Article published online: 2021-03-26

Original Article

# Awareness of Interventional Radiology among Clinical Years' Medical Students and Medical Interns at University of Hail

**Rahaf Albaqawi, Meshael Alreshidi, Dalal Alshubrami, Halah Alrasheedi, Fayez Alreshidi[1], Ibrahim Alrashidi[2]**

*College of Medicine, University of Hail, [1]Department of Family Medicine, College of Medicine, University of Hail, Hail, [2]Department of Radiology, Prince Sultan Military Medical City, Riyadh, Saudi Arabia*

## Abstract

**Context:** One of the most important challenges facing the evolution of modern interventional radiology is its lack of awareness among medical students. **Aims:** This study aimed to determine the knowledge, perception, and views of the University of Hail clinical year medical students and medical interns regarding various interventional radiology topics. **Settings and Design:** A cross-sectional study on 244 clinical years' medical students and 87 medical interns from the University of Hail. **Materials and Methods:** A validated anonymous electronic questionnaire regarding awareness of various interventional radiology topics was sent to all clinical years' students and medical interns, and the results were analyzed. **Statistical Analysis Used:** The sample size was calculated through the Raosoft sample size calculator website. Data analysis was performed using SPSS statistics. **Results:** We received 200 responses. Majority of the participants (45%) agreed that their knowledge and information regarding interventional radiology was poor. Few participants (17%) were interested in considering a career in diagnostic radiology or interventional radiology. The most common reported reason for not considering radiology as a career option was lack of adequate knowledge about the subject (27.5%). Majority of participants (72.5%) had not been exposed to interventional radiology. Only 36.5% of participants were interested in doing a 2-week interventional radiology elective during their internship year. **Conclusions:** This study demonstrated that the majority of undergraduates and interns lack basic knowledge of interventional radiology. About one-third of the respondents were interested in doing their elective term in interventional radiology, and more than half of the participants were not interested or were unsure.

**Keywords:** *Awareness, interventional radiology, medical students*

## Introduction

Interventional radiology uses minimally invasive, image-guided technology for the diagnosis and treatment of diseases. The field is rapidly expanding but lacks awareness among healthcare professionals, medical students, and patients.[1] Many prior studies have evaluated knowledge and awareness of medical students regarding interventional radiology; all have confirmed poor knowledge of this specialty.[2-4] In the sole study in Saudi Arabia, poor exposure to interventional radiology was observed among medical students and interns.[1] This study aimed to assess awareness of interventional radiology among medical students and medical interns at a Saudi university and to gauge their interest in this field as a career choice.

## Materials and Methods

A cross-sectional study was conducted on 244 clinical year medical students and 87 medical interns from our university [Figure 1]. Informed consent was obtained from the students through the electronic survey. The appropriate sample size was calculated through Raosoft sample size calculator website to be 179 with 95% confidence interval. A validated anonymous electronic survey used previously in similar European and Canadian studies [Appendix 1][4,5] was sent to all students during the period from September 10 to September 20, 2018. All students were informed of the study aim and objectives and provided consent to take part in the study.

The survey consisted of 20 questions, including multiple questions regarding the students' knowledge about radiology and interventional radiology, in comparison to other participants; a question regarding previous rotations or plans to take an elective rotation in radiology, and a question regarding the desire for diagnostic or interventional radiology as a future



**How to cite this article:** Albaqawi R, Alreshidi M, Alshubrami D, Alrasheedi H, Alreshidi F, Alrashidi I. Awareness of interventional radiology among clinical years' medical students and medical interns at University of Hail. Arab J Intervent Radiol 2019;3:58-64.

***Address for correspondence:***
*Dr. Rahaf Albaqawi, College of Medicine, University of Hail, Hail 55211, Saudi Arabia.*
*E-mail: dr.rahafalbaqawi@gmail.com*

**Access this article online**

**Website:** www.arabjir.com

**DOI:** 10.4103/AJIR.AJIR_3_19

**Quick Response Code:**

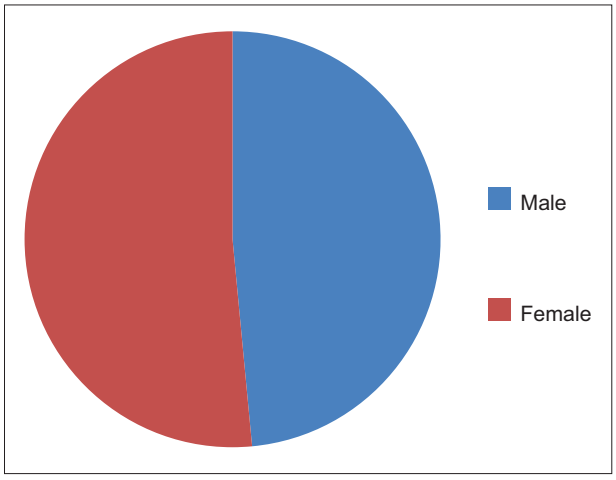
career specialty. In addition, a question was included regarding exposure to interventional radiology, as well as multiple questions regarding the duties of the interventional radiologist and the role of interventional radiologists in various procedures. Finally, the survey included questions regarding preferred methods for learning interventional radiology and a question regarding the suitability of a 2-week interventional radiology elective, if offered during surgery rotation. Data analysis was performed using SPSS statistics (Version 22; IBM Corp., Armonk, NY, USA).

## Results

The respondent distributions according to gender and according to educational year are shown in Table 1 and Graph 1, respectively. The majority of respondents (45%) reported that their knowledge and information regarding interventional radiology was poor; other respondents rated their knowledge as adequate (23%), good (8.5%), or excellent (1%). Notably, 22.5% of respondents reported that they had no knowledge regarding interventional radiology. Regarding diagnostic radiology, the majority of respondents (45%) rated their knowledge as poor; 19.5% of respondents reported their knowledge as adequate, 14% as good, 3% as excellent, and 18.5% agreed that they had no knowledge regarding diagnostic radiology. A small proportion (17.5%) of the respondents had completed or planned to complete an elective rotation in radiology. Similarly, small proportions of the respondents were interested in a career in diagnostic radiology (17%) or interventional radiology (13.5%); however, the majority were not interested in a career in either, or reported "not sure." Figure 2 shows that the most common reason (27.5%) for this lack of interest was that respondents did not have enough information about the specialties. The majority of respondents (72.5%) had not seen patients who were diagnosed or treated by an interventional radiologist. Regarding training, the majority (57%) of the respondents indicated that interventional radiologists should complete training in both radiology and surgery. Only 38% correctly indicated the route of training as radiology; however, 1% indicated that training should be in the surgery alone, 1% chose internal medicine alone, and 1% indicated "do not know." Most respondents in this study did not think there were outpatient clinics in interventional radiology (61.5%) or that interventional radiologists performed clinical ward rounds in the hospital (61%). The majority of respondents indicated that interventional radiologists admit patients to the hospital (62%) and that interventional radiologists can treat minor illnesses (59.5%) and major illnesses (64%); however, 29% of respondents indicated that interventional radiologists do not treat patients at all. The knowledge and awareness of respondents regarding the types of procedures performed by interventional radiologists were as follows. The majority of respondents indicated that interventional radiologists performed stenting or cardiac angioplasty (71%), but many respondents were unsure of whether interventional radiologists performed femoral-popliteal arterial bypass (47%) and venous access procedures (e.g., Hickman line) (57.5%). The majority of participants did not know if arteriovenous fistulas for dialysis (58%) or uterine artery embolization for fibroids (52%) could be performed by interventional radiologists. Most respondents agreed that lower limb angioplasty and stenting (72.5%) and endovascular repair of aortic aneurysms (74.5%) could be performed by an interventional radiologist. However, the majority thought that vertebroplasty (77%), radiofrequency ablation of tumors (51.5%), and percutaneous nephrostomy (75.5%) could not be performed by an interventional radiologist. Half of the respondents indicated that image-guided tumor biopsy could be performed by an interventional radiologist. The majority of respondents were familiar with angioplasty (56.5%); the participants explained the source of exposure as follows: 25.5% from a cardiologist, 11.5% from the vascular surgeon, 12% from the interventional radiologist, and 6% from internal medicine [Figure 3]. The source of information regarding interventional radiology for the majority of respondents was lectures from an interventional radiologist (19.5%), problem-based learning tutorials (13%), ward rounds in the hospital (11.5%), radiology elective rotation (7%), self-directed research (4.5%), multidisciplinary meetings (3%), course in radiology (0.5%), interventional radiologist on social media (0.5%), and radiology module (0.5%). Notably, 39.5% of respondents had no exposure to interventional radiology; Figure 4 summarizes these findings for each method. Only

**Table 1: Distribution of sample according to gender**

| Gender | Percentage |
|---|---|
| Female | 51.5 |
| Male | 48.5 |
| Total | 100.0 |




**Graph 1: Distribution of sample according to gender (Male 48.5%), ( Female 51.5%)**

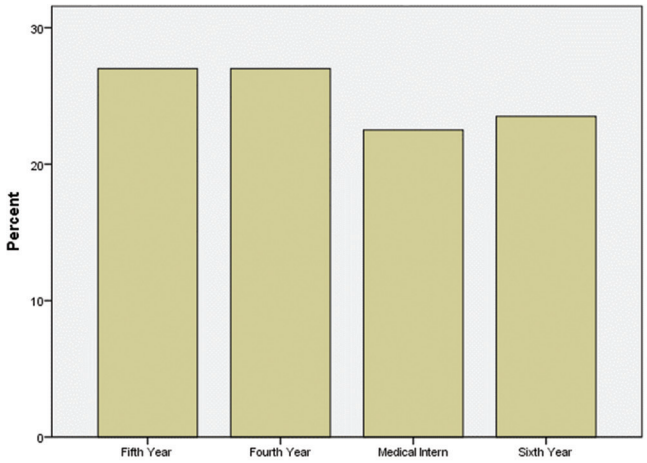



**Figure 1: Distribution of sample according to education level**

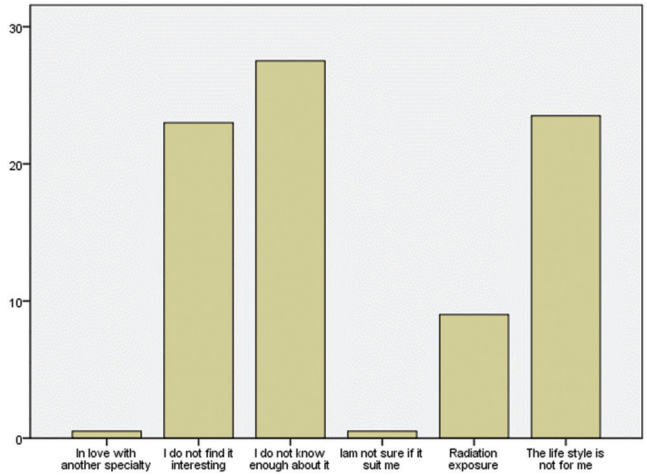



**Figure 2: The reasons of not considering a career in radiology**

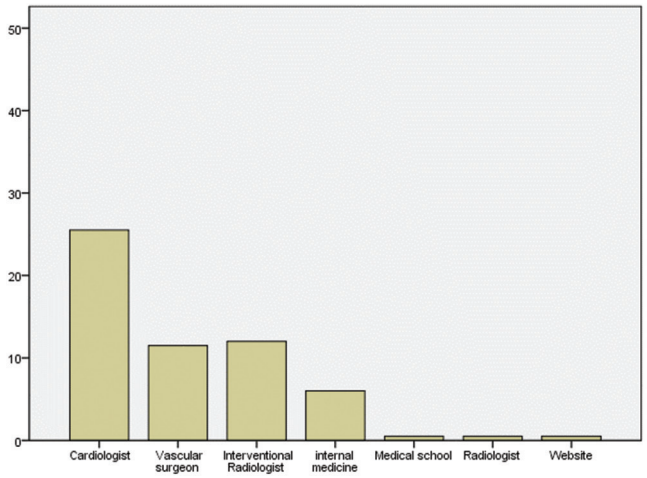



**Figure 3: The sources of exposure**

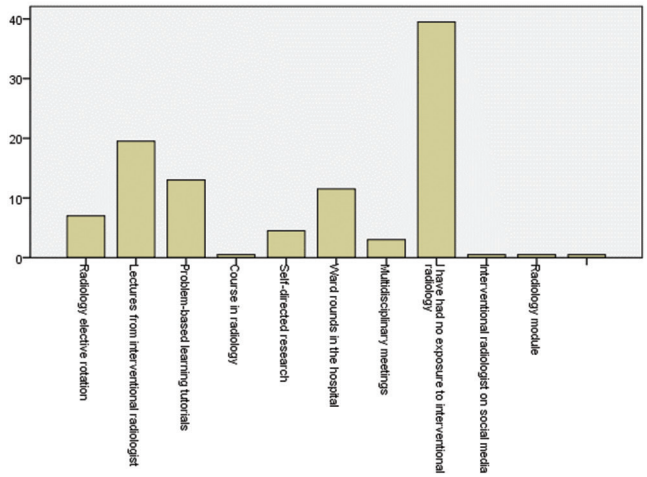



**Figure 4: The methods of learning**

36.5% of respondents were interested in completing a 2-week interventional radiology elective if offered during internship, whereas 63.5% indicated that they were not interested or not sure.

## Discussion

Interventional radiology is historically growing and expanding specialty. The number of interventional radiology procedures has increased by >50% since 2007 (Source RCR Workforce document 2012).[6] Many studies conducted internationally and locally have evaluated the level of knowledge and awareness of medical students regarding it, and all the studies confirmed the lack of knowledge regarding this specialty. However, no similar studies have been conducted in Hail city. In a Canadian study, O'Malley and Athreya found that students were eager to learn more about interventional radiology, and desired more exposure, although their knowledge about it was limited.[2] In the United States of America, Nissim *et al*. conducted a similar study and concluded that exposure to interventional radiology in accredited US medical education programs was inconsistent, but interest in the field was moderate among medical students compared with other hands-on specialties.[3] In a European study, Leong *et al*. found that interventional radiology was an attractive specialty although it remains nascent.[4] In a study conducted in Saudi Arabia, Alshumrani concluded that poor exposure to interventional radiology among medical students and interns could be addressed by dedicated undergraduate teaching of interventional radiology by interventional radiologists with emphasis on the clinical practice.[1] Medical students are considered to be an important part of future of interventional radiology. Therefore, it is important to estimate their level of knowledge about it. The majority of survey respondents had very poor knowledge regarding the basics of interventional radiology, which may be because this subspecialty is not included in the medical curriculum and this is a worrying observation for such emerging specialty. The majority of respondents were not interested in radiology because of inadequate knowledge about it and

most of them (72.5%) had not seen patients who were diagnosed or treated by an interventional radiologist. This feedback should be used to provide additional information regarding this specialty and greater exposure in clinical teaching. Approximately two-thirds of respondents indicated that training in interventional radiology requires training in both radiology and surgery, which is not a correct assumption. This supports that students and interns may have incorrect information regarding the specialty. Two-thirds of the respondents did not think that interventional radiologists have an outpatient clinic, or perform ward rounds; however, the majority indicated that interventional radiologists admit patients to the hospital and treat minor illnesses, which is correct. There are gaps in basic knowledge among medical students with respect to interventional radiology. This study demonstrated that the majority of undergraduates and interns lack knowledge of interventional radiology, which is likely to impact their selection of this field as a potential career choice. The most important point in this study is to attract the attention and focus of the students and medical interns on interventional radiology, which explained the real level and weaknesses, which must be corrected due to the importance of this information in their professional lives.

## Conclusion

This study demonstrated that the majority of undergraduates and interns lack basic knowledge of interventional radiology. About one-third of the respondents were interested in doing their elective term in interventional radiology, on the other hand ,more than half of the participants are not interested or not sure yet.

### Financial support and sponsorship

Nil.

### Conflict of interest

There are no conflicts of interest.

## References

1. Alshumrani GA. Awareness of interventional radiology among final-year medical students and medical interns at a university in Southwestern Saudi Arabia. Saudi Med J 2013;34:841-7.
2. O'Malley L, Athreya S. Awareness and level of knowledge of interventional radiology among medical students at a Canadian institution. Acad Radiol 2012;19:894-901.
3. Nissim L, Krupinski E, Hunter T, Taljanovic M. Exposure to, understanding of, and interest in interventional radiology in American medical students. Acad Radiol 2013;20:493-9.
4. Leong S, Keeling AN, Lee MJ. A survey of interventional radiology awareness among final-year medical students in a European country. Cardiovasc Intervent Radiol 2009;32:623-9.
5. O'Brien J, Baerlocher MO, Asch MR, Hayeems E, Kachura JR, Collingwood P. Limitations influencing interventional radiology in Canada: Results of a national survey by the Canadian interventional radiology association (CIRA). Cardiovasc Intervent Radiol 2007;30:847-53.
6. Royal College of Radiologists Curriculum – Interventional Radiology; May 2012. Available from: https://www.rcr.ac.uk/sites/default/files/docs/radiology/pdf/Curriculum%20-%20Interventional%20Radiology%20May%202012.pdf. [Last accessed on 2019 Feb 18].

# Questionnire

**Dear Participant :**

We are seniors medical student at Hail University.

In this research project, we're assessing the awareness of interventional radiology (IR) among clinical-year medical students and medical interns at a University of Hail.

Because you are a clinical year medical student or medical intern at Hail University, I am inviting you to participate in this research study by completing the survey.

The following questionnaire will require approximately three minutes to complete it.

In order to ensure that all information will remain confidential, please do not include your name. Copies of the project will be provided to my research instructors. Participation is strictly voluntary and you may refuse to participate at any time.

Thank you for your kind cooperation.

If you require additional information or have questions, please contact me directly via email listed below ..

Dr.rahafalbaqawi@gmail.com

## Questionnaire

- **Gender :**
  - male
  - female

- **Level:**
  - **Fourth year medical student**
  - **Fifth year medical student**
  - **Sixth year medical student**
  - **Medical intern**

**1. How would you rate your knowledge of interventional radiology as compared to other subjects?**

a. Excellent
b. Good
c. Adequate
d. Poor
e. No knowledge

**2. How do you rate your knowledge of radiology in general compared to other subjects?**

a. Excellent
b. Good
c. Adequate
d. Poor
e. No knowledge

**3. Have you completed, or do you plan to complete an elective rotation in Radiology (diagnostic or interventional)?**

a. Yes
b. No
c. Not sure

**4. Would you consider a career in diagnostic radiology?**

a. Yes
b. No
c. Not sure

**5. Would you consider a career in interventional radiology?**

a. Yes
b. No
c. Not sure

**6. If you answer No or Not sure to the previous question, please choose the most appropriate reason why.**

a. I do not find it interesting
b. I do not know enough about it
c. The life style is not for me
d. Radiation exposure
e. Other (please specify): _____

**7. Have you seen patients who were treated by an interventional radiologist?**

a. Yes
b. No
c. Not sure

**8. An interventional radiologist must complete training in:**

a. Radiology
b. Surgery
c. Both radiology and surgery
d. Internal medicine
e. Other (please specify): _____

**9. Interventional radiologists have outpatient clinics.**

a. True
b. False

**10. Interventional radiologists do ward rounds in the hospital.**

a. True
b. False

**11. Interventional radiologists admit patients to the hospital.**
a. True
b. False
**12. Interventional radiologists treat patients with minor illnesses.**
a. True
b. False
**13. Interventional radiologists treat patients with major illnesses.**
a. True
b. False
**14. Interventional radiologists do not treat patients at all.**
a. True
b. False
**15. An Interventional Radiologist performs the following procedures:**
a. Cardiac angioplasty or stenting Yes____No____
b. Femoral-popliteal arterial bypass Yes____No____
c. Venous access procedures (e.g., Hickman line) Yes____No____
d. Arteriovenous fistulas for dialysis Yes____No____
e. Uterine artery embolisation for fibroids Yes____No____
f. Lower limb angioplasty and stenting Yes____No____
**16. Are you familiar with the following procedures?**
a. VertebroplastyYes____No____
b. Radiofrequency ablation of tumoursYes____No____
c. Endovascular repair of aortic aneurysms Yes____No____
d. Percutaneous nephrostomy Yes____No____
e. Image-guided tumour biopsy Yes____No____
**17. Are you familiar with the procedure called 'angioplasty'?**
Yes____No____
**18. If you answer yes to the previous question, where did you gain that exposure?**
a. Cardiologist Yes____No____
b. Vascular surgeon Yes____No____
c. Interventional Radiologist Yes____No____
d. Others (please specify)_____
**19. What has provided you with the most information about interventional radiology?**
a. Radiology elective rotation
b. Lectures from interventional radiologist
c. Problem-based learning tutorials
d. Self-directed research
e. Ward rounds in the hospital
f. Multidisciplinary meetings
g. I have had no exposure to interventional radiology
h. Other (please specify): _____
**20. Would you be interested in doing a 2-week interventional radiology elective if it is offered during the 3-month surgery rotation**
in internship?
a. Yes
b. No
c. Not sure