



## Research: Evaluation of Perception and Self-Confidence Levels Regarding Endodontic Treatment Among Undergraduate Students of Penang International Dental College

Jalison Jacob, Abin Varghese\*, Ainur Sahira Noordin, Norish Eisiyiqin  
Abd Rashad and Nur Afrina Ellya Azhar

Penang International Dental College, Malaysia

\*Corresponding Author: Abin Varghese, Penang International Dental College, Malaysia.

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Abin Varghese, et al.

### Abstract

The undergraduate training in terms of endodontics presents with various types of challenges especially in clinical and pre-clinical practices. This research is intended to evaluate the perception and self-rated confidence levels regarding endodontic treatment among the undergraduate students of Penang International Dental College (PIDC). After being approved by the Internal Review Board (IRB), a questionnaire is distributed to an online platform (Google forms) among the undergraduate students of PIDC who have completed 5th year Endodontic departmental postings. Descriptive analysis is performed using the SPSS software version 21.0. The participation rate was 52% (n = 127 of 244). Anterior tooth is the most common first tooth treated. Relatively lower self-confidence levels were noted for more complex procedures such as non-vital bleaching, treatment of root resorption, repairing of perforations and removal of separated instruments. A moderate level of interest was shown in pursuing endodontics as a postgraduate program. Hence, this research's main goal is to be able to manage the shortcomings in preclinical and clinical endodontic training and also to find out key areas to stress upon for better student understanding and treatment outcome.

**Keywords:** Endodontic; Difficulties, Perception; Self-Rated Confidence; Undergraduates

### Introduction

The American Association of Endodontists defines *Endodontics* as the branch of dentistry concerned with the morphology, physiology and pathology of the human dental pulp and periradicular tissues. The scope of this field is vast and includes diagnosis and treatment of pathologies related to the pulpal and periradicular origin.<sup>1</sup>The practise of endodontics involves various treatment modalities with root canal treatment being one such treatment procedure [1]. The training related to endodontics differs among the various dental schools throughout the world. According to the European Society of Endodontology, the general dental practitioner's (GDP's) and expected to effectively manage the pulpal and periapical diseases and hence suggested the revision of the curriculum in order to strengthen the training program in terms of undergraduate endodontic learning [2]. The undergraduate Endodontic training aims to develop tactile enhancement and improve knowledge in external and internal dental anatomy in all phases involving endodontic treatment and diagnosis [3].

Penang International Dental College (PIDC) is one of the premier private dental institutions in Malaysia providing quality dental education for over 10 years. One of the course learning outcomes for Endodontics in PIDC include: 'to complete with confidence root canal therapy for permanent teeth to achieve form, function and aesthetics in harmonious relationship with surrounding hard and soft tissues. The teaching and learning activities in Endodontics is spread over a period of two years involving year 4 and Year 5. This is further divided into 'Pre-clinical' and 'Clinical learning'. The Pre-clinical tasks involve root canal treatment for maxillary and mandibular incisors, canines, premolars and molars. These teeth are evaluated based on the access opening, working-length determination, cleaning and shaping, and obturation. Each work is graded for evaluation of the students' work and performance. For clinical work, the students have to complete competency tasks during as a part of their learning process [4].

Due to the complexity of the tooth and root morphology, the students may encounter difficulties during their learning process

and may not have the confidence to perform endodontic treatment procedures [3]. The undergraduate training in terms of endodontics presents with various other challenges such as patients' absences and delays, selection of patients, preclinical and clinical training, difficulties found, type of technique employed, and teachers' orientation during endodontic treatment [5]. Various studies have reported such difficulties being experienced by undergraduate dental students throughout the world [5-7].

Students' perceptions in the educational process is considered a key component for quality management of academic programs. A number of factors, such as clinical experience, teacher/student/patient relationships, clinical application of theory, extracurricular activities, self-confidence and student dedication can significantly influence learning and practice [7,8]. The perception of students regarding learning in endodontics courses has not yet been fully evaluated. As there is a complex relationship among student, teacher, and educational environment, it is important that students provide feedback on the quality of their dental education [5]. Thus, this research is intended to evaluate and understand the challenges faced by PIDC students in carrying out the endodontic treatment.

### Materials and Methods

The present study was submitted and approved by the Internal Review Board (IRB) of Penang International Dental College (PIDC) (PIDC/IRB/SRP/07/20) and all participants filled a consent form. A total of two hundred and forty-four undergraduate dental students enrolled at Penang International Dental College were included in this study. Endodontics courses are offered in the fourth and fifth year. In the preclinical course, students have to complete root canal treatment on maxillary and mandibular incisors, canines, premolars and molars. Each work is graded for evaluation of the students' work and performance. In the clinical course, the students have to complete Minimum Clinical Experience (MCE) procedure of root canal treatment and undergo clinical competency assessment as part of their endodontic course completion.

### Questionnaire

This study is conducted by using a semi-structured questionnaire which is adopted from the survey conducted by Murray and Chandler [3].

The questionnaire is distributed to an online platform (Google forms) and the link was sent to the participants who fulfil the inclusion criteria.

The questionnaire was developed using a multiple choice and Likert-scale format, and included an opportunity for students to provide open-ended feedback. The first section covered demographic details, while the remainder of the questionnaire assessed the students' experiences regarding RCTs, their views on their preclinical training in this field, their self-rated levels of confidence in carrying out various endodontic tasks and their career intentions with regard to endodontic practice once graduated. Where questions explored levels of confidence, participants' classified their perceived level over a 5-point scale as 'very confident', 'confident', 'neutral', 'little confidence' or 'very little confidence'.

### Statistical analysis

The students' responses to the questionnaire is coded and entered into Microsoft Excel sheet. Descriptive analysis is performed to evaluate perception and the self-confidence level in endodontic treatment procedure using the IBM Statistical Package for the Social Sciences version 21.0 (SPSS Inc., Chicago, IL, USA). The chi-square test is used to test for significance of associations and relationships where appropriate, with the level of statistical significance set at  $P < 0.05$ .

### Results

The overall response rate was 52%, which comprised 127 respondents out of 244 sample size. Of the total respondents, 38 (29.9%) were male, while 89 (70.1%) were female.

Anterior tooth (63.8%) were the most frequent first tooth treated for RCT. With regard to the rate of satisfaction to their first RCT case 3.1% (4) participants responded with "Dissatisfied", 13.4% (17) responded with "Satisfied". Majority of the participants responded "Neutral" 67.7% (86), and 15.7% (20) responded with "Very satisfied". There is no statistical significance between the type of tooth treated first (anterior/premolar/molar) to the students' rate of satisfaction for their first case experience,  $P = 0.911$ .

Results also revealed that the majority of the students (71.7%) would consider specializing in endodontics in the future. There is a significant relationship between the student's choice to pursue endodontics as a postgraduate programme in the future and the overall perception and self-confidence level towards endodontic treatment,  $P = 0.033$ .

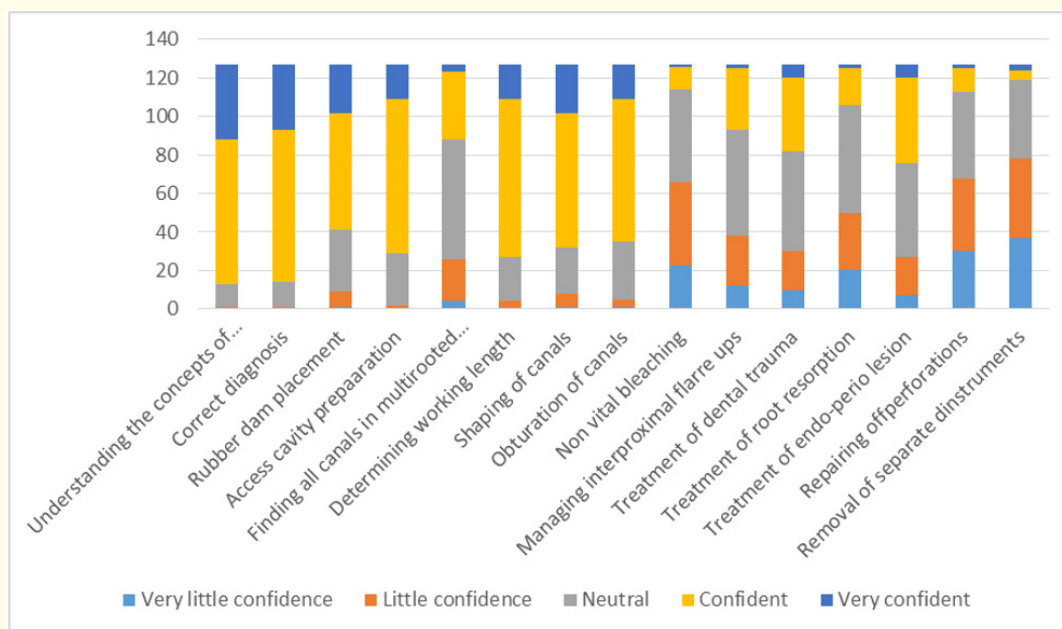
The overall confidence level of the undergraduate students of PIDC is satisfactory (Mean = 3.354). It is found that there is no statistically significant relationship between overall perception and self-confidence level with the gender of the undergraduate students of PIDC,  $P = 0.093$ .

Confidence levels regarding both the individual steps in carrying out a RCT and a list of endodontic procedures were explored. A relatively lower confidence levels were noted for more complex

procedures such as non-vital bleaching, treatment of root resorption, repairing of perforations and removal of separated instruments.

	Mean	SD (P < 0.05)	Minimum	Maximum
Understanding the concepts of diseased pulps	4.20	0.63	2	5
Correct diagnosis	4.15	0.61	2	5
Rubber Dam Placement	3.80	0.85	1	5
Access cavity preparation	3.90	0.64	2	5
Finding all canals in multirrooted teeth	3.10	0.83	1	5
Determining working length	3.90	0.66	2	5
Shaping of canals	3.87	0.81	1	5
Obturation of canals	3.82	0.73	1	5
Non vital bleaching	2.41	0.92	1	5
Managing interproximal flare ups	2.89	0.94	1	5
Treatment of dental trauma	3.09	0.99	1	5
Treatment of root resorption	2.63	0.97	1	5
Treatment of endo-perio lesions	3.19	0.95	1	5
Repairing of perforations	2.35	0.99	1	5
Removal of separated instruments	2.18	0.97	1	5

**Table 1:** Students' self-confidence in performing different endodontic procedure.



**Figure 1:** Students' self-confidence in performing different endodontic procedures.

## Discussion

To our knowledge, this is the first study that has explored the perception and self-confidence level regarding endodontic treatment among the Penang International Dental College undergraduate students. The research's main goal is to manage the shortcomings in preclinical and clinical endodontic training and also to find out key areas to stress upon for better student understanding and treatment outcome. Thus, student questionnaires are significant tools in collecting data for their educational requirements [14].

To achieve high confidence in endodontic treatment, one must gain great knowledge in anatomy of tooth. Endodontic treatment can be one of the most difficult and stressful disciplines for undergraduate dental students and for general practitioners as well. This difficulty is thought to be due to its expansion in recent years in terms of clinical managements of the pulp and periapical diseases as well as managements of the pulp and periapical diseases as well as the complex anatomical diversity and the huge number of developed instruments and materials used to perform the treatment along with the lack of self-confidence tends to make several students feels inadequately prepared to deal with endodontic treatments procedures, it is postulated that this may be because of a number of reasons including the difficulty of the technical procedures, lack of understanding of the principles and aims of treatment, poor remuneration for the time required and inadequate teaching at undergraduate level. Thus, the later will inevitably lead the students to errors in judgment and technique.

This study had a response frequency of 127 participants being 52% of the total sample size. It also revealed that there is a huge difference between female and male correspondents. This is due to the inequality of distribution of genders in the dentistry field. The results from data collected shows that with regard to gender there is no significant relationship with the overall perception and self confidence level. A similar finding is seen in a study conducted by AlQisi AY, *et al.* [10].

One way to standardize education is to poll students using questionnaires to help in the assessment, evaluation, and improvement of education. This study obtained information about the confidence of undergraduate dental students at PIDC regarding endodontics. It revealed that anterior tooth 78% was the most common tooth RCT treated by students. Anterior tooth root canal treatment is relatively easy, and this should encourage students. This finding differs than other study, the RCT teeth treated by stu-

dents were the first and second maxillary premolars [16]. Overall, the majority of students rate their first endodontic case experience as 'Neutral', in which they are neither satisfied nor dissatisfied with their performance. Most students performed a total of two RCT cases during their BDS program. However, it is seen that the number of cases of RCT done by participants are highly variable as some participants fill it in accordance to the clinical cases done only while some include both the number of clinical and pre-clinical cases of RCT done.

The second part of the questionnaire which comprises Likert scale revealed that the majority of students rated neutral and confident in the overall perception and self confidence level as shown in table 1. Majority students are confident in understanding the concepts of diseased pulp, in making the correct diagnosis, in rubber dam placement and in access cavity preparation. The students were also confident in determining working length, in shaping of the canals and also obturation of the canals. Similar findings were reported by Tavares LG, *et al.* [7]. However, most of the students found themselves as 'neutral' in finding all canals in the multirooted teeth, in managing interproximal flare ups, in the treatment of dental trauma and in the treatment of root resorption. For non-vital bleaching, repairing of perforation and removal of separated instruments, the students had neutral to little confidence in performing them. This is probably because these procedures are not greatly emphasized in the learning course of endodontic studies in PIDC [4]. Murray, *et al.* mentioned in his study that lack of clinical exposure in the undergraduate curriculum reduces the confidence that develops with clinical practice [3]. It is found that most students have considered pursuing endodontics as their postgraduate program as a 'maybe'. Unlike the study conducted by Murray, *et al.* where vast majority of students gave affirmative answer [3]. This could be influenced by student's personal preferences [16].

## Conclusion

In conclusion, colleges need to do further research in identifying the lacking areas of the undergraduate students during endodontic treatment in order to bring resolutions and improvements in this course of study. The literature has got various studies that address the general clinical preparedness of the new graduate. However, very few studies have been specific to endodontics, especially regarding self-confidence level. Hence, this study is anticipated to provide insight to students' self-evaluation of themselves in a branch they will encounter very frequently in their daily practice.

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