ORIGINAL ARTICLE

ASSESSMENT OF KNOWLEDGE AND ATTITUDE TOWARDS RADIATION HAZARDS AMONG DENTAL STUDENTS AND HOUSE OFFICERS AT TERTIARY CARE HOSPITAL

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ABSTRACT

The aim of the study was to determine the knowledge and attitude about radiation hazards among dental students and house officers. A Cross sectional study was conducted at the department of Dental Radiology, Faisalabad Medical University, Faisalabad from February 2019 to March 2019. A structured questionnaire consisted of total 15 open and closed ended questions were distributed among 150 participants of third year, final year BDS students and house officers. The questions were divided into three different sections; Section A: Demographic Detail; Section B: Knowledge Questions and Section C: Attitude Questions. Out of 150 distributed questionnaires 116 (77.3%) were collected and analyzed. The most of the participants were females 89 (76.7%) and the number of male participants were only 27 (23.3%) with male to female ratio 1:3.5. The age of the participants ranged from 15-30 years (mean age: 21.4 years). Among 116 participants 35 (30.2%) participants were from third year BDS class 41 (35.3%) from final year BDS class and 40 (34.5%) participants were House Officers. The majority of study participants (73%) had adequate knowledge about radiation hazards and its preventive measures. However, results revealed that there are still misinterpretations regarding the attitudes of participants towards radiation hazards and only 64% participants have adequate concept regarding this. The results of this study showed that the overall level of knowledge concerning radiation hazards among the BDS students and house officers is fairly satisfactory. However, there are quiet misapprehensions regarding the attitudes, which mirror the wrong impression of the radiation usage among study participants. This calls for well-defined programs on health education emphasizing on such misapprehensions.

Key Words: *Radiation, Attitude, Knowledge, Dental students.*

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INTRODUCTION

Radiography has an important and essential role in dentistry for diagnosis, treatment planning and monitoring treatment of simple to more complex pathologies, lesions, fractures etc.[1] Ionizing radiations hold detrimental effects on human health through the production of free radicals that lead to DNA damage including breakage at level of single or double strands, DNA mutations or protein cross-links.[2,3]

Biological hazards of radiations are classified as: Deterministic or Non-stochastic and Non-deterministic or stochastic effects.[3] The effects in which severity of response is proportional to dose are deterministic effects.[1,4] No response is seen below the threshold dose until dose is large enough to impart injurious effects.[1]Stochastic effects, on the other hand are those which do not have any threshold dose levels and leave the operating personals and the patients in a high risk zone .[1,2,4]

Dental radiography is categorized under stochastic effects, although the radiation exposure is minimal

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despite of this it is prime to lessen the dose to avoid accumulated effects.[2,5] This can be attained through ALARA principle (As Low As Reasonably Achievable) during routine dental radiographs.[2,6] Reduction of dose has been achieved through the technical advances in radiological equipment during intra-oral and extra-oral radiographs and its different variables are starting from use of high speed films ,selected techniques, rectangular collimaters that reduce patient exposure ,wearing of lead aprons maintaining an accurate distance from radiation source ,thyroid collars and protective barriers etc.[2,6,7] Significant role is also played by radiology room ,its construction should be in such a way that the walls should be coated with lead or gypsum to prevent the release of unnecessary radiation to the surrounding environment.[3,8]

The objective of the study was to evaluate the knowledge and attitude about radiation hazards and its protective measures taken by the dental students and house officers. By understanding the behavior of study participant's further improvements can be made in teaching curriculum for both undergraduate and postgraduate courses.

PATIENTS AND METHODS

This was a questionnaire based cross sectional study conducted over a period of two months February-March 2019 in the department of Dental Radiology, Allied Hospital/ Faisalabad Medical University, Faisalabad. The study was approved by ethical committee of Faisalabad Medical University, Faisalabad. All students from the third year and final year of the BDS course and House Officers from the academic year 2018-2019 were included in the study on voluntary basis. Instructions were advised and basis of the study was described to all the participants prior to attempt the questionnaire.

Study participants consisted of total 150 candidates out of which 116 participants completed the questionnaire.

A pre-validated questionnaire was used in this study which was developed after literature search and preliminary discussion with panel of experts. Questionnaire consisted of 15 open and closed ended questions. These questions were divided into three different sections; Section A: Demographic Detail; Section B: Knowledge Questions and Section C: Attitude Questions. Section B and C had Yes and No based options. The survey took an average only 10 to 15 minutes to complete. Informed consent was taken from the study participants prior to attempt the questionnaire and secrecy of data was retained. Data were collected by using a hard copy of questionnaire.

Statistical Analysis

In order to eliminate the intra-observer error, the data collection process was closely supervised by the same observer who reviewed and completed the data collection questionnaires. The collected data were entered and analyzed using SPSS version 21.0 (SPSS Inc., Chicago, IL, USA). Data were expressed in frequencies and percentages.[3,4,7]

RESULTS

Total 150 questionnaires were distributed. Out of these 116 participants completed the questionnaire with an overall response rate of 77.3%. The majority of the participants were females 89 (76.7%) and the number of male participants were only 27 (23.3%) with male to female ratio was found to be 1:3.5. The age of the participants ranged from 15-30 years (mean age: 21.4). Among 116 participants 35 (30.2%) participants were from third year BDS class 41 (35.3%) from final year BDS class and 40 (34.5%) participants were House Officers (Table: 1).

Overall majority of study participants (73%) had adequate knowledge about radiation hazards and its preventive measures. Among the study participants the knowledge level regarding radiation hazards was better in house officers followed by final year BDS class as compared to third year BDS class (Table 2).

On the questions regarding the attitude of students towards radiation hazards, only 64% total participants have adequate concept regarding this. These misconceptions were also more common among the junior dental students when compared to those in final year students and house officers as documented in (Table 3).

DISCUSSION

Occupational exposure to radiation remains a notable threat to health care workers mainly in third world countries like Pakistan where the protective measures are not channelized.[9,10] Radiation hazards become further damaging and becomes unassertive when there is a professional negligence.[11]

In common, health professionals and the general society have been reported to have negative viewpoint towards radiation hazards and its protective measures and usually medical and dental students show considerable fear of transmission of disease through radiation.[11,12] There are numerous aspects related with negative attitudes like; broad based ideology, a low level of knowledge, young age, panic, over-value risk assessment and lacking the encounter of caring for patient who are affected by radiation.[8,13,14]

In this study out of 150 questionnaires distributed

TABLE 1: KNOWLEDGE OF RADIATION HAZARDS AMONG THE STUDY GROUPS

	Questions	Answers	3rd Year	4th Year	Ho's
1	Are dental X rays harmful?	Yes	29	32	15
		No	06	09	25
2	Are you aware of use of rectangular collimators in X-ray machine?	Yes	11	05	10
		No	24	36	30
3	Do we use high speed films for peri-apical radiographs?	Yes	15	16	13
		No	20	25	27
4	Are radiographs absolutely contra indicated in pregnant patients?	Yes	22	22	11
		No	13	19	29
5	Does distance 5-feet from radiation source is mandatory?	Yes	24	14	11
		No	11	27	29

TABLE 2: ATTITUTES TOWARDS RADIATION HAZARDS AMONG THE STUDY GROUPS

	Questions	Answers	3rd Year	4th Year	Ho's
1	Do you prescribe dental X-rays after thorough clinical examination and history taking?	Yes	30	29	34
		No	05	12	06
2	Do you take multiple peri-apical radiographs for diagnostic purposes?	Yes	07	15	09
		No	28	26	31
3	Do you take informed consent before taking X-rays?	Yes	19	13	27
		No	16	28	13
4	Do you inform the patients about hazards of X-rays?	Yes	18	11	21
		No	17	30	19
5	Do you use film holding device for placement of film?	Yes	28	14	05
		No	07	27	35
6	Do you hold the film with your hand while taking X-rays?	Yes	13	33	34
		No	22	08	06
7	Do you wear lead apron during exposure on regular basis?	Yes	16	13	24
		No	19	28	16
8	Do you use thyroid collar in children during exposure?	Yes	17	06	00
		No	18	35	40
9	Do you use led apron in pregnant patients during exposure?	Yes	21	16	37
		No	14	25	03
10	Do you stand behind lead shield while taking X-rays?	yes	24	25	21
		No	11	16	19

among the participants 116 (77.3%) questionnaires were returned and analyzed. The majority of participants were female (76.7%) in this study. This female supremacy was also reported by other studies like Parveen et al[2] and Javali et al[3] who reported 65.6% and 56% females in their respective studies.[2,3,13]

The age of the participants in present study ranged from 15-30 years with the mean age of 21.4 years. Mean age of the participants in other studies were as follows: 22.6 years in the study of Singh et al[5] and 23.2 years in the study of Awosan et al.[7]

The results of present study are mostly acceptable despite some disappointing points on primary knowledge for example 58.6% students from third year BDS class, 38% from final year BDS class and 21% house officers think that dental x-rays are completely contraindicated in women who are pregnant whereas 47% of total participants do not wear lead aprons

while taking the radiographs. This is in contrast to the study conducted by Russell et al[6] who reported that 76 % study participants were well aware about the radiation hazards in pregnant patients. Studies like Arnout et al[1] also reported that 61% of first year and 73% students of final year BDS class were aware about the protective measures in pregnant patients while taking dental x-rays.[1,6]

According to results of present study it was also not encouraging to find that vast majority of study participants do not inform the patients about radiation hazards before taking the radiograph. It was also noted that in a question regarding do you take informed consent before taking x-rays, 53% students from first year, 46% students from final year and 41% of house officers do not take informed consent before taking the x-rays.

On the other hand, it was encouraging to find that the vast majority of the participants considered self-prevention during the x-rays and in response to the question that do you stand behind lead shield while taking X-rays? 88% from third year, 87% from final year and 81% house surgeons followed the protocol of self-protection while taking dental x-rays. These results are comparable with the results of Binnal et al[10] and Rout et al.[12]

CONCLUSION & RECOMMENDATIONS

According to results of present study the overall level of knowledge towards radiation hazards and its protective measures among the third year, final year BDS students and house officers is fairly satisfactory. However, there are quiet misapprehensions regarding the attitudes, which mirror a flawed perception of the radiation among study participants and has the prospective to considerably influence the standard of patient guidance as well as the doctor-patient correlation. This calls for well-defined programs on health education emphasizing on such misapprehensions. Repeated workshops and symposiums must be arranged in order to furnish up to date understanding about radiation hazards and means of prevention to both healthcare workers and patients.

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5 Ayesha Ahmed:	Drafting of article and tabulation of results.
6 Rida Ahmed:	Data collection and reviewing of manuscript.