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Dentistry Section

Knowledge and Self-perceived Confidence Level in Oral and Maxillofacial Surgery among Dental Interns in Riyadh

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ABSTRACT

Introduction: Minor oral surgical procedures are practiced in dental teaching. Interns are required to be competent, well-prepared and acknowledge its basics before their practice. Lack of training and knowledge could lead to serious consequences during clinical practice.

Aim: To assess the knowledge and confidence level between male and female dental interns in private and governmental Riyadh dental schools in performing simple dento-alveolar procedures.

Materials and Methods: A cross-sectional observational study was conducted at Princess Nourah bint Abdulrahman University in Riyadh, Saudi Arabia in January 2020 among dental interns from all Riyadh dental schools. A cross-sectional survey containing 23 items was used. The first part included the informed consent and demographic data (item 1-3). The second part consisted of 10 case scenarios to assess the knowledge level (item 4-13), and the third part was developed to self-rate their confidence level (item 14-23). Around 300 participants belonging to five Riyadh dental schools comprised the study population. All interns were included in the study after obtaining informed consent. All statistical analyses were performed using Statistical Package for the Social Sciences (SPSS) version 21.0 and Microsoft Excel 16.16. Groups were compared using Pearson chi-square and unpaired sample t-test. The p-value of <0.05 was considered statistically significant.

Results: Out of 300 interns invited to participate, 210 submitted the electronic survey (70%). The final study population included 117 (56%) females and 93 (44%) males. A total of 111 (53%) belonged to governmental college, and 99 (47%) belonged to private college. There was no statistically significant difference between females and males in total knowledge (p<0.272) and confidence score (p<0.850), respectively. However, a statistically significant difference in knowledge and confidence between government and private colleges was found (p<0.001). A weakly positive significant correlation (r=0.217, p=0.002) was found between the total score of knowledge and the total score of confidence in performing surgical procedures.

Conclusion: The study provides baseline data on the knowledge and perceived confidence of dental interns in Saudi Arabia about certain clinical procedures in oral surgery, where respondents were most knowledgeable in prescribing an appropriate medication. They were confident in giving effective local anaesthesia. All in all, interns had a superficial knowledge about the classification of impacted teeth and they were least confident in managing cases of an intraoral abscess.

Keywords: Clinical competence, Dental education, Minor surgical procedures, Questionnaires, Self-confidence

INTRODUCTION

Oral and maxillofacial surgery is a branch of dentistry dealing with diagnosis and treatment of disorders affecting the facial complex [1]. Oral surgery procedures are technique sensitive. In dentistry, there's an increase demand for oral surgery procedures. Students are required to be well-equipped with knowledge and skills in oral surgery prior to starting clinical practice [2].

In this speciality, students are trained to be competent and to acknowledge the basics of oral surgery in the clinical setting from giving effective local anaesthesia, carrying out an extraction to managing complications that might happen since it's a prerequisite for a general dentist [2,3]. Being a competent dentist is a goal of every dental student who will start practicing soon. What qualifies a dentist to be good enough is the technical skills that were obtained throughout the clinical years from carrying out a proper examination, diagnosis, surgical treatment and management of disorders [3,4]. Also, the student needs to be knowledgeable and acquainted with the theoretical part of oral surgery. In Saudi Arabia, the Bachelor of Dental Surgery (BDS) is a seven-year, full-time course, first year being a foundation year and the final year is an internship in which dental interns rotate through a range of different dental specialities to become gradually responsible to work unsupervised. After completing a year of internship and passing the Saudi Arabia dental licensing exam they are licensed to work as general practitioners [5,6]. Hence, measuring the knowledge and confidence of graduate dental students in the basics of oral and maxillofacial surgery is essential [7]. To the best of our knowledge, there is no study correlating the knowledge and self-perceived confidence level about various aspects in oral and maxillofacial surgery. The knowledge and skills gained through the clinical years are variable between students. Hence, measuring the knowledge and confidence level is of vital importance.

This study aimed to assess the knowledge and confidence level of freshly graduate dental interns in Riyadh city to carry out oral surgery procedures.

MATERIALS AND METHODS

This was a cross-sectional observational study conducted among dental interns from all Riyadh dental schools, Saudi Arabia in 2020 after obtaining approval from the Institutional Review Board (IRB) committee at Princess Nourah bint Abdulrahman University, Saudi Arabia. (IRB log number: 19-0162).

Around 300 participants belonging to five Riyadh dental schools comprised the study population. The dental schools were selected based on the original location of the study, Riyadh city. All current interns were asked to participate. All interns were included in the study after obtaining informed consent.

Study procedure: The survey was developed based on existing literature [8-11]. however, some questions were modified because they were not relevant to our particular region. Content validity and

reliability was checked by experts, Cronbach's alpha value was 0.75-0.8. The electronic survey tool was administered in English language. The survey included 23 items divided into three parts. The first part included the informed consent and demographic data: gender, college, and previous summer training in Oral and Maxillofacial Surgery (item 1-3). The second part consisted of 10 case scenarios to assess the knowledge of graduates in carrying out a range of minor surgical procedures in oral surgery (item 4-13) [10,11], and the third part was developed to self-rate their confidence level in performing simple dentoalveolar procedures (item 14-23). The possible responses regarding knowledge of graduates were classified as 'correct' and 'incorrect'. A correct answer was given 1 point, while the incorrect answer was given 0 points. A high score indicated excellent knowledge of the respondent. In order to quantify data, a self-designed scale was used and it was based on the percentage. The results of the survey were represented as follows: 10-8, good knowledge; 8-5, average knowledge; <5, below-average knowledge. For confidence level in performing simple dentoalveolar procedures, the survey instrument utilised a self-designed scale where 2=Confident, 1=Neutral, 0=Not confident. While the result of the confidence was represented as 20-15, high confidence; 14-9, moderate confidence; 8-0, low confidence. The scale was self-designed based on minimum and maximum scores.

The electronic survey had a greeting letter detailing the purpose of the study and informed the participants that their participation was optional.

STATISTICAL ANALYSIS

All statistical analyses were performed using SPSS version 21.0. (SPSS Inc., Chicago IL) and Microsoft Excel 16.16. Statistical significance was defined as $p<0.05$. The descriptive statistics included count (percent) and mean (standard deviation). Groups were compared using Pearson's chi-square and unpaired sample t-test. Pearson's correlation coefficient was computed to study the relationship between two continuous variables. Unpaired sample t-test analysis was used to assess significant differences between the means of two variables.

RESULTS

The response rate was 70% (N=210), the final study population included 117 (56%) females and 93 (44%) males. A total of 111 (53%) belonged to governmental college, and 99 (47%) belonged to a private college [Table/Fig-1]. Only 5% of the study subjects underwent summer training for oral and maxillofacial surgery.

Variables	Frequency		Percentage
Gender	Female	117	56
	Male	93	44
College	Government	111	53
	Private	99	47

[Table/Fig-1]: Distribution of study subjects according to gender and college.

[Table/Fig-2] represents the total knowledge scores of female and male dental interns, respectively. A total of 56% (117) females had a mean knowledge score of 5.32 (±2.016), and 44% (93) males had a mean knowledge score of 5.02 (±1.939) both of which indicated average knowledge. There was no statistically significant difference between females and males in total knowledge score (p=0.272).

Interns revealed the highest level of knowledge in prescribing an appropriate medication 76% (160) and the lowest in knowing the list of classification of impacted teeth 12% (25).

In addition, responses regarding the following knowledge questions revealed significant results. The appropriate anaesthetic technique (p=0.029), postextraction management (p=0.026), management of open extraction in proximity to vital structures (p=0.013), and classification of impacted teeth (p=0.005).

Sl. No.	Question	Gender	Correct answer frequency (%)	Incorrect answer frequency (%)	p-value (chi-square)
1.	Knowledge regarding the appropriate anaesthetic technique	Female	32 (27)	85 (73)	0.029*
		Male	39 (42)	54 (58)	
		Total	71 (34)	139 (66)	
2.	Knowledge regarding first movement during extraction	Female	36 (31)	81 (69)	0.054
		Male	17 (18)	76 (82)	
		Total	53 (25)	157 (75)	
3.	Postextraction management	Female	70 (60)	47 (40)	0.026*
		Male	41 (44)	52 (56)	
		Total	111 (53)	99 (47)	
4.	Management of open extraction in proximity to vital structures	Female	85 (73)	32 (27)	0.013*
		Male	52 (56)	41 (44)	
		Total	137 (65)	73 (35)	
5.	Management of case with an intraoral abscess	Female	76 (64)	41 (36)	0.177
		Male	69 (75)	24 (25)	
		Total	145 (69)	65 (31)	
6.	Management of case with pericoronitis	Female	75 (64)	42 (36)	0.774
		Male	57 (61)	36 (39)	
		Total	132 (63)	78 (37)	
7.	First step management of postextraction haemorrhage	Female	69 (59)	48 (41)	0.072
		Male	43 (46)	50 (54)	
		Total	112 (53)	98 (47)	
8.	Prophylactic antibiotic of patient with history of bacterial endocarditis	Female	91 (78)	26 (22)	0.625
		Male	69 (74)	24 (26)	
		Total	160 (76)	50 (24)	
9.	Classification of impacted teeth	Female	7 (6)	110 (94)	0.005*
		Male	18 (19)	75 (81)	
		Total	25 (12)	185 (88)	
10.	Diagnosis of chronic sinusitis	Female	82 (70)	35 (30)	0.654
		Male	62 (67)	31 (33)	
		Total	144 (68)	66 (32)	
			Mean	St. Deviation	Sig (2-tailed)
	Total knowledge score	Female	5.32	2.016	0.272
		Male	5.02	1.939	

[Table/Fig-2]: Comparison of responses to knowledge questions among male and female subjects with mean knowledge scores.
*denotes significant p-value

[Table/Fig-3] represents that 111 (53%) interns belonged to government college with mean knowledge score of 5.86 (±1.949) and 99 (47%) interns belonged to private college with mean knowledge score of 4.44 (±1.751). There was a statistically significant difference in knowledge between government and private colleges (p<0.001).

Furthermore, responses regarding the following knowledge questions showed significant results. Management of open extraction in proximity to vital structures (p<0.001), management of case with an intraoral abscess (p=0.007), management of case with pericoronitis (p<0.001), antibiotic prophylaxis of patient with history of bacterial endocarditis (p<0.001), classification of impacted teeth (p<0.01), and diagnosis of chronic sinusitis (p<0.001).

While [Table/Fig-4] showed 56% (117) females had a mean confidence score of 13.85 (±3.246), and 44% (93) males had a mean confidence score of 13.95 (±3.777) both of which indicated moderate confidence. There was no statistically significant difference between females and males in total score confidence (p=0.850).

Also, interns showed the highest level of confidence in giving effective local anaesthesia 76% (160) and they were least confident in managing cases of an intraoral abscess 29% (60).

Sl. No.	Question	College	Correct answer frequency (%)	Incorrect answer frequency (%)	p-value (chi-square)
1.	Knowledge regarding the appropriate anaesthetic technique.	Government	43 (39)	68 (61)	0.144
		Private	28 (28)	71 (72)	
		Total	71 (34)	139 (66)	
2.	Knowledge regarding first movement during extraction.	Government	32 (29)	79 (71)	0.265
		Private	21 (21)	78 (79)	
		Total	53 (25)	157 (75)	
3.	Postextraction management.	Government	61 (55)	50 (45)	0.58
		Private	50 (51)	49 (49)	
		Total	111 (53)	99 (47)	
4.	Management of open extraction in proximity to vital structures.	Government	90 (81)	21 (19)	<0.001**
		Private	47 (47)	52 (53)	
		Total	137 (65)	73 (35)	
5.	Management of case with an intraoral abscess.	Government	86 (78)	25 (22)	0.007*
		Private	59 (60)	40 (40)	
		Total	145 (69)	65 (31)	
6.	Management of case with pericoronitis.	Government	83 (75)	28 (25)	<0.001**
		Private	49 (49)	50 (51)	
		Total	132 (63)	78 (37)	
7.	First step management of postextraction haemorrhage.	Government	59 (53)	52 (47)	1
		Private	53 (54)	46 (46)	
		Total	112 (53)	98 (47)	
8.	Antibiotic prophylaxis of patient with history of bacterial endocarditis.	Government	96 (87)	15 (13)	<0.001**
		Private	64 (65)	35 (45)	
		Total	160 (76)	50 (24)	
9.	Classification of impacted teeth.	Government	7 (6)	104 (94)	0.01*
		Private	18 (18)	81 (82)	
		Total	25 (12)	185 (88)	
10.	Diagnosis of chronic sinusitis.	Government	93 (84)	18 (16)	<0.001**
		Private	51 (52)	48 (48)	
		Total	144 (69)	66 (31)	
			Mean	**St. Deviation**	**Sig (2-tailed)**
	Total knowledge score	Government	5.86	1.949	<0.001**
		Private	4.44	1.751	

[Table/Fig-3]: Comparison of responses to knowledge questions among Government and private schools with mean knowledge scores.
*denotes significant p-value; **denotes highly significant p-value

Sl. No.	Question	Gender	Confident frequency (%)	Neutral frequency (%)	Not confident frequency (%)	p-value (chi-square)
1.	I feel confident to give an effective local anaesthesia	Female	82 (70)	28 (24)	7 (6)	0.059
		Male	78 (84)	11 (12)	4 (4)	
		Total	160 (76)	39 (19)	11 (5)	
2.	I feel confident to extract a tooth	Female	48 (41)	60 (51)	9 (8)	0.009*
		Male	58 (62)	30 (32)	5 (5)	
		Total	106 (50)	90 (43)	14 (7)	
3.	I feel confident that I can recognise a case of dry socket and treat it properly	Female	79 (68)	27 (23)	11 (9)	0.349
		Male	54 (58)	29 (31)	10 (11)	
		Total	133 (63)	56 (27)	21 (10)	
4.	I feel confident that I can write an appropriate referral letter when to refer to a specialist in an appropriate time frame dependent on the clinical problem	Female	80 (68)	29 (25)	8 (7)	0.054
		Male	49 (53)	37 (40)	7 (8)	
		Total	129 (61)	66 (31)	15 (7)	
5.	I feel confident that I can manage a case of an intraoral abscess	Female	32 (27)	63 (54)	22 (19)	0.840
		Male	28 (30)	50 (54)	15 (16)	
		Total	60 (29)	113 (54)	37 (18)	
6.	I feel confident to diagnose and manage acute pericoronitis	Female	59 (50)	42 (36)	16 (14)	0.385
		Male	38 (41)	40 (43)	15 (16)	
		Total	97 (46)	82 (39)	31 (15)	
7.	I feel confident to manage haemorrhage from a socket	Female	42 (36)	62 (53)	13 (11)	0.137
		Male	46 (49)	38 (41)	9 (10)	
		Total	88 (42)	100 (48)	22 (10)	
8.	I feel confident that I can prescribe an appropriate medication	Female	39 (33)	62 (53)	16 (14)	0.711
		Male	36 (39)	46 (49)	11 (12)	
		Total	75 (36)	108 (51)	27 (13)	
9.	I feel confident to assess an impacted mandibular third molar and recognise the need for surgical removal	Female	66 (56)	34 (29)	17 (15)	0.598
		Male	46 (49)	32 (34)	15 (16)	
		Total	112 (53)	66 (31)	32 (15)	
10.	I feel confident to differentiate between pain of odontogenic and non-odontogenic origin	Female	51 (44)	58 (50)	8 (7)	0.229
		Male	38 (41)	42 (45)	13 (14)	
		Total	89 (42)	100 (48)	21 (10)	
			Mean	**St. Deviation**	**Sig (2-tailed)**	
	Total confidence score	Female	13.85	3.246	0.850	
		Male	13.95	3.777		

[Table/Fig-4]: Comparison of responses to confidence questions among male and female subjects with mean confidence scores.
*denotes significant p-value

However, response regarding confidence to extract a tooth showed significant result (p=0.009).

A total of 111 (53%) interns who belonged to government college reported mean confidence score of 14.64 (±2.642) and 99 (47%) interns who belonged to private college reported mean confidence score of 13.06 (±4.088) [Table/Fig-5]. There was a statistically significance difference in confidence between government and private colleges (p<0.001).

However, responses regarding the following confidence questions showed significant results. Writing an appropriate referral letter (p<0.001), management of intraoral abscess (p=0.02), management of acute pericoronitis (p<0.001), management of postextraction haemorrhage (p=0.013), medication prescription (p<0.049), and assessment of impacted teeth (p<0.001).

A weakly positive significant correlation was found between the total score knowledge and the total score confidence in performing surgical procedures (r=0.217, n=210, p=0.002) [Table/Fig-6].

DISCUSSION

In dentistry, the undergraduate dental curriculum is prepared in a way that offers adequate training for students to be competent and well-equipped after graduation and during clinical practice. It also trains them to be committed to continuous learning throughout their careers. It is very important for dental graduates to be able to evaluate their confidence throughout their internship and during practice, doing so will help them define and identify the areas of weakness and shortage that they need to work on [12].

Oral surgery procedures are technique sensitive, technique demanding and irreversible. Competency in skills and knowledge

Sl. No.	Question	College	Confident frequency (%)	Neutral frequency (%)	Not confident frequency (%)	p-value (chi-square)
1.	I feel confident to give an effective local anaesthesia	Government	86 (78)	22 (19)	3 (3)	0.208
		Private	74 (75)	17 (17)	8 (8)	
		Total	160 (76)	39 (19)	11 (5)	
2.	I feel confident to extract a tooth	Government	53 (48)	52 (47)	6 (5)	0.410
		Private	53 (54)	38 (38)	8 (8)	
		Total	106 (50)	90 (43)	14 (7)	
3.	I feel confident that I can recognise a case of dry socket and treat it properly	Government	75 (68)	29 (26)	7 (6)	0.142
		Private	58 (59)	27 (27)	14 (14)	
		Total	133 (63)	56 (27)	21 (10)	
4.	I feel confident that I can write an appropriate referral letter when to refer to a specialist in an appropriate time frame dependent on the clinical problem	Government	80 (72)	29 (26)	2 (2)	<0.001**
		Private	49 (50)	37 (37)	13 (13)	
		Total	129 (62)	66 (31)	15 (7)	
5.	I feel confident that I can manage a case of an intraoral abscess	Government	36 (32)	63 (57)	12 (11)	0.02*
		Private	24 (24)	50 (51)	25 (25)	
		Total	60 (28)	113 (54)	37 (18)	
6.	I feel confident to diagnose and manage acute pericoronitis	Government	57 (52)	47 (42)	7 (6)	<0.001**
		Private	40 (41)	35 (35)	24 (24)	
		Total	97 (46)	82 (39)	31 (15)	
7.	I feel confident to manage haemorrhage from a socket	Government	44 (40)	61 (55)	6 (5)	0.013*
		Private	44 (45)	39 (39)	16 (16)	
		Total	88 (42)	100 (48)	22 (10)	
8.	I feel confident that I can prescribe an appropriate medication	Government	38 (34)	64 (58)	9 (8)	0.049*
		Private	37 (37)	44 (45)	18 (18)	
		Total	75 (36)	108 (51)	27 (23)	
9.	I feel confident to assess an impacted mandibular third molar and recognise the need for surgical removal	Government	62 (56)	43 (39)	6 (5)	<0.001**
		Private	50 (51)	23 (23)	26 (26)	
		Total	112 (53)	66 (32)	32 (15)	
10.	I feel confident to differentiate between pain of odontogenic and nonodontogenic origin	Government	49 (44)	55 (50)	7 (6)	0.168
		Private	40 (40)	45 (46)	14 (14)	
		Total	89 (42)	100 (48)	21 (10)	
			Mean	St. Deviation	Sig (2-tailed)	
	Total confidence score	Government	14.64	2.642	<0.001**	
		Private	13.06	4.088		

[Table/Fig-5]: Comparison of responses to confidence questions among Government and private schools with mean confidence scores.
*denotes significant p-value; **denotes highly significant p-value

	N	r	p-value
Pearson correlation	210	0.217	**0.002**

[Table/Fig-6]: Correlation between the knowledge scores and confidence scores in performing surgical procedures of 210 dental interns.
Bold p-value denotes significant

are of a major importance in this speciality. As the skills improve and increase, the confidence also increases. Successful treatment outcomes are achieved by enough knowledge, competence and confidence [13]. The present study focuses on the importance of applying adequate knowledge to clinical training in order to achieve competency and overcome shortages. To the best of the authors' knowledge, no study has been conducted on correlation between the knowledge and the confidence level in the speciality of oral surgery in Saudi Arabia. This study has been done in Riyadh, the capital of Saudi Arabia which has the maximum number of dental interns and dental colleges. The results of the study indicated that female interns reported lesser self-confidence than males regarding extraction (p=0.009). It is a self-reported confidence.

The main findings of the study revealed that the more knowledge the interns had, the more confidence they gained in performing oral surgery procedures. A weakly positive correlation (r= 0.217) between the knowledge scores and confidence scores in performing surgical procedures of 210 dental interns was found. A study by Gilmour AS et al., highlighted the importance of competence and the perception of it (confidence), both terms are different in such a way that a person might have the competence but might not have the perceived ability (confidence) to achieve a required procedure. It's important to note and understand that the level of confidence in oneself should be assessed in such a way that an over-confident practitioner might risk the safety of their patients by attempting procedures beyond their scope of competence and in contrast under-confident individuals are slow in progress and over-rely on other practitioners. Self-based competence and confidence assessment is important [14].

In the present study, no statistically significant difference between females and males in total knowledge score and total confidence score was found (p=0.272). Gilmour AS et al., found gender differences in the confidence level in which the female students reported a lower confidence level compared to their male colleagues [14]. Interns revealed the highest level of knowledge in prescribing an appropriate medication 76% (160) while showed the lowest in knowing the list of classification of impacted teeth 12% (25). The study showed that interns were knowledgeable in prescribing an appropriate medication. And they were confident in giving effective local anaesthesia. All in all, interns had a superficial knowledge in knowing the list of classification of impacted teeth and they were least confident in managing cases of an intraoral abscess.

Also, interns showed the highest level of confidence in giving effective local anaesthesia 76% (160), and they were least confident in managing cases of an intraoral abscess 29% (60). A study's findings of Al-Dajani M showed increased confidence with the increased practical experience. When students extracted more teeth, they had more confidence in clinical competence. This can be traced to the contribution of both clinical instructors' supervision and interaction with their patients [4]. A study by Cabbar F et al., indicated that students were confident about their capacity to extract teeth, nonetheless, they needed self-assurance in performing careful surgical extractions and its related techniques. This may result from the absence of suitable cases for students to take part in [8].

This is also similar to the findings of Al-Dajani M which depicted that, the students were highly confident in carrying out simple oral surgery clinical procedures and they were less confident in doing the complex ones such as, surgical extractions, raising flap, removal of bone or tooth sectioning [4]. Performing complex oral surgery procedures is considered difficult at the level of students or dental interns because it's not in their scope of competency [4].

Further results showed a statistically significant difference in knowledge score and confidence level between government and private colleges (p≤0.001).

The present study had the following strengths, the correlation between knowledge and confidence level was used for the first time in this type of study, it also involved the participation of a large group of dental interns from Riyadh city, Saudi Arabia. Sufficient interns were included to analyse the correlation between objectively assessed knowledge and self-rated confidence.

Limitation(s)

The present study had some limitations; hence the results of this cross-sectional study should be interpreted with caution. We recognise that most participating interns belonged to different colleges that differed in their teaching strategies and curriculums and it was conducted in one region of Saudi Arabia, this may have hampered generalising the study to all dental interns in Saudi Arabia. Rating self-confidence (subjective certainty) is a personal perception that doesn't necessarily mean competence in clinical skills. The results also might have been affected by the response rate, in which government colleges showed a higher response compared to private colleges.

CONCLUSION(S)

The study showed that there was no statistically significant difference between females and males in total knowledge and confidence score, respectively. However, a statistically significant difference in knowledge and confidence between government and private colleges was found. Further training is needed so they can overcome the deficiencies. It is important to encourage interns to take part in continuous education programs and workshops to fill knowledge gaps in certain areas where they lack experience in oral surgery. Future researches should investigate the important role of internship in enhancing graduates' clinical skills (competence), clinical experience and confidence by conducting a national survey. Also, it is important to identify the attitude, perception, and knowledge of fresh graduates about their internship training program.

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