Original Research Article

Knowledge attitude and Practice of Radiation safety awareness Among, Radiology Technician and Nurses who Works in The Radiology Department of Tertiary Care Hospital Located in Raigad District

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Abstract

Background: The present study was aimed to explore the This is an observational descriptive study conducted to assess Knowledge, attitude and practices of radiation safety awareness among,radiology technician and nurses this study design was carried out in the radiology department of Tertiary care hospital Raigad district. In total radiation workers and nurses were participated to make a response. The participants had answered the Questionnaire. This study was set in tertiary care hospital kamothe. The study was conducted from August 2021 to June 2022 for a period of 10 months. from August 2021 to November 2021 Data collection was done on October 2021 to December 2021 Data receiving and data editing was done, from November 2021 to January 2022 data analyzing and completion process was done, Thesis writing was done in month of February 2022 and thesis was be submitted in August 2022 This study was carried out in Radiology Department of tertiary care hospital in kamote Navi Mumbai.

Keywords: Radiation protection, Ionizing radiation, Radiation workers, Interventional Radiology

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INTRODUCTION

Medical radiation workers and nurses are potentially at risk of unwanted ionizing radiation exposures. This study assessed the Knowledge, Attitude and practice of radiation safety awareness among healthcare workers of the radiology department of tertiary care hospital located in Raigad district. This Medical radiation workers and nurses are occupationally exposed to ionizing radiation which may lead to health hazards due to radiation exposure and protective measures taken against them would be beneficial for minimising such health hazards. There are different types of commonly used Personal protective equipment for radiation protection from X-rays **Lead aprons or vests, Lead thyroid collar**, **Lead gloves, Safety glasses and Dosimeters** The increased demand for interventional radiology (IR) has drawn concern because these procedures are associated with high

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radiation risks for both Medical radiation workers and nurses. Training in Radiation Protection is widely considered to be one of the basic components of medical exposure optimization programs. Some recent studies have found that cardiologists and radiologist who received formal Radiation Protection training were more likely to be aware of radiation safety than those who did not Examine employees attitudes and clinical practices may be a well-known methodology of decisive the practices performed in clinical centers and also the necessity for safety improvement. By conducting a study in tertiary care hospitals equipped with interventional machines. it's highlighted that there's poor Radiation protection awareness among the medical employees in Bharat concerning the Justification of practices, Radiation and its hazards to Radiology technician and nurses throughout the radiology examination that indicates that there's a requirement for educating concerning the hazards and health risks related to radiation exposure and coaching for safeguarding themselves against radiation Thus, this study is designed to evaluate Knowledge attitude and practice of radiation safety awareness and self-protection against radiation among, Medical radiation workers and nurses who work in the radiology department of tertiary care hospital located in Raigad district

Data collection: The data was collected prospectively from the Radiology technician in the Radiology department and nurses in the radiology department, ICU, OT and Emergency department of tertiary care Hospital. A total of 200 staff members was selected by a convincing sampling technique for the study. Informed written consent was obtained from the participants before data collection. The single best choice questionnaire was used to collect relevant information from the participant's questionnaire was framed in a pattern that was be helpful to analyze the level of knowledge and awareness regarding radiation protection among Radiation workers and nurses. Questions were regarding different types of radiation, Health hazard of radiation, Protective devices of radiation, and limitations of radiation doses. Pilot study was conducted on 18 respondents (Radiation workers and Nurses) This data was collected and compiled on a Day-to-day Basis. The result would be reported as Mean, median standard Deviations and inter-Quartile Range. Chi-square test was used to assess knowledge attitude and practices adapted for radiation protection among radiation workers and nurses.

Questionnaires: A self-well designed questionnaire was prepared consisted of three parts to collect demographic particulars of the respondents along with KAP towards Medical Radiation part of the study was conducted by surveying the samples of Radiation workers and nurses in tertiary care hospital kamothe who were asked to complete the questionnaires. An anonymous questionnaire comprising single best choice questions were categorized into three sections including the knowledge (K = questions), attitude (A = questions), and practice related to Radiation Protection (P = questions). Radiation Protection - knowledge questions focused on
issues such as the relationship between radiation exposure, what are the uses of
Thermoluminescent dosimeter TLD badge, Types of radiation, health hazards of radiation, protective devices of radiation, levels of radiation, different shielding of radiations and the duration that scatter rays remain at X-ray room. Questions regarding Radiation Protection -attitude assessed items such as regular/irregular use of personal dosimeter in radiation environment and applying personal dosimeter incorrect/wrong places. It is noteworthy that Radiation Protection practice was assessed through self-appraisal.

Data analysis: Analysis was carried out to find the significant difference between those values. Analysis of the data was done by using descriptive and inferential statistics both. Descriptive statistics are used to describe the basic features of the data in a study. They provide simple summaries about the sample and the measures. Together with simple graphics analysis, they form the basis of virtually every quantitative analysis of data. Descriptive statistics are typically distinguished from inferential statistics. With descriptive statistics you are simply describing what is or what the data shows. With inferential statistics, you are trying to reach conclusions that extend beyond the immediate data alone. For instance, we use inferential statistics to try to infer from the sample data what the population might think. Or, we use inferential statistics to make judgments of the probability that an observed difference between groups is a dependable one or one that might have happened by chance in this study. Thus, we use inferential statistics to make inferences from our data to more general conditions; we use descriptive statistics simply to describe what's going on in our data. The software used in the analysis were SPSS 24.0 and Graph Pad Prism 7.0 version and $p<0.05$ is considered as level of significance.

Knowledge: Table 1.1 shows that Assessment with level of knowledge score shows that 10.61% of nurses and 11.67% of radiology technician had poor level of knowledge score, 72.73% of nurses and 78.33% of radiology technician had average and 15.15% of nurses and 10% of radiology technician had good level of knowledge score. Minimum knowledge score for nurses was 0 and for radiology technician it was 1 and maximum knowledge score for nurses was 5 and for radiology technician it was 4. Mean knowledge score for nurses was 2.74±0.97 and for radiology technician it was 2.48±0.83.By using Chisquare test statistically no significant difference was found in knowledge score of nurses and radiology technician**(χ2-value=1.93,p=0.58).**

Table 1.1: Assessment with level of knowledge score

Level of knowledge score	Score Range	Level of Knowledge Score	
		Nurses	Radiology Technician
Poor	0-25%	14(10.61%)	7(11.67%)
Average	26-50%	96(72.73%)	47(78.33%)
Good	51-75%	20(15.15%)	6(10%)
Excellent	76-100%	2(1.52%)	0(0%)
Minimum score		0	1
Maximum score		5	4
Mean knowledge score		2.74±0.97	2.48±0.83
Mean % of knowledge score		45.70±15.76	41.38±13.89
χ2-value		1.93,p-value=0.58,NS	

Table 1.2: Assessment with level of attitude score

Level of attitude score	Score Range	Level of Attitude Score	
		Nurses	Radiology Technician
Poor	0-25%	0(0%)	0(0%)
Average	26-50%	6(4.55%)	1(1.67%)
Good	51-75%	45(34.09%)	21(35%)
Excellent	76-100%	81(61.36%)	38(63.33%)
Minimum score		2	2
Maximum score		5	5
Mean attitude score		3.73±0.78	3.66±0.60
Mean % of attitude score		74.69±15.79	73.33±12.02
χ2-value		0.97,p-value=0.61,NS	

Table 1.3: Assessment with level of practice score

Level of practice score	Score Range	Level of Practice Score	
		Nurses	Radiology Technician
Poor	0-25%	2(1.52%)	0(0%)
Average	26-50%	8(6.06%)	1(1.67%)
Good	51-75%	28(21.21%)	11(18.33%)
Excellent	76-100%	94(71.21%)	48(80%)
Minimum score		1	3
Maximum score		7	7
Mean practice score		5.87±1.38	6.20±0.93
Mean % of practice score		83.87±19.84	88.57±13.35
χ2-value		3.20,p-value=0.36,NS	

Attitude: Table 1.2 shows that Assessment with level of attitude score shows that 4.55% of nurses and 1.67% of radiology technician had average level of attitude score, 34.09% of nurses and 35% of radiology technician had good and 61.36% of nurses and 63.33% of radiology technician had excellent level of attitude score. Minimum attitude score for nurses and radiology technician was 2 and maximum attitude score for nurses and radiology technician it was 5. Mean attitude score for nurses was 3.73±0.78 and for radiology technician it was 3.66±0.60. By using Chisquare test statistically no significant difference was found in attitude score of nurses and radiology technician**(χ2-value=0.97, p=0.61).**

Practices: Table 1.3 shows that Assessment with level of practice score shows that 6.06% of nurses and 1.67% of radiology technician had average level of practice score, 21.21% of nurses and 18.33% of radiology technician had good and 71.21% of nurses and 80% of radiology technician had excellent level of practice score. Minimum practice score for nurses was 1 and radiology technician it was 3 and maximum practice score for nurses and radiology technician it was 7. Mean practice score for nurses was 5.87±1.38 and for radiology technician it was 6.20±0.93. By using Chisquare test statistically no significant difference was found in practice score of nurses and radiology technician **(χ2-value=3.20,p=0.36).**

Table 2.1 Correlation between knowledge, attitude and practice score of nurses shows that negative correlation was found between knowledge and attitude score **(r=-0.123,p=0.161)**, knowledge and practice score **(r=-0.095,p=0.278)**, positive correlation was found between attitude and practice score **(r=0.094,p=0.284)**

Table 2.1: Correlation between knowledge, attitude and practice score of nurses

		Knowledge	Attitude	Practice
Knowledge	r-value	1	-0.123	-0.095
	p-value		0.161,**NS**	0.278,**NS**
	n	132	132	132
Attitude	r-value	-0.123	1	0.094
	p-value	0.161,**NS**		0.284,**NS**
	n	132	132	132
Practice	r-value	-0.095	0.094	1
	p-value	0.278,**NS**	0.284,**NS**	
	n	132	132	132

Table 2.2: Correlation between knowledge, attitude and practice score of radiology technician

		Knowledge	Attitude	Practice
Knowledge	r-value	1	-0.045	-0.104
	p-value		0.732,**NS**	0.427,**NS**
	n	60	60	60
Attitude	r-value	-0.045	1	-0.030
	p-value	0.732,**NS**		0.819,**NS**
	n	60	60	60
Practice	r-value	-0.104	-0.030	1
	p-value	0.427,**NS**	0.819,**NS**	
	n	60	60	60

Table 2.2 Correlation between knowledge, attitude and practice score of Radiology Technician shows that negative correlation was found between knowledge and attitude score **(r=-0.045,p=0.732),**correlation between knowledge and practice score **(r=-0.104,p=0.427)** correlation between attitude and practice score **(r=-0.030,p=0.819).**

DISCUSSION

Radiation health workers Plays an imperative role in civilizing the humanity and society. Radiation health workers are expected to spread attentiveness of key health and hygiene messages amongst communities. Analysis revealed that the level of knowledge attitude and practices regarding radiation safety awareness was not much varied significantly with respect Radiology technician and nurses However, Correlation between knowledge, attitude and practice score of Radiology Technician and nurses were negatively correlated .The analysis and interpretation of the observations are mentioned in the manner where age criteria of participant were between 21-30 which is about 72% (63.64% of participant were nurses and 81.67% of participants were radiology technician). Shima Moshfegh, showed a study Evaluation of Knowledge, Attitude and Practice of Personnel in Operating Room, ERCP, and ESWL towards Radiation Hazards and Protection its conducted in iran. This findings shows that Age distribution (ranged 30 to 39 years) was 54% and 45% which will on average 49% and there were mixture of 192 participants with 60 radiology technician and 132 were nurses, Maximum participant were female where in which there were nurses are (87.88%) and radiology technician were (55%)which is 71% and male Nurse and radiology technician were (12.12%) and (45%) respectively which is on average 28.5% Shima Moshfegh, showed a study Evaluation of Knowledge, Attitude and Practice of Personnel in

Operating Room, ERCP, and ESWL Towards Radiation Hazards and Protection its conducted in iran. This findings shows that female participant were 66% and male participants were 34% in the study population comparatively participant with less than 5 years of experience were about average 53.33% in which(nurses were 50% and radiology technician were 56.67%)the study performed by Soujanya Mynalli, showed a study Evaluation of Awareness on Radiation Protection and Hazards among Paramedical Personnel Working in Radiology Department of a Teaching Hospital it is conducted in Karnataka manglore shows that 68% of nurses and radiation workers were having experience less than 5 years in another such cases knowledge of radiation amongst paramedical staffs was at average range of 26-50% which was75% on an average which includesnurses and radiology technician 96(72.73%) and 47(78.33%) Respectively . In comparative study by Soujanya Mynalli, showed a study Evaluation of Awareness on Radiation Protection and Hazards among Paramedical Personnel Working in Radiology Department of a Teaching Hospital it is conducted in Karnataka manglore shows that The overall knowledge of radiation amongst paramedical staffs was good (54%) and satisfactory and level of attitude score amongst paramedical workers it has been observed that attitude score comes excellent criteria in which nurses score is 81 (61.36%) and radiology technician is 38 (63.33%) which is on an average is 62% and (p-value=0.61) There was no significant difference between the attitude level which indicates radiology technician and nurses follow safety procedures for themselves and for the patients during a radiological examination, In comparative study performed by Sneha R Sharma showed a study Attitude and Awareness of General Population Towards Radiation Hazards and Safety: An Institutional Study is conducted in Mumbai shows that the attitude level of personnel. There was no significant difference in the attitude level of operating room personnel towards radiation protection with distinct gender (P = 0.964) There was no significant difference between the attitude level.in another different observation overall practices carried out by radiation workers and nurses are 48(80%) and 94(71.21%) respectively which comes under excellent criteria which is on average 75% In comparative study perfomed by Tabish S. A showed a study Knowledge, Attitude And Practice of Radiation Saftey among radiologist, technologists and X-ray technicians in hospitals in Kashmir shows that Among male x-ray technicians 95.3% (n=61) were awareof safe radiation dose per year and use of lead apron while among female x-ray technicians92.1% (n=13) were aware of safe practices performed in hospital.

The correlation of knowledge, attitude, practice tables done with the score of nurses which indicates that there is no Correlation between knowledge, attitude and practice and no significant relationship between KAP level, similarly The comparative study perfomed by Shima Moshfegh shows a study of Evaluation of Knowledge, Attitude and Practice of Personnel in Operating Room, ERCP, and ESWL Towards Radiation Hazards and Protection in iran shows that There was no Correlation between knowledge, attitude and practice score of nurses significant relationship between KAP level and gender (P = 0.106), the time since graduation (P = 0.406), and work experience (P = 0.106). A significantly higher level of KAP towards radiation protection was observed in the personnel of private clinics (P = 0.023). The lowest value of KAP was observed in the personnel of non-educational hospitals.

The Correlation between knowledge, attitude and practice score of Radiology Technician which indicates that there is no significant relationship between KAP level, similarly in the comparative study performed by Seyedeh Shohreh Alavi showed a study Medical radiation workers knowledge, attitude, and practice to protect themselves against ionizing radiation in Tehran Province from iran shows that A significant number of participants had poor RP-knowledge (78.9%), RP-attitude (70.7%), and RP-practice (32.4%).

CONCLUSION

Majority of the staff did not practice a radiation safety Practices. Most of the staff had knowledge about safe radiation dose per year and use of Radiation protective gears. There is strong need to enforce radiation safety rules by the staff. Standard operating procedures and radiation safety manual should be made available to all health facilities. Staff directly involved in radiation should receive proper training in radiation safety and then made accountable. Besides the positive changes revealed in the knowledge, attitude and behavior, among the radiation workers and nursing staff, preventive behaviour among the staff could still be improved.

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