

Self-confidence in oral and maxillofacial surgery: a cross-sectional study of undergraduate dental students at Kuwait University

Mohammad Kamal (✉ mohammad.kamal@ku.edu.kw)

Kuwait University Faculty of Dentistry <https://orcid.org/0000-0002-2833-4550>

Mohammad Abdulwahab

Kuwait University Faculty of Dentistry

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Abstract

Background: To evaluate the self-confidence of undergraduate dental students in relation to oral and maxillofacial surgery (OMFS) in order to assess the teaching curriculum at Kuwait University using a validated questionnaire originally developed by the Association of British Academic Oral Maxillofacial Surgeons (ABAOMS).

Methods: A cross-sectional survey of 6th year (n=20) and 7th- year (n=19) dentistry students was conducted Kuwait University Faculty of Dentistry between the 1st and 15th May 2020. The ABAOMS questionnaire is composed of 17 questions assessing various areas of the undergraduate OMFS curriculum. The response options to the questionnaire utilised a Likert scale. Independent sample t-tests were performed to assess the difference in responses between the two year groups. Spearman's Rho correlations were calculated to measure the strength of association between confidence in all aspects of surgical and forceps exodontia.

Results: A total of 39 questionnaires were completed by the students. The majority of students expressed that they feel confident that they have enough knowledge to undertake independent practice (61%). General aspects of the questionnaire were answered favourably except for surgical extraction of teeth, in which both classes reported a lower level of self-confidence.

Conclusions: This survey revealed the students' self-confidence in undertaking independent practice and performing basic oral surgery procedures. Students felt comfortable with exodontia using forceps and elevators, root removal, managing acute pericoronitis, managing haemorrhage from a socket, assessing impacted teeth, and recognising the clinical features of potentially malignant and malignant lesions of the oral cavity. They reported a lower level of confidence for performing surgical procedures. The ABAOMS survey instrument is a useful and thorough tool to assess the self-confidence of dental students according to their undergraduate oral and maxillofacial surgery teaching.

Background

A dental school teaching curriculum aims to provide students with the highest theoretical and practical education to prepare for clinical practice. Several educational schemes and curricula have been developed across academic institutions internationally to enhance undergraduate education in Oral and Maxillofacial Surgery (OMFS) [1-3]. A step-wise approach to teaching practical procedures and thorough clinical assessments has allowed instructors to assess the students' educational level and prepare them for the challenges of surgery [1, 3-5]. In order to enhance the teaching experience and constant refinement of the OMFS teaching curriculum and clinical competency assessments, survey instruments have been developed to evaluate the self-confidence of undergraduate dental students in performing OMFS procedures. Moreover, these survey instruments are also essential to enhance educational quality and teaching effectiveness based on their feedback [3, 4, 6, 7]. The Association of British Academic Oral Maxillofacial Surgeons (ABAOMS) educational committee has designed a validated survey instrument to

assess dental students' self-confidence in OMFS and has been used in several countries [7-10]. The ABAOMS instrument is made of 17 questions assessing the student's confidence in performing oral surgery procedures, the role of outreach in oral surgery, anatomy teaching concerning oral surgery, and oral surgery career aspiration [7].

The Faculty of Dentistry at Kuwait University began the undergraduate OMFS teaching curriculum in 2002 for dental students during their clinical training years. Kuwait University follows a 7-year dentistry program, in which the students start their clinical training in the 5th year of the program. Courses focusing on OMFS are taught during the 5th, 6th and 7th year of training. Students' perceptions of the OMFS training they receive have received little attention. There have been no prior studies assessing students' views on their oral surgery education and their confidence in conducting surgical procedures.

The aim of this study was to evaluate the dental students' perceptions of the undergraduate OMFS teaching curriculum using the ABAOMS questionnaire and assess their self-confidence and readiness to perform common oral surgical procedures.

Methods

We conducted a cross-sectional survey of all 6th and 7th-year dentistry students in the Kuwait University Faculty of Dentistry between May 1st and May 15th 2020.

A previously validated questionnaire by Association of British Academic Oral Maxillofacial Surgeons (ABAOMS) was used as the survey instrument the study [7, 10]. The survey was distributed electronically using Google Forms (<https://www.google.com/forms>) to all eligible students at Kuwait University via the student portal network. Students were consented to voluntarily fill out the survey instruments, and of the responses remained anonymous throughout the study. Students provided information about age, gender, year of study, and the number of extractions performed, along with 17 questions assessing various areas of the undergraduate OMFS curriculum. Responses to the questions were in the form of a Likert scale, with five options ranging from strongly agree (1) to strongly disagree (5). All questions were answered completely by each participant.

Statistical Analysis

The data was analysed using SPSS version 23 (SPSS; IBM Company, Chicago, IL, USA). Responses to the questionnaire were summarised as counts and percentages and compared according to the year of study (6th versus 7th year). Independent sample t-tests were also performed to assess the difference in responses between the two groups by using the Likert responses as a continuous variable. Spearman's Rho correlations were calculated to measure the strength of association between confidence in all aspects of surgical and forceps exodontia. Additional analysis was performed to measure the Spearman's rho correlations between confidence in surgical and forceps exodontia and anatomical teaching as well as the number of previous extractions performed. For all analyses, a p-value (two-tailed) of less than 0.05 was considered statistically significant.

Ethical Considerations

Students gave informed consent to participate in the survey voluntarily. All responses remained anonymous throughout the study. The study protocol was approved by the Ethical Committee at Kuwait University Health Sciences Center, according to the Helsinki Declaration.

Results

A total of 39 questionnaires were completed, representing a response rate of 90.9% for the 6th year students (n=20), and 90.47% of the 7th year students (n=19). Table 1 shows the demographic characteristics of the study participants and the number of extractions performed by respondents to date. Thirty-seven respondents were female (94.9%), and the mean age was 23.25 years for 6th year students and 24.26 years for 7th year students. The seventh year students had greater experience in tooth extractions with 78.9% of students having performed greater than 25 extractions compared to 35% of 6th year students.

The Likert responses to each question in the ABAOMS survey instrument regarding confidence in oral surgery procedures, dental anatomy and enjoyment of oral surgery are shown in Table 2. The majority of students expressed that they feel confident that they have enough knowledge to undertake independent practice (61%). The difference in confidence between the 7th year students compared to 6th year students (78.9% vs 45%) was borderline significant ($p = 0.051$). Both 7th and 6th year students felt confident that they could extract an upper single-rooted tooth with an intact crown (94.7% and 90% respectively). Both groups were also confident that they could remove the visibly retained roots of an upper left first molar with elevators or forceps (84.2% and 65% respectively).

The majority of students (74.4%) expressed that they viewed oral surgery as an enjoyable and rewarding discipline. The majority of students had some experience at an off-campus dentistry centre (59%). However, less than half (41%) carried out simple extractions at this off-campus site, and only two students (5.1%) performed a surgical extraction off-campus (Table 3). In terms of experience in teeth extraction, 78.9% of 7th year students reported extracting greater than 25 teeth to date while just 35% of 6th year students reported having had a similar amount of experience (Table 1).

Statistically significant positive correlations were found between confidence in almost all aspects of surgical and forceps exodontia (Table 4). Only the correlation between confidence in extracting a single tooth and confidence in managing a failed extraction necessitating bone removal did not reach statistical significance but was borderline significant ($p = 0.075$).

The belief that anatomy teaching was appropriate (D1) correlated well with confidence in most aspects of surgical and forceps exodontia (Table 5). When questioned about confidence in undertaking oral surgery because of their knowledge and understanding of anatomy (D2), the only significant correlation was with confidence in managing a failed extraction necessitating the raising of a mucoperiosteal flap

(B4a). This is because few students responded as “strongly agree” to this question. Furthermore, question D3 did not correlate with confidence in OMFS as students appeared to differ in their interpretation of this question which asked if knowledge of jaw and tooth morphology was the “only” anatomical knowledge needed for oral surgery. Table 5 also showed that confidence in undertaking OMFS was significantly correlated with the number of teeth students have extracted to date for all questions except B1 (The teaching that I have received in oral surgery has given me sufficient knowledge to undertake independent practice). This may have been due to a reluctance of students to strongly agree with this question.

Discussion

In recent years, there has been an increase in the number of dental schools around the world with differing standards of undergraduate teaching, the number of years in training, and the numbers of qualified teaching faculty members [4, 7, 8]. This makes it difficult to compare graduates from these dental schools. A study by Lee et al. demonstrated that undergraduate grades and scores on the standardised dental admission test are poor predictors of performance in examinations used for residency admission in OMFS [11]. A major part of any dentistry curriculum relies on helping students acquire predefined clinical competencies and technical skills, and many consider the mastery of these technical skills to be of the highest importance in clinical practice [3, 6]. Thus, clinical competency and self-confidence in one’s abilities are the primary objectives of any dental school curriculum [3]. Self-assessment of students’ knowledge and confidence to complete clinical skills have previously been used in the field of dentistry and oral surgery [1-4, 7-10, 12-15].

Given that the department of OMFS at Kuwait University is a relatively new one (established in 2002), feedback from students is of paramount importance to improve the quality of teaching delivered in the department. The high response rate seen in this study reflects the interest of students to voluntarily assess their undergraduate OMFS teaching in preparation for their entry in the dentistry practice. The majority of the dental students were females, which indicates the overall interest of the female students in Kuwait to embark on a career in the field of dentistry. Even though the class sizes are small, the responses of the students were regarded as promising as they feel confident that they have enough knowledge to undertake independent practice (61%). This is even greater (78.9%) when considering just those in their final year of university.

Overall, when assessing readiness to undertake private practice and perform extractions with forceps and minor oral surgery procedures, confidence scores were favourable and similar to previous studies utilising the same survey instrument [3, 4, 7-10].

Both the 7th and 6th year students reported confidence in extracting an upper single-rooted tooth with an intact crown (94.7% and 90% respectively). In addition, both groups were also confident that they could remove visible retained roots of an upper left first molar with elevators or forceps (84.2% and 65% respectively). This finding was different from a study by Burdurlu et al., in which the older class reported being more confident than those in lower year groups [8]. This may be due to the fact that dental students

at Kuwait University undergo a more extensive teaching curriculum with a longer study period, where dentistry studies take seven years (with the last 2 and ½ years as clinical years), compared to the study by Burdurlu et al., where the study program was of five years duration. Nevertheless, the responses of the 7th year and 6th year students were statistically different when reporting their level of confidence for performing surgical procedures, ranging from raising of a mucoperiosteal flap, sectioning of teeth, bone removal, wound closure and suturing (Table2). This was in line with other studies which reported relatively less self-confidence in conducting surgical extractions [4, 8, 9, 14].

Responses about the level of confidence in diagnosing and managing acute pericoronitis, assessing impacted third molars, or managing haemorrhage from a socket were more favourable than recognising benign and malignant conditions, differentiating pain origins, or writing detailed referral letters to other specialists (Table 2). Similar findings were also demonstrated in the studies by Cabbar, Burdurlu, and Macluskey [7-10]. One explanation to why most students score relatively low in confidence in conducting surgical extractions is that they are considered the most invasive procedure that students are exposed to during their dental school training, and even if they are clinically competent as dentists, they may feel intimidated by it [9, 16].

When assessing anatomical knowledge, the responses from the students indicate that their teaching was sufficient to prepare them for OMFS clinical scenarios, and the responses were not significantly different between 6th and 7th year students. This maybe is because the students receive extensive didactic OMFS teaching in their clinical years with a strong emphasis on head and neck anatomy. The importance of instilling constant anatomical knowledge during dental education to help with consolidation and retention of the clinical knowledge was advocated by Thomas et al. [8, 17]. The fact that both classes disagreed unequivocally to the item that only anatomical knowledge needed for oral surgery is that of jaw and tooth morphology shows a maturation of their understanding that general anatomy knowledge is of paramount importance when treating patients or performing oral surgical procedures.

Just 59% of students reported that they had the opportunity to gain experience in dental centres off-campus. This gave students the chance to perform more simple extractions with some being allowed to perform surgical extractions. The role of off-campus learning needs to be emphasised in our teaching, in order to increase the exposure of the students to the more complex procedures that are not heavily emphasised in the dental school's clinic.

In our study we found that students in both junior and senior clinical years have sufficient level of confidence to perform extractions by the use of forceps, and a good higher level of confidence when diagnosing conditions commonly seen in oral surgery practice, such as management acute pericoronitis, manage haemorrhage from a socket, assessing impacted teeth, and recognising the clinical features of potentially malignant and malignant lesions of the oral cavity. However, both year groups showed a lower level of self-confidence in performing more invasive procedures such as raising of a flap, sectioning of teeth and bone removal, and wound close with suturing. This prompts us to put more emphasis on hands-on training sessions, utilising phantom heads in oral surgical education, assisting in major

surgical procedures, and utilising novel models to conduct these surgical procedures which are considered to be essential for dentists wanting to practice the whole spectrum of general dentistry in clinical practice.

A limitation encountered in this study was that dental students have different performance and academic caliber, and this were not adequately assessed by our methodology. Given the nature of the dental curriculum, students were evaluated mostly through institution-based didactic examinations and through grading supervised competency in performing limited numbers of procedures. The true caliber and performance level of the students could thus be under-evaluated. Further detailed and standardized didactic and clinical assessment tools need to be introduced to better understand and evaluate the students' performance in OMFS.

Conclusions

Students felt confident undertaking independent practice and performing exodontia using forceps and elevators, root removal, managing acute pericoronitis, managing haemorrhage from a socket, assessing impacted teeth, and recognising the clinical features of potentially malignant and malignant lesions of the oral cavity. They reported a lower level of confidence for performing surgical procedures, ranging from raising of a mucoperiosteal flap, to sectioning of teeth, to bone removal, to wound closure and suturing, and writing of a detailed referral letter to specialists. This should prompt us to increase their clinical exposure to these procedures in the faculty clinic and off-campus rotations, and refine our training schemes in the areas of surgical extractions and procedures related to minor oral surgery, such as raising a flap, bone removal, root section, and wound suturing. The ABAOMS survey instrument is a useful and thorough tool to assess the self-confidence of dental students according to their undergraduate oral and maxillofacial surgery teaching.

Declarations

Ethics approval and consent to participate:

Participating students gave consent and voluntarily filled out the questionnaire. Responses were kept anonymous. The Ethical Committee at Kuwait University granted ethical approval for the study, in accordance with the Helsinki Declaration.

Consent for publication:

Not applicable.

Availability of data and materials:

The data used in this study is not publicly available, but data can be made available from the corresponding author on request.

Competing interests:

The authors declare that they have no competing interests.

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None.

Authors' contributions:

MK and MA conceived and designed the study. MK collected the data and conducted the analyses. MK interpreted the results. MK and MA have drafted the manuscript or substantively revised it. All authors read and approved the final manuscript.

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Tables

Table 1. Students characteristics and number of extractions performed.

Group Year of Study	Respondents n	Response rate %	Age - (years) Mean	Gender n (%)	Number of extractions performed - n (%)				
					<10	10-15	15-20	20-25	>25
6th year	20	90.90%	23.25	Male - 1 (5%) Female - 19 (95%)	3 (15%)	2 (10%)	4 (20%)	4 (20%)	7 (35%)
7th year	19	90.47%	24.26	Male - 2 (10.53%) Female - 17 (89.47%)	0	1 (5.3%)	0	3 (15.8%)	15 (78.9%)
Total	39	90.79%	23.76	Male - 3 (7.69%) Female - 36 (92.31%)	3 (7.7%)	3 (7.7%)	4 (10.3%)	7 (17.9%)	22 (56.4%)

Table 2. The frequency of answers for each of the questions; % response by Likert scale (Independent t-test).

Question/Statement	Class	Strongly agree	Agree	Unsure	Disagree	Strongly Disagree	Mean ± STD	p-value
B1. The teaching that I have received in oral surgery has given me sufficient knowledge to undertake independent practice	6 th year	2 (10%)	7 (35%)	7 (35%)	4 (20%)	0	2.65 (±0.93)	0.051
	7 th year	5 (26.3%)	10 (52.6%)	2 (10.5%)	2 (10.5%)	0	2.05 (±0.91)	
B2. I feel confident that I could extract an upper single-rooted tooth with an intact crown, in an otherwise intact dentition	6 th year	11 (55%)	9 (45%)	0	0	0	1.45 (±0.51)	0.161
	7 th year	16 (84.2%)	2 (10.5%)	1 (5.3%)	0	0	1.21 (±0.54)	
B3. I feel confident that I could remove visible retained roots of an upper left first molar with elevators or forceps	6 th year	6 (30%)	7 (35%)	3 (15%)	4 (20%)	0	2.25 (±1.1)	0.157
	7 th year	11 (57.9%)	5 (26.3%)	0	3 (15.8%)	0	1.74 (±1.10)	
B4. I feel confident to assess and perform the surgical management of a failed extraction (e.g. a lower second molar) necessitating:								
B4a. The raising of a mucoperiosteal flap	6 th year	0	2 (10%)	0	9 (45%)	9 (45%)	4.25 (±0.91)	<0.001
	7 th year	0	6 (31.6%)	8 (42.1%)	3 (15.8%)	2 (10.5%)	3.05 (±0.97)	
B4b. Bone removal	6 th year	0	1 (5%)	5 (25%)	6 (30%)	8 (40%)	4.05 (±0.94)	0.002
	7 th year	0	6 (31.6%)	8 (42.1%)	3 (15.8%)	2 (10.5%)	3.05 (0.97)	
B4c. Sectioning the tooth to facilitate elevation of the roots	6 th year	0	1 (5%)	0	9 (45%)	10 (50%)	4.40 (±0.75)	<0.001
	7 th year	0	6 (31.6%)	9 (47.4%)	2 (10.5%)	2 (10.5%)	3.00 (0.94)	
B4d. Wound closure using appropriate suture materials	6 th year	2 (10%)	7 (35%)	4 (20%)	3 (15%)	4 (20%)	3.00 (±1.34)	0.002
	7 th year	11 (57.9%)	5 (26.3%)	2 (10.5%)	0	1 (5.3%)	1.68 (±1.06)	
B5. I feel confident to diagnose and manage acute pericoronitis	6 th year	6 (30%)	10 (50%)	4 (20%)	0	0	1.90 (±0.72)	0.082
	7 th year	13 (68.4%)	3 (15.8%)	3 (15.8%)	0	0	1.47 (±0.77)	
B6. I feel confident to manage haemorrhage from a socket	6 th year	5 (25%)	9 (45%)	6 (30%)	0	0	2.05 (±0.76)	0.732
	7 th year	7 (36.8%)	9 (47.4%)	1 (5.3%)	1 (5.3%)	1 (5.3%)	1.95 (±1.08)	
B7. I feel confident to assess an impacted mandibular third molar with respect to guidelines and recognise the need for surgical removal	6 th year	5 (25%)	14 (70%)	0	1 (5%)	0	1.85 (±0.67)	0.015
	7 th year	12 (63.2%)	7 (36.8%)	0	0	0	1.37 (±0.50)	
B8. I feel confident that I can recognise the clinical features of potentially malignant and malignant lesions of the oral cavity	6 th year	1 (5%)	11 (55%)	6 (30%)	2 (10%)	0	2.45 (±0.76)	0.340
	7 th year	1 (5.3%)	15 (78.9%)	2 (10.5%)	0	1 (5.3%)	2.21 (±0.79)	
B9. I feel confident that I can write an appropriate referral letter to a specialist in an appropriate time frame dependent on the clinical problem	6 th year	0	9 (45%)	7 (35%)	4 (20%)	0	2.75 (±0.79)	0.086
	7 th year	3 (15.8%)	10 (52.6%)	5 (26.3%)	0	1 (5.3%)	2.26 (±0.93)	
B10. I feel competent to differentiate between pain of odontogenic and non-odontogenic origin	6 th year	1 (5%)	14 (70%)	5 (25%)	0	0	2.20 (±0.52)	0.971
	7 th year	7 (36.8%)	4 (21.1%)	6 (31.6%)	1 (5.3%)	1 (5.3%)	2.21 (±1.18)	

D1. I believe my teaching in anatomy has been appropriate for my clinical needs in oral surgery	6 th year	5 (25%)	10 (50%)	5 (25%)	0	0	2.00 (± 0.73)	0.696
	7 th year	7 (36.8%)	9 (47.4%)	1 (5.3%)	2 (10.5%)	0	1.89 (± 0.94)	
D2. I am more confident about undertaking oral surgery because of my knowledge and understanding of head and neck anatomy	6 th year	1 (5%)	10 (50%)	7 (35%)	2 (10%)	0	2.50 (± 0.76)	0.777
	7 th year	2 (10.5%)	10 (52.6%)	5 (26.3%)	1 (5.3%)	1 (5.3%)	2.42 (± 0.96)	
D3. The only anatomical knowledge needed for oral surgery is that of jaw and tooth morphology	6 th year	0	5 (25%)	0	5 (25%)	10 (50%)	4.00 (± 1.26)	0.887
	7 th year	1 (5.3%)	1 (5.3%)	0	11 (57.9%)	6 (31.6%)	4.05 (± 1.03)	
E1. Oral surgery is an enjoyable and rewarding discipline	6 th year	8 (40%)	4 (20%)	3 (15%)	5 (25%)	0	2.25 (± 1.25)	0.477
	7 th year	4 (21.1%)	13 (68.4%)	1 (5.3%)	0	1 (5.3%)	2.00 (± 0.88)	

Table 3. Responses to questions regarding off-campus learning.

Question	Yes			No		
	6 th year	7 th year	Total	6 th year	7 th year	Total
C1. Where you involved in any rotation outside the faculty of dentistry dental centre (off-campus) scheme?	10 (50%)	13 (68.4%)	23 (59.0%)	10 (50%)	6 (31.6%)	16 (41.0%)
C2. Did you carry out any simple extractions outside the faculty of dentistry dental centre (off-campus)?	7 (35%)	9 (47.4%)	16 (41.0%)	13 (65%)	10 (52.6%)	23 (59.0%)
C3. Did you carry out any surgical extractions outside the faculty of dentistry dental centre (off-campus)?	2 (10%)	0	2 (5.1%)	18 (90%)	19 (100%)	37 (94.9%)

Table 4. Spearman's rho correlation coefficients (r) for questions in section B (forceps and surgical extractions).

Questions	B2	B3	B4a	B4b	B4c	B4d
B2. I feel confident that I could extract an upper single-rooted tooth with an intact crown, in an otherwise intact dentition	1.000	-	-	-	-	-
B3. I feel confident that I could remove visible retained roots of an upper left first molar with elevators or forceps	0.800**	1.000	-	-	-	-
B4a. I feel confident to assess and perform the surgical management of a failed extraction (e.g. a lower second molar) necessitating the raising of a mucoperiosteal flap	0.334*	0.322*	1.000	-	-	-
B4b. I feel confident to assess and perform the surgical management of a failed extraction (e.g. a lower second molar) necessitating Bone removal	0.288	0.326*	0.770**	1.000	-	-
B4c. I feel confident to assess and perform the surgical management of a failed extraction (e.g. a lower second molar) necessitating sectioning the tooth to facilitate elevation of the roots	0.361*	0.428**	0.786**	0.788**	1.000	-
B4d. I feel confident to assess and perform the surgical management of a failed extraction (e.g. a lower second molar) necessitating Wound closure using appropriate suture materials	0.615**	0.623**	0.683**	0.658**	0.721**	1.000

**P < 0.01, *P < 0.05 using a two-tailed test.

Table 5. Spearman's rho correlation coefficients (r) for questions in section B (forceps and surgical exodontia) and section D (anatomy teaching).

Questions	D1. I believe my teaching in anatomy has been appropriate for my clinical needs in oral surgery	D2. I am more confident about undertaking oral surgery because of my knowledge and understanding of head and neck anatomy	D3. The only anatomical knowledge needed for oral surgery is that of jaw and tooth morphology	F1. Total number of teeth extracted to date
B1. The teaching that I have received in oral surgery has given me sufficient knowledge to undertake independent practice	0.372*	0.241	0.127	-0.191
B2. I feel confident that I could extract an upper single-rooted tooth with an intact crown, in an otherwise intact dentition	0.258	-0.136	-0.209	-0.418**
B3. I feel confident that I could remove visible retained roots of an upper left first molar with elevators or forceps	0.168	-0.185	-0.019	-0.484**
B4a. I feel confident to assess and perform the surgical management of a failed extraction (e.g. a lower second molar) necessitating the raising of a mucoperiosteal flap	0.584**	0.361*	0.005	-0.382*
B4b. I feel confident to assess and perform the surgical management of a failed extraction (e.g. a lower second molar) necessitating Bone removal	0.468**	0.199	-0.293	-0.502**
B4c. I feel confident to assess and perform the surgical management of a failed extraction (e.g. a lower second molar) necessitating sectioning the tooth to facilitate elevation of the roots	0.484**	0.130	-0.135	-0.425**
B4d. I feel confident to assess and perform the surgical management of a failed extraction (e.g. a lower second molar) necessitating Wound closure using appropriate suture materials	0.320*	-0.020	-0.140	-0.458**

**P < 0.01, *P < 0.05 using a two-tailed test.