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قسم العمليات

Operations technician provider's Knowledge and Attitudes on Fire Risk Assessment During Time Out in The Operating Room at Sana'a Hospitals, Yemen .

A research project

Submitted to department of medical operation technician, 21september university of medical, applied

As partial fulfillments for the diploma degree in medical operation technician

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أَعُوذُ بِاللّٰهِ مِنَ الشَّيْطَانِ الرَّجِيمِ



صدق الله العظيم

سورة يوسف (76)

Dedication

To the light that illuminates our path of success, our fathers, and who taught us to hold out no matter circumstances change, our mothers. To those who lit our path. To please us and to live in blissful our brothers.

To whom his knowledge that lit the middle of others and guide the correct answer puzzled questions by allowing him to show the humanity of scientists and their eminence, our Doctors. To the most beautiful melody among all love songs, our Homeland.

Researchers

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Abstract

Background: Operating room (OR) fires are a serious but often overlooked hazard during surgical. Objective: This study aimed to evaluate the knowledge and attitudes of operations technician providers on fire risk assessment during the time-out process in the operating rooms of hospitals in Sana'a, Yemen. Purpose : The purpose of this descriptive study was to examine the knowledge and attitudes of operation technician providers on fire risk assessment during time-out in the operating room at Sana'a hospitals Yemen. Design: A descriptive, cross-sectional design was used to assess the operation technician providers' knowledge attitudes on fire risk assessment during time out in the operating room at Sana'a hospitals Yemen . Methods: A descriptive cross-sectional study was conducted among 100 operations technicians from various hospitals in Sana'a. A structured questionnaire was used to collect data on demographic characteristics, educational background, years of experience, and their knowledge levels regarding fire risk assessment. Results: Most participants were between 31–40 years of age (30%), with the majority having a diploma (41%) and 1–5 years of experience (39%). Technicians were mainly specialized in anesthesia (32%) and surgery (18%), and 67% were male. Knowledge assessment revealed that 13% had low knowledge, 35% had moderate knowledge, and 52% had high knowledge regarding fire risk assessment during time-out procedures, A structured questionnaire was used to collect data on total knowledge characteristics, their knowledge levels regarding fire risk assessment was high in (62%) and moderate in (25%) and low in (13%) distribution of operation technicians to collect data on total attitude regarding on fire risk was positive in (57%) and negative in (43%) Conclusion: While over half of the operations technicians demonstrated high knowledge, a significant portion still showed moderate to low awareness of fire risk assessment protocols. These findings highlight the need for targeted training and implementation of standardized fire safety practices during the surgical time-out in Yemeni hospitals to ensure comprehensive OR safety. However, they still need more education on how to disseminate key information related to fire risk assessment during operating room time-out to improve fire safety practices for health care professionals in the operating room. **Keywords:** Operating room fire, time-out, fire safety, operations technician, Yemen, knowledge assessment.

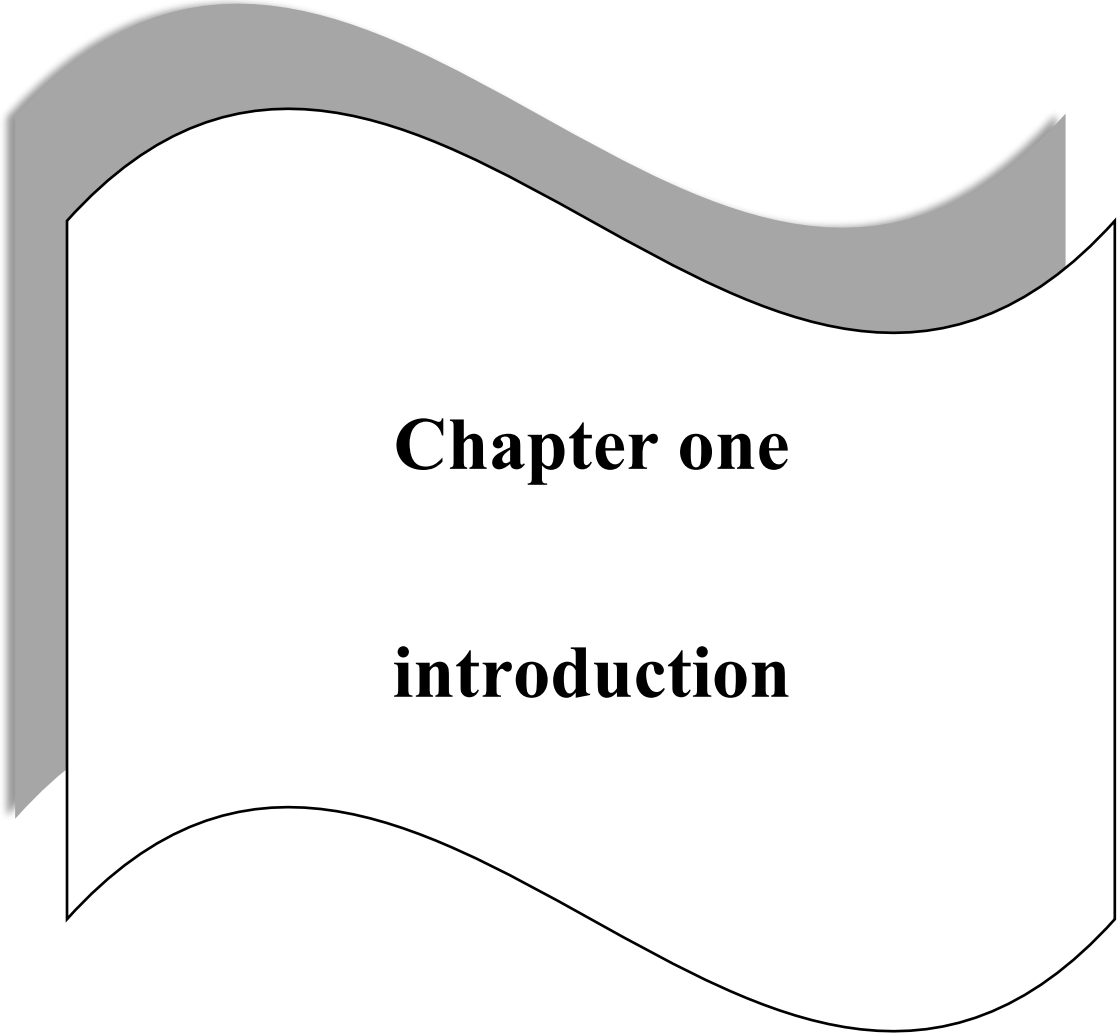
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Chapter one

introduction

Introduction

1.1. introduction

Operating Room Fires are classified as "Never events"-Preventable Incidents that can lead to serious patients. Despite Widespread Recognition of the Risk, there is currently no standard policy Risk in the operation time-out. However, all organizations Acknowledge the important of addressing this hazard. Patient safety is a critical aspect of healthcare in the united states , serving as a cornerstone of high-quality patient care To enhance safety and standardization, the healthcare industry has adjusted checklists inspired by the military and aircraft industries. These checklists help improve patient care by incorporating essential information, such as allergies and correct synthesis **(Hales & Pronovost, 2006)** .Currently, Healthcare Providers Routinely Perform Time-outs before any procedure as a standard practice. These time-outs take place at the bedside for bedsides and in designed Procedural Areas, such as the operating room.

Key Elements Of The Time-out Typing Include, but are not limited to, verifying the patient's name and date of birth, identifying team Members and Their Roles, Confirming The Correct Procedure and Surgical Site, Reviewing Allergy Information Prophylactics. With recent advances in surgery due to developments in medicine, science, and technology, the use of complex and enhanced equipment has improved patient care and safety. However, the use of excess anesthetic gas, radiation, electrical and electronic equipment in the operating room, and the risk of infection and drug addiction, are increasing, threatening the safety of patients and perioperative healthcare workers **(Hey & Turner, 2016; Erdozien, 2005)**. Therefore, it is ideal that perioperative nurses be knowledge of patient safety risk factors Concerning patients' safety, risk assessment behaviors, and accident types have been identified by looking at human factors (e.g., communication and behavior according to the patient's situation; **Carbrai et al., 2016**), system factors (e.g., work environment; **Edozien, 2005; Kim et al., 2018**), contributing factors (e.g., organizational control, extrinsic factors of policies; **El-Jardall et al., 2011 Park et al., 2016**), and problem factors **(Park & Kim, 2019; Vaismoraci et al., 2020)**

Further, the importance of human factors has also been identified (The World Alliance for Patient Safety Drafting Group **et al., 2009** nurse's operation or patient safety to invasive procedure (**Park&Kim, 2019**). the risk of infection and drug addiction, are increasing, threatening the safety of patients and perioperative healthcare workers (**Hey & Turner, 2016; Erdozien, 2005**). accident types have been identified by looking at human factors (e.g., communication and behavior according to the patient's situation; **Carbrai et al., 2016**), system factors (e.g., work environment; **Edozien, 2005; Kim et al., 2018**), contributing factors (e.g., organizational control, extrinsic factors of policies; **El-Jardall et al., 2011; Park et al., 2016**), and problem factors (**Park&Kim,2019; Vaismoraci et al., 2020**.)

1.2. justification of study

This study was designed to:

The fire risk are classified as never event that causes harms to patient during some operation in operation room that can leading to fire in human body in medical staff or operation room.

1.3. Objectives of study

1.3.1. General Objectives

-Objective of the study the primary aim of this study to assessment of Operations technician provider's Knowledge and Attitudes on Fire Risk during time out in the operation room at Sana'a hospitals , Yemen

1.3.2. Specific Objectives

The present study has been designed To Assess the Level of Knowledge of Operation Technicians On fire risk during time-out in the operating room at Sana'a Hospitals, Yemen. To evaluate the attitude of operation technicians on fire risk during time-out in the operating room at Sana'a Hospitals, Yemen, To determine the relationship between Demographic Data and Knowledge of Operation Technicians on Fire Risk during Time-Out in the Operating Room at Sana'a Hospitals, Yemen..

Chapter Two
Literature Review

2. Literature Review

This section reviews key literature relevant to the knowledge and attitudes of operations d.technician providers regarding fire risk assessment during surgical time-out procedures,

2.1. Introduction to Operating Room Fires

Operating Room) fires, although relatively uncommon, pose a serious threat to patient and staff safety. These incidents are considered never events, meaning they are entirely preventable with proper precautions and protocols. The fire triad—which includes an oxidizer (oxygen or nitrous oxide), an ignition source (e.g., electrosurgical units, lasers), and a fuel source (e.g., alcohol-based skin prep solutions, drapes, sponges)—is central to understanding how these fires occur (**ECRI Institute, 2009**). Operating Room's Culture of Safety particularly in low-resource settings. This section reviewed current literature related to patient safety, fire safety in the operating room, and reported fire events in the operating room. In summary, the existence of the fire triad in the OR is well recognized in the literature. Based on case reports and information from insurance claims, there seem to be clear situations in which OR fires occur. **The US Food and Drug Administration (2015)** recommends fire safety practices for health care professionals in the OR. There is not, however, a standard of care for dealing with the existence of OR fire risk. There is a paucity of literature regarding the incorporation of fire risk assessment into the operative time-out. Practice standards do not exist for fire risk, though there are recommendations from industry organizations. Health care has borrowed checklist mentality from the military and aviation industries, in which they can incorporate awareness of fire risk The culture of safety in the operating room and current reports of fire safety in the operating room are central to this study. In order to reduce the risk of wrong-sided surgery, the surgeon will frequently sign the side of surgery and verify with the patient and other staff and will verify the surgical side on the consent forms. During the procedure, it is common practice for operating room staff to count surgical instruments and dressings twice to ensure that what was placed on the sterile field was placed back on the sterile field after use to reduce the risk of retained instruments. Retained surgical instruments are defined as a "never event," and counting surgical instruments twice aims to reduce its incidence. Operating room fire is also considered a "never event," but there is currently no standard practice to address the risk among members of the healthcare team A study by **Schmidt et al. (2020)**

2.1.1. Context in the Operating Room:

In Yemen, like many low-resource settings, the roles of operations technicians might not be well defined, and these professionals might not receive formal training on fire safety or other essential OR protocols. A study by **Schmidt et al. (2020)** highlighted the lack of comprehensive training for OR technicians, particularly in fire risk management, in many low-resource settings. They argued that lack of formal training programs leads to a lack of awareness of the fire risks in the operating room.

Operating room (OR) fires occur when three elements—oxidizer, ignition source, and fuel—combine in a surgical environment. **Studies (e.g., Bruley, 2004)** emphasize that awareness of the "fire triangle" is essential for preventing incidents. Despite the known risks, many surgical teams fail to assess fire hazards systematically during procedures. OR fires usually occur during procedures involving the head, neck, and upper chest, where open oxygen delivery systems are used and ignition sources are close to oxygen-rich environments (**Healy et al., 2014**). The use of alcohol-based antiseptics further increases the flammability risk, especially when adequate drying time is not observed. According to the U.S. Food and Drug Administration (FDA) and the ECRI Institute, between 550 and 650 surgical fires occur each year in the United States alone (**FDA, 2020**). These fires can cause severe burns, permanent disfigurement, and even death. Moreover, they can lead to costly legal claims, loss of trust in healthcare providers, and emotional trauma for staff and patients alike. Despite the availability of guidelines and preventive strategies, many healthcare workers are still not fully aware of the risks or how to mitigate them. Inadequate training, lack of protocols, and poor communication during surgical procedures are often cited as leading causes (**Smith & Jones, 2015**). In many low- and middle-income countries, including Yemen, these issues are compounded by resource limitations, outdated equipment, and a lack of regular staff education. Furthermore, surgical fire incidents are underreported, particularly in developing countries, where incident tracking systems may be weak or non-existent. As a result, the actual frequency of OR fires could be significantly higher than reported figures suggest. In recognition of the danger, professional organizations such as the Association of perioperative Registered Nurses (AORN), the Joint Commission, and the American Society of Anesthesiologists (ASA) have all issued recommendations. These include assessing fire risk during the surgical "time-out," reducing.

2.2. Operations Technician Providers

Operations technicians (also referred to as perioperative technicians or surgical technologists) are healthcare professionals who support surgeons and other surgical team members during surgical procedures. Their roles typically include assisting with surgical equipment, maintaining a sterile environment, preparing and handling instruments, and ensuring proper functioning of medical devices. In many healthcare systems, the operations technician is a vital member of the operating room (OR) team, though their specific responsibilities may vary depending on the institution. They argued that lack of formal training programs leads to a lack of awareness of the fire risks in the operating room.

2.3. Time-Out Protocol and Its Importance

The time-out protocol is a critical patient safety step designed to prevent avoidable errors in the operating room. Introduced as part of the Universal Protocol by(**the Joint Commission in 2004,**)it mandates a final verification of key details before any surgical procedure begins. This includes confirming the correct patient, correct procedure, and correct surgical site (**The Joint Commission, 2021**).

2.3.1. Definition of Time-out:

The time-out is a crucial moment in the surgical process where the surgical team pauses to verify key information before starting the procedure. This includes confirming the patient's identity, the procedure to be performed, and any potential safety hazards. The time-out process serves as a final opportunity to assess potential risks and ensure patient safety.

2.3.2. Fire Risk Assessment During Time-out:

A fire risk assessment should be part of the time-out checklist. During this pause, the surgical team can identify potential fire hazards, such as the presence of oxygen-enriched environments, flammable skin prep solutions, and electrosurgical devices. The primary goal is to ensure that everyone in the OR is aware of any potential fire risks before the procedure begins.

2.3.3. Relevant Literature:

The culture of safety in the operating room and current reports of fire safety in the operating room are central to this study. In order to reduce the risk of wrong-sided surgery, the surgeon will frequently sign the side of surgery and verify with the patient and other staff and will verify the surgical side on the consent forms. During the procedure, it is common practice for operating room staff to count surgical instruments and dressings twice to ensure that what was placed on the sterile field was placed back on the sterile field after use to reduce the risk of retained instruments. Retained surgical instruments are defined as a "never event," and counting surgical instruments twice aims to reduce its incidence. Operating room fire is also considered a "never event," but there is currently no standard practice to address the risk among members of the healthcare team fire triad, which consists of an oxidizer, an ignition source, and a fuel, must be present for a fire to occur in the operating room (2015).

In the operating room, oxidizers include oxygen and nitrous oxide. Fuel includes surgical drapes, gauze, dressings, and hair. Ignition sources include electrosurgical units (i.e., cautery) and lasers. These three elements are commonly found in the operating room. The aviation industry has been using checklists for many years to reduce the risk of human error (**Hales & Pronovost, 2006**). The medical community has been slower to adopt checklists as a means to reduce the risk of human error. Checklists make users aware of essential criteria involved in a particular task. Checklists are commonly used in hospitals when inserting central lines, weaning mechanically ventilated patients, and discussing daily goals of patient care. In operating rooms, a time-out is performed prior to initiation of surgical procedures. In surgical time-outs, the patient's name, date of birth, allergies, procedure to be performed, and administration of pre-operative antibiotics are discussed, among other items that Electrocautery, which was extinguished by the surgical team (**Moskowitz, 2009**). In this case, there was no harm to the patient. Further review of the incident revealed that a lack of communication between providers might have been involved in the development of the fire. The reviewer determined that more effective team communication might have prevented the fire (**Moskowitz, 2009**). This case report highlights the importance of communication between the surgical team in reducing fire risk in the operating room.

Batra & Gupta (2008) wrote a case report of an operating room fire attributed to alcohol-based surgical prep that had not been allowed to dry completely. The vapors from an alcohol-based

.).

Because operating room fires are relatively rare, little research other than case reports exists in the literature. Aspects of operating room fire have been studied, however. **Van Cleave et al. (2014)** conducted research related to the use of intraoral suction as a means to reduce the risk of fire in the operating room related to dental surgery. The study found that without intraoral suction a "pop" and "flash" were more likely to appear (**VanCleave et al., 2014**). Further, in cases where a flame was observed, the duration of the flame was reduced when intraoral suction occurred (**VanCleave et al., 2014**). **Culp, Kimbrough, and Luna (2013)** performed a study of fuel sources for operating room fires at varying oxygen concentrations. This study found that a statistically significant decrease in time to ignition exists as oxygen concentration increases. They also point out that surgical gowns are required to meet textile flammability standards and surgical drapes are not; however, surgical drapes are implicated in 81% of operating room fires (**Culp, Kimbrough, & Luna, 2013**).

(Mehta, Bhananker, Posner, and Domino (2013)) performed a closed claims analysis using the ASA Closed Claims Project database, related to operating room fires. The closed claim analysis illustrated the situations in which operating room fires occur and demonstrated that most operating room fires occurred during monitored anesthesia care (MAC), where the oxygen source, often a nasal cannula, is typically open to the environment (**Mehta et al., 2013**). Oxygen was the most common oxidizer, found to be in use in 95% of the cases reported in the Closed Claim Analysis database. Cautery was determined to be the most frequent ignition source of operating room fires. Operating room fires were also found to be more common in outpatient procedures (**Mehta et al., 2013**). The Closed Claim Analysis database is limited in that the total number of operating room fires is likely not the number of fires that actually occurred, as these are not mandatorily reported. The number of anesthetics delivered is also not reported. Nonetheless, this closed claim analysis does provide valuable information related to factors that increase the risk of In 2003, two operating room fires occurred at Christiana Care Health System .operating room fires (CCHS) in Newark, Delaware (**Carlson & Rice, 2014**). This prompted CCHS to create their own fire risk assessment, do extensive training of operating room staff, conduct operating room fire drills, and incorporate fire risk into their operative time-out (**Carlson & Rice, 2013**). CCHS has made their materials publicly available for use. Between 2009 and 2010, the Cleveland Clinic reportedly had six operating room fires occur (Suchetka, 2010). CEO, Toby Cosgrove, reported

According to Singer et al. (2009), integrating fire risk assessment into the time-out process is critical for enhancing safety and preventing errors. The **Joint Commission (2021)** stresses that the time-out process should include specific checks for fire hazards, provide standardized training and adequate safety protocols, including those related to fire safety in ORs. Hospitals in Sana'a may lack the infrastructure, tools, and consistent training necessary to implement and enforce fire safety protocols during surgeries. A study by **Al-Awlaqi et al. (2017)** found that many hospitals in Yemen lack formal safety measures, and staff often operate without adequate fire prevention training.

The time-out is typically performed after the patient has been prepped and draped but before the first incision. It involves all members of the surgical team—surgeons, anesthesiologists, nurses, and operations technicians—who must actively participate. It promotes effective communication, teamwork, and situational awareness, all of which are essential for reducing perioperative errors (**WHO, 2009**). The surgical time-out is a safety pause before an operation begins, designed to confirm critical details like patient identity and procedure site. Recent best practices include fire risk assessment as a key step in this protocol (**ECRI Institute, 2020**). However, implementation varies widely across healthcare systems. Importantly, the time-out process is now being expanded to include fire risk assessment in many healthcare settings. Organizations like the Association of perioperative Registered Nurses (AORN) and the American Society of Anesthesiologists (ASA) recommend that the surgical team explicitly discuss fire risk factors—such as the use of oxygen, electrosurgical units, and alcohol-based skin preps—during the time-out (**AORN, 2018; ASA, 2020**). This addition allows teams to preemptively adjust procedures, reduce oxygen concentration if necessary, and take preventive actions like ensuring adequate drying time for antiseptics. Research has demonstrated that structured time-outs significantly reduce the incidence of wrong-site surgeries and improve safety culture. A study by Haynes et al. (2009), which evaluated the WHO Surgical Safety Checklist across eight countries, showed that implementing a structured checklist—including time-out—led to a 36% reduction in surgical complications and a 47% decrease in mortality rates. Despite its benefits, the effectiveness of the time-out largely depends on staff compliance, awareness, and attitudes. In many low-resource environments, such

the time-out may be either inconsistently applied or treated as a routine task without active engagement. This undermines its purpose and may result in missed opportunities to identify risks, including those related to OR fires. In summary, the time-out protocol is a vital safeguard in surgical care. When properly executed, it not only prevents procedural errors but also provides a platform to assess and mitigate intraoperative risks—such as surgical fires. Strengthening adherence to time-out practices and incorporating fire safety elements are key strategies in improving operating room safety, especially in under-resourced healthcare systems.

2.4. Knowledge and Awareness of Fire Risks in Operating Rooms

Knowledge refers to the familiarity and understanding that OR technicians have about fire hazards in the operating room. This includes knowledge about: The fire triangle (fuel, oxygen, and heat) Fire prevention methods (e.g., handling oxygen levels, using fire-resistant drapes, and allowing alcohol-based antiseptics to dry) Procedures for managing fire emergencies (e.g., using fire extinguishers, evacuating the patient, etc.) Studies suggest that OR staff often lack comprehensive knowledge regarding fire prevention despite the presence of fire risk in OR environments (**Heilbrun et al., 2016**). Understanding the fire risks in the operating room (OR) is essential for all surgical team members, including surgeons, anesthesiologists, nurses, and operations technicians. Surgical fires are preventable, yet they continue to occur due to lack of knowledge, awareness, and preparedness among OR staff (**ECRI Institute, 2009**). The components of the fire triangle—an oxidizer (oxygen or nitrous oxide), an ignition source (e.g., electrosurgical unit, laser), and fuel (e.g., alcohol-based solutions, surgical drapes)—are frequently present during surgeries, making education about their interaction crucial (**Healy et al., 2014**). A survey conducted by **Jones et al. (2015)** among operating room staff in several U.S. hospitals revealed that only 37% of respondents could correctly identify all three components of the fire triangle. Additionally, fewer than 50% reported receiving formal training on surgical fire prevention. This highlights a significant gap in knowledge, even in well-resourced settings. In contrast, hospitals that implement routine fire safety training and protocols see a marked improvement in staff knowledge and response. A study by **Patel et al. (2019)** found that after conducting a simulation-based training on fire safety, correct identification of fire risks increased by 60% among participants. In developing countries, particularly in conflict-affected regions like Yemen, there is limited access to structured fire safety education. Health professionals .

support for continuous training (Al-Awlaqi et al., 2017). As a result, many operations technicians and surgical staff may lack awareness of fire risk assessment procedures or may not recognize the importance of incorporating fire safety into their daily practice. Furthermore, fire safety is often not included in the core curriculum of medical or nursing education in such regions. Without standardized training, staff may underestimate the risk or fail to implement proper precautions, such as allowing antiseptic solutions to dry or minimizing oxygen concentration near the surgical site (Smith & Liu, 2017). Moreover, incident underreporting is another problem. In many hospitals, near-misses or minor surgical fires may not be documented, leading to a lack of awareness at the institutional level and missed opportunities for systemic learning and prevention. In conclusion, the knowledge and awareness of OR fire risks are influenced by multiple factors, including training availability, institutional policies, staff experience, and overall safety culture. Improving this knowledge is a critical step toward reducing the occurrence of surgical fires and ensuring a safe operating environment, especially in under-resourced healthcare systems like those in Yemen.

2.5. Attitudes Toward Fire Risk Assessment

Attitudes describe the perceptions, beliefs, and emotional responses of operations technicians toward fire risk assessment and prevention during surgical procedures. Positive attitudes toward safety and fire risk management contribute to safer work environments. On the other hand, negative or indifferent attitudes may result in non-compliance with safety protocols, leading to increased risks. In Yemen, a study by Al-Awlaqi et al. (2017) revealed that many healthcare providers did not prioritize fire risk management, viewing it as unnecessary or unimportant.

2.5.1. Relevant Literature:

A study by Jones et al. (2015) found that staff attitudes toward fire safety significantly influenced their adherence to fire prevention measures. Negative attitudes were associated with lower compliance rates. According to Wright et al. (2020), educational interventions are critical to changing both knowledge and attitudes of OR staff regarding fire safety. Attitudes held by operating room (OR) staff play a significant role in whether or not fire risk assessments are properly conducted during surgical procedures. Even when knowledge is present, positive attitudes and a strong safety culture are essential for translating knowledge into effective action (Weinger et al., 2011). Some healthcare workers view fire risk assessment as an unnecessary step

or a bureaucratic formality, especially in high-pressure environments where speed and efficiency

Research shows that when staff perceive fire risks as low or believe that fires are extremely rare, they are less likely to support or participate in preventive efforts (Jones et al., 2015). A study by Heilbrun et al. (2016) found that positive attitudes toward patient safety, including fire prevention, were significantly associated with increased adherence to time-out protocols and proactive risk assessments. Teams that had experienced previous near-miss incidents were also more likely to support comprehensive safety checks. Conversely, a lack of direct experience with OR fires often results in underestimation of the risk and reduced motivation to follow fire safety procedures. Institutional leadership also has a major influence on staff attitudes. Supportive management, clear policies, and regular safety briefings help foster a culture where staff feel empowered and responsible for identifying and mitigating risks. In facilities where leadership emphasizes patient safety as a core value, staff demonstrate greater engagement in protocols such as fire risk assessments (Singer et al., 2009). In resource-limited settings like Yemen, the situation is more complex. Healthcare professionals are frequently overworked, underpaid, and faced with equipment shortages and limited training opportunities. Under such conditions, priority. A study by Al-Ghazzawi & Al-Awlaqi (2020)

in Yemeni hospitals found that many OR technicians viewed fire risk assessment as impractical due to a lack of equipment, time constraints, and insufficient institutional support. Some staff also reported a lack of clarity about whose responsibility fire prevention actually was, reflecting the need for better role definition and team-based accountability. In conclusion, staff attitudes—whether positive, indifferent, or negative—directly affect the implementation of fire risk assessments. To improve compliance and outcomes, it is essential to address both cognitive (knowledge) and emotional (attitudinal) components through regular training, leadership engagement, and reinforcement of a strong safety culture.

2.6.Fire risk assessment

Fire risk assessment in the operating room involves the evaluation of the potential risks for fire during surgical procedures. This includes identifying potential sources of ignition, flammable materials, and oxygen-enriched environments, all of which contribute to fire risk. The time-out period, a critical safety check before the commencement of surgery, is the ideal moment to conduct a fire risk assessment.

2.6.1. Significance of Fire Risk Assessment:

A formal fire risk assessment helps identify specific risks in the OR and ensures that necessary precautions are taken. For instance, during the time-out, the team checks whether there are any

2.6.2. Relevant Literature:

Smith et al. (2017) demonstrated that fire risk assessments during time-out protocols help reduce surgical fire incidents by enhancing communication and ensuring that necessary precautions are in place before surgery begins. The American Society of Anesthesiologists (**ASA, 2020**) recommends conducting a **fire** risk assessment as part of the time-out procedure, which includes evaluating the patient's airway, oxygen levels, and the use of flammable materials.

2.7. Training and Policy Implementation

Effective training and implementation of institutional policies are critical components in reducing the incidence of operating room (OR) fires. While awareness and attitudes are important, structured education and clear protocols are what ensure consistent and safe practices in clinical environments (**AORN, 2018**).

2.7.1. Importance of Training

Training equips OR staff with the knowledge, skills, and confidence needed to recognize and mitigate fire risks. A well-designed training program should cover: The fire triangle (fuel, ignition source, oxidizer) High-risk scenarios (e.g., head and neck surgeries with open oxygen delivery) Proper use of electrosurgical and laser equipment Safe handling and drying of alcohol-based skin prep agents Emergency response steps in case of fire (Patel et al., 2019) Simulation-based training has proven particularly effective. In a study by **Wright et al. (2020)**, surgical teams that underwent fire safety simulation training showed a 70% increase in correct fire response behavior, compared to teams without training. However, in resource-limited settings such as Yemen, access to regular, high-quality training is limited. Often, fire safety is not included in the continuing education curriculum for operations technicians or nursing staff, leaving many professionals unaware of current best practices (**Al-Awlaqi et al., 2017**).

2.7.2. Policy Implementation

Training alone is not enough without institutional policies to support, enforce, and standardize safety protocols. Policies must clearly define: Roles and responsibilities of each team member Fire risk assessment as part of the surgical time-outsteps for minimizing oxygen concentrations in open-air procedures Regular fire drills and equipment checks Procedures for reporting and analyzing fire incidents (**ASA, 2020**)Hospitals with established fire prevention policies report lower rates of surgical fires and better staff compliance (**ECRI Institute, 2009**). These policies must be integrated into the broader framework of perioperative safety management and supported by hospital leadership. Unfortunately, many hospitals in developing regions lack formal fire prevention policies, or if policies do exist, they are often not enforced or reviewed regularly. A study by **Al-Ghazzawi & Al-Awlaqi (2020) in Yemen** found that over 60% of surveyed OR staff had never participated in a fire drill and were unaware of any hospital policy related to OR fire safety.

2.7.3. Sustainability and Evaluation

Training and policy efforts must be sustainable and subject to ongoing evaluation. Routine audits, performance feedback, and updates to training materials are essential to keep up with technological changes and evolving best practices. Collaboration with international organizations (**e.g., WHO, AORN**) can also help resource-limited facilities access tools and materials for training.

2.8.Global Recommendations and Local Application

provide evidence-based guidelines to minimize preventable surgical fires, enhance teamwork, and ensure patient and staff safety. The American Society of Anesthesiologists (ASA) issued a comprehensive Practice Advisory for the Prevention and Management of Operating Room Fires. It recommends: Identifying high-risk procedures, especially those involving oxygen near ignition sources Reducing supplemental oxygen concentration when possible Allowing alcohol-based antiseptics to fully dry Assigning clear

responsibilities for fire prevention and management within the OR team (ASA, 2020) The Association of perioperative Registered Nurses (AORN) advocates for: Routine fire safety education and fire drills Integration of fire risk assessment into the surgical time-out Safe handling and storage of flammable materials Use of fire-retardant drapes and appropriate equipment maintenance (**AORN, 2018**) The Joint Commission (TJC) includes fire safety as part of its Universal Protocol and patient safety standards. It encourages OR

The World Health Organization (WHO), though not specific to OR fires, promotes the Surgical Safety Checklist, which improves team communication, confirms patient identity and procedure, and includes equipment checks—key steps in overall surgical risk reduction (**WHO, 2009**). These recommendations stress: Interprofessional communication Formalized safety training Institution-wide policies Incident reporting systems Ongoing evaluation and quality improvement

2.8.1. Local Application in Yemen: Barriers and Potential Solutions

Implementing global standards in Yemen's healthcare system is highly challenging due to its ongoing conflict, limited resources, and systemic health infrastructure weaknesses. Yet, these recommendations can be adapted to the local context with strategic and context-sensitive interventions Key barriers in Yemen include: Lack of national surgical safety policies or hospital-level fire safety protocols Inadequate training programs for operating technicians and OR staff Shortages of essential fire safety supplies, such as fire extinguishers or fire-retardant drapes Limited institutional support for safety audits, risk assessments, and emergency preparedness Low awareness of OR fire hazards, as shown in studies by **Al-Awlaqi et al. (2017)** and **Al-Ghazzawi & Al-Awlaqi (2020)**

Local application should emphasize cost-effective solutions, such as: Switching to povidone-iodine-based skin prep in high-oxygen environments Using metal trays and non-flammable materials where possible Promoting low-tech fire drills and tabletop simulations that do not require advanced equipment By aligning global recommendations with local realities, Yemen's hospitals can make meaningful progress in improving surgical safety. Even incremental changes can have a significant impact in preventing OR

fires and protecting both patients and healthcare workers. Global health and surgical safety authorities have emphasized the importance of systematic fire risk management in operating rooms (ORs). These organizations Leading international health organizations have developed comprehensive guidelines and frameworks to prevent and manage operating room (OR)

These recommendations are based on decades of research and practical experiences in high-resource healthcare settings. The Joint Commission (TJC) emphasizes the inclusion of fire risk assessment in the Universal Protocol and mandates active communication between surgical team members during the time-out process **(The Joint Commission, 2021)**. The American Society of Anesthesiologists (ASA) provides a detailed Practice Advisory which outlines specific recommendations for reducing oxidizer buildup, avoiding ignition near oxygen-enriched environments, and ensuring fuel sources are properly managed **(ASA, 2020)**. The Association of perioperative Registered Nurses (AORN) has created evidence-based guidelines that stress the importance of routine staff education, use of non-alcohol-based antiseptics when possible, and standardized fire response procedures **(AORN, 2018)**. The World Health Organization (WHO), through its Surgical Safety Checklist, also indirectly supports fire prevention by reinforcing principles of communication, patient verification, and equipment readiness before every surgical procedure **(WHO, 2009)**.

2.8.2. Challenges include:

Limited access to equipment and fire safety materials
Absence of structured fire safety, especially among operations technicians and nurses
Weak hospital administration systems that do not enforce or monitor compliance
Underreporting and minimal documentation of OR fires or near-miss events **(Al-Ghazzawi & Al-Awlaqi, 2020)** teams to conduct a fire risk assessment during every time-out and document high-risk cases **(The Joint Commission, 2021)**.

A qualitative study by **Al-Awlaqi et al. (2017)** found that many healthcare professionals in Yemen had never received formal education on surgical fire safety. Additionally, due to the ongoing conflict and economic instability, safety practices are often deprioritized in favor of urgent care delivery. However, despite these barriers, there are clear opportunities for localized adaptation of

global best practices: Developing context-appropriate protocols, such as simplified checklists in Arabic that include fire risk assessment Incorporating fire safety into existing training programs for OR staff and technicians Collaborating with international health NGOs .

2.8.3.Potential solutions for local adaptation:

Customizing the WHO Surgical Safety Checklist to include a specific section on fire risk, using simple language and local terminology Developing low-cost training modules and fire safety posters for hospital walls Collaborating with international NGOs and health education partners to supply training resources and safety equipment Encouraging hospitals to adopt a basic fire safety are prioritized. This mindset can lead to non-compliance with safety protocols, including those related to surgical fire (Smith & Liu, 2017).

flammable substances (e.g., alcohol-based skin prep), the oxygen concentration in the room, and the functionality of fire extinguishers.training materials, fire-resistant surgical drapes, and simulation-based education Establishing a pilot fire safety program in one or more hospitals as a model for broader implementation.

Chapter three
Materials and methods

3. method of resarch

3.1.study area

The present study done in capital city of yemen ,sana'a.



Figure 3.1. shows the location of sana'a city on the map of republic of yemen (wikipedia)

3.2. Study Setting

The research project titled "Operations Technician Providers' Knowledge and Attitudes on Fire Risk Assessment During Time-out in the Operating Room at Sana'a Hospitals, Yemen" takes place in various public hospitals within Sana'a City. These hospitals house operation rooms where fire risks could potentially affect patient safety. Understanding the knowledge and attitudes of operation technicians in these settings is crucial for improving fire safety protocols

3.3. Study Design

The study employs a descriptive cross-sectional design, which is effective for assessing the current state of knowledge and attitudes among operation technician providers. This approach allows for the evaluation of data at a single point in time, providing insight

into the existing understanding and perceptions of the participants regarding fire risk assessment during the time-out phase in the operating room. The data collection period spans from December 2024 to January 2025

3.4. Population of the Study

The target population for this study comprises all operation technicians (also known as surgical technologists) working in public hospitals in Sana'a City during the designated sample collection period. These technicians play a critical role in the operation room, and their knowledge and awareness of fire risks are essential to ensuring patient safety and effective emergency response

3.5. Participants

The study targeted operation technicians working in various specialties (e.g., anesthesia, surgery, pediatrics, ICU, ER) at hospitals in Sana'a. A total of 407 participants were surveyed, capturing a diverse demographic

3.6. Sampling Technique

To obtain a representative sample of operation technicians, a convenience sampling technique will be utilized. This will involve selecting participants who are readily accessible and willing to participate within the study period. The sampling will ensure diversity among participants by including technicians from various specialties and experience levels, thus enhancing the generalizability of the findings

3.7. Statistics

Descriptive statistical methods were used to analyze demographic data and results from the knowledge and attitude assessments. Percentages were calculated for each category to summarize findings

3.8. Materials

Questionnaire Tool: The questionnaire was designed with input from fire safety experts and medical professionals to ensure relevance and comprehensiveness

Software for Analyses Data were analyzed using statistical software (e.g., SPSS, R) to generate descriptive statistics and frequency distributions

3.9. Research Methodology

3.9.1. Questionnaire Development

A structured questionnaire will be meticulously designed to gauge the knowledge and attitudes of the operation technicians concerning fire risk assessment. The questionnaire will include demographic questions as well as specific items aimed at assessing both knowledge levels and attitudes towards fire safety protocols

3.9.2. Sampling Method

A convenience sampling method was utilized to select participants from different departments within the hospitals, ensuring a broad representation of technicians.

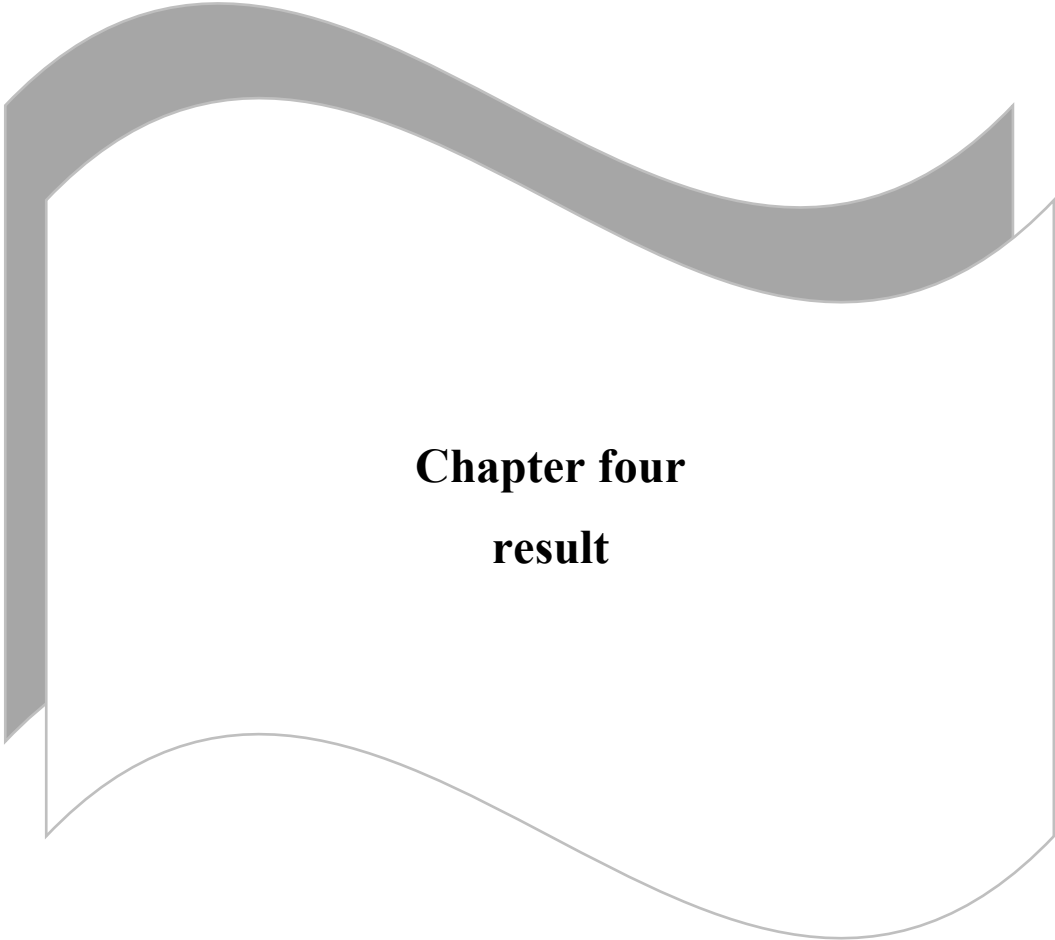
3.9.3. Data Collection Method

The data will be collected through self-administered questionnaires distributed to the selected operation technicians in the participating hospitals

3.9.4. Analysis

After data collection, statistical analyses will be performed to evaluate the responses. Descriptive statistics will summarize the data, and inferential statistics may be utilized .to explore correlations or differences among various demographic groups

By implementing this methodology, the study aims to shed light on the current knowledge levels and attitudes of operation technicians regarding fire risk assessment, paving the way for targeted interventions to improve safety standards in operating rooms



Chapter four

result

4.Results

Results 4.1. distribution of operation technicians providers demographic data regarding on fire risk assessment during time out in the operating room at Sanaa hospitals , Yemen.

Age Group	Sub Items	frequency	percentage
	15 - 20	0	0 %
	21 - 30	30	30 %
	31 - 40	40	40 %
	41 - 50	24	24 %
	51 - 60	6	6 %

Age Group:

The majority of operating room technicians are aged between **31–40 years (40%)**, indicating a relatively young and active workforce.

The **21–30 age group** follows with **30%**, showing that a substantial portion of the staff are early in their careers.

The **41–50 group** makes up **24%**, while only **6%** are aged **51–60**. No participants were in the 15–20 range, indicating that all technicians are mature and experienced adults.

Results 4.2. distribution of operation technicians providers demographic data regarding on fire risk assessment during time out in the operating room at Sanaa hospitals , Yemen.

specification	Sub Items	frequency	percentage
	anesthesia	38	38 %
	surgery	32	32 %
	pediatrics	12	12 %
	ICU	18	18 %
	ER	0	0 %

Specialization:

Anesthesia technicians represent the largest group at **38%**, followed by those in **surgery (32%)**, indicating that these two areas are the most critical in the operating room team.

ICU specialists account for **18%**, while **pediatric** specialists make up **12%**.

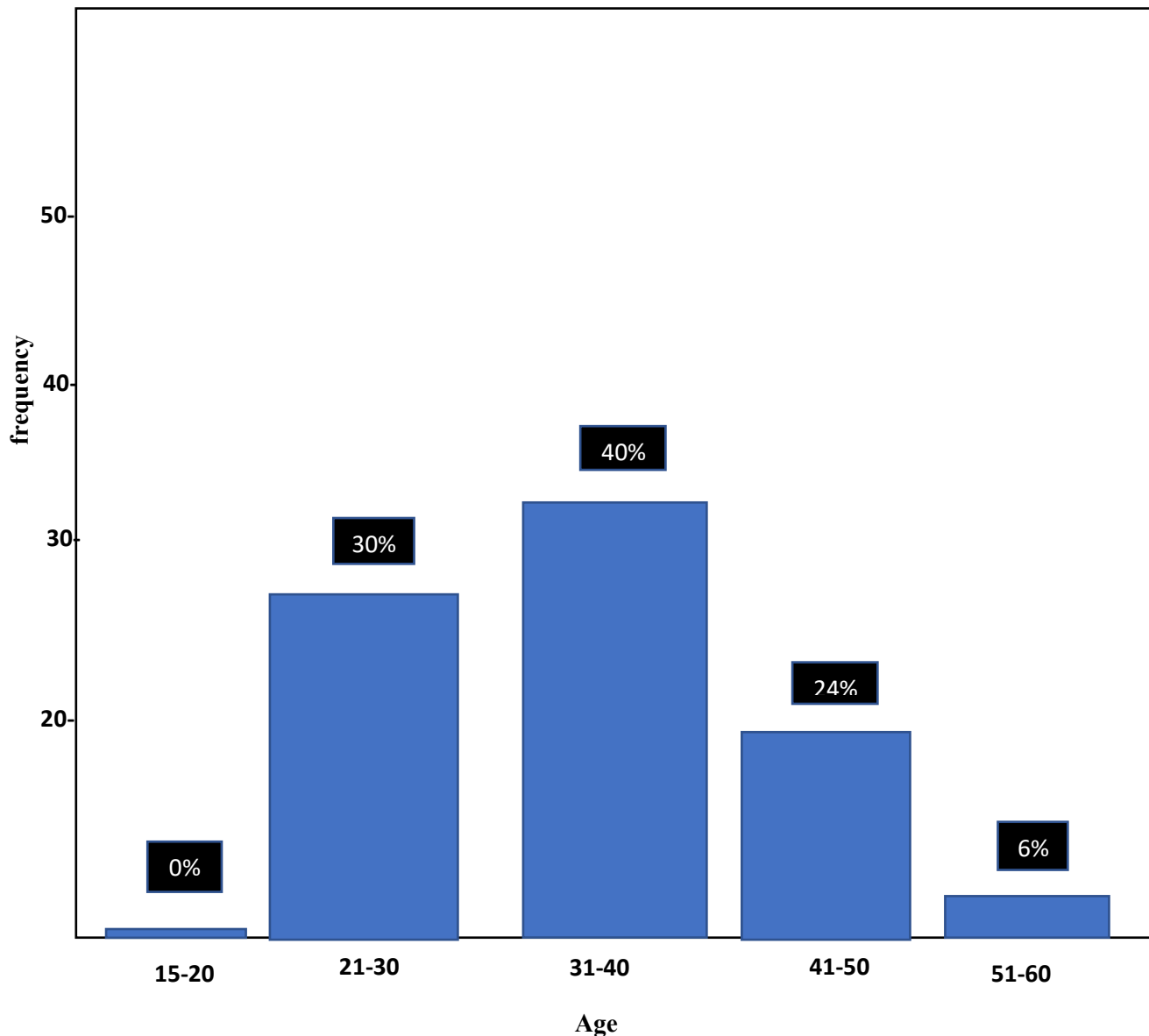
Notably, **no technicians** reported specialization in **Emergency Room (ER)** work, possibly reflecting a separation between ER and OR staff in these hospitals.

Results 4.3. distribution of operation technicians providers demographic data regarding on fire risk assessment during time out in the operating room at Sanaa hospitals , Yemen

	Sub Items	frequency	percentage
Educational level	Diploma	30	30 %
	Bachelor	35	35 %
	Master	25	25 %
	PhD	10	10 %
	Other	0	0 %
Gender	Male	65	65 %
	Female	35	35 %
Type of Jop	Fixed	83	83 %
	Retired	17	17 %
Years' experience	1-5 years	33	33 %
	6-10 years	35	35 %
	11-15 years	20	20 %
	More than 15 years	12	12 %

The table 4.3. show that most of Educational level was (35%) , whereas (65%) was male .the majority of job was fixed (83%),and the most years' experience was (35%)

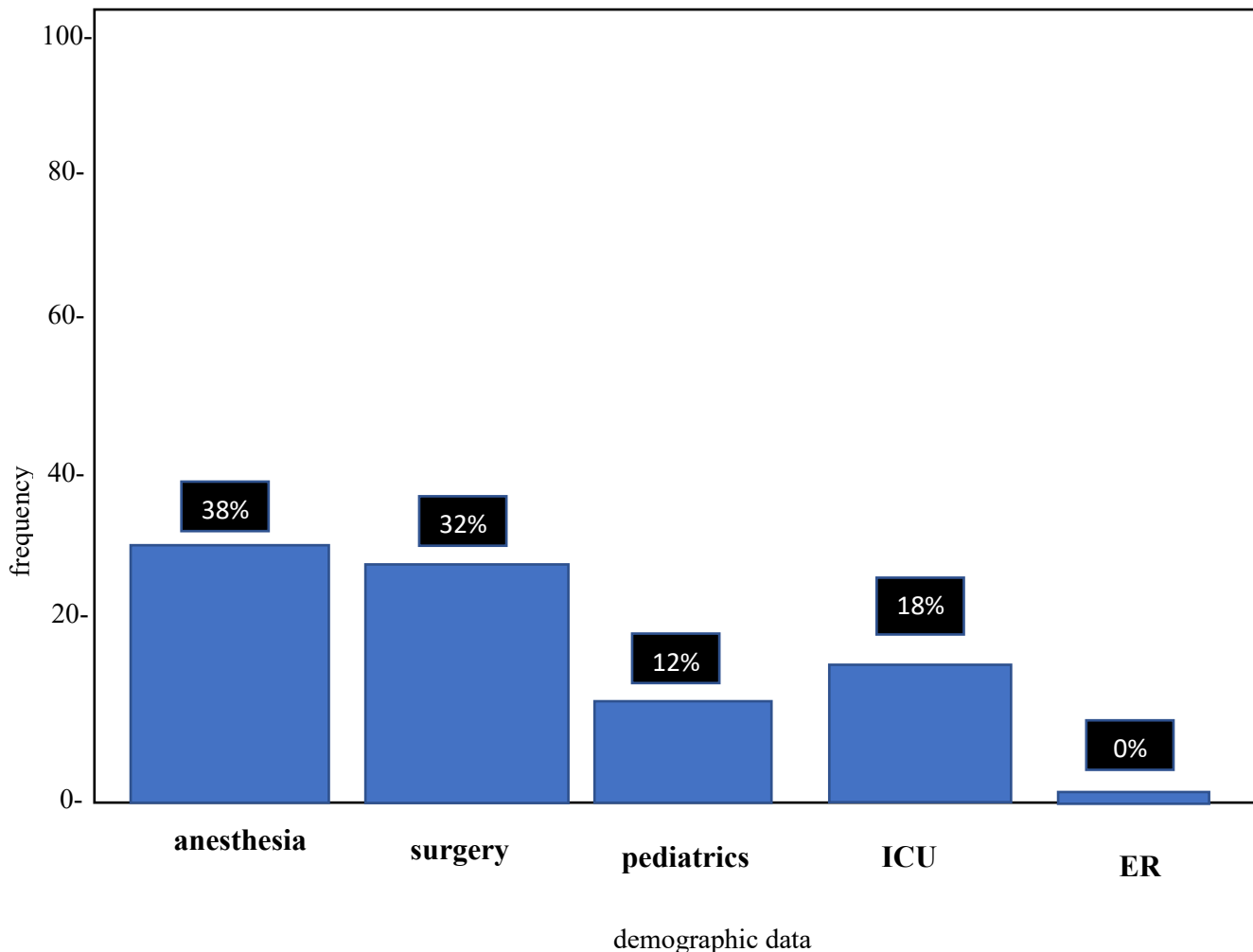
Results 4.4. distribution of operation technicians providers demographic data regarding on fire risk assessment during time out in the operating room at Sanaa hospitals , Yemen.



Age Group:

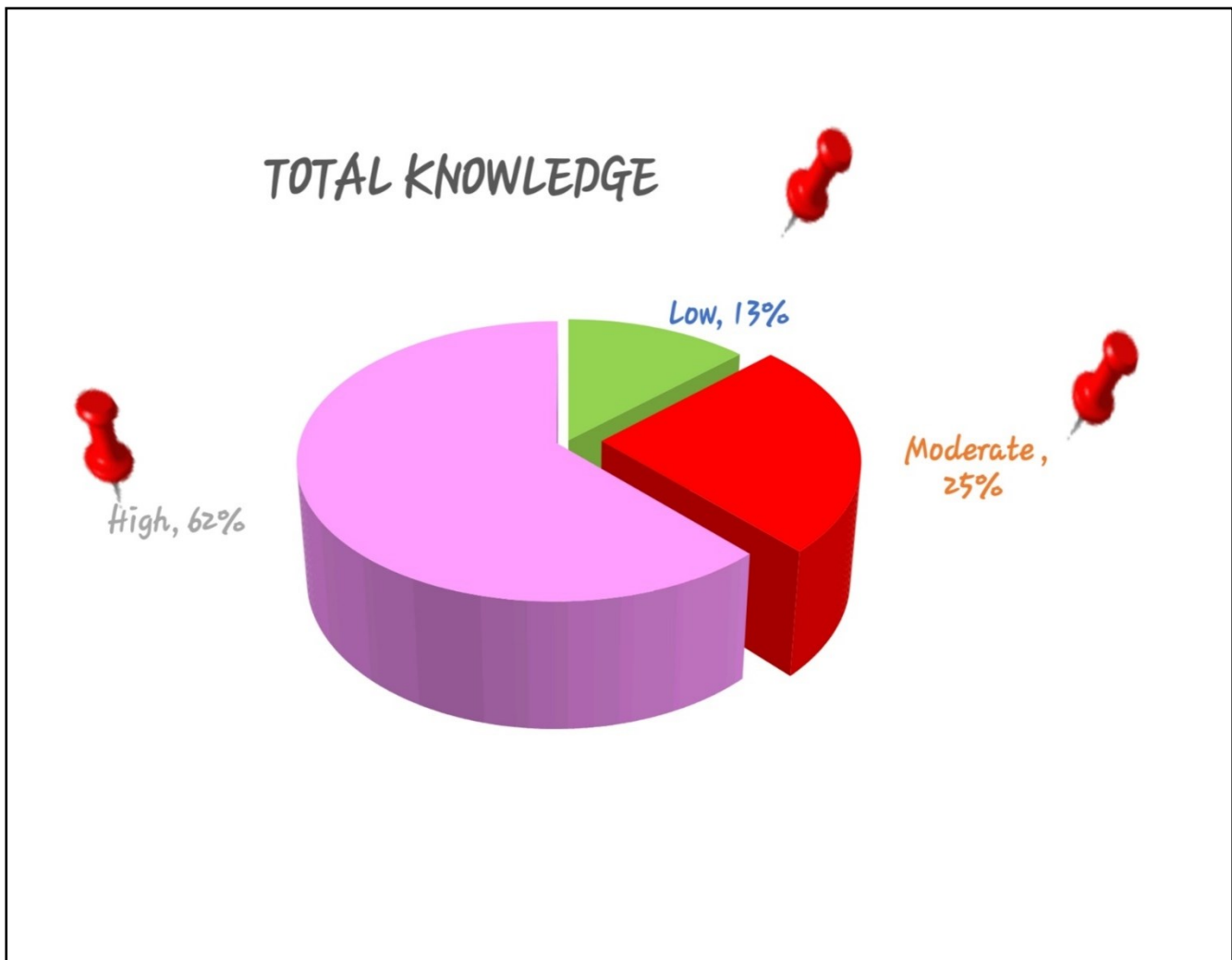
The majority of operating room technicians are aged between **31–40 years (40%)**, indicating a relatively young and active workforce. The **21–30 age group** follows with **30%**, showing that a substantial portion of the staff are early in their careers. The **41–50 group** makes up **24%**, while only **6%** are aged **51–60**. No participants were in the 15–20 range, indicating that all technicians are mature and experienced adults.

Results 4.5. distribution of operation technicians providers demographic data regarding on fire risk assessment during time out in the operating room at Sanaa hospitals , Yemen.



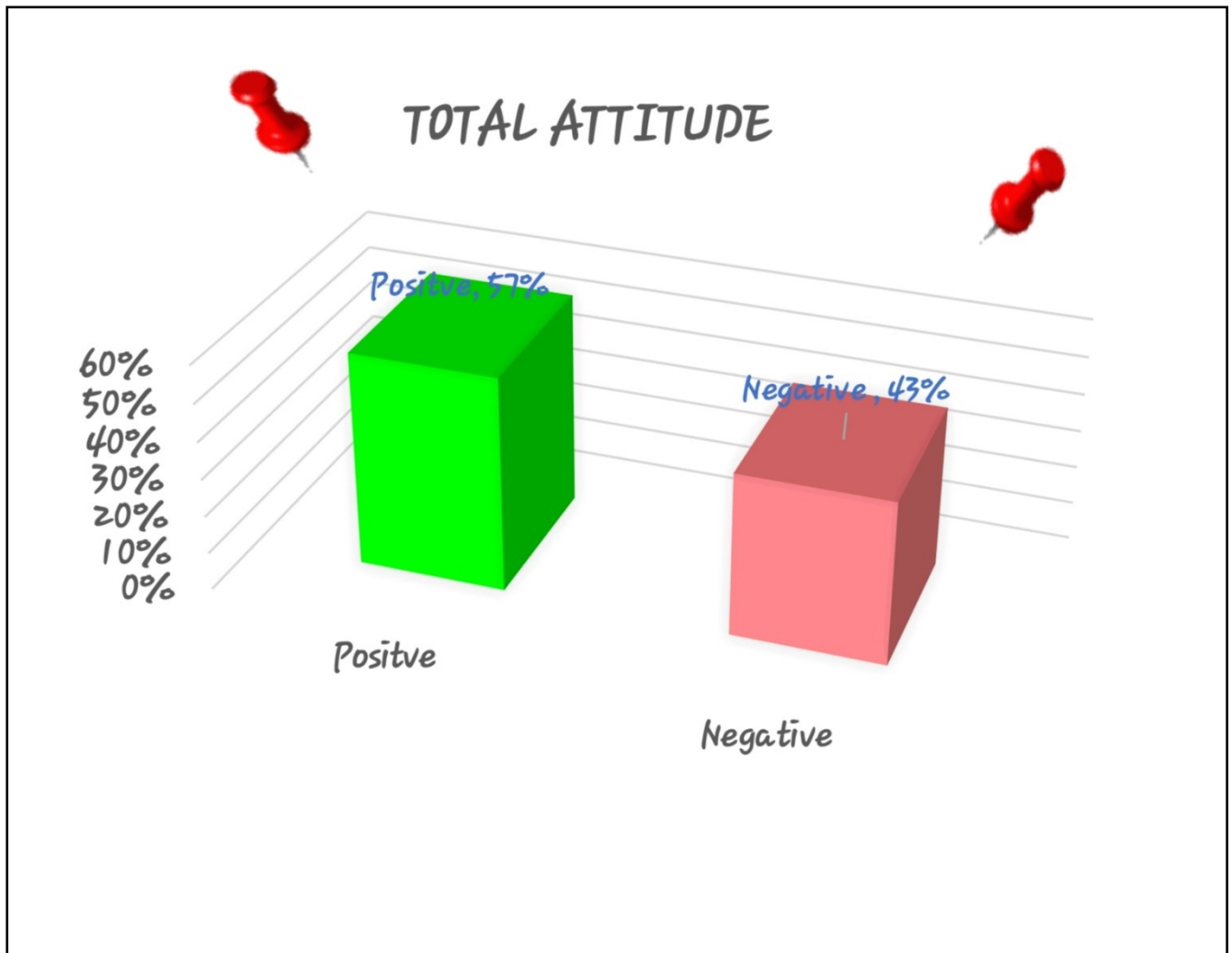
Specialization: Anesthesia technicians represent the largest group at **38%**, followed by those in **surgery (32%)**, indicating that these two areas are the most critical in the operating room team .ICU specialists account for **18%**, while **pediatric** specialists make up **12%**.Notably, **no technicians** reported specialization in **Emergency Room (ER)** work, possibly reflecting a separation between ER and OR staff in these hospitals.

Results 4.6. distribution of operation technicians providers total knowledge regarding on fire risk assessment during time out in the operating room at Sanaa hospitals , Yemen.



The finding that 65% of technicians demonstrated adequate knowledge of fire risk assessment suggests that there is a solid foundation of understanding among the staff. However, the 13% with low knowledge and 30% indicating negative knowledge show that there are pockets of staff who may, either through lack of training or awareness, be ill-prepared for fire emergencies .

Results 4.7. distribution of operation technicians providers total knowledge regarding on fire risk assessment during time out in the operating room at Sanaa hospitals , Yemen.



A positive attitude (60%) towards fire risk assessment suggests that most technicians are open to engaging with fire safety training and protocols. However, the 40% negative attitude may highlight a need for further educational programs aimed at improving not only their knowledge but their confidence and willingness to engage with fire risk assessments

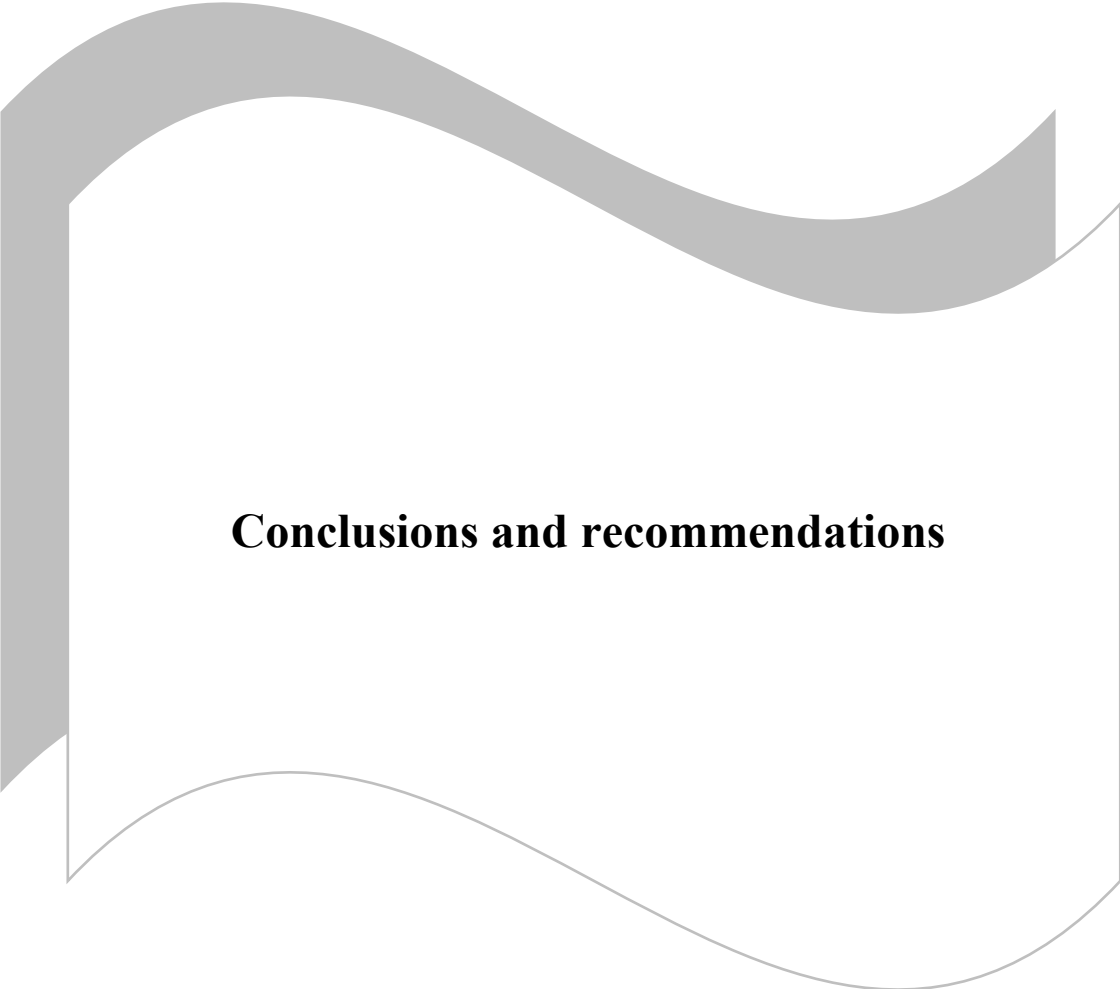
Chapter five
Discussion

5.discussion

This study done in Sanaa city – Yemen in Dec 2024 to Jan 2025 which aimed to assessment of operations technicians providers knowledge and attitudes on fire risk during time out in the operating room at Sanaa hospitals Yemen. The majority of technicians (62%) demonstrated high knowledge, reflecting a strong foundation in safety practices. This could be attributed to their education level and on-the-job experience, as many held bachelor's degrees and had between 6–10 years of experience .

However, the presence of moderate (25%) and low (13%) knowledge levels is concerning. This gap suggests inconsistencies in training or access to continuous professional development. Additionally, although over half of the participants (57%) expressed a positive attitude toward fire risk assessment, a significant 43% held negative attitudes. Negative attitudes could act as barriers to the proper implementation of safety measures in the operating room and may stem from a lack of motivation, awareness, or organizational support

Gender imbalance and the dominance of anesthesia and surgical specialties indicate a workforce focused on critical areas but may require broader interdisciplinary training. Furthermore, the relatively young age distribution presents an opportunity to shape safety culture early in their careers. The results of this study provide important insights into the current status of fire risk awareness and preparedness among operating room technicians. The data shows that 62% of participants demonstrated a high level of knowledge, which is a strong and promising indicator. This could be attributed to their educational background, with most having bachelor's or master's degrees, and their years of work experience—many falling within the 6–10 years range. In terms of attitude, the study shows a positive outlook in 57% of technicians, but also reveals that 43% hold a negative attitude toward fire risk assessment. A negative attitude could mean underestimating the importance of fire safety, lack of motivation to engage in training, or feeling that fire incidents are unlikely to occur. Such attitudes could lead to carelessness, delayed responses, or poor compliance with safety protocols during surgery or emergencies. Moreover, the demographic data revealed that most of the staff are in fixed positions and relatively young (ages 21–40), meaning there is a significant opportunity to influence and shape their professional habits and safety culture. The majority of technicians specialized in anesthesia and surgery.

A decorative border with a wavy, flowing design. It starts with a thick grey band on the left, curves into a white space, and then forms a grey band at the top right. The bottom of the page is also framed by a thin grey line that follows a similar wavy pattern.

Conclusions and recommendations

Conclusions and recommendations

Conclusions

The study concludes that although the general level of knowledge and attitude regarding fire risk assessment is acceptable, it is not uniform across all technicians. While most have high knowledge, there is still a significant portion with moderate to low knowledge, which could lead to gaps in safety practice. Additionally, the 43% of technicians with a negative attitude present a risk to the full implementation of fire safety measures. Without a supportive attitude, even knowledgeable staff might not act effectively during an emergency.

The data suggest that these issues may be rooted in a lack of formal training, insufficient institutional policies, and a misconception that fire risk assessment is not essential during time-out procedures. Additionally, time pressures, heavy workloads, and lack of continuous professional development opportunities contribute to these challenges. Staff resistance to ongoing education, whether due to low motivation or logistical challenges, also suggests that hospitals may need to re-evaluate their engagement strategies.

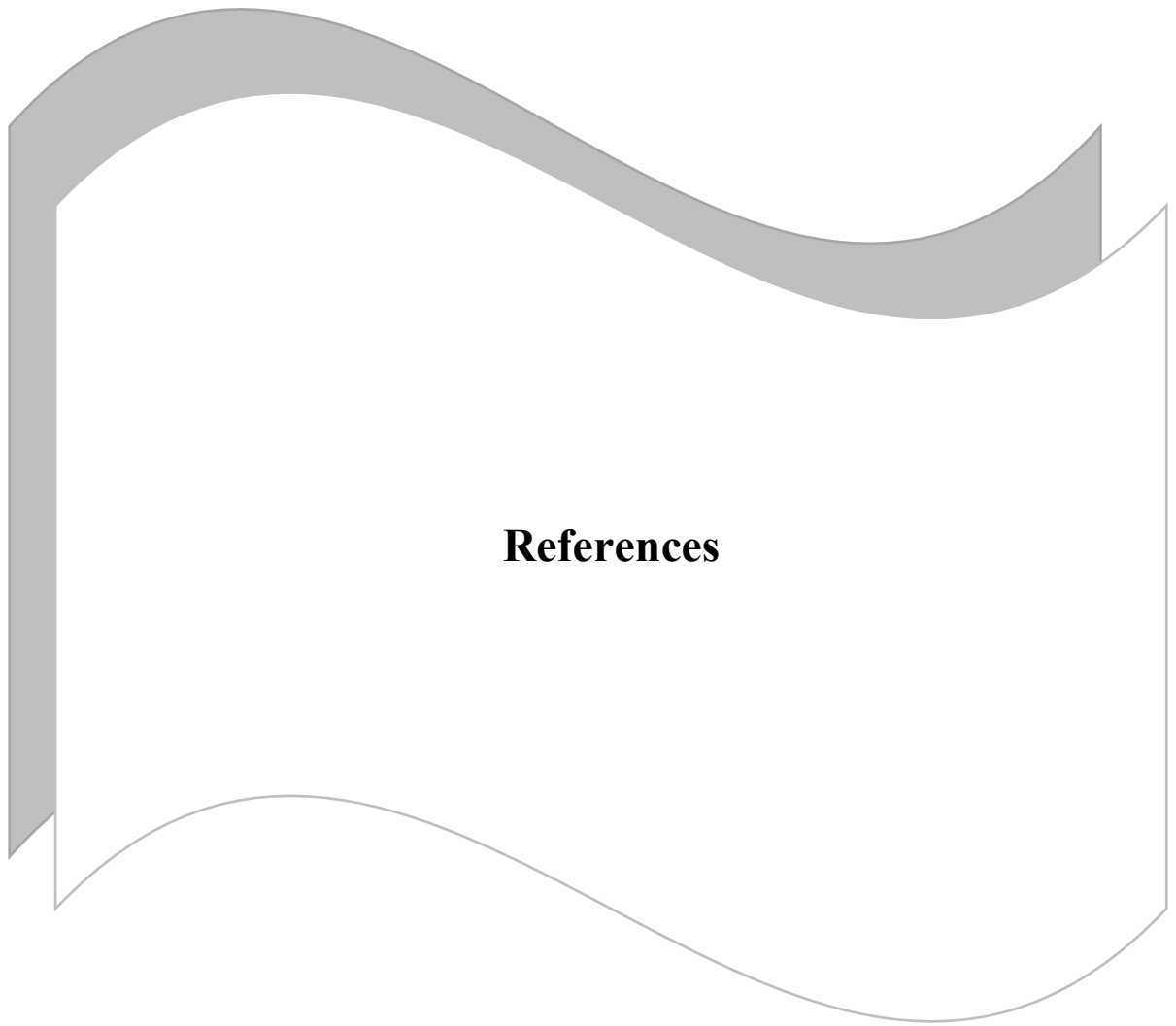
In essence, while there is a good foundation to build upon, the current level of preparedness is not sufficient to ensure optimal fire safety. Addressing these issues through structured interventions and leadership commitment will be key to improving compliance and promoting a culture of safety.

significant proportion of operation technicians at hospitals in Sana'a demonstrate a high level of knowledge and positive attitudes regarding fire risk assessment during time-out procedures, there are still critical gaps that need attention. These include variations in knowledge levels, where some staff lack essential understanding of fire safety practices. Furthermore, a concerning percentage of staff show negative attitudes, which could hinder proper implementation of fire risk protocols in high-risk areas like the operating room.

Conclusions and recommendations

recommendation

1. Standardized Fire Risk Training:
 - a. Implement regular, structured training programs focusing specifically on fire risk,
 - b. These should include theoretical sessions, practical demonstrations, and simulated drills.
2. Mandatory Orientation for New Staff:
 - a. Make fire safety training a compulsory part of the induction process for all new operating room staff.
3. Ongoing Refresher Courses:
 - a. Conduct periodic refresher courses to update existing staff on new technologies, procedures, and risks.
4. Develop a Fire Safety Protocol Manual:
 - a. Distribute a manual or guidebook that clearly outlines steps to prevent and respond to fire incidents during surgical procedures.
5. Promote Positive Attitudes Through Leadership:
 - a. Department heads and senior staff should model good practices and emphasize the importance of fire safety during meetings and daily operations.
6. Regular Assessment of Knowledge and Attitudes:
 - a. Carry out evaluations and surveys to monitor changes in knowledge and attitudes and to identify areas needing improvement.
7. Encourage a Safety-First Culture:
 - a. Use posters, announcements, and visual reminders in the operating rooms to keep safety top of mind.
 - b. Recognize and reward staff who show outstanding commitment to safety practices.
8. Collaborate with Fire and Emergency Experts:
 - a. Invite external fire safety professionals to conduct training or review hospital readiness for emergencies.



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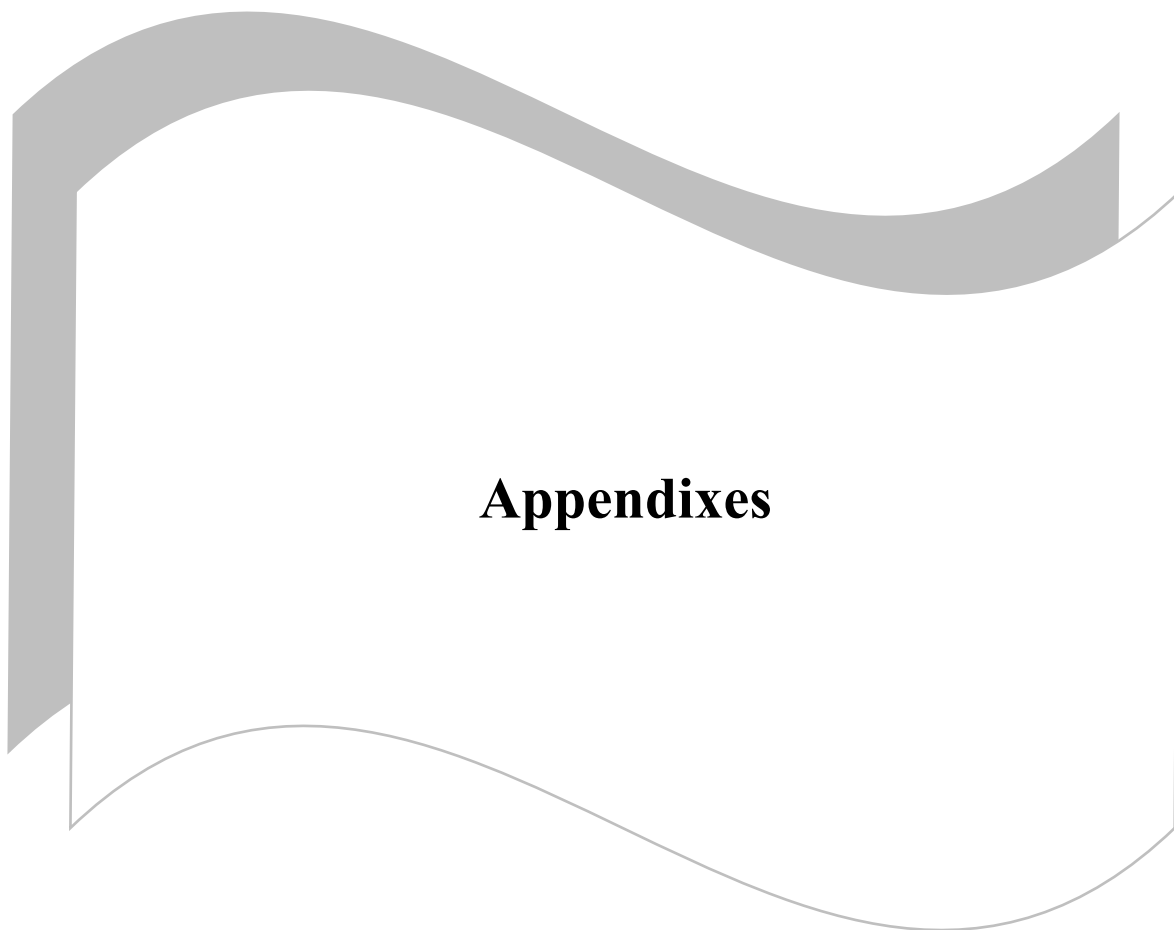
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Appendixes



استبيان حول معرفة ومواقف فنيي غرف العمليات بشأن تقييم مخاطر الحريق أثناء الوقت المقطوع في غرف العمليات بالمستشفيات الحكومية في مدينة صنعاء

Assessment Operation Room Technicians ' Knowledge and Attitudes on Fire Risk During Time-Out in the Operating Room

(at Public Hospitals in Sana'a city)

تعد سلامة المرضى وفريق العمل في غرف العمليات أولوية قصوى ضمن النظام الصحي. في هذا السياق، يلعب تقييم مخاطر الحريق أثناء الوقت المقطوع في غرف العمليات دوراً حيوياً في تعزيز معايير الأمان وتقليل الحوادث. يهدف هذا الاستبيان إلى قياس مدى معرفة ومواقف فنيي غرف العمليات بشأن تقييم مخاطر الحريق أثناء العمليات الجراحية، مع التركيز على المستشفيات الحكومية في مدينة صنعاء. يأتي هذا البحث كجزء من متطلبات التخرج لطلاب دبلوم فني العمليات المركز الطبي، كلية البيئة وخدمة المجتمع، جامعة 21 سبتمبر.

ملاحظات للمشاركين:

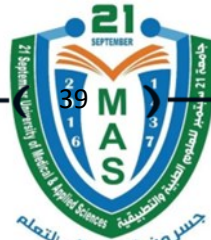
يُرجى الإجابة على جميع الأسئلة بصدق وشفافية.
جميع البيانات ستستخدم لأغراض بحثية فقط وستعامل بسرية تامة.

مشاركتم القيمة تساهم في تحسين معايير السلامة وتعزيز الجودة في القطاع الصحي.

نشكر لكم وقتكم وتعاونكم.

الباحثون: طلاب دبلوم فني العمليات

بإشراف: [د. زيد السريحي]



أولاً: البيانات الشخصية:

- 1) العمر:
- 2) التخصص:
- 3) الجنس: ذكر ☐ انثى ☐.
- 4) المستوى التعليمي: شهادة التمريض المدرسي ☐ الدبلوم ☐ بكالوريوس ☐ ماجستير ☐ . دكتوراه ☐ اخوي ☐
- 5) نوع الوظيفة : ثابت ☐ متقاعد ☐.
- 6) سنوات الخبرة: 1-5 سنوات ☐ من 6-10 سنوات ☐ من 11-15 سنوات ☐ اكثر من 15 سنوات ☐

ثانيا : الجانب المعرفي :

1) ما المقصود ب الوقت المقطوع في غرفة العمليات :

- ☐ التوقف لتجنب الأخطاء الجراحية
- ☐ اجراء للتأكد من سلامة المريض
- ☐ تقييم مخاطر الحريق
- ☐ جميع ما سبق

2) ماهي العناصر الثلاثة الرئيسية التي تشكل مخاطر الحريق في غرفة العمليات :

- ☐ الاكسجين , الوقود , مصدر الاشتعال
- ☐ الأدوات , الجراح , التخدير
- ☐ التهوية , الإضاءة , الكهرباء

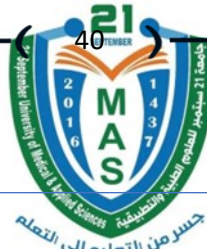
3) ماهي المخاطر المرتبطة باستخدام الأجهزة الكهربائية الجراحية :

☐ انفجار الأجهزة

☐ انتاج شرارة يمكن ان تسبب حريقا

☐ زياده تدفق الاكسجين

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عمادة البيئة وخدمة المجتمع
المركز الطبي للتدريب والتأهيل

4) كيف يمكن الحد من مخاطر الحريق عند استخدام المطهرات الكحولية:

☐ تجفيف المنطقة تماما قبل بدء الجراحة

☐ التهوية الجيدة للغرفة

☐ وضع حد لاستخدام الكحول

5) ما هو الاجراء الأول الذي يجب اتخاذه عند نشوب حريق اثناء الجراحه :

☐ إطفاء مصدر الاشتعال

☐ اخلاء المريض

☐ إيقاف التدخل الجراحي

6) ما مدى أهمية الاكسجين في زياده مخاطر الحريق

☐ قليل جدا

☐ معتدل

☐ مرتفع جدا

7) أي من هذه الأدوات تعد مصدرا شائعا للاشتعال :

☐ أجهزة الليزر

☐ المقصات الجراحية

☐ القلغزات الجراحية

8) ماهي الاجراءات الوقائية لتجنب الحريق عند استخدام الليزر :

☐ استخدام نظارات واقية

☐ تغطية المناطق المحيطة بمواد مقاومة للحريق

☐ الحد من كمية الاكسجين

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(9) ما الهدف من تقييم مخاطر الحريق اثناء الوقت المقطوع :

☐ تحديد العوامل التي تزيد من مخاطر الحريق

☐ تحسين إجراءات التعقيم

☐ تقليل وقت الجراحة

(10) هل يعتبر التدريب المستمر للفريق الجراحي أداة فعالة للحد من مخاطر الحريق :

☐ نعم

☐ لا

(11) هل اجراء تقييم مخاطر الحريق اثناء الوقت المقطوع يعد ضروريا في ممارسات فني العمليات

☐ نعم

☐ لا

(12) هل انت على علم بانواع المصادر الأساسية للمعلومات المتعلقة بتقييم مخاطر الحريق اثناء الوقت المقطوع

☐ نعم

☐ لا

(13) هل لديك المعرفة الكافية بكيفية استرجاع المعلومات حول تقييم مخاطر الحريق اثناء الوقت المقطوع

☐ نعم

☐ لا

(14) هل تستطيع تقييم مدى صحة البيانات المتعلقة بتقييم مخاطر الحريق اثناء الوقت المقطوع

☐ نعم

☐ لا

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عمادة البيئة وخدمة المجتمع

المركز الطبي للتدريب والتأهيل

- ثالثا الاتجاهات:

(1) إلى أي مدى ترى أن تقييم مخاطر الحريق أثناء التوقف المؤقت أمر ضروري؟

☐ ضروري جداً

☐ ضروري

☐ غير ضروري

(2) هل تشعر بالثقة الكافية لتحديد مصادر خطر الحريق في غرفة العمليات؟

☐ نعم

☐ لا

(3) إلى أي مدى تعتقد أن الحريق في غرفة العمليات يمكن الوقاية منه

☐ يمكن الوقاية منه تمامًا

☐ يمكن تقليله

☐ لا يمكن الوقاية منه

(4) هل توافق على أن التقييم المنتظم لمخاطر الحريق أثناء التوقف المؤقت يقلل من الحوادث

☐ أوافق بشدة

☐ أوافق

☐ لا أوافق

(5) هل تشعر بأن التوقف المؤقت في منشأتك يتم تنفيذه بشكل فعال؟

☐ نعم

☐ لا

(6) هل تعتقد أن فريق العمل بأكمله مسؤول عن تقليل مخاطر الحريق؟

☐ نعم

☐ لا

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المركز الطبي للتدريب والتأهيل

(7) إلى أي مدى تعتقد أن التدريب الإضافي على مخاطر الحريق سيزيد من سلامة غرفة العمليات؟

☐ بدرجة كبيرة جدًا

☐ بدرجة متوسطة

☐ لا تأثير

(8) هل تعتقد أن استخدام معدات مقاومة للحريق في غرفة العمليات أمر مكلف لكنه ضروري؟

☐ أوافق بشدة

☐ أوافق

☐ لا أوافق

9) إلى أي مدى تشعر أن إدارة المستشفى تدعم جهود الحد من مخاطر الحريق؟

☐ دعم كبير جدًا

☐ دعم معتدل

☐ لا يوجد دعم

☐

10) هل توافق على أن تقييم مخاطر الحريق يجب أن يصبح جزءًا رسميًا من التوقف المؤقت

☐ أوافق بشدة

☐ وافق

☐ لا أوافق

والبحر جزييل الشكر



الأستاذ الدكتور / محمد جحاف

رئيس هيئة مستنفي الجمهوري العام
الموضوع: تسهيل مهمة بحث

تودركم جامعة ٢١ سبتمبر للعلوم الطبية والتطبيقية أطوب تحياتها وتقديرها وإشارة إلى الموضوع أعلاه تكموا مشكورين بالتوجيه إلى من يلزم بتسهيل مهمة بحث طلاب المركز الطبي للتدريب والتأهيل تخصص (فني عمليات) الدفعة السادسة مستوى ثالث ، تحت إشراف د/ زيد المريحي ولمدة (ثلاثة اشهر) بحسب عنوان البحث الموضح قرين اسمائهم:

الاسم	عنوان البحث
١	بشائر محمد صالح المجوشي
٢	عبدالله محمد سالم بنتراميل
٣	عبدالله ناصر أحمد علي محمد
٤	مخولة سيف محمد زيمان
٥	فردوس صالح علي محب الجلال
٦	اسمى محمد أحمد الخزالي
٧	بغداد علي مهدي لكسر عباد

Operating Room Technicians
Knowledge and Attitudes on Fire
Risk, Assessment during Time out, in
OR at public Hospitals in Sana'a.

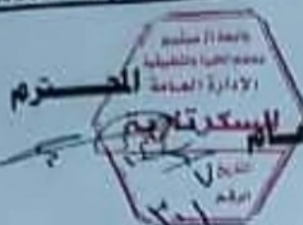
...ولكم جزيل الشكر...

استاذ دكتور

مجاهد علي معصا
رئيس الجامعة

08 DEC 2023





الأستاذ الدكتور/ محمد جحاف

رئيس هيئة مستشفى الثورة العام

الموضوع: تسهيل مهمة بحث

تهديكم جامعة ٢١ سبتمبر للعلوم الطبية والتطبيقية أطيب تحياتها وتقديرها وإشارة إلى الموضوع أعلاه تكموا مشكورين بالتوجيه الى من يلزم بتسهيل مهمة بحث طلاب المركز الطبي للتدريب والتأهيل تخصص (فني عمليات) الدفعة السادسة مستوى ثالث ، تحت اشراف د/ زيد المريحي ولمدة (ثلاثة اشهر) بحسب عنوان البحث الموضح قرين اسمائهم:

الاسم	عنوان البحث
١	بشار محمد صالح المعجني
٢	عبد الرحمن مكيو بشراميل
٣	عبد ناصر احمد علي محمد
٤	خولة سيف محمد رمضان
٥	فردوس صالح علي محب الجلال
٦	امالي محمد احمد الغزالي
٧	بغداد علي مهدي ناصر عبدالله

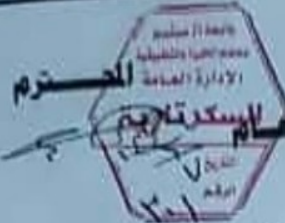
Operating Room Technicians
Knowledge and Attitudes on Fire
Risk, Assessment during Time out, in
OR at public Hospitals in Sana'a.

ولكم جزيل الشكر،،،

استاذ الدكتور
مجاهد علي معصار
رئيس الجامعة

08 DEC 2023





الأستاذ الدكتور / محمد جحاف

رئيس هيئة مستشفى الكويت العام
الموضوع: تسهيل مهمة بحث

تهدىكم جامعة سبتمبر للعلوم الطبية والتطبيقية أطيب تحياتها وتقديرها وإشارة إلى الموضوع أعلاه تكموا مشكورين بالتوجيه إلى من يلزم بتسهيل مهمة بحث طلاب المركز الطبي للتدريب والتأهيل تخصص (فني عمليات) الدورة السادسة مستوى ثالث ، تحت إشراف د/ زيد المريخي ولمدة (ثلاثة أشهر) بحسب عنوان البحث الموضح قرين اسمائهم:

الاسم	عنوان البحث
1. بشير محمد صالح المجعني	Operating Room Technicians Knowledge and Attitudes on Fire Risk, Assessment during Time out, in OR at public Hospitals in Sana'a.
2. عابد أمين سالم بشراميل	
3. عمار ناصر أحمد علي محمد	
4. مخلوطة سيف محمد زيمان	
5. فردوس صالح علي محب الهلال	
6. اسماء محمد أحمد الخرافي	
7. بغداد علي مهدي ناصر عبدالله	

...ولكم جزيل الشكر...

استاذ الدكتور

معاهد علي معصار

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08 DEC 2023

الخلاصة

تُعد حرائق غرف العمليات خطرًا خطيرًا، ولكنه غالبًا ما يتم تجاهله أثناء العمليات الجراحية. هدفت هذه الدراسة إلى تقييم معارف ومواقف فنيي العمليات بشأن تقييم مخاطر الحرائق أثناء عملية الاستراحة في غرف العمليات بمستشفيات صنعاء، اليمن. يُدرج حريق غرفة العمليات ضمن فئة "الأحداث التي لا تحدث أبدًا" والتي يمكن الوقاية منها وغالبًا ما تؤدي إلى نتائج سيئة للمرضى. ومع ذلك، لا توجد حاليًا سياسة موحدة بين منظمات الصناعة فيما يتعلق بإدراج خطر الحريق في عملية الوقت المقطوع، على الرغم من أن جميع المنظمات تدرك وجود الخطر. كان الغرض من هذه الدراسة الوصفية هو فحص معارف ومواقف فنيي العمليات بشأن تقييم مخاطر الحرائق أثناء الاستراحة في غرفة العمليات بمستشفيات صنعاء، اليمن. تم استخدام تصميم وصفي مقطعي لتقييم معارف ومواقف مقدمي خدمات فنيي العمليات بشأن تقييم مخاطر الحرائق أثناء الاستراحة في غرفة العمليات بمستشفيات صنعاء، اليمن. أُجريت دراسة وصفية مقطعية على 100 فني عمليات من مستشفيات مختلفة في صنعاء. واستُخدم إستبيان مُنظم لجمع البيانات حول الخصائص الديموغرافية، والخلفية التعليمية، وسنوات الخبرة، ومستوى معرفتهم بتقييم مخاطر الحرائق. تراوحت أعمار معظم المشاركين بين 31 و40 عامًا (30%)، وحصل غالبيتهم على دبلوم (41%) وخبرة تتراوح بين سنة وخمس سنوات (39%). وتخصص الفنيون بشكل رئيسي في التخدير (32%) والجراحة (18%)، وكان 67% منهم من الذكور. كشف تقييم المعرفة أن 13% لديهم معرفة منخفضة، و35% لديهم معرفة متوسطة، و52% لديهم معرفة عالية فيما يتعلق بتقييم مخاطر الحرائق أثناء إجراءات الاستراحة، وتم استخدام إستبيان منظم لجمع البيانات حول خصائص المعرفة الكلية، وكانت مستويات معرفتهم فيما يتعلق بتقييم مخاطر الحرائق عالية في (62%) ومتوسطة في (25%) ومنخفضة في (13%). وكان توزيع فنيي العمليات لجمع البيانات حول الموقف الإجمالي فيما يتعلق بمخاطر الحرائق إيجابيًا في (57%) وسلبياً في (43%). في حين أظهر أكثر من نصف فنيي العمليات معرفة عالية، إلا أن نسبة كبيرة منهم لا تزال تُظهر وعيًا متوسطًا إلى منخفضًا ببروتوكولات تقييم مخاطر الحرائق. وتسلط هذه النتائج الضوء على الحاجة إلى التدريب المستهدف وتنفيذ ممارسات السلامة من الحرائق الموحدة أثناء الوقت المقطوع للعمليات الجراحية في المستشفيات لضمان السلامة الشاملة لغرفة العمليات. في حين أظهر أكثر من نصف فنيي العمليات معرفة عالية، إلا أن نسبة كبيرة منهم لا تزال تُظهر وعيًا متوسطًا إلى منخفضًا ببروتوكولات تقييم مخاطر الحرائق. تسلط هذه النتائج الضوء على الحاجة إلى تدريب مُستهدف وتطبيق ممارسات موحدة للسلامة من الحرائق أثناء فترة الاستراحة الجراحية في المستشفيات اليمنية لضمان تقييم شامل لمخاطر السلامة في غرفة العمليات أثناء فترة الاستراحة. وقد وُجد أن التقييم كان إيجابيًا إلى حد كبير بين المشاركين. ومع ذلك، لا يزالون بحاجة إلى مزيد من التنقيف حول كيفية نشر المعلومات الرئيسية المتعلقة بتقييم مخاطر الحرائق أثناء فترة الاستراحة في غرفة العمليات لتحسين ممارسات السلامة من الحرائق لمهنيي الرعاية الصحية في غرفة العمليات.

الكلمات المفتاحية: حريق غرفة العمليات، الوقت المقطوع، السلامة من الحرائق، العمليات، فني عمليات، تقييم المعرفة.

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قسم العمليات

معرفة ومواقف فني العمليات بشأن تقييم مخاطر الحريق أثناء الوقت المقطوع في غرفة العمليات في مستشفيات صنعاء اليمن

مشروع بحث مقدم إلى قسم فني العمليات بالمركز الطبي للتدريب والتأهيل جامعة 21 سبتمبر للعلوم
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