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Original Research Article

UNDERSTANDING THE LEVEL OF KNOWLEDGE AMONG NURSES ABOUT FIRE SAFETY IN TERTIARY CARE HOSPITAL LAHORE

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Abstract: *Fire safety in healthcare facilities is an important but frequently disregarded part of hospital administration and patient care. Despite substantial study on different aspects of healthcare delivery, there is still a significant gap in understanding and measuring fire safety knowledge and practices among healthcare personnel, particularly in Pakistan's tertiary care facilities.* ***Objective:*** *The purpose of this study was to assess the degree of fire safety knowledge among medical personnel at a tertiary care hospital in Lahore, Pakistan, to identify any shortcomings that may affect their capacity to respond effectively in the event of a fire.* ***Methods:*** *A cross sectional quantitative descriptive study was conducted at Public Tertiary care hospital in Lahore involving 202 nurses. A customized questionnaire was administered to assess the participant's fire safety knowledge, selected through successive sampling. Data analysis was performed using SPSS version 22.0, categorizing knowledge level as poor, average and good.* ***Results:*** *85% of survey participants were aware of fire response procedures. However, only 15% knew the fire department contact numbers, and 25% were unaware that foam or water extinguishers are ineffective against grease fires. Additionally, a significant proportion of participants struggled to correctly identify different types of fire extinguishers (65%) and fire categories (50%). The finding underscore the importance of comprehensive fire safety training to address significant knowledge gaps.* ***Conclusions:*** *Healthcare institutions should develop comprehensive fire safety training programs that extend beyond basic emergency protocols. Regular fire drills and simulations should be held to check staff members' understanding and reinforce fire safety procedures. Administrators should examine and update fire safety protocols on a regular basis to reflect new technology, legislation, and lessons learnt from previous events.*

Keywords: Fire Prevention Health Personnel Safety Management Hospitals, Public Cross-Sectional Studies

Introduction

Fire safety in healthcare facilities is an important but frequently disregarded part of hospital administration and patient care (1). Despite substantial study on different aspects of healthcare delivery, there is still a significant gap in understanding and measuring fire safety knowledge and practices among healthcare personnel, particularly in Pakistan's tertiary care facilities.

Hospitals are distinct settings characterised by the presence of combustible materials and the complicated demands of severely sick patients, which complicate evacuation processes and heighten the risk for serious outcomes during crises. (2). Fire preventive measures are critical for preventing fatalities and minimising financial losses, especially as patients with illnesses or impairments escape more slowly (3). The majority of hospital fires related with COVID-19 happened in developing nations such as Iraq, India, and Russia, where a lack of sufficient firefighting equipment increases the danger of fire (4). To avoid fire-related incidents, frontline healthcare personnel must understand and follow fire safety prrotocols (2). Additionally, fire emissions have a substantial influence on atmospheric composition, which affects security, health, and climate. Fire, both lethal and non-fatal, has devastating effects on buildings and other structures (5).Effective fire safety standards are vital to limit these hazards, as hospital fires can cause severe loss of life and substantial property damage (6). Despite global acknowledgement of fire safety as a critical component of preparedness for emergencies, research particularly focussing on the fire safety knowledge and practices of healthcare personnel in Pakistan is sparse.

This study seeks to close this gap by assessing the present level of fire safety awareness and the application of fire safety measures among healthcare staff in Pakistani tertiary care facilities. By identifying current weaknesses and advocating increased fire safety standards, this research hopes to contribute to the development of fire safety practices, eventually assuring a safer environment for patients, staff, and hospital infrastructure.

Methodology

A quantitative descriptive survey was conducted among nurses at Sir Ganga Ram Hospital in Lahore between June 2024 and August 2024.The sample included staff nurses, male female and Using Raosoft, a sample size of 202 healthcare professionals was determined with a 0.5% margin of error and a 95% confidence interval from total population of 421 workers. The research was approved from institutional review board and ethical committee gave its approval for the conduction of this research. Informed consent was taken from all the participants.

Strict confidentiality measures were followed, and all information was safely preserved. Participants experienced

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no dangers during the study, and all precautions were taken to protect their safety. The independence of this study and its conflict-free implementation maintained its integrity and ethical conduct.

All paticipants who gave their consent were enrolled in the study while those who didn't gave consent or filled incomplete questionaire were excluded from the research. Demograohics details of all participants based on age, gender, education, title, and years of service were collected. Percentages were utilised to express healthcare personnel' fire safety understanding. Tables and charts were used to show the data so that the conclusions could be understood clearly. The data was analysed using SPSS version 22.0. Knowledge levels were classified into three categories: poor (<50%), average (50-75%), and good (>75%).

Results

Out of the 202 participants, 175 (86.63%) were female, and 27 (13.36%) were male (figure1). The average age of the respondents was 32.64 years, with the majority (37.12%) falling in the 18-27 age group, followed by 28-37 years (33.66%), 38-47 years (19.90%), and 48-57 years (9.40%).

In terms of qualifications, 33% had post RN credentials, 7% had a generic BSN, 4% has MSN, and 56% had a nursing diploma. Furthermore, 85% of the participants were staff nurses, while only 15% were head nurses (table 1). Regarding professional experience, 25% had less than 1 years, 35% had 1-4 years, 25% had 5-8 years, and 15% had more than 9 years of experience.

According to an assessment of their understanding of fire safety, 85% of participants knew what to do in the case of a fire. Additionally, 60.50% of respondents correctly recognised the sorts of fires for which dry chemical powder extinguishers are appropriate. Only 15% of respondents were aware of the fire department's emergency contact numbers. Surprisingly, 25% of participants were unaware that water and foam extinguishers are useless against grease or cooking oil fires. Furthermore, 50% and 65% of participants struggled to accurately identify the five categories of fires and the various types of fire extinguishers. On a bright side, 60.53% of respondents knew where the evacuation map was, and 66.60% could identify at least two types of firefighting equipment accessible at the institution.

25% of the study population fell in the poor category while 62.5% fell in the average cateogory while 12.5 % had good knowledge about fire safety (table 2).

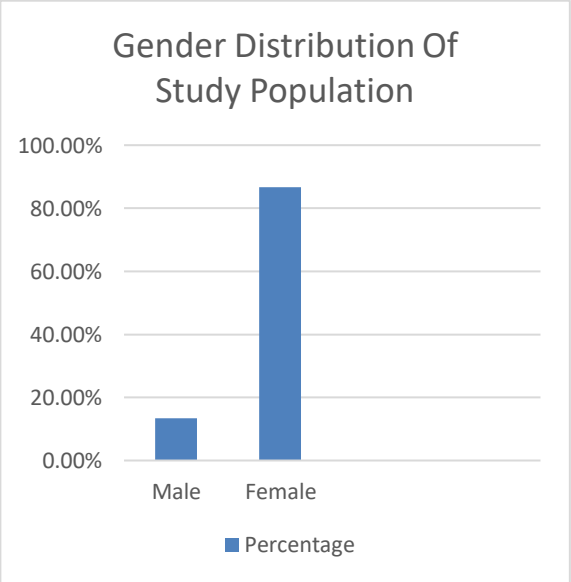

Figure 1 showing gender distribution of the study population

Table 1: Showing Demographics of the study population

Characteristics	Number (n=202)	Percentage
Age in Years		
18-27	74	36.63%
28-37	68	33.66%
38-47	40	19.80%
48-57	20	9.90%
Mean age 32.64		
Education		
General Nursing and Midwifery	114	56%
Post RN BSN	66	33%
BSN Generic (4 years)	14	07%
MSN	8	04%
Designation		
Staff Nurses	172	85%
Head Nurses	30	15%
Work experience		
<1 years	50	24.75%
1-4 years	71	35.14%

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5-8 years	51	25.24%
>9 years	30	15.85%

Table 2: Showing the knowledge status of the study population

Knowledge Category	Frequency %
Poor	25%
Average	62.5%
Good	12.5%

Discussion

Fire safety in healthcare settings is a crucial problem, considering the sensitive nature of patients and the complex environs of hospitals. The study's conclusion provides a detailed assessment of the existing level of fire safety knowledge among healthcare workers at a tertiary care centre in Lahore. The findings demonstrate diverse levels of comprehension, with some areas demonstrating appropriate knowledge and others revealing considerable gaps that might cause concerns during a fire emergency. A good finding from the study was that the majority of participants were aware of the correct protocols to follow in the event of a fire, suggesting a basic comprehension of fire emergency procedures. However, worrying gaps were detected, such as only a few responders knowing the fire emergency contact number, which may result in delays in notifying fire services during crises.

Recent studies have underscored the importance of fire safety knowledge among healthcare workers to ensure patient and staff safety (7). Healthcare facilities, particularly tertiary care hospitals, are at a higher risk due to the presence of flammable materials and equipment (8) . A study by Che Huei et al. found that comprehensive fire safety training significantly reduces the incidence of fire-related incidents in hospitals (9). In Pakistan, the emphasis on fire safety has been relatively recent, with increasing awareness and implementation of safety protocols (10). A survey conducted by Khan et al revealed that many healthcare workers in Pakistani tertiary care hospitals have limited knowledge of fire safety procedures (11). This gap in knowledge can lead to disastrous outcomes in emergency situations. The study by Patel et al. highlighted that regular fire drills and updated training programs are crucial in maintaining a high level of preparedness among hospital staff (12). Moreover, the integration of fire safety education in the curriculum for healthcare workers has shown promising results in improving safety awareness (13) . Another research by Liu et al demonstrated that continuous professional development and refresher courses in fire safety are essential to keep the staff updated with the latest safety protocols (14). The role of hospital administration is also pivotal in ensuring that fire safety measures are adhered to and regularly reviewed (15). Additionally, technological advancements, such as the use of fire detection and suppression systems, have been effective in mitigating fire risks in healthcare settings (16). The study by Meechang emphasized that despite technological aids, the human factor knowledge and preparedness of healthcare workers remains a critical component of effective fire safety management (17). The study also identified gaps in understanding about various types of fires and proper firefighting equipment. While some participants accurately recognised key characteristics, a large number lacked precise comprehension, notably in recognising fire classifications and discriminating between fire extinguishers. A lack of technical knowledge may limit an efficient reaction in emergency circumstances demanding particular firefighting procedures. On a bright side, the majority of participants were aware of the placement of evacuation maps and could identify firefighting equipment on-site. However, a significant proportion of responders were ignorant of the evacuation map's position, emphasising the significance of regular drills and increased visibility of critical fire safety components to guarantee a safe evacuation procedure.

The study highlights the difficulties of maintaining fire safety in hospital settings, where specific characteristics such as fragile patients, combustible materials, and modern technology raise the danger of fire events. While fundamental fire safety knowledge is widely shared among healthcare staff, addressing gaps in more advanced concepts via focused training and continuous education is critical to improving overall fire safety in healthcare institutions.

There are certain limitations to the findings of this study that should be kept in mind. The study was carried out at a single tertiary care facility in Lahore. While the sample size was appropriate for the study's aims. The findings may not be applicable to other hospitals in various cities due to differences in resources, staff training programs, and fire safety measures. The use of self-reported data in this study may introduce bias, since respondents may have misread questions or overstated their knowledge in order to appear more educated. The survey's quantitative descriptive approach gives a snapshot of people's awareness of fire safety, which limits the capacity to examine changes in knowledge over time or the effectiveness of fire safety training programs. This study did not take into account contextual influences, such as recent fire safety training or previous encounters with fire events, which might have impacted participants' knowledge and reactions.

Conclusion

Healthcare institutions should develop comprehensive fire safety training programs that extend beyond basic emergency protocols. Regular fire drills and simulations should be held to check staff members' understanding and reinforce fire safety procedures. Administrators should examine and update fire safety protocols on a regular basis to reflect new technology, legislation, and lessons learnt from previous events.

Declarations

Data Availability statement

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All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-NSUP-02/24)

Consent for publication

Approved

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Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

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Coordination of collaborative efforts.
Study Design, Review of Literature.
ASMAT NAZAR (Co-Investigator)
Conception of Study, Development of Research Methodology Design, Study Design, Review of manuscript, final approval of manuscript.
Conception of Study, Final approval of manuscript.
MS. MAHNOOR (Supervisor)
Manuscript revisions, critical input.
Data acquisition, and analysis.
Manuscript drafting.
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