



## Original article

## Practice with confidence: Analyzing confidence level of final year dental students from four Saudi dental colleges in Riyadh

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## ABSTRACT

**Objective:** To investigate the confidence level of final year dental students in Riyadh.**Materials:** Cross-sectional study was conducted at four dental colleges in Riyadh (N = 312, 220 and 70,5% responded). Oneway ANOVA and post hoc Tukey-Kramer was used.**Results:** The greatest self-reported confidence scores were for pit fissure sealant (4.6(0.7)). Whereas, students reported least confidence in conducting surgical extractions (2.7 (1.2)). Females were found more confident in conducting preventive resin restorations, oral hygiene instructions, and rubber dam placement as compared to male who were more confident in surgical extraction, copy dentures, veneer preparation and managing orthodontic emergencies.**Conclusion:** All students were confident in performing essential dental procedures however higher confidence was observed in performing simple procedures compared to more complex ones.© 2021 Published by Elsevier B.V. on behalf of King Saud University. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## 1. Introduction

Graduates of dental universities are expected to continue their careers with confidence in performance. The Oxford English Dictionary defines confidence as 'a feeling of self-assurance arising from an appreciation of one's own abilities or qualities' (confidence | Definition of confidence in English by Oxford Dictionaries [Internet]. Oxford Dictionaries | English, 2018). Final

year dental students are expected to confidently perform many dental procedures and manage different circumstances that they may encounter during their practice. Students are found to perform more comfortably and successfully when they perceive themselves as confident (Stankov et al., 2013). Measuring their confidence is one way of assessing their competence. One study suggested that the more familiar one becomes in completing a procedure the more they are confident in it (Premadasa, 2008).

Dentistry in Saudi Arabia is taught by many universities. Some universities are private, and some are governmental, but all the dental colleges' curriculum is divided in 6 years. Five of these six years are completed at the dental college campus as undergraduate studies and the sixth year is the internship year. Basic medical and dental sciences are taught in the first two years. By the third year, students are usually exposed to patients. Third-year students start to perform diagnosis, treatment planning, simple scaling and operative procedures under the supervision of their clinical instructors. In the last two years of undergraduate training, students can perform multiple advanced procedures such as endodontics, simple and surgical extractions, management of pediatric patients and

**Abbreviations:** PNU, Princess Nourah bint Abdulrahman University; KSU, King Saud University; KSAU, King Saud bin Abdulaziz University; RCD, Riyadh College of Dentistry; REU, Riyadh Elm University.

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many other procedures. The sixth and final year is the internship training. Students are then assigned to complete their internship training in different clinical settings. It can range from hospital settings to primary care clinical settings. During the internship year, students work independently with no direct clinical supervision. Only after completion of this year, students can graduate successfully as licensed dental practitioners.

The confidence level of the final year students can be measured to assess their ability to provide comprehensive and quality dental treatment independently. Confidence is an important educational outcome; it is the ability to complete procedures completely without fear of failure. Using the graduates' feedback can help in improving the curriculum and hence improve the dental college's outcome. A similar study done in 2017 compared confidence level among final year graduates of two dental colleges in Riyadh (Baidas and Al-Husseyen, 2017) however, this present study conducted at a wider scale includes comparing the confidence level of final year dental students of four renowned dental colleges of Riyadh. It aims to identify the overall confidence of final year Saudi dental college students in conducting dental procedures along with identifying the procedures that final year Saudi dental college students feel the most and least confident in conducting. In addition, the effect of performing dental procedures according to gender and college are also investigated.

## 2. Materials and methods

### 2.1. Ethical guidelines

The current cross-sectional study was conducted at the College of Dentistry, Princess Nourah Bint Abdulrahman University PNU, Riyadh, Saudi Arabia. This study has been reviewed and finally approved by the institutional review board of the College of Dentistry. A brief description of the study was mentioned in the consent. Participation was voluntary, answering the survey meant that participants agree to join the study.

### 2.2. Study participants

The survey was distributed to final year dental students studying in three governmental and one private university in Saudi Arabia. Responses were collected from college of dentistry from Princess Nourah bint Abdulrahman University (PNU), King Saud University (KSU), King Saud bin Abdulaziz University (KSAU), Riyadh College of dentistry (RCD) Riyadh Elm University (REU). Total study population was 312, 219 responded resulting in a 70.5% response rate.

Study participants were different, gender wise, in all four dental colleges of the mentioned universities. For instance, Princess Nourah bint Abdulrahman University participants were all female because it is an all-female university. On the other hand, King Saud bin Abdulaziz University had all male students because the final year dental students at the time of the study were all males. Yet, both King Saud University and Riyadh College of dentistry (RCD) Riyadh Elm University (REU) had female and male participants.

### 2.3. Questionnaire development

The questionnaire was obtained from the General Dental Council document: "The first five years" in London (Council, 2008). The first part of the questionnaire consists of demographic data; gender and the dental school attended. The second part consists of 41 procedures that are regularly accomplished by final year dental students in Saudi dental schools. The confidence level of each procedure can be assessed through a five-point scale ranging from

1 (very little confidence), 2 (little confidence), 3 (neutral), 4 (confident), 5 (very confident).

### 2.4. Data collection and statistical analysis

A principal investigator managed data collection to maintain privacy and confidentiality. Paper-based questionnaires were given to a member of each batch in all the four colleges and were later collected from that same member. Descriptive statistics were obtained, and data was analyzed using SPSS for Windows (V.13.0). Oneway ANOVA (Khan, 2019) and post hoc Tukey-Kramer was used to compare overall confidence between colleges. Logistic regression was conducted on the five items with the highest and lowest overall confidence to determine whether gender or college significantly increased the odds of reporting low confidence.

## 3. Results

### 3.1. Participants demographics

Four colleges from four universities in Riyadh participated in the study with two including both male and female students. Of the 312 students approached, 219 responded resulting in a 70.5% response rate. Overall an equal proportion of each gender participated in the study (110 males, 109 females). The number of participants in each college are presented according to gender in Table 1.

### 3.2. College wise confidence comparison

The overall mean (SE) score for all 41 procedures was assessed for each college (Table 2). A cut-off score of 4 was used to indicate an acceptable confidence level. Overall the total sample mean for confidence did not reach an acceptable level of confidence (3.9 (0.01)). Only two of the four colleges, KSU and PNU, showed acceptable overall confidence level (4.1(0.06), 4.1 (0.11) respectively). Oneway ANOVA and post hoc Tukey-Kramer was used to compare overall confidence between colleges and showed a significant difference between KSU and RCD (REU) ( $p < .0001$ ) and PNU and RCD (REU) ( $p = .02$ ).

Low confidence (less than 4.0) in the categories of dental emergencies, surgery, esthetics, orthodontics, fixed prosthodontics and removable prosthodontics (Table 3) was reported by all colleges. College RCD (REU) had the lowest overall confidence (3.7(0.06)) with students reporting below acceptable confidence in 35 out of 41 procedures. PNU and KSU reported an equal level of overall confidence (4.1(0.06), 4.1 (0.11) respectively) and had low confidence in the same procedure categories (dental emergencies, surgery, esthetics, orthodontics, fixed prosthodontics and removable prosthodontics). Both had lower than acceptable confidence in 15 of the 41 procedures.

**Table 1**

Frequency and proportion of final year dental students participating in survey according to gender and college.

College	M N (%)	F N (%)	Total N (%)
KSU	52 (24%)	36 (16%)	88 (40%)
PNU	0 (0%)	30 (13%)	30 (13%)
KSAU	10 (5%)	0 (0%)	10 (5%)
RCD (REU)	48(22%)	44(20%)	92(42%)
Total	110 (50%)	109 (50%)	219

**Table 2**

Level of overall confidence in conducting dental procedures of final year dental college students in various colleges in Riyadh (N = 219).

College (N)	Total Mean Confidence (SE)	95%CI
KSU(n = 88)	4.1 (0.06)	(4.0,4.2)
PNU (n = 29)	4.1 (0.11)	(3.8,4.3)
KSAU (n = 10)	3.9 (0.18)	(3.5,4.2)
REU(RCD) (n = 92)	3.7 (0.06)	(3.6, 3.8)
Total	3.9 (0.01)	(3.8, 4.0)

**Table 3**

Logistic regression of variables predictive of dental procedures with lowest reported confidence.

Surgical extraction	
Variable	OR (95%CI)
<b>Gender</b>	<b>Reference</b>
Male	<b>Reference</b>
Female	4.16 (1.95,8.89)
<b>University</b>	<b>Reference</b>
PNU	<b>Reference</b>
KSU	2.06 (0.63,6.71)
RCD(REU)	1.39 (0.45, 4.31)
<b>Copy dentures</b>	<b>OR (95%CI)</b>
<b>Variable</b>	<b>OR (95%CI)</b>
<b>Gender</b>	<b>Reference</b>
Male	<b>Reference</b>
Female	2.82 (1.47, 5.41)
<b>University</b>	<b>Reference</b>
PNU	<b>Reference</b>
KSU	0.92 (0.29, 2.92)
RCD(REU)	0.43 (0.14, 1.31)
<b>Veneer preparation</b>	<b>OR (95%CI)</b>
<b>Variable</b>	<b>OR (95%CI)</b>
<b>Gender</b>	<b>Reference</b>
Male	<b>Reference</b>
Female	1.98 (1.07, 3.69)
<b>University</b>	<b>Reference</b>
PNU	<b>Reference</b>
KSU	1.21 (0.46, 3.17)
RCD(REU)	1.24 (0.48, 3.19)
<b>Vital tooth bleaching</b>	<b>OR (95%CI)</b>
<b>Variable</b>	<b>OR (95%CI)</b>
<b>Gender</b>	<b>Reference</b>
Male	<b>Reference</b>
Female	0.91 (0.50,1.66)
<b>University</b>	<b>Reference</b>
PNU	<b>Reference</b>
KSU	0.71 (0.27, 1.86)
RCD(REU)	0.45 (0.17, 1.15)
<b>Orthodontic emergencies</b>	<b>OR (95%CI)</b>
<b>Variable</b>	<b>OR (95%CI)</b>
<b>Gender</b>	<b>Reference</b>
Male	<b>Reference</b>
Female	1.96 (1.06, 3.62)
<b>University</b>	<b>Reference</b>
PNU	<b>Reference</b>
KSU	1.78 (0.69, 4.56)
RCD (REU)	1.15 (0.46, 2.85)

**3.3. Procedure wise confidence comparison**

Overall, the students reported the least confidence conducting surgical extractions (2.7 (1.2)) followed by copy dentures, (3.0 (1.2)) veneer preparation (3.2(1.1)), vital tooth bleaching (3.2 (1.3)) and orthodontic emergencies (3.2(1.3)).

The students felt the greatest confidence in their ability to apply pit fissure sealant(4.6(0.7)) followed by equal levels of confidence in preventive resin restorations (4.5 (0.8)), oral hygiene instructions(4.5 (0.7)), scale and polish (4.5) and followed by rubber dam placement (4.3 (0.9)) (Fig. 1).

**3.4. Gender wise confidence comparison by predictive variables**

Logistic regression was conducted on the five items with the highest and lowest overall confidence to determine whether gender or college significantly increased the odds of reporting low confidence. College KSAU was not included in the analysis due to insufficient number of students. In the five items with the lowest overall confidence levels, females were more likely to report low confidence in four of the items as compared to men (Table 3). Females were 4.2 times more likely to have low confidence in surgical extraction, nearly 3 times lower confidence in conducting copy dentures, and had nearly 2 times the odds of reporting low confidence in veneer preparation and orthodontic emergencies. The college did not significantly increase risk for low confidence in these items.

In the five items with highest overall reported confidence levels, men were significantly more likely to report low confidence as compared to women in four of the items (Table 4). Males were 2–3 times more likely to report low confidence in conducting pit fissure sealant (OR 2.74), preventive resin restorations (OR 5.62), oral hygiene instructions (OR 2.78), and rubber dam placement (OR 3.15). KSU showed 89% lower risk of reporting low confidence as compared to PNU in preventive resin restoration.

**4. Discussion**

The results of this study are in agreement with previously performed studies investigating undergraduate students' confidence level in clinical practice(Ihm and Seo, 2016; Sonbol et al., 2017; Ali, 2017; Al-Dajani, 2015; Alrahabi, 2017; Davey et al., 2015; Karaharju-Suvanto, 2014; Albelaihi, 2017). From the list of investigated procedures students were found more confident in performing preventive procedures like giving oral hygiene instructions, performing pit and fissure sealants, caries diagnosis, scale and polish and the application of rubber dam. However surgical extractions, making copy dentures, veneer preparation, vital tooth bleaching and orthodontic emergencies were not confidently performed by students, showing that these colleges reflected more focus on preventive dental procedures within their curriculum with possible limited students' clinical exposure for complex cases. Botelho et al. (2018) also correlates students specific clinical incompetence to the gaps in curriculum design, variable clinical instructor experiences and the patients involved. Doughty et al. (2016) mentions teeth bleaching as a widely requested treatment by patients and the lack of confidence by students in this regard raises concerns over curriculum alignment with modern clinical practice.

Looking at the colleges involved in this study overall the total sample mean for confidence did not reach an acceptable level of confidence (3.9 (0.01)). However, two of the four colleges, KSU and PNU, showed acceptable overall confidence level (4.1(0.06), 4.1 (0.11) in similar procedures respectively whereas College R had the lowest overall confidence (3.7(0.06)) with students reporting below acceptable confidence in 35 out of 41 procedures. This disagrees to the study done by Baidas LF, et al 2017 where College RCD (REU) students' confidence level was reported to be higher. This disparity urges an insight in teaching strategies and curriculum adopted by these institutions. All colleges have 6 years of teaching with KSU, PNU and KSAU College having their preparatory year corresponding to first year of RCD (REU) and so on. KSU mainly has traditional hands on learning with a blend of problem based and self – directed learning approaches whereas PNU and College KSAU have implemented a hybrid curriculum based on balanced problem based, self-directed traditional and hands on learning strategies. In addition, a comprehensive patient care model is

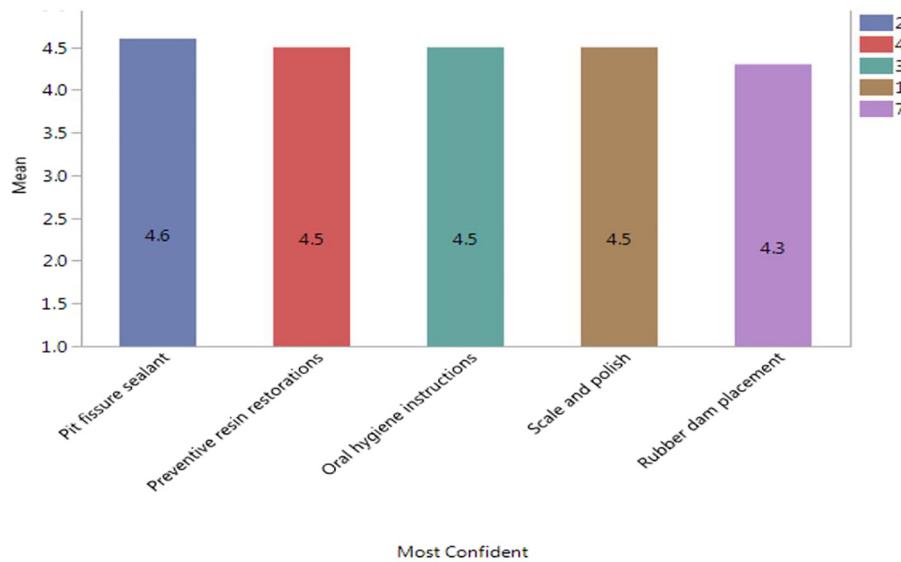


Fig. 1. Most Confident procedures.

**Table 4**  
Logistic regression of variables predictive of dental procedures with highest reported confidence.

Variable	OR (95%CI)
<b>Rubber Dam Placement</b>	
<b>Gender</b>	
Female	Reference
Male	3.15 (1.41,7.0)
<b>University</b>	
PNU	Reference
KSU	0.28 (0.06,1.39)
RCD(REU)	3.58 (0.93,13.77)
<b>Scale and Polish</b>	
<b>Variable</b>	
<b>Gender</b>	
Female	Reference
Male	2.02 (0.81,5.04)
<b>University</b>	
PNU	Reference
KSU	0.47 (0.10,2.27)
RCD(REU)	1.40 (0.34,5.84)
<b>Oral Hygiene Instructions</b>	
<b>Variable</b>	
<b>Gender</b>	
Female	Reference
Male	2.78 (1.10,6.98)
<b>University</b>	
PNU	Reference
KSU	0.20 (0.04,1.14)
RCD (REU)	1.69 (0.40,6.97)
<b>Preventive Resin Restoration</b>	
<b>Variable</b>	
<b>Gender</b>	
Female	Reference
Male	5.62(2.07,15.27)
<b>University</b>	
PNU	Reference
KSU	0.11 (0.02,0.68)
RCD(REU)	1.25(0.29,5.43)
<b>Pit Fissure Sealant</b>	
<b>Variable</b>	
<b>Gender</b>	
Female	Reference
Male	2.74(1.05,7.19)
<b>University</b>	
PNU	Reference
KSU	0.205(0.04,1.16)
RCD(REU)	1.41(0.44,5.98)

adopted by PNU and College RCD (REU) however students start comprehensive patient management in PNU in their last three years earlier than college RCD (REU) where last two years are dedicated for comprehensive patient management by students. In general, these differences can probably be attributed to the availability of cases, clinical requirements, and the variations in the curriculum design.

Looking at the amount of supervision among the different types of dental colleges, it was concluded that schools with lower ratio of faculty to dental student gave them an upper hand on their confidence level, however, during this study it was clear that it is not the case (JW, R., 2017).

Coming to the confidence related to gender it was assumed to be similar amongst males and females as both received similar curricular instructions however this was not the case as found in this study. Females were 4.2 times more likely to have low confidence in surgical extraction, nearly 3 times lower confidence in conducting copy dentures, and had nearly 2 times the odds of reporting low confidence in veneer preparation and orthodontic emergencies in contrast to males which showed low confidence in conducting pit fissure sealant (OR 2.74), preventive resin restorations (OR 5.62), oral hygiene instructions (OR 2.78), and rubber dam placement (OR 3.15). These statistics can be illusive in indicating low competency regarding both genders, but it can be an indicator of the natural way both genders learn and practice their skills as shown in multiple studies (Rafeek, 2004; Waldman and Perlman, 2002; Gina Arena, 2007; Gilmour, 2016). Another study done in Finland; University Dental Clinics also agrees with the present study where gender-related differences in confidence levels were assessed. Male subjects reported a higher level of confidence compared to female participants. The most significant differences were in performing surgical procedures and 3–4 unit fixed partial dentures (Karaharju-Suvanto, 2014). One study done in the College of Dentistry, Al-Qassim University found that females were more competent in the management of bleeding after extraction than males (65% and 47% respectively) (Albelaihi, 2017). Female natural kindness, better communication skills and the urge for perfection in their work might affect their self-confidence.

### 5. Conclusion

It was concluded that all students were confident in performing essential dental procedures however higher confidence was

observed in performing simple procedures of preventive nature compared to more complex ones including surgical extractions, veneers and vital tooth bleaching. Males showed higher confidence in few procedures requiring more clinical skills compared to females which were more confident in procedures involving increased communication with patient. It is therefore suggested to devise strategies involving more clinical time as it might help students in increasing their confidence in the deficient areas.

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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