

How to Cite:

Zafar, S., Junaid, R., Taj, R., Talha, M., Khalid, F., & Zuhrah, S. (2022). Awareness of dental practitioners regarding oral radiology. *International Journal of Health Sciences*, 6(S9), 4259–4266. <https://doi.org/10.53730/ijhs.v6nS9.13678>

Awareness of dental practitioners regarding oral radiology

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Abstract---Background: The damaging radiations exposure can causes harm to body cells and DNA. It also leads to shortening of life expectancy. Many Dental techniques and equipment made to lower the radiation dose for staff and patients. Objective: In this study the knowledge, attitude and practice based questions were asked to analyze the awareness level of house officers regarding oral radiology. Study design: It is a questionnaire-based study conducted for the duration of the six months from Feb 2022 to July 2022. Material and Methods: The study comprised of 105 house officers that were practicing dentistry after completion of their degrees. They were fully aware of the objective of the study. They were practicing in institutes like Liaquat College of medicine and dentistry, Fatima Jinnah dental College and Bahria university medical and dental College. Results: All the subjects had taken the radiographs and 38 subjects reported

about using both conventional and digital method during practice. The average age of the subjects was 25 years. There were 32 subjects that prefer using conventional method and among them 27 reported that they had only one equipment that's why they have to use it. The 37 house officers said that they think only the radiology staff need to learn the precautionary measures. Conclusion: The study showed that most of the house officers were fully aware of the harms of unnecessary radiations and they followed the protection protocols. However, still the level of awareness of the doctors is speckled.

Keywords---Dental practitioner and oral radiology, attitude, knowledge.

Introduction

There are different types of effects are associated with the radiations. The damaging radiations exposure can causes harm to body cells and DNA. These also leads to shortening of life expectancy¹⁻³. Many dental techniques and equipment made to lower the radiation dose for staff and patients. The stochastic and deterministic effects of the radiations are increasing with the passage of the time. In the field of medical and dental science, different types of radiations are used for the diagnosis of the disease. Such as X-ray applications in the field of dental sciences can ranged from diagnosis to therapeutics. These radiations have extensive uses. The concerns against the ionizing radiations are raised by the International commission on the radiological protections⁴⁻⁵. The radiations protections must be constantly monitored. Many researchers have given the rules for first protection recommendations. One of the most essential rule is to keep the exposure time as short as possible. The term tolerance defined the dose range of the radiations in order to protect the subjects from the over-exposure of the radiations. The dentist must be aware of the basic knowledge of over-exposure. The radiation became one of the most essential part of life now a days. These have applications in every sector of life⁶⁻⁸.

To reduce radiation exposure, orthodox and conventional methods are being replaced by specific radiation techniques such as CBCT (cone beam computed tomography) and MRI. Although dental radiography is not as dangerous as other fields, it still requires careful monitoring to avoid any harm. Basic features such as time, distance, and radiation shielding must be precisely controlled. Radiology examination is essential because it helps in diagnosis⁹. The study was conducted to determine the level of oral radiology awareness. In this study the knowledge, attitude and practice based questions were asked to analyze the awareness level of house officers regarding oral radiology.

Material and Methods

It is a questionnaire-based study conducted for the duration of the six months from Feb 2022 to July 2022. The study comprised of 105 house officers that were practicing dentistry after completion of their degrees. They were fully aware of the objective of the study. The willingly signed the consent and participated in the

study. We have collected data from house officers of all dental colleges of Karachi. A cross-sectional questionnaire was created and provided to the house officers.

According to the inclusion criteria the subjects must be medical officer practicing in any medical College. Those who refused to participate were excluded from the study. The questionnaire with the missing or incomplete information were also excluded. The demographic data was collected. The questionnaire format was designed in accordance with the study conducted by the group of researchers of the Egypt¹⁰. The data was collected and stratified with the help of SPSS tool. The results were analyzed and presented in the form of tables. The significant p-value were also analyzed for the results.

Results

The study comprised of 105 house officers that were practicing dentistry after completion of their degrees. They were fully aware of the objective of the study. There were 63 male and 42 female subjects and average age of the subjects was 25 years. They were practicing in institutes like Liaquat College of medicine and dentistry, Fatima Jinnah dental college and Bahria university medical and dental college. The demographic profile of the subjects is shown in table 1.

Table no.1: Demographic profile of the subjects

Features	No. of subjects
Number of participants	105
Gender	
Male	63
Female	42
Average age of subjects	25
Institute of practice	
Liaquat college of medicine and dentistry	24
Fatima Jinnah dental college	42
Bahria university medical and dental college	39
Educational level of subjects	House officers

The KAP study involved knowledge based, attitude based and practice based questions that were asked to analyze the awareness level among house officers regarding oral radiology. All of them had taken the radiographs and 38 subjects reported about using both conventional and digital method during practice (table no.2). There were 32 subjects that prefer using conventional method and among them 27 reported that they had only one equipment that's why they have to use it. 67 subjects stated that conventional method carry high radiation dose (table no.2).

Table no.2: Knowledge based questions regarding participants related to oral radiology and their response

Study questions	Response	No. of subjects	P value
Have you ever taken a radiograph	Yes	105	0.0002
	No	-	
If yes if method was preferred	Conventional	32	0.0002
	Digital	35	
	Both	38	
If you are still using the conventional method, why are you still using it	Its more easier to use	3	0.0003
	Only available equipment	27	
	Better for specific cases	5	
Either conventional or digital carry higher radiation dose	Conventional	65	0.001
	Digital	35	
	Both carry same dose	3	
	Don't know	2	

There were 66 subjects that reported about taking radiographs often at their work place. Among the 105 subjects, 65 had idea about the un-necessary radiation exposure they had to face. There were 27 house officers that had no idea about any principle for radiation protection (table no.3)

Table no.3 Attitude based questions regarding oral radiology

Study questions	Response	No. of subjects	P value
How many radiographs you take in a day	Often	66	0.003
	Sometimes	32	
	Rarely	7	
Do you think by taking radiographs you are exposed to un-necessary radiations	Yes	65	0.000
	No	19	
	No idea	21	
Do you know any principle that is used for staff radiation protection	Yes	41	0.000
	No	37	
	No idea	27	
What is your technique of choice of endodontic radiography	Bisecting angle	34	0.001
	Paralleling	64	
	Any other	7	

Among the 105 subjects that were questioned, 34 used bisecting angle method of endodontic radiography and 6 used paralleling method. (Table no.3). When 84 subjects asked reported that they don't ask their patients to hold the film with their hands during exposure. 37 house officers said that they think only the radiology staff need to learn the precautionary measures and majority of them said that they are busy and can't attend any workshop related to awareness about oral radiology (table no.4).

Table no. 4: Practice based questions given to subjects and their response

Study questions	Response	No. of subjects	P value
Do you ask patients to hold film with their hands during exposure	Yes	21	0.000
	No	84	
Do you think it's important to train dentists about ways to decrease radiation dose in dental practice	Yes	42	0.000
	Only the radiology staff	37	
	No	26	
During exposure do you hold the film by using your hand	Yes	45	0.000
	No	43	
	Don't know	17	
How would you rate yourself when it comes to awareness about practicing oral radiology	Excellent	35	0.000
	Good	61	
	Fair	9	
Will you be interested to attend any workshop related to self-awareness regarding oral radiology	Yes, as a fresher	21	0.000
	Yes, as formal training	28	
	No, I am busy	51	
	No, I don't need it	5	

Discussion

Exposure to damaging radiations causes harm to body cells and DNA, it has led to shortening of life expectancy¹¹. There are many dental techniques and equipment made to lower the radiation dose for staff and patients. There should be full awareness of oral radiology among practicing dentists so that they can understand the severity of the issue¹². Radiology examination is a crucial part as it plays important role in diagnosis. The study was done to find the awareness level of dental practitioner related to oral radiology. The orthodox and conventional methods are replaced by specific radiation techniques like CBCT (cone beam computed tomography) and MRI to minimize the radiation exposure¹³. The radiography related to dentistry is not as such hazardous as other fields but still it needs proper monitoring to avoid any harm caused by it. The basic features like time, distance and shielding of radiations is needed to be controlled in a precise manner¹⁴. As per studies the conventional methods costs 0.004-0.016 re/case radiations to the practitioner. But modern methods now have made the radiation dose as low as 9-29 mSv¹⁵⁻¹⁶. The radiology experts should have an in depth knowledge about the radiation exposure its use so that the diagnosis can be made with minimal risk¹⁷⁻¹⁸. There were 21 subjects that were unaware of the harms caused by these unnecessary radiations. The good practice includes adequate information to lessen the dose given to patients because of imaging modalities. The questionnaire consisted of house officers from three medical institutes that were practicing dental oral radiology. All of them had performed radiographs often during the duty hours. Most of them reported about using both conventional and digital methods for imaging and those who used only conventional methods reported the reason is that they only have one sort of

machine available for radiography. In this study when the subjects were asked that either they ask their patients to hold the film in their hand, 84 had their answer in a “no”. The subjects were asked that either they feel the need to attend workshop regarding awareness of oral radiography most of them said no as they are busy with their routine. This study showed that almost all the house officers were aware of the harms caused by X-rays and the importance of their controlled use. They were aware that certain precautions are needed to avoid harms. There were 64 subjects that used paralleling technique and bisecting angle technique was used by 34 subjects. When they were asked which type of method they are using, most of them told about using both methods. But they were fully aware that the conventional method had more radiation harms than the digital method. Among the 105 subjects, 65 had full knowledge about the unnecessary radiation exposure they had to face. There were 27 house officers that had no idea about any principle for radiation protection. In some cases, the subjects were only using conventional method and that was because they had no access to the modern digital method. Most of the patients claimed that they make sure the protection protocols are fulfilled and there are no mistakes made. But there were some that reasoned financial issues, congested space and such related issues as the cause of poor protocol administration. In this study after the data was collected the subjects were recalled and it was made sure that they know about the importance of misuse of radiations. Most of the house officers were satisfied with their work and they claimed that they follow protection protocols to their fullest. However, in future lectures, conference and related talks should be arranged so that new dentists who are willing to work in oral radiology department are familiar with the protection protocols¹⁹. Specifically, the senior doctors should monitor fresh house officers so that any mistake they make can be pointed out. Our studies are in accordance with the previous studies where KAP study was carried out to find the awareness among undergraduate students, graduate students and practitioners²⁰⁻²¹. However, this study was composed of house officers from three institutes so it was a population based study if sample size was much greater the results would be more clear and better.

Conclusion

The study was carried out to find the awareness of practitioners regarding oral radiographic protection. The study showed that most of the house officers were fully aware of the harms of unnecessary radiations and they followed the protection protocols. However, still the level of awareness of the doctors is speckled. Therefore, there is need to arrange lectures and guide programs for young practitioners to strictly adhere to the protocols.

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