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Medical Students' knowledge about Radiology Specialty in Sohag University

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Abstract: Investigating knowledge and attitude is an important process in the field of medical research and medical learning. This research is not the first one of this category to be done in radiology department Sohag University. Wehad investigating before subspecialty knowledge and application in between out department members. Undergraduate's radiology curriculum has undergone significant changes in the last decades reflecting a great advancement in the structure, and components. These changes are aiming to serve the medical students knowledge about radiology advancement of its different branches and improve the basal knowledge. This article is investigating medical students and house officer's knowledge in our faculty for the purpose of improving radiology teaching and medical learning in general.

Keywords: Radiology Teaching, Medical Learning, Medical students.

1 Introduction

Investigating knowledge and attitude is an important process in the field of medical research and medical learning. This research is not the first one of this category to be done in radiology department Sohag University. We had investigating before subspecialty knowledge and application in between our department members [1]. Lecture is an important method for teaching and medical training of medical undergraduates and postgraduates all over the world. the previous knowledge of audience about its field may significantly affect both the structure of the lecture, manner of presenting and the acquired knowledge from it, lack of knowledge about the basic understanding level of students about the science field especially in early lectures may significantly decrease the value of the course and reduce its affectivity in supplying required data to the students [2]. Diagnostic radiology is mandatory to be connected to the Internet and is a medical branch located at the forefront of medical technology. The past decades have seen a significant advancement in Internet-based medical technology. No available clear assessment of students' knowledge about it either before or after studying of radiology course as undergraduates [3]. Medical imaging undergraduate curriculum has undergone great changes reflecting the advancements in the structure, contents and basics of instructions. Radiology education is now more correlated to the advancement of different modalities its different applications of other medical fields. These changes must be suitable for delivering the required level of knowledge to the graduated medical students that make them enough qualified general practitioners. The recent parameters and instructions of medical learning and training must be in mind in the designing of radiology curriculum and the process of teaching and exams [4].

2 Aim of the study

- To assess the knowledge of medical students in different stages and house officers about basic information and knowledge about radiology (Diagnostic and Interventional) . For using it in the later improvements of curriculum of radiology in faculty of medicine, Sohag University.

- To train students about basics of works of scientific researches by joining them as a co-authorsand cooperating in publishing questionnaire, collecting data.

3 Material & Methods

Study design: Questionnaire survey.

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Subjects: - An on line Questionnaire formed of 3 sectors & (37) questions had been published on line for medical studentsof faculty of medicine, Sohag University different years& house officers , Answers were collected automatically and analyzed in tables , data & different types of graphs to acquire data about different items students' knowledge of diagnostic radiology.

The Study targeting all medical students (males & females) from 1st up to 6th year students and house officers in Sohag university hospital. With No exclusion criteria. The Questionnaire is published by different ways online (e mails & social media) at 15th of November 2022 and receiving data was continuous to 25th January 2022 (about 2 months duration)

1730 responses were received from total number of 3408students of different years and house officers which represent about 50% (as Total number of students in our faculty at time of study was as explained in fig. 1 year : 1st year 581 students , 2nd year 558, 3rd year 697, 4th year 383, 5th 383, 6th 402 and House officers 387).

4 Results

The ages of students incorporated in the study was between 18 : 25. 56.1% males and 43.9% females (fig 2).

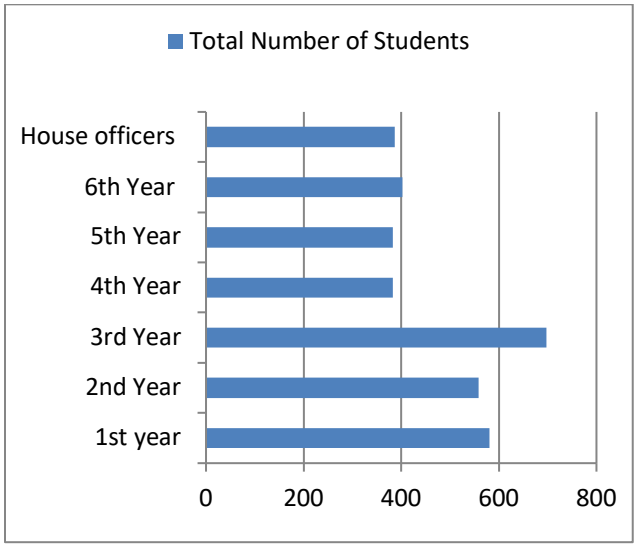

Fig.1: Total Number of students of every year in faculty of medicine Sohag University , targeted by the study.

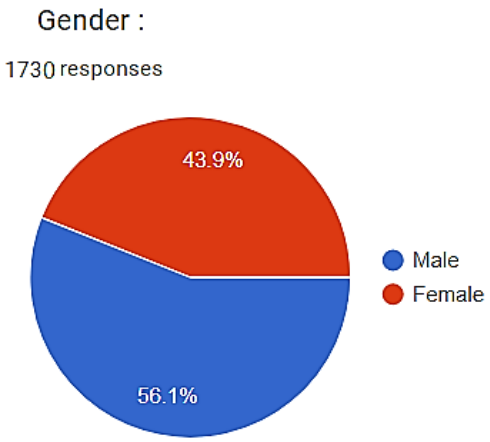

Fig.2: Gender percent of students in the study.

Students from all years answred the questionaire and join our study, with maximal number from 2nd year was 370 (21.4 %) student, while the least was 60 student from 4th year reprtesenting (3.5 %) as explained in Fig 3. 44.2% of them had studies Radiology while the others are not yet (Fig 4).

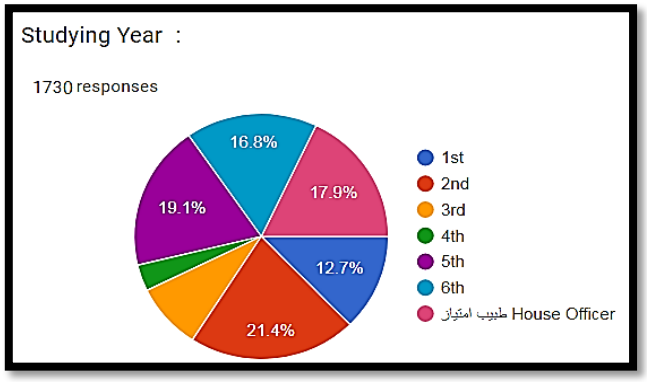

Fig.3: Different percent of students from different years joining the study.

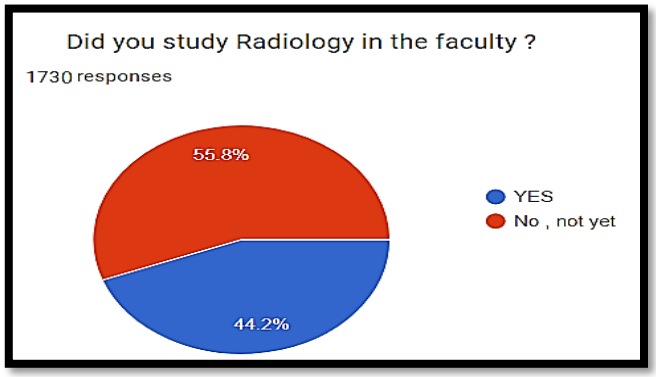

Fig.4: Percent of studying and non-studying radiology of students in the study.

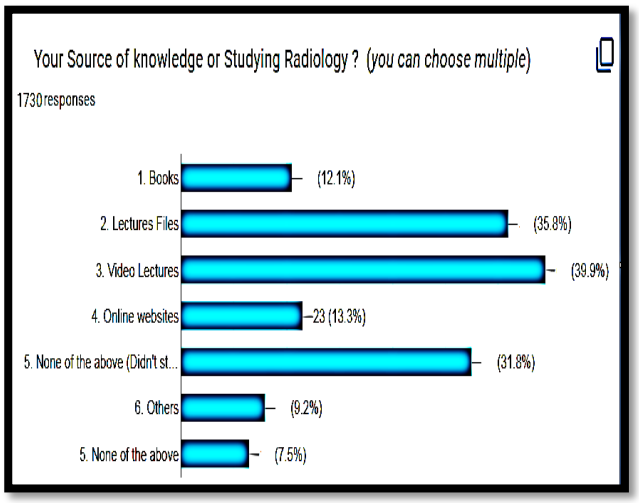

Fig.5: Different sources of studying radiology in our faculty.

As regarding the sources of studying radiology in our faculty, as explained in (Fig 5) Video lectures is the commonest source of percent 39.9 % . The main medical speciality which is prefered by students in the study , 680 student (39.3%) did not have a choice yet , while Medical specilaity is more prefered by 36.4% of students. A small percent (30 students , 1.7 %) are prefering to be a GP (Fig 6).

Although more than half of students incorporated in the study did not study radiology yet, but the vast majority of them (82.7 %) are familiar with the term "Diagnostic radiology" (Fig 7).

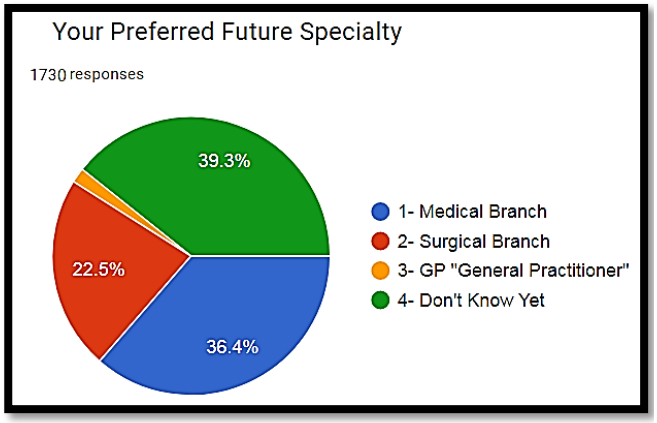

Fig.6: Preferred subspecialty of our students.

While (48.6 %) only are familiar with the term "interventional radiology" and 62.4 % of them know about contrast material. The clinical importance of interventional radiology has a great advancement in recent decades, with widly extended applications and image-guided theraputic techniques, especially in the vascular and oncologic fields[6].

551 student (31.8 %) did not see any diagnostic modality before. The majority of students (83%) donot know about the term of PACS and Teleradiology. X ray is the most known modality by students (Fig 8), while Doppler was the least of them. (Fig 9) is explaining that 49% of students are donot know that CT is using X ray which are an important information in the field radiology safty. 34% of them don't know which modality is using ionizing radiation, while 24.3% of the know it well and 27.7 % know which modalities are using non ionizing radiation (Fig 10). 60.7% are know that MRI is using a strong magnetic field, while 34.7% don't know that.

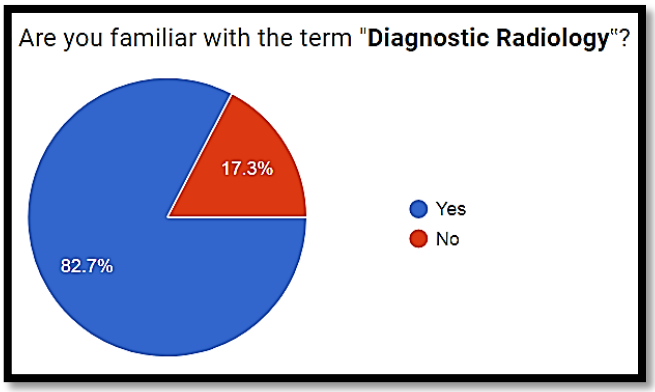

Fig.7: Familiarity of students with the term of Diagnostic Radiology"

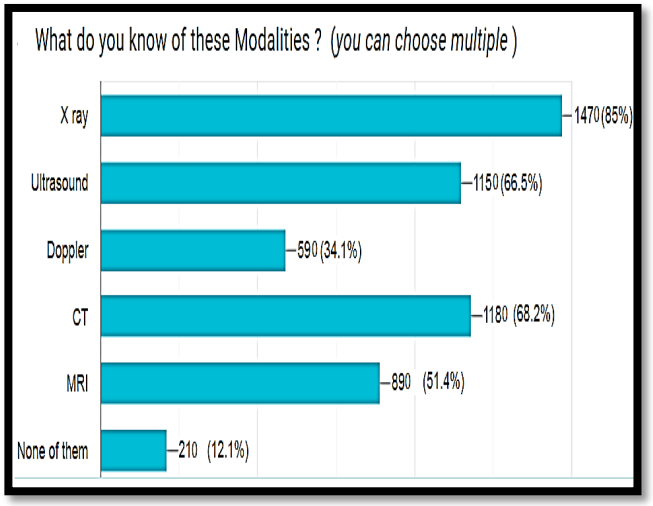

Fig.8: Percent of Different modalities known by students in our study.

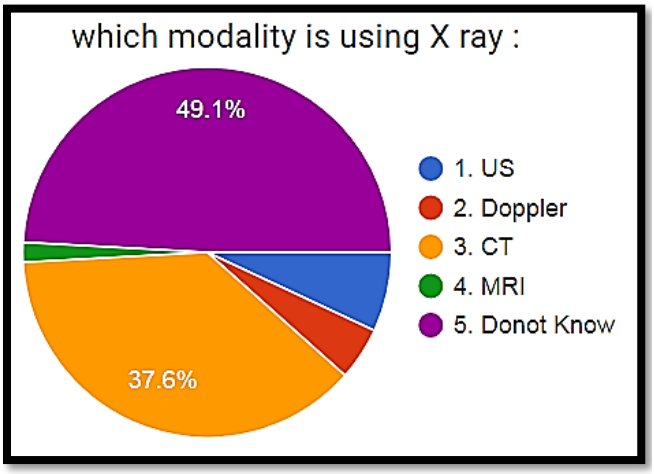

Fig.9: Knowledge of students about CT used energy.

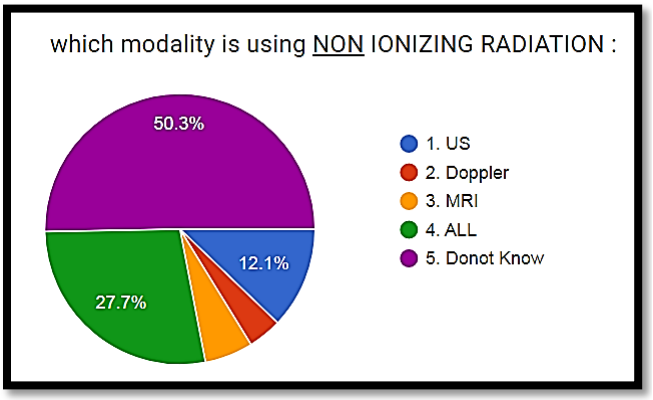

Fig.10: Knowledge about modalities using non ionizing radiation.

Fig.11: Chest X ray "CXR" which done basically in erect postro-anterior view.

34.1% of students were know that chest X ray basic position is erect postero-anterior view, 57% of them know that CXR is the first modality to diagnose chest disease. 59% of them know that CT is the best modality to assess cases of covid 19 [7].

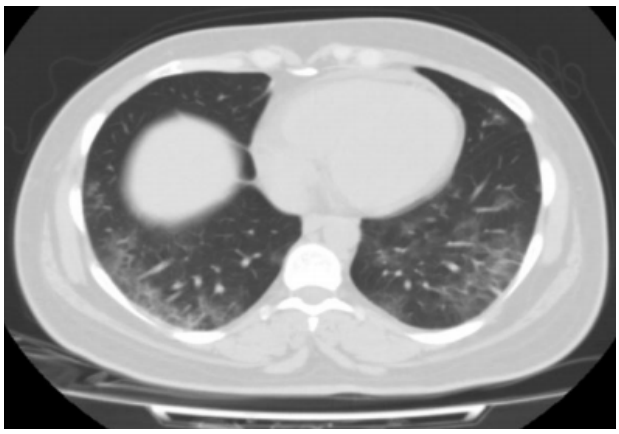

Fig.12: Axial CT chest of 52 y old patient with significant respiratory complaint. It showing bilateral multiple large ground-glass opacity patches , posterior sub pleural located [7].

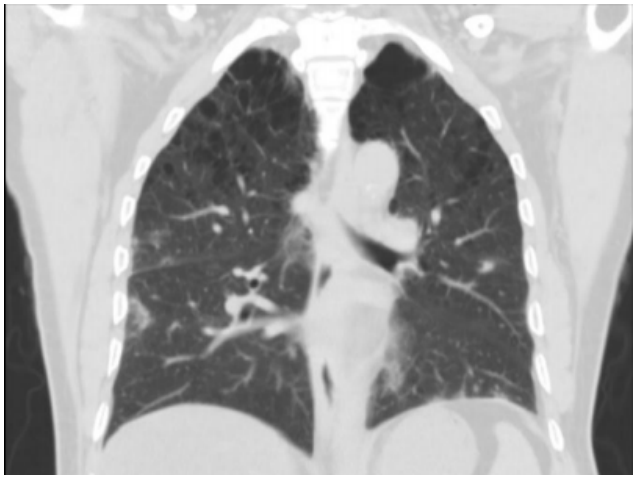

Fig.13: CT chest coronal reformate of 31 years old patient with severe respiratory illness. It showing right lower lobe faint small subpleural patches of ground-glass opacities[7].

Our study try to cover the most important general topics in radiology, as best modality for emergency diagnosis, main contraindications of modalities, and side effects of some techniques which considered many important topics knowledge that every medical students or recently graduated doctor should know.

Table "1": is explaining the choice of modality for common ER diagnoses and students answers about it :

Question	PERCENT (%)	
	Know	Don't Know
MRI is the best for assessment of spinal cord injury	48	32
US is the best for assessment of minimal pleural effusion	31.2	39.9
MRI is the best modality to assess ligamentous injury	35.3	41
Type of contrast used IV in CT "Urographine"	11	55.5
US as 1st modality to assess abdominal pain & trauma	52	31.8
CT as 1st modality to assess Head Trauma	53.2	33.5
Main procedures that can be done under radiological guide (Aspiration , Biopsy, &Tumor Ablation)	52.6	34.1

Head trauma is a very common and important presentation in ER (falling from height, motor car accident, assault, ….etc) that every medical student should know the basics about it. CT is the best modality to explore it for proper management. It also can reformate image into coronal and sagittal images for more details [12].

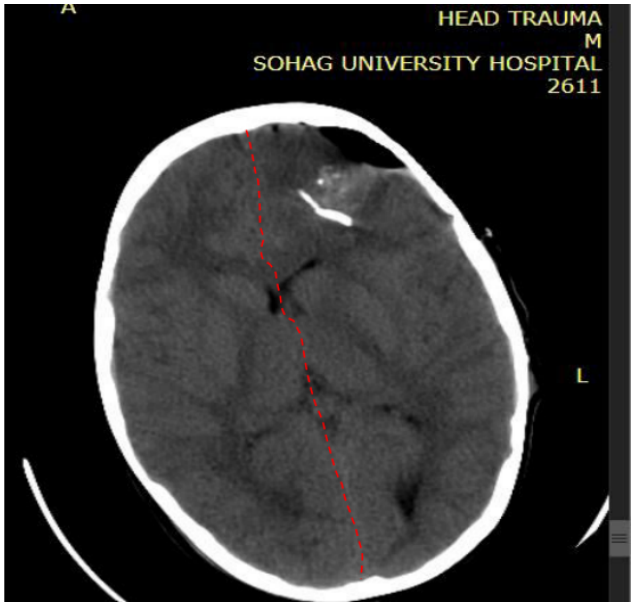

Fig.14: Axial CT scan, 5-year-old boy, soft tissue window, above the level of the previously described penetrating stone, It showing related pneumocephally and cerebral contusion. It causing minimal mass effect on the anterior horns of lateral ventricles with med line shift[8].

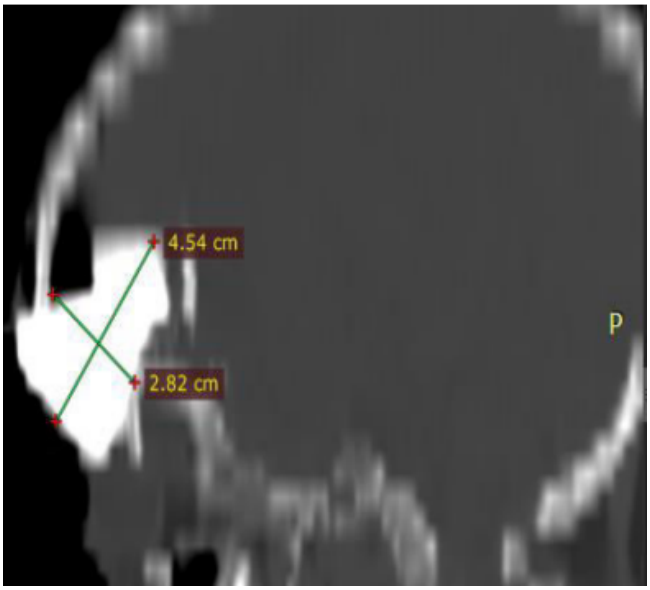

Fig.15 CT brain Sagittal reformate bone window of 5-year-old male patient, , it showing the maximal dimensions of the penetrating stone, which measures (45 X 28 X 29 mm)[8].

The 3rd part of questionnaire as explained in Table "2" is explaining main indications & contraindications and hinders of modalities:

Table "2": is explaining the main indications & contraindications and hinders of modalities

Question	PERCENT (%)	
	Know	Don't Know
Mandatory indications of contrast in CT	32.9	42.2
X ray & CT contraindication in Pregnancy	56.6	18.5
MRI contraindicated in pacemaker & Metallic objects	50.9	34.1
Contraindications of IV contrast	15	34.1
Contraindications of Barium study	42.2	48
Gases are masking US images	15.6	42.2

The tables are explaining the comparison between percentages of students that know the right answer versus the others who are don't know, the rest of percent is representing other answers.

5 Discussions:

Diagnostic and interventional radiology advancement is nearly to be a daily process. In 2009 the Union of

European Medical Specialists (UEMS) recognized interventional radiology as a distinct specialty of radiology and over the years, there has been a worldwide growth in radiology courses (for under & postgraduates purposes). Distance learning represents an educational method which occupies a significant place in real-life medical teaching, [6, 7, and 10].

Blended learning (BL) means a new educational method that integrates conventional face-to-face academic way of learning with synchronous or asynchronous e-learning, to support and improve interactions between students, teachers, and electronic learning topics(8). From all these scopes our study general purpose is to improve radiology learning and achieve the highest benefits for medical students from radiology learning. Many studies was done before to assess either the knowledge of students or opinion and acceptance of radiology learning in different years. Radiology other than to be a specialty of medical teaching, it can serve in learning of other specialty like anatomy. SILVA, V. A., et al conclude that most of undergraduate medical students at the first-year evaluated as positive and beneficial the use of radiology to teach human anatomy. They considered that this method increases their interest for anatomy and that it can improve and facilitate learning and performance in the clinical practice.The results show that students' opinion of the usage of radiology can be an excellent method in human anatomy learning. Nevertheless, other studies are necessary to demonstrate the long-term retention of what was learnt and students that went through the experience of using radiology will present a superior professional performance (9, 10). In other research Turkish medical students were reached from 10 different schools of medicine by social media and email. 20-question survey related to their radiology curriculum and their perceptions of the radiology education at their schools and of different imaging modalities. Radiology education has an important place in the medical curriculum, and more time should be allocated to such education and appropriate methods should be used [11, 12].

6 Suggestions and Recommendations:

Our study recommendations according to suggestions of students were as following:

- Practice week during emergency round. As they consider practical teaching of radiology is not enough.
- Recoding more videos for lectures and rounds.
- Increase the duration of radiology round and workshops for house officers.
- More lectures for house officers.
- A specific concentrated non overwhelmed book of radiology for undergraduate.
- Radiology basics courses for GB.
- Teaching basics of interventional radiology for medical students.
- Adding cases solving questions in radiology exam.
- Improve methods and facilities of learning.
- Radiology lectures should be all the year not in specific time only
- Suggest having basic knowledge in radiology for the first 3 years.
- Radiology lecture is needed after finishing every branch of medical study to explain it from the view of radiological diagnosis.
- To make an atlas of cases for medical students.
- Increase duration and number of rounds of radiology study.
- Explaining the basics of "How to investigate the pathology exists in the radiograph"
- Updating lectures and lessons according to principles of Training of Trainers and scientific roles of preparing power point files.

7 Conclusions

Our study proved that the students of faculty of medicine Sohag University has an overall knowledge about the basic information and data that every medical student and newly graduated doctor should know. The questions of the study were designed specifically to cover these topics and the study of its current form is suitable to be a good source of these basic data for next students. Curriculum of radiology for next year's must concentrate and explain more data that students don't know well or related to the topics of patient safety. The suggestions and recommendations of our study should be concerned in the preparation of radiology curriculum and books for medical students of next years.

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