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A CROSS-SECTIONAL STUDY TO KNOW AWARENESS AMONG FIRST YEAR MBBS STUDENTS REGARDING RADIATION HAZARDS IN REHMAN MEDICAL COLLEGE PESHAWAR

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ABSTRACT

Background: Medical students will be the future medical health care providers, so they should have up to date knowledge regarding the radiation hazards. But unfortunately, in majority of the previous published studies it is observed that medical students have very little information in this regard. So, the aim of our study was to know the awareness among the first year MBBS students of Rehman Medical College Peshawar regarding radiation hazards.

Materials & Methods: This was a descriptive cross-sectional study conducted in Rehman Medical College Peshawar from January to March 2025. All the first year MBBS students were included in this study and a self-designed questionnaire of 10 items were distributed among them. The data was then entered and analyzed in SPSS version 22. The research variables were knowledge regarding radiation hazards in terms of gender and location-residence (urban/rural) of students. The results are shown in frequencies and percentages. Table and graphs are used where necessary. A p-value of less than 0.05 was considered as significant.

Results: Among 137 participants 56(40.9%) were male and 81(59.1%) were female students. About 58.4% (80) were from urban areas while 41.6% (57) were from rural areas. In our study we found that location had a significant effect on awareness regarding X-ray radiation with a p-value of 0.047 whereas gender had an insignificant effect with a resulting p-value of 0.081. It was found that more 90% of the participants were aware about the adverse effects of radiation hazards of CT-Scan and MRI. Regarding pregnant women and children, more than 85 % of the student have awareness that Xray's have hazardous effects on them. As far as protective measures taken while performing Xray's and the systems mostly affected by radiation, more than 50% of the study population were familiar and had up to date knowledge. Majority answered that radiation can cause cancer in different organ.

Conclusions: We observed that knowledge regarding hazards among First year MBBS students is quite good, and hope that in the future they will be more updated in this regard.

KEY WORDS: Awareness; Cancer; Hazards; Medical students; Radiation; Protection.

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INTRODUCTION

Studies have shown that medical students and doctors are not well equipped with knowledge of radiation hazards and their protection. This lack of knowledge may cause harm to patients and health-care professionals.[1]The advancement of medical technologies in healthcare has paved the way to an increased use of radiological diagnostic procedures to accurately diagnose a variety of diseases and injuries. While these technologies undoubtedly give life-saving diagnosis and treatment for patients, inappropriate utilization may lead to undesired exposures to ionizing radiation which pose a long-term risk of cancer development.[2] It is proven that if precautionary measures are not taken, the person can be severely affected by these radiations. The harmful effects of radiation on biological tissues can

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be categorized into deterministic and stochastic effects. Deterministic effects have a specific threshold dose, meaning that surpassing this threshold causes adverse outcomes like burns and hair loss. In contrast, stochastic effects do not have a threshold, so harmful consequences like mutations, teratogenesis, and cancer can occur at any dose.[3]

Ionizing radiation is a term that describes the type of energy that can remove an electron from atoms and molecules of materials such as air, water, and living tissue. Since its inception, the use of ionizing radiation in medical practice has evolved. Regarding convenience and diagnostic and therapeutic effectiveness, they provide significant benefits to patients.[4] Nowadays, radiology is considered one of the most important disciplines of medicine as it guides physicians to reach the proper diagnosis by using many types of medical imaging modalities, such as x-ray radiography, computed tomography (CT), ultrasonography (US), and magnetic resonance imaging (MRI). These modalities are used to create dynamic images of different parts of the human body, which are being used to accurately diagnose and follow up on a variety of medical conditions. Moreover, in recent decades, radiology has experienced substantial growth and transformation, establishing itself not just in diagnostics but also in the domain of medical interventions, which includes the increasingly recognized discipline of interventional radiology.[5] The objective of this study was to determine the level of knowledge regarding radiation exposure from common diagnostic imaging procedures like X-ray among first year medical students of Rehman Medical College Peshawer (RMC). The results of this study may help the policy makers to do the necessary measures in that specific direction to make utilize the imaging gadgets for proper indications and also make ensure the public awareness regarding radiation hazards.

MATERIAL AND METHODS

This was a cross- sectional study that was conducted after approval from ethical review committee. A specific designed questionnaire was distributed among all newly admitted students in First year MBBS student of RMC. Data was entered and analyzed in SSPS version 22. A p-value of less than 0.05 was considered as significant. All newly admitted Male and Female first year MBBS students of RMC were included in this study. Students not willing to participate were excluded; also students of higher classes and other discipline were not included.

Descriptive variables were gender and location (urban/ rural). Research variables were knowledge regarding radiation hazards of X-rays. Sample size was all 150 newly admitted MBBS First year students of RMC in 2025. Our hypothesis was that, the newly admitted students have no knowledge regarding radiation hazards of x-rays. This hypothesis was partially proved in this cross-sectional study.

RESULTS

There was total 150 students, among them 4 students did not return the questionnaire and 9 forms were incomplete so the results were compiled for 137 participants, in which 56(40.9%) were male and 81(59.1%) were female students. About 58.4% (80) were from urban areas while 41.6% (57) were from rural areas. In our study we found that location had a significant effect on awareness regarding X-ray radiation with a p-value of 0.047 whereas gender had an insignificant effect with a resulting p-value of 0.081, as shown in tables 1 and 2

Table 1: Correlation between gender and awareness

		Gender	Know
Gender	Pearson Correlation	1	-.081
	Sig. (2-tailed)		.346
	N	137	137
Know	Pearson Correlation	-.081	1
	Sig. (2-tailed)	.346	
	N	137	137

Table 2: Correlation between location and awareness

		Location	Know
Location	Pearson Correlation	1	-.047
	Sig. (2-tailed)		.589
	N	137	137
Know	Pearson Correlation	-.047	1
	Sig. (2-tailed)	.589	
	N	137	137

It was very interesting in our study that 114(83.2%) were already exposed to X-rays for some disease diagnosis. About 95(69.3%) and 93(67.9%) of the participants were aware that CT scan and MRI has adverse effects on human beings respectively. It was also found that 119(86.9%) and 123(89.8%) of the participants were aware that X- ray had adverse effects on children and on pregnant women respectively.

Around 91(66.4%) of the participants answered positively to the question that X-ray has adverse effect on some specific body system and 83(60.6%) agreed to the fact that some kind of protective measures should be taken while taking X-rays. Regarding the question of which body system is mostly affected by radiation, different answers were found. But more than 50% were relevant and majority have an opinion that radiation can cause cancer in different organs.

DISCUSSION

Medical students are future medical practitioners. Therefore, it is important to emphasize about adherence to safe practice in the event of radiological examinations which require substantial knowledge of ionizing and non-ionizing radiation source, exposure and health risks during their formal education. When students have better knowledge regarding radiation exposure, they can protect themselves, the patients and the patients' caretakers from unnecessary radiation exposure, and teach the general population about radiation exposure and risks. All the medical field professionals from medical students to consultants should be familiar with these radiation hazards so as to take preventive measures not only for themselves but also for the patients. But there is growing concern that the knowledge of medical staff regarding this issue is inadequate, and this lack knowledge may cause harm to patients and health care professionals.[6,7] The medical technologies has done great advancements in all fields and same is in radiology subject. So radiology use in diagnostic as well as therapeutic is well established for variety of diseases and injuries. On one side these modalities undoubtedly give life saving options for patients in multiple aspects but inappropriate and undesired use can cause so many adverse effects that may be difficult to handle.[8,9]

In our study we evaluated the awareness of first year MBBS students at RMC about hazards of X-rays on human body. Our results are different from previously published studies in different aspects. In our study there was female predominance, that was in contradiction to study of Alali's et al and shafiq's et al who reports equal proportion of male and female participants.[1,3] We found in our study that majority >90% were aware about radiation hazards not only that of xrays but also of CT scan and MRI. But Reem Bashri et al. reported that medical students lack sufficient knowledge regarding radiology and radiation hazards and stressed that they need to be trained in radiology and they need to be made aware regarding adverse effects of radiations.[5] Sahil et al. in his research writes about awareness regarding ionizing radiations among nursing students and their attitude towards it and also concluded that majority of students lack the knowledge regarding ionizing radiations and did not follow proper safety regulations. In an-other study conducted by Dagnachew et al. they also found similar results and concluded that medical students need to be trained regarding radiology and radiation hazards enabling them for a safe radiological practice.[2] Also in other studies it is observed that the medical students lack proper attitude towards radiology and its safety precautions.[4] we found a positive correlation between location/ residence of students and awareness regarding radiation hazards. The students from urban areas had more knowledge than those residing in rural areas, this may be due to better opportunities for studying in school/college providing good quality and up to date information. Also the students living in big cities may have better access to net and social media and may be getting awareness regarding this aspect.

In our study we found no significant difference among genders for awareness about radiation and this may a good information that female participants are also well aware in this aspect. Also, majority of the participants were aware about importance of the protective measures during x-ray performance. This is also evident from literature review, that great emphasis is given on patient shielding while imaging is doing.[10] This is especially important in pregnant ladies and paediatric population, as the fetus and growing children are more prone to radiation hazards.

The participants of the current study are well aware of the teratogenic effects of radiation as similar to other studies.[11,12] Although these radiological facilities have negative impacts but they have a greater role in diagnostic and therapeutic fields, so the medical personnels should prescribe Xray's, ultrasounds, CT scan and MRI when required.[13,14] In our study, the participants were familiar with the system mainly affected by radiation hazards along with protective precautions that are necessary and same is in other studies.[15,16]

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
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AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design:	MKK, MAK
Acquisition, Analysis or Interpretation of Data:	MKK, MAK
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All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.