



Radiation Safety Awareness Among Healthcare Workers In Education And Hospital

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Abstract:

Radiation safety is vital for healthcare workers who are exposed to ionizing radiation as part of their routine. This study assesses the knowledge and awareness of radiation safety practices among healthcare workers in a tertiary care hospital in Ambala, India. Conducted as a cross-sectional survey with 50 participants, the study evaluated their understanding of radiation hazards, protective measures, and training needs. While 92% of respondents recognized the harmful effects of radiation, only 36% had formal training in radiation safety. The findings reveal a gap between theoretical awareness and practical application, emphasizing the need for regular workshops and strict adherence to safety protocols. The study highlights the importance of fostering a culture of safety to minimize radiation-related risks for healthcare professionals.

Keywords: Radiation safety, ionizing radiation, ALARA, healthcare workers, occupational safety.

I. INTRODUCTION

Radiation plays a pivotal role in modern healthcare, particularly in diagnostic and therapeutic applications. Since the discovery of X-rays in 1895 by Wilhelm Roentgen, imaging modalities like computed tomography (CT), magnetic resonance imaging (MRI), and fluoroscopy have transformed medical practice. However, the benefits of radiation are accompanied by risks, especially for healthcare workers who are exposed daily.

Exposure to ionizing radiation can lead to deterministic effects such as skin burns and cataracts, as well as stochastic effects like cancer. Recognizing these risks, international guidelines emphasize the importance of the ALARA (As Low As Reasonably Achievable) principle.

Healthcare workers' knowledge and adherence to radiation safety protocols are crucial to minimizing these risks. This study evaluates the current level of awareness and practices among healthcare professionals in a tertiary care setting and highlights areas needing improvement.

II. Literature review:

Historical context: Radiation safety awareness has evolved significantly since the early 20th century. Initial efforts focused on shielding devices, while contemporary practices emphasize active monitoring and training. International bodies such as the International Commission on Radiological Protection (ICRP) have established guidelines for occupational exposure limits.

Knowledge Gaps

Studies worldwide report varying levels of awareness among healthcare workers. Research in Malaysia revealed only 40% of nurses were aware of radiation safety protocols, while a study in the Middle East found significant gaps in training among non-radiology staff.

Importance of Training

Regular workshops and certifications enhance compliance with safety protocols. Studies show that training increases adherence to the ALARA principle and improves the proper use of protective equipment like lead aprons and thyroid shields.

III. Methodology

Study Design

This cross-sectional survey was conducted between November 2021 and April 2022 at Maharishi Markandeshwar Institute of Medical Science and Research, Ambala.

Participants

Fifty healthcare workers, including radiologists, radiographers, nurses, and support staff, were selected. Inclusion criteria required participants to have regular exposure to radiation zones.

Data Collection

A 27-item structured questionnaire was used, covering demographics, radiation safety knowledge, and practical application.

Analysis

Data were analyzed using descriptive statistics to identify knowledge gaps and trends.

IV. Results

Demographics

- **Age Distribution:** 46% of participants were aged 20–30 years, and 30% were 31–40 years.
- **Gender:** 70% female, 30% male.

Awareness Levels

- 92% recognized the harmful effects of radiation.
- 88% identified ionizing radiation as more hazardous than non-ionizing radiation.
- 86% knew that children are more radiosensitive.

Training and Application

- 36% had formal training in radiation safety.
- 50% adhered strictly to ALARA principles.
- 36% reported discomfort during radiological procedures due to inadequate shielding.

Table 1: Summary of Awareness Levels

Awareness Factor	Percentage Aware
Harmful Effects of Radiation	92%
Importance of Protective Equipment	98%
ALARA Principle Compliance	50%

V. Discussion

Findings Compared to Literature

The study aligns with global trends, where awareness is high, but training remains inadequate. For instance, similar gaps were noted in studies from Trinidad and the Middle East.

Implications

Lack of formal training undermines the application of safety protocols. Institutions must prioritize continuous education to enhance compliance.

Recommendations

1. Regular workshops on radiation safety.
2. Periodic evaluations to ensure adherence to ALARA principles.
3. Availability and enforcement of protective equipment use.

VI.Conclusion

The study underscores the importance of bridging the gap between theoretical knowledge and practical application of radiation safety. By fostering a safety-first culture, healthcare institutions can protect both staff and patients from radiation-related risks.

VII.References:

1. International Commission on Radiological Protection. "Occupational Exposure Guidelines."
2. Ahmad, R. (2021). "Radiation Safety Practices in Healthcare Settings." Open Journal of Radiology.
3. Khamtuikrua, C. "Radiation Hazards Awareness Among Nurses." Journal of Radiological Research, 2020.

