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A STUDY ON AWARENESS AND USAGE OF PERSONAL PROTECTIVE EQUIPMENT IN RADIOLOGY DEPARTMENT IN ONE OF THE MULTISPECIALITY HOSPITALS IN COIMBATORE

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ABSTRACT:

Purpose: The study aims to measure the awareness and Use of Personal Protective Equipment in the radiology department. **Methods:** This descriptive study intends to assess how well the radiology department is aware of and using personal protective equipment. To gather data, a random sample method is employed. Questionnaires were the instruments utilized for data gathering. Cross-sectional research was conducted. **Results:** A total of forty data were collected from the radiology technicians who participated in the study. 25 respondents were technicians and 15 respondents were other staff. The majority of participants (63%) believed that radiation exposure which happens on a regular basis at work is extremely detrimental. When working in a radiation-exposed area, 78% and 72% of respondents said they always used lead aprons and thyroid shields, respectively. The understanding of radiology technicians and assistant technicians on radiation protection must therefore be improved, notably with regard to the use of lead aprons and radiation dosimeters.

Keywords: Radiation, technicians, respondents, radiology.

I. INTRODUCTION:

The World Health Organization (WHO) defines personal protective equipment as "clothes placed to protect the healthcare workers or any other persons from becoming infected."Face protection, goggles, a mask or face shield, gloves, a gown or coverall, a head cover, and rubber boots are common components of medical PPE (Personal Protective Equipment). A radiographer has a special professional responsibility to himself and others around him for a decrease in the risks brought on by ionizing radiation because they are at the forefront of radiation dose delivery. Atomic interactions that cause ionization during radiation exposure to people might result in chemical and biological alterations that are harmful to the cells and chromosomes. Two different cellular damage can result from these radiation-induced alterations. Protection from unnecessary radiation becomes of utmost importance in light of the potential dangers that radiation may pose. Radiation protection refers to the numerous techniques and tools that should be used to safeguard all radiation workers and patients against these dangers. For radiation protection, the linear non threshold (LNT) model is used for all radiation practices (Martin 2004).

Lead aprons: Lead aprons are created by mixing lead powder with a rubber or vinyl binder. They are available in different lead equivalents. An apron with a lead equivalent of at least 0.25mm should be employed if used as a secondary barrier to absorb dispersed radiation. Lead aprons for fluoroscopy must be at least 0.5mm of lead equivalent thick, however they are permitted to be as thick as 1mm. The heavier weight of higher lead equivalent aprons is a drawback. Aprons are now produced using composite materials, which combine lead, barium and tungsten.

Lead Gloves: These gloves protect against at least 0.25mm of lead equivalent. Used primarily by individuals holding patients during examinations or in fluoroscopy.

Understanding radiation safety issues is crucial since they are a significant topic that must be taken into account in the diagnostic radiography department (Moores, 2006). If not handled carefully, ionizing radiation can really harm both present and future generations, so it is crucial to understand radiation protection and how PPE should be used in this job to help with radiation protection.

Objectives of the Study:

- To study on awareness of PPE (Personal Protective Equipment) kit in radiology department.
- To measure the usage of PPE kit by the employee.
- To encourage technicians to use PPE more frequently and to better understand radiation protection procedures.

II REVIEW OF LITERATURE:

According to Joao Andre Antunes-Raposo, et al (2022), dosimetric monitoring and anti-radiation personal protection equipment are crucial because hospitals are using more ionizing radiation, which exposes medical staff to health risks. Low risk perception, however, has a detrimental effect on compliance. To qualitatively describe worker ionizing radiation exposure, adherence to personal dosimeters, and anti-radiation personal protective equipment at a university hospital in Portugal.

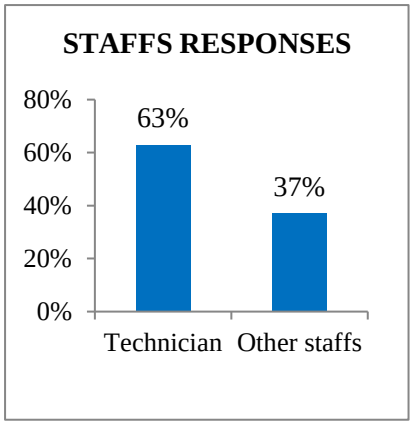
According to Chaowanan Khamtuikrua, Sirilak Suksompong (2020), medical radiation is increasingly used for surgical and procedural procedures, as well as for diagnosis. Hence, in order to safeguard themselves and their patients from radiation's harmful effects, healthcare professionals should be fully informed about radiation threats. The aim of this study was to investigate the anesthesia staff and surgical subspecialists at a quaternary care academic center's awareness of radiation hazards and understanding of protective measures.

III METHODOLOGY:

This is descriptive research that aims at the radiology department technicians of the selected hospital and their awareness of radiation hazard and usage of PPE kit in their hospital. Simple random sampling is used in order to collect data. About 45 employees were present in the hospital and, by considering Morgan’s table, 40 data were collected as a sample with a 95% confidence level. For this purpose, a questionnaire has been designed, making sure that the research questions do justice to what the researcher is trying to find and to provide the direction and shape of the research. Accordingly, the survey tool is a structured questionnaire divided into three parts. The first part includes demographic questions such as position, department, experience, radiation exposure percentage etc. and the second part is composed of usage of personal protective equipment and the third part includes awareness of radiation hazards.

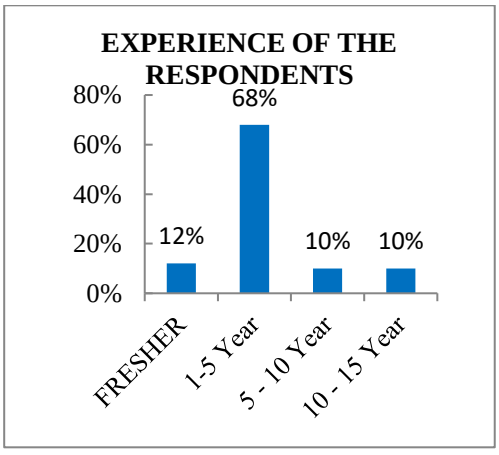
IV ANALYSIS

Chart -I Chart showing the respondents of staff



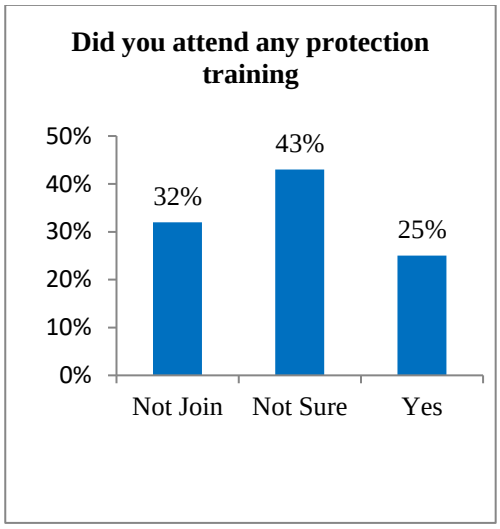
The above chart-I shows that 37% of respondents are from other staff, whereas 63% of respondents are technicians.

Chart -II Chart showing the respondents experience



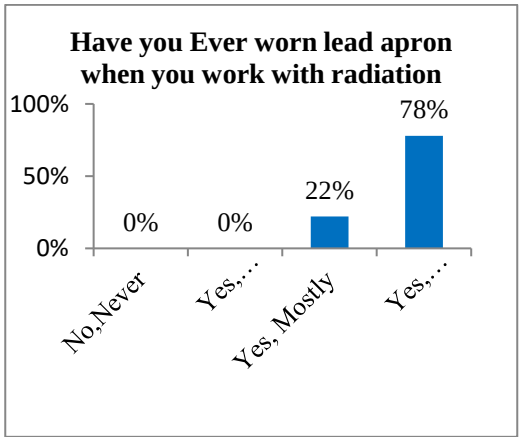
From the above chart – II, it is evident that in the responses 68% of technicians have 1 -5 year work experience, (12%) of technicians are fresher , 10% of technicians have 5-10 year experience and 3% of technicians have 10- 15 year experience.

Chart -III Chart showing the respondent's opinion for the question, "did you attend any protection training in hospital



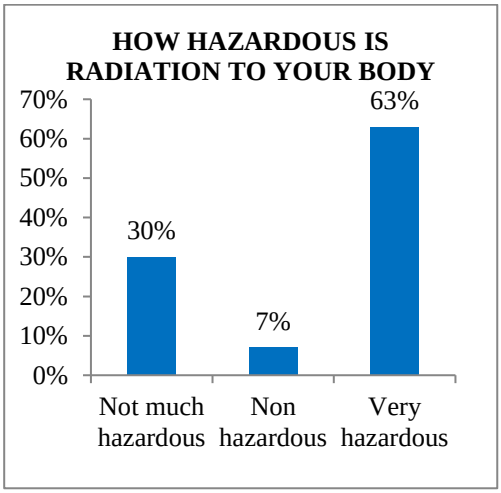
From the above chart – III, it is evident that about 43%, i.e., the majority of the technicians working in that hospital have answered not sure about the radiation protection training and 32% have answered they have not undergone radiation protection training and only 25% attended the radiation protection training.

CHART- IV Chart showing the respondents opinion for the question, "have you ever worn lead apron when you work with radiation"



From the above chart-IV, it is interpreted that the majority, 45% of the technician's responded every time they wore a lead apron when they work with radiation. 22% of the technician's responded that mostly they worn lead apron when they work with radiation.

CHART- V Chart showing the respondents opinion for the question, "how hazardous is radiation to your body"



From the above chart-V, it is interpreted that the majority, 63% of the technicians responded that radiation is very hazardous to their body, 30% of the technicians responded that radiation is not hazardous to their body and only 7% of technicians responded that radiation is non hazardous to their body.

MAJOR FINDINGS:

1. It was found that 78% of technicians wore a lead apron every time when they work with radiation.
2. It was found that 50% of technicians never wore lead goggles when they work with radiation.
3. It was found that 82% of technicians change gloves every time while treating each patient.
4. It was found that 72% of technicians wore thyroid shields every time when they work with radiation.
5. It was found that 43% of technicians were not sure about attending any radiation protection training session in hospital.

SUGGESTIONS:

1. All technicians must take up the recommended training about using personal protective equipment when they work with radiation.
2. Inspect all technicians if they are using their TLD batch properly in order to protect them from high radiation.
3. Once in every three months, the radiation dose must be calculated by all the technicians.
4. In case if the radiation dose is too high, respective technicians should be appointed in another department on a rotation basis to reduce their radiation dose.

CONCLUSION:

According to current research, radiation employees only have a fair amount of awareness but a relative lack of understanding about radiation threats and personal protective equipment. Therefore, it is necessary to mandate ongoing radiation protection training and teaching about radiation threats.

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