



Study on Work Safety for Employees in Radiology Department

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Background: Working staff in the radiology department are exposed to harmful factors such as Radiation exposure, injuries; needle pricks while performing an investigation, leads to exposure to body fluids, muscle stress due to wearing heavy lead aprons, and while moving portable equipment for examinations. Strategies to prevent and reduce such harmful factors are guaranteed by taking regular inspections by radiation safety officers. Safety supervision in radiology is important in shielding the patients, radiologists and healthcare staff. Observational safety audits and regular inspections in the radiology department for staff safety are the main and important parts of this study.

Objective: To assess and evaluate the current safety measures in Radiology Department and Scope of innovations and interventions in current working safety condition awareness.

Methods: All employees working in radiology department satisfying the inclusion criteria are evaluated for the study. A survey carried out related to general working and routine procedures carried out in radiology department. Regular audits and inspection studies are covered in the study. The study consists of closed-ended questions regarding the profession and the knowledge of the basic safety measures in diagnostic and special scans in radiology department.

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Results: Employees in the radiology department are highly aware about work safety measures. There are regular safety audits and inspection studies are carried out by RSO and concerning departments. There is also scope for radiation workers to have introductory seminars on radiation safety before they start working with radiation.

Conclusion: Working in the radiology department has several types of safety risks, which can be barred or compact if manage suitably. Informally with these types of risks and their penalty, agreement with policy and strategy on work ecological safety, and expansion of a traditions that supports supervision, treatment, and on time conduct will go far toward civilizing overall employee security for all employees in the radiology department.

Keywords: Employee safety; radiology staff; radiation; safety strategies; protective tools; monitoring and radiation safety program.

1. INTRODUCTION

Health is considered one of the fundamental human rights and the role of workers in the medical services system is indistinguishable [1].

In addition to this, healthcare sector is growing in India, on the contrary, not much research is done to determine the impact of developing policies for healthcare employees in order to progress the excellence of healthcare sector in the Indian subcontinent, suitable management of healthcare workers is necessary. The study suggests that training and continuous development of healthcare employees is critical for improving the performance of healthcare employees, and in turn the healthcare sector. Health is one of our fundamental human rights and the role of workers in the healthcare system is inseparable [2].

Work safety is the basic right of every employee. This is applied to every worker in every field. There is very much attention is focused on patient safety in healthcare environment. Employee safety is also important but given less importance at the healthcare sites. Few efforts can be taken to get better employee protection and the hospital's work surroundings. The radiology department is one of the significantly working departments in hospitals which poses numerous unique pressure to healthcare worker like radiation exposure, rhythmic stress injuries or poor ergonomics, injuries due to trying weighty lead aprons or moving portable tools, metal injuries in Magnetic resonance imaging stress conditions. as well, there is a authoritarian organization i.e. Atomic energy regulatory board (AERB) that provide rules and regulations for working and limiting radiation dose, isotopes managing, and chemotherapy agent, managing patients having infections that are airborne, and needle prick injuries. All-inclusive study programs

can be implemented in the radiology department to afford and shore up a agenda for employees safety and injury avoidance [3].

Regular teaching concerning the place of work ecological risks and their cost, fulfillment with policies and rules on ecological protection, and the culture growth that supports observation, reporting, and instant action will go an extensive way in the direction of enhancing largely the safety for all health workers in department of radiology.

Atomic Energy Regulatory Board is the Indian regulatory board for the radiology protection appraisal and Regulation of such services using ionizing emission in India, at here nuclear protection is synchronized by the atom fission is a nuclear reaction or produced by nuclear reaction. The Board aims to make sure such like utility of collision emission and reaction in here is not reason excessive difficult or hazardous to well being with surrounding [4].

Field of radiology is speedily rising with the assist of technological advances and the internationalization of healthcare. These continuing developments encompass a huge outcome on the excellence of care and delivery of services. Doctors and expert organizations should demonstrate plan and handle and attempt challenging situation in an effective way to defend patient safety and values of care. More importantly, the medical organization offering radiology services desires to allow improvement and approachable measures that can develop radiology. Thus, Safety administration in radiology is necessary in defensive the patients, radiologists, and medical association (i.e., protecting the organization's assets and its status with patients).

Faculty tutoring programs about the environmental risks and their cost at the place of

work, fulfillment with standards and instruction on protection and security of environmental, and progression of a traditions observation, announcing and communicating, and taking accomplishment all these things take a time in the direction of improving general protection for every health employee in this field [5].

In this piece of writing, I mentioned the chief risks for employees and healthcare professionals operational in the department medical radiology and tried to explain the main component of the staff safety program to make/develop strategies to avoid and mitigate these risks.

It is the basic right of every health worker to work and apply in a safe and healthy atmosphere. conventionally, medical foundation or academy were careful to be cautious or attentive during working field, and health peasant observe or judged as executive those are able of keep going or nourishing their basic fitness without any support, director have selected some capital and measure to the professional well being and risk free life . Professional human being safety is about guaranteeing a risk free place of work. All vital of medical staff to afford a protected and sound functions surrounding for health workers in a radiology department. It is the right of an employees to be familiar with about the risky equipments, apparatus or appliance attending their work by which they can exposed to, and what all must be done to keep away from hurts or sickness during these procedure below the working Health and safety Act 2004, employees have an compulsion to report any hazards recognized in the place of work. Management assurance to medical fitness and risk free and strong staff involvement in are very important factors of any famous place of work medical fitness and risk free programmes. Mainly effectual disaster, illness avoidance starts with work development is ongoing phase. An act has advised maximum permissible doses and particular in various city and recognized physical codes by setting specific calculating values equivalent as hazardous free from ray profession. No such proposals are there that smaller or minimal allowable dose are medically fit or I'll free for us. Smaller dose are also poisonous for body [6].

To avoid the smaller ray, many programs are ongoing and concern for this. Many author and concern person planned that it should be taken in noticed that there should be protection for employees against the rays and does not receive

too much radiation. Protection of employees from ray room should wear lead apron or lead screen to use during the procedure. Personnel handling should take high protection for this ray. Medical student, staff, nursing person, technique, should also wear a lead apron and have own care, protection [7].

One encouraging factor that is there are many ways of organizing provision of medical care to individual or a community radiation security enhancements. An extremely good primary and prior footstep need to be taken so that everyone who work or employee, staff of medical professional should take safety course. Even though some can flight working day is so busy and have hardly time but it should be first concern. Training can't help but result in development in safer use of radiation.

It is also significant to encourage adequate communication amongst the healthcare team, and make sure that everyone understands importance of radiation safety and that it is his or her work. Medical attendants and technologists must make urges to speak out if they are worried about safety operations. Physician should be made to realize that the staff working and supporting them needs to raise their voices over the issue and that they need to mull over those concerns and be worried about them and not overlook them [8].

Supreme importance to dose reduction is also considered, for the reason that radiation dispersion due to patient our health worker gets exposed a lot. Calculating patient dose, accordingly, it helps employee at the same as patients. That includes minimizing fluoroscopy time as well as the number of fluoroscopic images.

Radiation safety may be a involvement for patients, doctors, and employees in many departments, including radiology, interventional radiology, cardiology and department of surgery. Radiations release during fluoroscopic investigations is susceptible for the best radiation dosage for health worker employees. Radiations from diagnostic imaging machineries, like CT scan, mammography and pet scan are minor benefactor to the additive dose exposures of healthcare organization. Although, any radiations exposure causes a possible risk to both patients as well as medical staff similarly [4]. Radiation shelter purposes to scale back avoidable exposure of radiations with a target to attenuate

the damaging effects of radiation. Within the hospital specially in radiology department, the utilization of radiations has become an unavoidable equipment used for the medical diagnosis and clinical treatment of a spread of medical situations. Most radiation dose exposures in radiological environment originate from fluoroscopic procedures, which uses computed radiography to acquire impulsive and cinematic functional imaging. Especially, radiologist or health worker staff that uses fluoroscopic imaging procedures external of committed radio diagnosis or interventional radiology departments have low attachment to radiation protection programme. Fluoroscopy is working in many departmental procedures, including orthopedics dept, urology dept, interventional radiology dept, interventional cardiology dept, vascular surgery dept, and gastroenterology dept. As radiation exposure becomes more widespread, a radical perceptive of radiation exposure hazard and dose diminution techniques are going to be of extreme values. Consideration involves an understanding for the advantages and risks of using radiation dosage for radiological procedures or clinical treatments. Frequently, investigations that expose patients to comparatively maximum doses of radiation—such as, procedures in interventional Radiology and interventional cardiology are medically necessary, and thus the advantages are more important than the hazard. The principle As Low as Reasonably Achievable (ALARA) , defined by the codification of authorities rules and regulations, was created to make sure that each one measures to scale back radiation exposure are taken while acknowledging that radiation is an integral a part of diagnosing and treating patients. Any amount of radiation exposure will increase the danger of random effects, namely the amount of developing malignancy following radiation exposure [9].

2. MATERIALS AND METHODS

2.1 Materials

Site of study- AVBRH, Sawangi, Wardha.

Study Population- Healthcare professionals in Radiology Department

Study Duration- 12 months study.

Study design- Observational study.

Participants- Healthcare workers in Radiology Department.

Data sources/measurement- Observational

Sample size: 40 Healthcare professionals' participants in Radiology Department.

Complete enumeration: (take all the healthcare professionals who are working in radiology department)

Inclusion criteria: Staffs who willing to give consent and age more than 18 yrs.

Exclusion criteria: Staff already has any comorbidity and who are not willing to give consent.

Research tool- Tool consisting of self - administered observation record form Contains observations including daily routine working,

Source of data collection- Data has been collected by using observational recorded form.

Inclusion criteria- Radiologist, radiology technologist, radiation safety officer.

Exclusion criteria- Nursing staff, Clerk, Receptionist, Attendants.

2.2 Methods

An observational study was done at AVBRH, Wardha to assess the safety measures and discuss various types of risks management for healthcare professionals in Radiology Department. Working in the radiology department has several types of safety risks, which can be barred or compact if manage properly. Informally with these types of danger and its penalty, agreement with policy and instruction on work ecological risk free or non hazardous and progressive to way of life such like chains supervision, communication and advancing step can take long time all over enhancement and raising employee security for all employee in this section. Safety measures like radiation protection, light weight lead aprons, carefully handling of, materials while performing an investigation etc. This only protects people from the direct effects. But this does not mean that all the risks and injuries are mitigated. Secondary scattered radiation, unawareness about radiation hazard heavy lead aprons can create hurdles in smooth working in radiology department. Other departmental personals like ward boys taking patients are directly exposed to scattering.

3. RESULTS

Employees in the radiology department are highly aware about work safety measures. There are regular safety audits and inspection studies are carried out by RSO and concerning departments. There is also scope for radiation workers to have introductory seminars on radiation safety before they start working with radiation.

4. DISCUSSION

Based on the observational study it is observed that all the 40 (100%) participants practices safety measures which shows high awareness while working in the hospital. Similarly, some sort of compliance was observed in medical staff as they are having heavy workload among HCW. There is much attention is given to risks that are subjected to patients safety while employee safety shouldn't be overlooked [10,11]. The employee safety in radiology is mostly focused on radiation safety. Ultrasonography and Magnetic resonance imaging are the non radiation fields where employee safety shouldn't be overlooked. The Warnings and instructions should be clear and written in bold letters and need to be focused [12].

The patients in rural area hospitals have less intentions and less knowledge about their safety, so when there any examination or investigation is going on, concerning healthcare professional should affirm them about the same [13]. Main note point from this article is Proper use of safety products and techniques can helps to mitigate and prevent risks. Nimbalkar et. al. reported on assessment of knowledge, attitude and adherence to radiation safety measures and radiological waste management among mapped manpower [7]. Few of the related studies included studies by Toshniwal et al. [12] Sharma et al. [13] Simkhada et al. [14] and Zodpey et al. [15].

5. CONCLUSION

Working in the radiology department has several types of safety risks, which can be barred or compact if manage suitably. Informally with these types of risks and their penalty, agreement with policy and strategy on work ecological safety, and expansion of a traditions that supports supervision, treatment, and on time conduct will go far toward civilizing overall employee security.

6. LIMITATIONS

The safety conditions and safety measures in the field of healthcare are mainly patient focused. Most of the studies are done for assessment and evaluation of patient's safety. A few numbers of studies are done on Employee safety in hospitals. These studies are based on overall safety conditions and risk associated in health care field. This study is mainly focused on employees working in radiology department, where the posses a several type of risks and hazards. The main focus is on risk conditions and applicable safety conditions assessment and evaluation.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Siewert B, Brook OR, Mullins MM, Eisenberg RL, Kruskal JB. Practice policy and quality initiatives: Strategies for optimizing staff safety in a radiology department. *Radiographics*. 2013;33(1): 245-61.
2. Healthcare Employee Management-A focus on Indian Healthcare Sector, Mohammed Owais Qureshi - UNSW Sydney, Rumaiyya Sajjad - King Abdulaziz University.
3. D'souza AI, D'cunha S, Suresh S. A study on the awareness on occupational health safety among health care professionals in Radiology Department in a Selected Hospital. *RGUHS Journal of Medical Sciences*. 2013;3(2):85-90.
4. Mitchell EL, Furey P. Prevention of radiation injury from medical imaging.
5. Tsapaki V, Balter S, Cousins C, Holmberg O, Miller DL, Miranda P, Rehani M, Vano E. The international atomic energy agency action plan on radiation protection of

- patients and staff in interventional procedures: Achieving change in practice. *Physica Medica*. 2018;52:56-64.
6. Jr BFP, Federico R. Tewes. What attorneys should understand about Medicare set-aside allocations: How Medicare Set-Aside Allocation Is Going to Be Used to Accelerate Settlement Claims in Catastrophic Personal Injury Cases. *Clinical Medicine and Medical Research*. 2021;2(1):61-64. Available: <https://doi.org/10.52845/CMMR/2021v1i1a1>
 7. Nimbalkar SM, Patel VK, Patel DV, Nimbalkar AS, Sethi A, Phatak A. Effect of early skin-to-skin contact following normal delivery on incidence of hypothermia in neonates more than 1800 g: Randomized control trial. *J Perinatol*. 2014;34(5):364-8.
 8. Sharma K, Zodpey S, Gaidhane A, Syed ZQ, Kumar R, Morgan A. Designing the framework for competency-based master of public health programs in India. *Journal of Public Health Management and Practice* 2013;19(1):30–39. Available: <https://doi.org/10.1097/PHH.0b013e318241da5d>.
 9. Daniel V, Daniel K. Exercises training program: It's Effect on Muscle strength and Activity of daily living among elderly people. *Nursing and Midwifery*. 2020;1(01): 19-23. Available: <https://doi.org/10.52845/NM/2020v1i1a5>
 10. Sharma K, Zodpey S, Quazi SZ, Gaidhane A, Sawleshwarkar S, Khaparde S. Mapping and opportunities of human resource capacity building initiatives for HIV/AIDS in India. *Annals of Tropical Medicine and Public Health*. 2013;6(1):30–41. Available: <https://doi.org/10.4103/1755-6783.115176>.
 11. Daniel V, Daniel K. Perception of nurses' work in psychiatric clinic. *Clinical Medicine Insights*. 2020;1(1):27-33. Available: <https://doi.org/10.52845/CMI/2020v1i1a5>
 12. Toshniwal V, Mudey G, Khandekar A, Kubde V, Mudey A. Gram positive bacteria carriage among health care workers: An under-reported source of infections? *Journal of Pure and Applied Microbiology*. 2020;14(4):2677–82. Available: <https://doi.org/10.22207/JPAM.14.4.45>.
 13. Sharma K, Zodpey S, Zahiruddin QS, Gaidhane A. Accreditation of public health education in India: Enhancing quality, competence and trust. *National Medical Journal of India*. 2013;26(6):344–47.
 14. Simkhada P, Poudel AN, Simkhada B, Sumnall H, Jones L, Bista S, McVeigh J, et al. Need and scope of global partnership on public health research. *Journal of Datta Meghe Institute of Medical Sciences University*. 2016;11(2):202–4.
 15. Zodpey S, Sharma A, Zahiruddin QS, Gaidhane A, Shrikhande S. Allopathic doctors in India: Estimates, norms and projections. *Journal of Health Management* 2018;20(2):151–63. Available: <https://doi.org/10.1177/0972063418763651>.

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