

Evaluation of Undergraduate Dental Student Radiographic Interpretation in Qassim University (QU)

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ABSTRACT

Introduction: Periapical radiographs become extremely important diagnostic tool in dentistry. The aim of this study was to evaluate and validate radiographic interpretation of the undergraduate Dental Student in QU. **Materials and method:** the study was based on questionnaire about periapical radiographs interpretation. 70 undergraduate dental students from QU took part in the study. **Result:** the present study revealed that 80% of the students were giving the correct answers in Q2 and Q3, while 31.4% of students were giving the correct answers in Q1 and Q9. **Conclusion:** dental radiographs are essential in making an accurate diagnosis, in evaluating procedural success and in documentation of dental and oral health.

KEYWORDS: Dentistry, Peri-apical, Radiograph, Questionnaire

INTRODUCTION

Dental radiographs are a useful and necessary tool in the diagnosis and treatment of oral diseases such as caries, periodontal diseases and oral pathologies.¹ The range of knowledge of dental radiography and radiology required can be divided conveniently into four main sections: basic physics and equipment , the production of x-rays, their properties and interactions which result in the formation of the radiographic image radiation protection , the protection of patients and dental staff from the harmful effects of x-rays radiography , the techniques involved in producing the various radiographic images radiology , the interpretation of these radiographic images.²

However, a clinician must be trained to identify normal anatomical landmarks and their variations as well as variations owing to pathology in a radiograph.³ Radiograph images have all the elusive

qualities of a shadow so normal anatomical structures in a radiograph must be known thoroughly before interpreting the abnormalities.⁴

Wuehrmann described an organized method of interpreting an intraoral periapical radiograph.⁵ The production of accurate radiographic images depends on adequate equipment and precise technique, including careful processing of the exposed films. Unfortunately most of the dental radiographs made in practice have distorted images that make interpretation uncertain.³

The aim of the current work was to evaluate the radiographic interpretation of the undergraduate Dental Student in QU.

MATERIALS AND METHODS

This study was based on questionnaire about periapical radiographs interpretation, the

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questionnaire consisted of nine periapical radiographs, and these radiographs were taken from dental clinic of QU which have been made by the undergraduate students. The selected radiograph were viewed to two radiologists (Assistant professors at College of Dentistry QU, Radiology Department) to assure that the radiographs and the questionnaire were selected and designed correctly. The study included three sets of questionnaire, each set contained of three periapical radiographs, the questions measuring the ability to determine the anatomical landmarks(Q1,Q3,Q7), the ability to diagnose the pathological conditions as well as treatment mistakes (Q2,Q5,Q8), and recognize the errors of periapical radiographs among the participants (Q4,Q6,Q9) Table 1.

Third, fourth and fifth year dental students of QU (male, female) were the study subjects. The questionnaires were distributed to them while the radiographs were viewed as slides in a lecture room; the students were allowed one minute to answer each question.

The study results were expressed by mean values and standard deviations (SD), P-values less than 0.05 were considered statistically significant. The data were analyzed using an SPSS (version17) statistical program package.

RESULTS

Seventy undergraduate dental students from QU took part in the study, representing 25 3rd year students, 22 4th year students and 23 5th year students. Table 2 is demonstrating number and percentage of 3rd, 4th and 5th year students' correct answers. However, the present study revealed that 80% of the students were giving the correct answers in Q2 and Q3, while 31.4% of students were giving the correct answers in Q1 and Q9.

Question 1, 5th year students representing 56.5% which have been found the high percentage of the correct answer while 18.2% found in 4th year and 20% in 3rd year students. Therefore, there was a statically significance different at $X^2p= 0.007$.

Question 2, all of 4th year students were answered

correctly 100%, while the 82.6% of 5th year students and 60% of the 3rd year students were giving the right answer , so there was statically significance different at $X^2p= 0.003$.

Respectively, questions 3, 5 and 7 showed 95.7%, 73.9% and 91.3% of 5th year students and 86.4%, 63.6% and 86.4% of 4th year students were giving the correct answer. However 60%, 28% and 56% of 3rd year student were giving the right answers. Therefore there were a statically significance different at $X^2p= 0.006$, $X^2p= 0.004$ and $X^2p= 0.007$ respectively.

Eventually, there was no statically significance different at questions 4, 6, 8 and 9 between 3rd, 4th and 5th year students. The highest percentage found in Q4 was 80.0% of 3rd year students. And question 6 were answered correctly by 4th year students (72.7%).While 50.0% of the 4th year students were giving the correct answer in Q8. Finally, Q9 demonstrated that 3rd year students (36.0%) have been found as the highest percentage among the entire groups.

DISCUSSION

In Previous study by Rushton et al⁶ to identify the ability of the final year students to recognize radiographic film faults, two groups of undergraduates were studied, the students who were shown 11 dental radiographs using a slide format. All the students were asked to evaluate each film while there were an 8 films with faults and the others without or minimum fault, to detail how to correct the fault (if appropriate) and to give a subjective quality rating of each film. Their results were demonstrated that the maximum score achieved among university an undergraduates was 26 (53%), the lowest 8 (16%) and the median was 17 (35%). Only two students at university A achieved a pass mark of over 50%. By comparison, within the university B undergraduates, the lowest score was 9 (18%), the highest 32 (65%) and the median was 21 (43%). Seven students (15%) scored more than 50%.⁶

However, the findings of the current study do not

The Questionnaire (Table 1)			
The Question And The Answer	The Periapical Radiograph		
<p>Q1. 55 years male patient came to the clinic suffering of pain upper right side, After Examination the General practitioner has taken a periapical radiograph and he noticed a radiolucency around to the molars area .What do you think the radiolucency is ? Maxillary sinus.</p>		<p>Q5.What's the radiopaque line? Gutta Percha</p>	
<p>Q2. What's wrong with this Periapical radiograph: Initial file of the central incisor not long enough.</p>		<p>6. What's the error in this radiographic picture? Over Developing.</p>	
<p>Q3.Which one is the mandibular canal: Letter B</p>		<p>Q7.The arrow refers to: Nasal Septum.</p>	
<p>Q4.The students has taken a periapical radiograph, when he showed it to the supervisor, he asked him to retake it, why? faint, cone cut and shortening, All of above.</p>		<p>Q8. The carious lesion is: Approximating to the pulp.</p>	
		<p>Q9. The following periapical radiograph should be retaken, why? The film position was wrong.</p>	

support the previous research.⁶ This disagreement is due to several explanations, the materials and method used in the previous study⁶ were entirely different with the current study. Their study was concerning about the identification of radiographic film faults while the present study was concerned

about the radiographic interpretation of periapical radiographs. In present study, 70 undergraduate dental students from QU took part in the study, representing 25 3rd year students, 22 4th year students and 23 5th year students. The study included three sets of questionnaire, each set contained of

three periapical radiographs, the questions measuring the ability to determine the anatomical landmarks(Q1,Q3,Q7), the ability to diagnose the pathological conditions(Q2,Q5,Q8) as well as treatment mistakes(Q4,Q6,Q9), and recognize the errors of periapical radiographs among the participants Table 1.

Initially, question 1 was about the anatomical landmark "maxillary sinus" which revealed that 56.5% of 5th year students, 18.2% of 4th year and 20% of 3rd year students were answered correctly. Therefore, there was a statically significance different at $X^2p= 0.007$.

Obviously, this result showed that the 5th year students have the highest percentage of the correct answers and the possible explanation for this might be that they have been practicing three years on the clinical field so they obtained the fair amount knowledge and experience of identifying the anatomical landmark such as maxillary sinus. In contrast, the 4th year students demonstrated that they have the lowest percentage of right answer although they have more experience in dental practicing than 3rd year, this might be attributed to that the 4th year students were just finished a course of pathological lesions therefore most of their

answers were concerning about lesions. Regardless, these results were not very encouraging.

Despite that most of the participants were giving the correct answer (80%) in the question 2, 3rd year students (60.0%) have the lowest percentage among the all groups and that may be explained by they were not yet practicing endodontic treatment in the clinic.

In the present study, there were a statically significance different at $X^2p= 0.006$ and $X^2p= 0.007$ respectively in questions 3 and 7 that showed 95.7% and 91.3% of 5th year students and 86.4% and 86.4% of 4th year students were giving the correct answer while 60% and 56% of 3rd year student were giving the right answers.

Questions 3 and 7 were about anatomical landmark "mandibular canal, nasal septum" this a proof that the 5th year students have obtained the fair amount knowledge and experience of identifying the anatomical landmark. In other hand, the 4th year student have a good knowledge and experience of identifying the anatomical landmarks contrary to the result showed in question 1 and that support our previous explanation that they have misunderstanding with a pathological lesions.

Table 2		Number and percentage of students answer								P value
		Third Year		Fourth Year		Fifth Year		Total		
		Count N= 25	Column N %	Count N= 22	Column N %	Count N= 23	Column N %	Count N= 70	Column N %	
Q1	Right Answer	5	20.0%	4	18.2%	13	56.5%	22	31.4%	$X^2p= 0.007 *$
Q2	Right Answer	15	60.0%	22	100.0%	19	82.6%	56	80.0%	$X^2p= 0.003 *$
Q3	Right Answer	15	60.0%	19	86.4%	22	95.7%	56	80.0%	$X^2p= 0.006 *$
Q4	Right Answer	20	80.0%	17	77.3%	15	65.2%	52	74.3%	$X^2p= 0.468$
Q5	Right Answer	7	28.0%	14	63.6%	17	73.9%	38	54.3%	$X^2p= 0.004 *$
Q6	Right Answer	15	60.0%	16	72.7%	10	43.5%	41	58.6%	$X^2p= 0.136$
Q7	Right Answer	14	56.0%	19	86.4%	21	91.3%	54	77.1%	$X^2p= 0.007 *$
Q8	Right Answer	8	32.0%	11	50.0%	4	17.4%	23	32.9%	$X^2p= 0.066$
Q9	Right Answer	9	36.0%	5	22.7%	8	34.8%	22	31.4%	$X^2p= 0.567$

Therefore question 1 was not an appropriate scale for measuring their ability to identify the anatomical landmarks.

Questions 5 showed that 28% of 3rd year student were giving the right answers while 73.9% of 5th year students and 63.6% of 4th year students were giving the correct answer. Therefore, there were a statically significance different at $X^2p= 0.004$. Question 5 was about treatment mistake (overextended gutta percha) so most of them have confused to identify what was the wrong especially they were not yet practicing in the clinic in addition to they have not the same amount of clinical knowledge that the 4th year and 5th year students have.

In this study, question 4, 6, and 9 were about recognition of the errors of periapical radiographs among the participants and the result manifested that the students have low ability to recognize the errors whether processing or techniques and there was no statically significant different.

Question 8 was revealed that 67.1% of students were giving wrong answers. Contrary to the expectations, the 5th year students have the lowest percentage among the entire groups however this result were not very encouraging as well. There are several possible explanations for this result, it might be due to the hurrying of giving the diagnosis thru the radiographs film or totally dependent on the periapical radiograph and neglecting the clinical picture.

CONCLUSION

Dental radiographs are essential in making an accurate diagnosis, performing dental procedures, in evaluating procedural success and in documentation of dental and oral health. Moreover, undergraduate dental students in QU must realize the value of understanding the basic knowledge of periapical radiograph interpretation and its influence upon taking an accurate diagnosis. Dental radiographs are one tool and not adequate to diagnose any conditions so neglecting the clinical view and other diagnostic tools are not recommended. It was noticeable that both 4th year and 5th year students performed better in knowledge of how to interpret

the radiographs. However, further studies should be applied in the future to support the data and/or evaluate the progress among the students.

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