A Study on Adherence to Radiation Safety for Employees in Multispeciality Hospital.

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Abstract -The purpose of this study was to evaluate how well medical professionals who work in radiation zones comply to radiation safety regulations. At a hospital with multiple specialties, a study was conducted in radiation exposure departments Cathlab, OT, endoscopy, dental, urology, nuclear medicine and radiology departments. Clinicians, nurses, technicians, and other staff members who work in the radiation exposure area were the study's target populations.133 people in all, including doctors (30), technicians (39), nurses (55), and other employees (9), participated in this study. One crucial element to ensure good practise in the radiation exposure department is the observance of safety precautions. It is also important to evaluate the all radiation exposure department's ongoing quality improvement. Adherence to safety precautions is important for many accreditation and approval processes like NABH, JCI, etc.This study is to determine the practices and knowledge of radiation safety measures such as using of PMS(Personnel Monitoring Service) and PPE kit (Personal Protective Equipment) during procedure, among healthcare professionals in multi specialty hospital.

***Key Words*:** Adherence, radiation safety, radiation exposure, PMS and PPE kit.

1.INTRODUCTION

1.1 DEFINITION:

Radiation safety is a concern for patients, physicians, and staff in many departments, including radiology, interventional cardiology, and surgery. Radiation emitted during fluoroscopic procedures is responsible for the greatest radiation dose for medical staff. Radiation from diagnostic imaging modalities, such as computed tomography, mammography, and nuclear imaging, are minor contributors to the cumulative dose exposures of healthcare personnel. However, any radiation exposure poses a potential risk to both patients and healthcare workers alike. Radiation protection aims to reduce unnecessary radiation exposure with a goal to minimize the harmful effects of ionizing radiation. In order to minimize the detrimental effects of ionising radiation, radiation protection seeks to prevent unneeded radiation exposure.

This research is to ascertain the usage and familarity of medical staff in amulti speciality hospital with radiation safety precautions such the use of PMS(Personnel Monitoring Service) and PPE(Personal Protective Equipment) during procedures.

1.2 OBJECTIVES OF STUDY

1. To study the present radiation safety practises followed by staff in the radiation exposure departments in hospital.
2. To analyse the adherence to radiance safety by the staff.
3. To suggest proper radiation safety practice in the current workplace.

2.1LITERATURE REVIEW

1. According to **Prashant Kumar Jha.[8] (2022),** The purpose of this study was to evaluate how well medical professionals who work in radiation zones comply to radiation safety regulations. Across-sectional study was conducted at Gurgaon's tertiary medical facility. The study's target population comprised doctors, nurses, technicians, and other OT staff who worked in the operating room under the C-Arm. One crucial element to ensuring good practise in the radiology department is the observance of safety precautions. It is also important to

evaluate the radiology department's ongoing quality improvement. Adherence to safety precautions is crucial for numerous accreditation and approval processes, including NABH, JCI,and others.

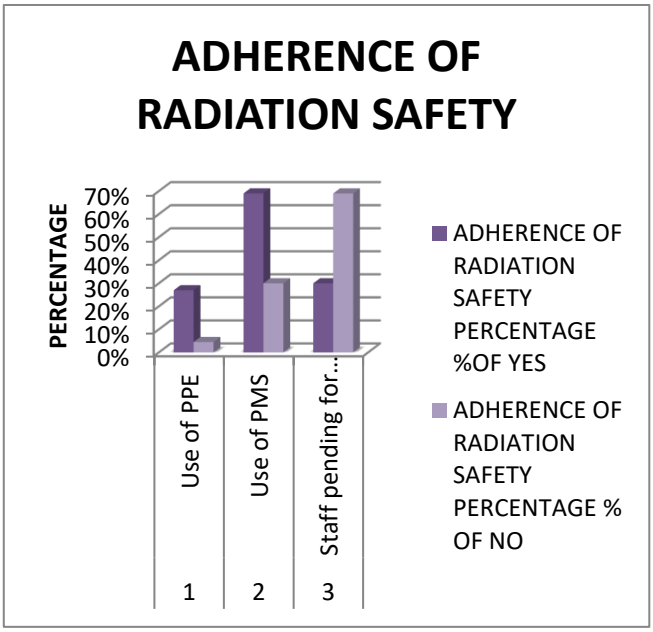
2. According to **Philip Nii Gorleku et al.[10] (2022)** to evaluate the knowledge and practises of radiation protection among radiographers in Ghana's central area. The awareness of radiation safety practises was typically high, and there was a decent amount of adherence to them, but that is insufficient. There is still potential for development in terms of ensuring that knowledge is applied in order to improve appropriate safety precautions, ensure successful work, and generally lessen the adverse effects of ionising radiation.

2.2 METHODOLOGY

This cohort study took place in the radiation exposure departments (Cathlab, OT, endoscopy, dental, urology, nuclear medicine and radiology) of the selected hospital from January 2023- March 2023. The simple random sampling technique and primary data is used inorder to collect data. About 133 data were collected by observational method using a checklist. For this purpose percentage analysis and statistical analysis has been recognized.

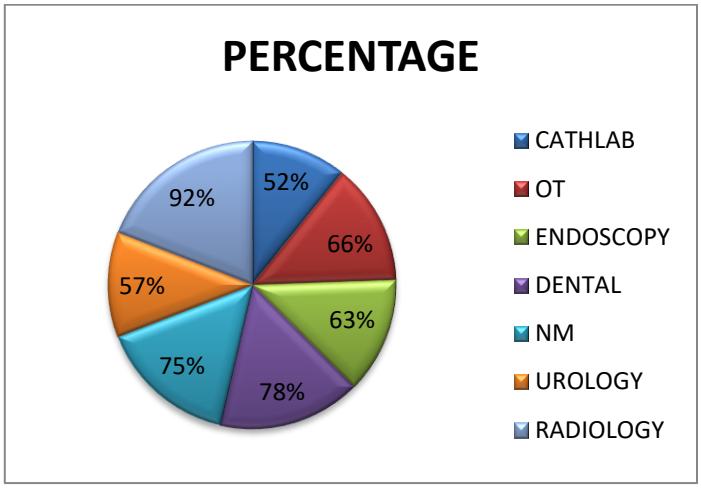
2.3 ANALYSIS

Chart 2.3.1. showing the percentage of observation of Adherence of radiation safety by employees working under radiation exposure.



This above chart 2.3.1.Shows the staff compliance with radiation safety. During the procedure, 69% members of the crew used PMS, and 30% of them lacked TLD(Thermo Luminescent Dosimeter) badge, where that 30% of the staff are awaiting TLDs from RSO (Radiation Safety Officer). And 27% of the participants used PPE kit during the procedure and 4.5% weren't utilised.

Chart- 2.3.2. Showing the percentage of observation of Adherence of radiation safety by employees department wise.



This chart- 2.3.2. shows the percentage of departments that adhere to radiation safety. Which 52% of the staff in cathlab uses TLD badges in that 32% of staff did not applied for TLD badges and 16% did not collected their TLD badges from RSO, 66% of the staff in OT uses TLD badges, 34% have not

applied for TLD, 63% of the staff in Endoscopy uses TLD, where 21% have not applied and 13% of staff TLD badges are in procees, 78% of the staff in Dental uses TLD, where 22% have not applied for TLD badges, 75% of the staff in Nuclear Medicine uses TLD, 2% of staff have not applied and 23% of staff TLD badges are in process, 57% of the staff in urology uses TLD, 43% have not applied and 92% of the staff in radiology department uses TLD badges, 8% of staff have not collected their TLD badges from RSO.

2.4 MAJOR FINDINGS AND RECOMMENDATIONS:

1. Adequate training was not provided for employees.
2. 10% of employees, according to the statistical research, are not aware that they are exposed to radiation.
3. 16% of staff in cathlab and 8% of staff in radiology was not able to retrieve their TLD badges.
4. 30% of employees did not apply for TLD badges.
5. The PPE kit was improperly stored in OT, Cathlab and radiology.
6. The PPE screening is done once in every six months.

The recommendations includes,

1. As per the observation, Employee should recieve proper training once in every six months in order to update them.
2. Appointing a staff member in each department to manage the list of employees with TLD and the number of TLD's yet to be applied.
3. Each department,s responsible staff members should ensure that PPE kits are properly maintained and stored.
4. The maintenance of PPE, TLD resubmission, and whether all new staff hasreceived their badges should all be inspected monthly by the RSO.

3. CONCLUSIONS

The total number of participants included in this study was 133. Participant gender distribution was 44% male and 56% female, with ages ranging from 22 to 62. Overall, 69% of professionals follow safety protocols when working in radiation prone areas and 27% of workers employed personnel protection equipment like a lead apron.There are various safety dangers associated with working in the radiation department, but that can be minimized or eliminated with proper management. Each and every healthcare professional should be provided with proper information and training regarding radiation exposure. Equipment for radiation monitoring and personnel protection is an essential part of radiology practice. It is the duty of employer to provide it to each employee who works in the radiation zone. This study primarily examines how health care professionals adhere to radiation safety precautions and their understanding. Overall in this study, adherence was in moderate level, certain suggestions are provided in this study in order to improvise the adherence level. To achieve the highest degree of proficiency, proper instruction and good practise must be used.

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