies, hospital management, and maintenance companies must work together to implement a proper fire safety management system in hospital buildings.

KEYWORDS
Fire Safety Management Plan
Evacuation
Rules and Regulations
Emergency Management Plan
Fire Safety Training and practice
Fire Safety Maintenance
Fire Safety Rules
Fire Safety Management procedures

1. Introduction

Hospitals are usually classified according to their function and there are three main types of hospitals. These are general acute care hospitals, specialty hospitals, and community hospitals. Later, added another type of hospital: university hospitals. These types of hospitals have different functions. In Malaysia, Ministry of Health (MoH) hospitals are classified into four categories: in State Hospital, hospitals with specialists, hospitals without specialists, and special medical facilities. Each hospital has a specific fire safety plan in the event of a fire. The safety of patients and staff in hospitals is the most important and fundamental issue to consider in terms of quality. The safety standards described in the current laws of this country should apply to both private and government hospitals. There is a very high risk of fire in hospitals because most of the equipment is electrical and there are many explosive and flammable devices in the hospital. There are many examples of accidents in hospitals mainly due to improper fire safety plans. [4], [23], [22], [13], [10], [39], [17], [34]. All fire safety equipment and management must be

thoroughly inspected and it must be ensured that everything is in working condition. To avoid all these accidents, a proper fire safety management plan must be in place. Hospitals themselves have a lot of flammable equipment that can start a fire in just a second.

All of this equipment must be well maintained and managed to reduce the likelihood of an accident. Aside from the equipment itself, attention must also be paid to immobile patients. These types of patients cannot be evacuated without the help of others. Helping patients with machines is more difficult because most machines are not transportable. A fire can start for any reason. To ensure the safety of hospital occupants during a fire, hospitals must comply with the fire safety requirements of the 1984 Uniform Building Code (UBBL) and the 1988 Fire Code. Both the UBBL and the Fire Services Act of 1988 apply to both public and private hospitals. The additional requirement for private hospitals is compliance with the Private Healthcare Facilities and Services Act (PHCFSA). The Dewan Rakyat was informed on October 5, 2021 that a 2016 fire audit ordered by the then Minister of Health found that 47 public hospitals and facilities were more than 50 years old and another 32 were between 30 and 49 years old, and that more than 50% of hospital facilities were more than 10 years old. These findings were indicative of a high fire risk. Of the 76 public hospitals and clinics required to obtain a fire safety certificate, 32 have obtained the certificate and the remaining 44 are in the process of obtaining it. What is the status of fire safety management in public hospitals today? Have there been any improvements since 2016?

An investigation into the deadly fire at Hospital Sultanah Aminah (HSA) in Johor in 2016, the worst hospital fire in Malaysia, found that the government-run facility had operated for years without a fire safety certificate. The independent investigation by a seven-member panel led by former Court of Appeal judge Mohd Hishamudin Yunus found, among several other troubling aspects, that despite previous fires at the Ministry of Health (MOH) hospital since 2008, the overall management of Hospital Sultanah Aminah (HSA) and the ministry did not appear to take fire safety seriously [11], [12]. The main objective of the fire safety management plan for buildings should be to ensure the safety of human life, protection of property, and continuity of operation or functionality. Our government is still in the process of developing the latest regulations and standards to ensure that the quality of fire safety management plans in government hospital buildings is comparable to that in developed countries. It is questionable why fire safety management plans in government hospitals do not meet the acceptable standard and why the relevant laws are not adequately enforced. The purpose of this paper is to evaluate the critical success factors for implementing fire safety management plans for existing and future government hospital buildings in Malaysia. The condition of fire safety management plans in government hospitals is of great importance because it can reduce fire accidents, property damage, and loss of life.

1.1 Fire Safety Management Plan in the Hospital Buildings

Fire risk in hospitals is very high [6], [31], [25], [26]. Potential fire sources and flammable materials are easily found in the hospital buildings themselves, such as faulty electrical circuits, poor electrical wiring and insulation, textiles, medical equipment, volatile flammable chemicals, and others. Emergency evacuation of patients on mechanical life support systems, such as oxygen delivery systems and dialysis machines, is a major challenge because the medical equipment is usually non-portable and bulky [30], [36], [42]. One of the most important considerations in the fire safety management plan for all facilities is the prevention of fires, particularly with regard to the flammability of building and furnishing materials and the spread of fire and smoke. Fire extinguishers must be available to fight these fires in the event of an accidental or malicious fire. Health care facility staff must know how to use the equipment and how to avoid panic.

On the afternoon of June 28, 2020, a fire broke out at Sultanah Aminah Hospital (HSA) in Johor Bharu, Johor. It was the second fire at the government hospital after a fatal fire in 2016 at the same hospital but at a different location. However, the fire flared up again and the Fire and Rescue Department (JBPM) was called. They arrived within five minutes and the fire was out within 10 minutes. There were 24 patients in the ward and they were evacuated by the responders and staff [11], [12]. There are many cases of hospital fires around the world. Not only in our country, Malaysia. In another country, there are also some typical problems that we face in our country. In a South Korean hospital, at least 37 people died in the fire outbreak. Nearly 130 were injured in the fire. The main cause is not known, but later the building manager was arrested for numerous safety deficiencies, including non-functioning sprinkler systems [13]. Another case occurred in Saint Petersburg, Russia. In this fire accident, 5 patients died. The

hospital specialized in patients with coronaviruses. Another 150 people were evacuated after the fire broke out on the sixth floor of Saint George Hospital. The cause of the fire outbreak was a short circuit [5]. It is important to learn from this case because it can provide valuable lessons and experience to prevent a similar mistake from happening again.

Fire safety threats are commonly referred to as fire hazards. A fire hazard can be a situation that increases the likelihood of a fire or makes it difficult to escape in the event of a fire. The report of the Independent Committee to Investigate the Fire at Hospital Sultanah Aminah (HSA), Johor Bharu, on October 25, 2016, raises questions about fire safety in government hospitals. There are allegations from some quarters that fire safety in government hospitals is subject to financial constraints. According to the investigation, the Fire and Rescue Department is empowered under the Fire Services Act of 1988 to ensure compliance with fire safety regulations. Section 28 of the Act, in conjunction with the Fire Services (Designated Premises) Order 1998, requires hospitals (including state hospitals) to have a fire safety certificate; otherwise, the owners of the premises are guilty of an offense [11], [12].

Based on the studies conducted by [25], [26] on fire safety management implementation problems in government hospitals in Malaysia and fire safety management problems in fire accidents in hospital buildings. It was found that there were problems with fire safety management in hospitals, such as documentation problems, combustible materials, lack of installation of fire safety measures or outdated fire safety technology, doors locked for safety reasons, lack of training for hospital staff, and blocking of fire safety systems. In conclusion, government agencies, hospital management, and maintenance contractors must work together to implement proper fire safety management in hospital buildings. In conclusion, fire safety management plays an important role in fire safety in a hospital. If these buildings were equipped with an ideal fire safety management plan, the impact of fires could be reduced and more people could survive in these fires.

As mentioned earlier, a fire safety management plan plays an important role in hospitals as it prevents business interruptions, reduces property insurance premiums, increases public confidence, and thus increases the profitability of an organization. A fire safety management plan is a set of actions designed to reduce the destruction caused by fire. Fire safety management plan measures include those that prevent the ignition of an uncontrolled fire and those that limit the development and impact of a fire once it has started. Fire safety plan measures include those planned during the construction of a building or implemented in existing buildings, as well as those taught to the building's occupants. If a fire accident occurs due to negligence in the fire safety management plan, it will negatively affect the competence of government hospitals compared to private hospitals.

1.2 Fire Safety Management Plan

Implementation of a fire safety management plan ensures that acceptable standards of fire safety are achieved and maintained in government hospital buildings. This guide is intended to help building owners/occupants, local government officials, fire safety officials, consultants, and designers understand the features of a fire safety management plan. It should be read in conjunction with legislation, the fire safety standard and other available guidance. The fire safety management plan establishes the arrangements for implementing, controlling, monitoring, and reviewing fire safety standards and ensuring that they are properly met. Fire safety plans define the effective management and procedures to prevent fires and protect the property and its occupants if a fire does occur. There are management standards that should be followed when it comes to fire safety policy, fire emergency plan, fire safety information and training, fire drills, fire safety maintenance, and keeping comprehensive records. The plan describes the arrangements for effectively managing fire safety to prevent a fire and protect people and property in the event of a fire.

Factors to be considered in the fire safety management plan include establishing goals and priorities, an organizational structure to ensure decisions are implemented, continuous monitoring and review, a person responsible for fire safety, a fire safety risk assessment procedure, a fire emergency plan and trained individuals responsible for its implementation at all times, maintenance of all escape routes, staff training, contingency plans in case life-saving systems are out of service, and notification of risks and fire safety actions. Regular fire drills ensure that employees understand and are familiar with the fire safety plan, evaluate its effectiveness, and identify any weaknesses in the evacuation strategy. The premises, escape routes and exits, fire extinguishers, fire alarms, emergency lighting, fire and rescue service facilities, and

other fire protection measures must be maintained in good repair. Regular inspections, regular maintenance and repair, and correcting deficiencies as quickly as possible are critical.

2. Method

The research methodology is important so that the research conducted has the most appropriate and effective method to answer the research problem. Therefore, the methodology of the study includes the design, the surveys of the study or topic, the study procedures, the data collection procedures, and the data analysis procedures. For the purpose of this study, this research focuses on six selected government hospitals.

Table 1. The criteria for the selection of the hospital (Source: Researcher Survey, 2021)

Hospital Label	The year of hospital operation	No. of bed	MSQH Accredited
Hospital A - StateHospital	81	1090	25/7/11 – 24/7/12
Hospital B - Hospital with Specialist.	20	314	28/8/14 – 27/8/18
Hospital C - Hospital with Specialist.	50	242	-
Hospital D - Hospital with Specialist.	15	108	15/12/14 – 14/12/18
Hospital E - Hospital Without Specialist.	50	105	4/11/14 – 14/12/18
Hospital F - Hospital Without Specialist.	91	150	2/6/16 – 1/6/20

Note: All hospitals in the study are in the process of reaccreditation by the Malaysia Society Quality Health (MSQH)

The method used in conducting the study is a mixed method used to achieve its objectives. In this study, the research methodology begins with the determination of the research topics, followed by a thorough study of a literature review from previous research and journals. The researcher decided to use a survey because it was the most appropriate to answer the questions and objectives of the study. In other words, only a portion of the population is studied and it is expected that the results can be generalized to the entire population [29]. Similarly, McBurney D. H. [24] defines the survey as a study of public opinion or individual characteristics through the use of questionnaires and sampling methods. This study uses the exploratory design method, which begins with a qualitative approach and is followed by a quantitative approach. The researcher begins with a structured interview with the experts, followed by a quantitative approach that uses a checklist and observation method to review the elements of the fire safety management plan in the government hospital buildings.

Fig. 1. Sequential exploratory design (Source: Researcher Survey, 2021)

The interview technique was used to collect the primary data. In interviewing, the interviewer asks questions and the respondent answers these questions. However, for this research, a structured interview was used to collect data because it is consistent with the purpose and objectives of this research. The structured interview approach is similar to the standard questionnaire survey method. For example, the structured method is similar to an observational study with checklists, where the observer, rather than the respondent, completes the questionnaire and the questions are generally closed-ended. The researcher

designed an interview schedule as one of the data collection tools for this study. The Ministry of Health (MoH) including hospital management, hospital staff and hospital operations department, Ministry of Public Works, Fire and Rescue Department of Malaysia (FRDM), NIOSH, professional architects, professional engineers, maintenance experts, and the concession companies that provide services to the contract hospitals were interviewed.

For the large sample, the minimum number of respondents to be appointed should not be less than 100. The sample size must be based on prior commonalities. The experienced researcher considers a sample of about 100 respondents as the minimum sample size requirement for a large population. According to Hair [29], the minimum sample size should not be less than 100 respondents to meet the minimum requirement for data analysis. The interview questions aimed to elicit relevant information about the fire safety management plan in Government hospital buildings. The questions addressed the methodology and materials used for fire safety management, perceived problems in learning fire safety management, and possible strategies that could be used to improve fire safety management in Government hospital buildings. The outbreak of COVID -19 also contributed to the length of the interview. For the purposes of this study, the interview was divided into five sections and the details of each section are described.

Table 2. The sections in the research interview (Source: Researcher Survey, 2021)

Section	Topic
A	Respondent's Background
B	The scenario of the fire safety management plan in the Government Hospital Buildings.
C	The critical aspects of the fire safety management plan in the Government Hospital Buildings.
D	The measures to improve the prioritization of fire safety in Government hospital buildings.
E	The work plan for fire safety management in the Government hospitals.

Data are entered and analysed using the Statistical Package for the Social Science (SPSS). It is one of the most popular statistical packages that can perform highly complex data manipulation and analysis with simple instructions. It is designed for both interactive and non-interactive (batch) applications. Descriptive statistics are used to summarise the socio-demographic characteristics of the subjects. Numerical data are presented as mean (SD) or median (IQR) based on their normality distribution. Categorical data are presented as frequencies (percentages).

Table 3. Method of Data Analysis (Source: Researcher Survey, 2021)

Strongly Agree (SA)	Agree (A)	Neither Agree nor Disagree (NAD)	Disagree (D)	Strongly Disagree (SD)
5 points	4 points	3 points	2 points	1 point

Data collected in the field were analysed. The statistically weighted mean was used to answer the research questions. The response options in the instrument are weighted as shown. The acceptance point for the items was 2.50 and any mean below 2.50 was considered rejected, not disseminated, and an unpopular view. A total of 100 questionnaires were sent to respondents. This number represents 100% of the participants who responded to the survey. Table 3.3 shows the distribution of participants according to their position in the organizations. In terms of participants' position in the organization, professional architects and engineers were the majority of respondents with 30 people (30%), followed by professional maintenance experts and senior managers with 20 people (20%), and engineers with 11 people (11%). Overall, the study received feedback from all target respondents.

3. Results and Discussion

Developing and implementing an effective fire safety management plan program can have many benefits, such as reducing property insurance premiums, preventing business interruptions, improving customer service and public image, promoting an efficient work environment, achieving quality improvements, and impacting an organization's profitability [20]. A good fire safety management plan program should be developed in an organized manner. Therefore, sequence plays an important role in an

action plan. Implementation of fire safety management plan will ensure that acceptable standards of fire safety are achieved and maintained in government hospital buildings. Based on the results and findings of the analysis, it appears that hospital management and officials qualitatively assessed fire safety management. It was subjective and resulted in different aspects of fire safety in different hospitals. However, all the selected hospitals implemented the discussed parameters of fire safety management plan at a satisfactory level. Figure 4.0 shows that the main components of fire safety management in the government hospitals were emergency management plan, fire safety training and practice, fire safety maintenance, fire safety rules, and fire safety management procedures. The details of each component are discussed in more detail.

Table 4. Position of respondents (Source: Researcher Survey, 2021)

Position of Respondent	Frequency	Percent (%)	Cumulative Percent (%)
Admin Assistant	1	1.0	1.0
Architect	7	7.0	8.0
Assistant Facility Manager	1	1.0	9.0
Asst. Fire Superintendent	4	4.0	13.0
Building surveyor	5	5.0	18.0
Deputy Fire Superintendent	2	2.0	20.0
Engineer (MoH)	11	11.0	31.0
Facility Engineer (MoH)	5	5.0	36.0
Facility Head of Engineering (MoH)	3	3.0	39.0
Facility Manager	1	1.0	40.0
Fire Superintendent	2	2.0	42.0
Professional Architects	15	15.0	57.0
Professional Engineers	15	15.0	72.0
Professional Maintenance experts	10	10.0	82.0
Senior Asst. Fire Superintendent	1	1.0	83.0
Senior Executive (MoH)	10	10.0	93.0
Technical Executive	7	7.0	100.0
Total	100	100.0	

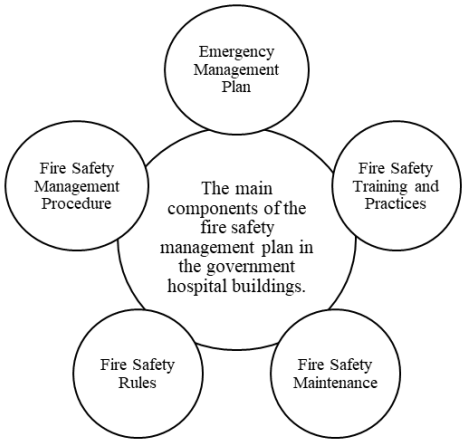

Fig. 2. The main components of the fire safety management plan in the government hospital buildings. (Source: Researcher Survey, 2021)

3.1 Emergency Management Plan

Implementation of an emergency management plan ensures that acceptable fire safety standards are achieved and maintained in government hospital buildings. Using Figure 4.1, seven (7) major components of the Government Hospital Emergency Management Plan have been identified: Premises Information, Fire Equipment Maintenance Plan, Emergency Evacuation/Evacuation Plan, Fire Alarm/Fire Prevention Plan, Emergency Operations Manual, Emergency Response Team, and Staff Training Plan. Hospital staff

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felt that an emergency plan was the most important parameter for fire safety management. The results also show that the health and safety team plays an important role in emergency management plans. It must consist of at least one member from different departments. The size of the community depends on the number of hospital employees. Their role is to plan and design an emergency manual, fire identification, notification and evacuation procedures for emergencies. Authorities such as the Fire and Rescue Department of Malaysia (FRDM) and the Department of Occupational Safety and Health in Malaysia (DOSH) will assist them in its development and monitoring, and review it from time to time. In addition, an emergency response team and a firefighting team will be formed under the supervision of the health and safety authorities.

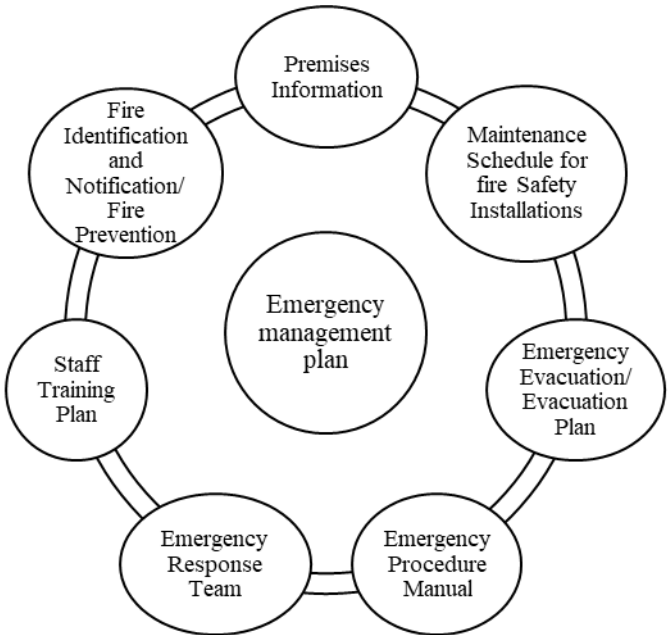

Fig. 3. The components of an emergency plan selected by the respondents for the parameters of fire safety management in the Government hospital building are as follows (Source: Researcher Survey, 2021)

3.2 Fire Safety Training and Practices

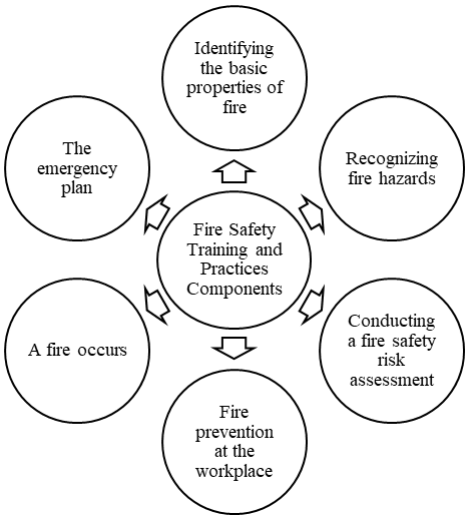

Fig. 4. The components of fire safety training and practice selected by the respondents for fire safety management in government hospitals. (Source: Researcher Survey, 2021)

Referring to Figure 4.2, six (6) major components have been identified for fire safety training and practice in the government hospital, namely, identifying the basic characteristics of fire, recognizing fire

hazards, conducting a fire safety risk assessment, fire prevention in the workplace, fire emergency, and emergency plan. Through fire safety training and practices, employees learn how to prevent fires, and it is important that everyone in the workplace is prepared for a fire. There were two types of training for hospital staff, internal and external. However, from the interviews, some hospitals do not provide internal training for their staff, but at least one staff member from each department attends external training. Fire safety training and practices can help staff identify fire hazards, conduct a fire safety risk assessment, prevent a fire in the workplace, and respond in the event of a fire.

Training and drills are offered from time to time to all employees, whether or not they are permanent employees. Training should include evacuation routes, the location and proper use of fire extinguishers and fire alarm systems, procedures for evacuating patients, etc., as well as procedures for reporting fires and the special operating procedures required to shut down, secure, or move certain critical equipment to safety, and procedures for evacuating bedridden persons, persons in critical care situations, and/or other persons with special needs. In addition, staff should be made aware that they are responsible for ensuring that patients are evacuated first in the event of a disaster, are able to identify vulnerable patients, children, the elderly, ICU patients, etc., who need assistance first, and know how to respond to and report a fire. Education plays an important role in fire safety management. [2], [20].

3.3 Fire Safety Maintenance

Figure 4.3 shows that there are three (3) types of components of fire protection maintenance in a government hospital, namely, fire protection equipment and facilities maintenance, fire protection maintenance plan, in-house staff maintenance, and outsourcing of maintenance services. There are two main components in hospital fire protection equipment and facilities maintenance that should be maintained regularly: passive fire protection and active fire protection. Passive fire protection includes things like compartments, stairwell closures, doors, hallways, lobbies and stairwells. Active fire protection includes automatic fire extinguishers, first-aid firefighting equipment, fire department aids, alarm and notification systems, and fire and explosion suppression systems.

Fig. 5. Fire safety maintenance components selected by respondents for the fire safety management plan in the government hospital. (Source: Researcher Survey, 2021)

There are two types of maintenance plans for fire protection: preventive maintenance and corrective maintenance. Preventive maintenance is performed to address minor deterioration and reduce the need for corrective maintenance, while corrective maintenance is used after a deficiency in the fire protection

system has occurred, such as a functional failure of the fire protection system. In preventive maintenance, maintenance companies schedule the maintenance. In corrective maintenance, on the other hand, maintenance companies performed corrective maintenance only for two reasons. First, due to complaints from hospital staff or patients. Second, when the NCRs or warnings issued by the authority were due to the negligence of the maintenance companies in preventive maintenance and therefore corrective maintenance was needed to fix the problem.

According to Arditi and Nawakorawit [4], 61% of companies that outsource maintenance services use only competitive bidding to select their contractors, while 23% use only negotiation and 16% use both. The negotiation approach appears to be a viable alternative, especially for short-term and low-cost work. Concession companies have consistently chosen to outsource maintenance services through negotiation with subcontractors due to the lack of specialised contractors for fire protection maintenance.

3.4 Fire Safety Rules

Building codes, or fire codes, are legal instruments that ensure that buildings, when constructed in compliance with codes, provide a socially acceptable level of health, safety, welfare, and amenity for the building's occupants and for the community in which the building is located.[19]. Every local building should follow the instructions of the authorities, local fire codes and regulations, whether it is a new building or an existing building. There are many important fire safety regulations applicable to Malaysian hospital buildings. The regulations applicable to hospital buildings are Act 133 Street, Drainage and Building Act 1974, Uniform Building Bellows' 1984 (UBBL 1984), Fire Services Act 1988 (Act 341), Rules and Regulations, Occupational Safety and Health Act 1994 (Act 514) & Rules and Regulations, Act 447 Electrical Supply Act 1990, Malaysia Standard, British Standard, National Fire Protection Association and others. (Association, 2005, 2011; "Electricity Supply Act and regulations 1990," 2005; "Fire Services Act 1988 (Act 341)," 2010; "Local Government Ordinance 1961," 2000; "Occupational Safety and Health Act and regulations 1994," 2007; "Sarawak Building Ordinance 1961," 2000; "Street, Drainage and Building Act 1974 (Act 133)," 2008; "Uniform Building By-Laws 1984," 2010). These fire codes were used for overall fire safety management.

As shown in Figure 6, the community health and safety department prepared the evacuation plans by referring to guidelines, standards, and local fire codes. The main references were the local fire code, Malaysian standard, British standard, National Fire Protection Association (NFPA) standard, Department of Occupational Safety and Health in Malaysia (DOSH) comments and guidelines, Ministry of Health Malaysia (MoH) guidelines, and Fire and Rescue Department of Malaysia (FRDM) comments. These standards have been adopted in building design and emergency management planning by organizations.

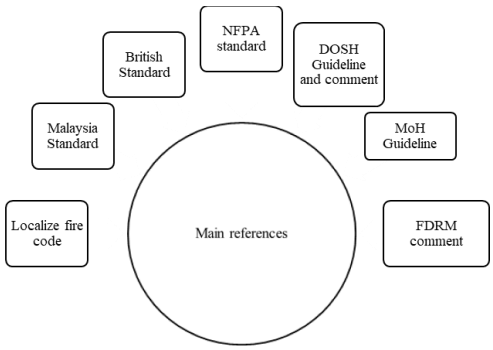

Fig. 6. Main References of Community Health and Safety (Source: Researcher Survey, 2021)

3.5 Fire Safety Management Procedure

Referring to Figure 7, five (5) components of fire safety management were identified at the government hospital: Fire Evacuation Procedures, Employee Personal Profile Procedures, Evacuation Plan and Fire Suppression Procedures, Fire Suppression Policy Procedures, and Fire Suppression Equipment Operation and Maintenance Procedures. One example is that evacuation drills should be properly planned, scheduled, and documented. The evacuation plan should be reviewed at least annually to update or delete

any items that need to be changed due to changes in occupancy, construction, use of the space, or other changes that would invalidate the plan. An evacuation drill should be conducted annually as part of a fire drill. Some hospitals hold an evacuation drill two or three times a year. Hospital staff then learn the proper procedures to escape a fire and evacuate patients. In addition, half of the hospitals have not included the entire hospital block in the evacuation drill. This is because there is a lack of personnel to conduct a large-scale fire drill. Therefore, there needs to be a procedure for this process.

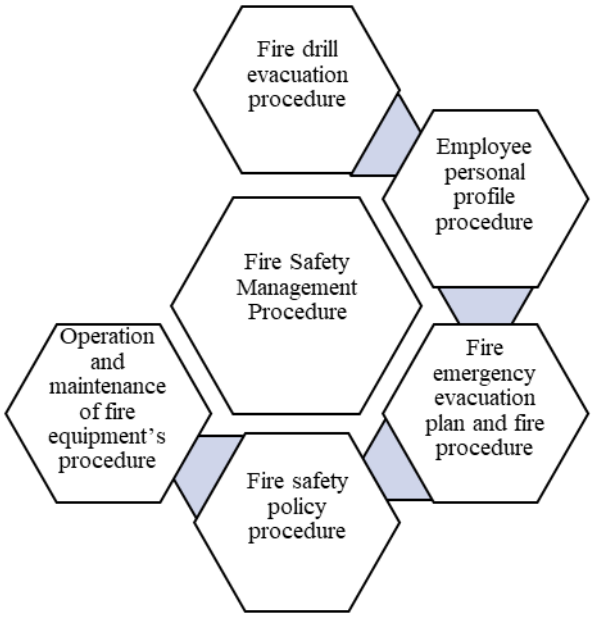

Fig. 7. Fire Safety Management Procedure Components for the Fire Safety Management Parameters at the Government hospital building Chosen by Respondents (Source: Researcher Survey, 2021)

The same is true for other components of emergency management. It is very important to evaluate the fire safety plan of the Government hospital buildings. For example, for evacuation plans and fire suppression measures. Most hospitals have highly visible and appropriate signage indicating the location of exits and firefighting equipment. However, during this survey, signage indicating the location of exits was not found in some hospitals. Also, signage indicating fire extinguishers was not present or not well visible in some hospitals. This clearly indicates that emergency management procedures need to be included in the fire safety management plan of government hospitals. This needs to be evaluated when conducting a fire safety audit.

4. Conclusion

This work examined the information necessary to evaluate the factors affecting fire safety management plans for existing and future Government hospital buildings. This was done through a phenomenological type of qualitative research and a case study in six selected six government hospital buildings. The condition of fire safety management plan in Government hospital buildings is significant because it can reduce fire accidents, property damage, and loss of life. This was achieved through some staff interviews with distinguished participants from Ministry of Health (MoH), Fire and Rescue Department Malaysia (FRDM) and Department of Occupational Safety (DOSH), hospital management, hospital staff and maintenance company. It can be concluded that the identified measures of fire safety management parameters in government hospital buildings are emergency management, fire safety training and practice, fire safety equipment maintenance, life safety facilities, fire safety management procedures, and fire safety regulations. Each of these parameters must be considered in detail when developing a fire safety management plan at the Government hospital buildings. Based on the study conducted, all of the selected hospitals have implemented the discussed fire safety management plan at a satisfactory level. Fire safety is everyone's business. Every employee is responsible for knowing the fire hazards in his or her work environment, practicing and promoting fire prevention, and knowing what actions to take in the event of a fire.

The importance of having a fire safety management plan in place is demonstrated by the report of the independent committee investigating the October 25, 2016 fire incident at Sultanah Aminah Hospital, Johor Bharu. The investigation found that one of the causes that led to the death of patients and injuries to one patient and several staff members in the Southern Intensive Care Unit was the lack of preparation by hospital management and staff, even considering the number of staff members present in relation to the number of patients in the unit (seven in number), and based on the evidence, we believe that the patients, or at least some of the patients, especially those closer to the exit doors, could have been saved if the staff had received serious training on evacuating patients in emergencies (CodeBlue, 2020)). Without a good fire safety management plan, this hospital building, even if it complies with existing codes, cannot be guaranteed to be safe in the event of a fire. Therefore, an adequate fire safety management plan would ensure that this building is safe if it does not meet code requirements.

In summary, the overall responsibility for fire safety management lies at the highest level of management, i.e., the Ministry of Health (MOH), the hospital or clinic director, and the board of visitors. As an employer, management must take seriously its responsibility to provide a safe work environment for all employees, patients, visitors, and contractors with respect to fire safety in the workplace. In addition, all public and private sector healthcare facilities in Malaysia must adhere to a uniform standard for facility design and operation, referencing the standards set forth in the Private Healthcare Facilities and Services Act 1998, which does not regulate government healthcare facilities. This assessment can help the authorities and management to make the right decision regarding fire safety management plan with limited duration and resources.

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