ORİJİNAL ARAŞTIRMA ORIGINAL RESEARCH

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Assessment of Undergraduate Dentistry Students' Experiences and Self-Confidence Levels During Endodontic Treatment: A Cross-Sectional Survey Study

Lisans Diş Hekimliği Öğrencilerinin Endodontik Tedavi Sırasındaki Deneyimlerinin ve Öz Güven Düzeylerinin Değerlendirilmesi: Kesitsel Bir Anket Çalışması

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ABSTRACT Objective: The goal of this study is to compare experiences and self-rated confidence levels between 4th and 5th year students across endodontic assignments. **Material and Methods:** A survey consisting of 26 questions was organized at the termination of the academic year with the involvement of 4th and 5th year students studying at Kırıkkale University Faculty of Dentistry in accordance with the Principles of the Declaration of Helsinki. First 16 questions were about levels of confidence. Other questions prepared as multiple choices are about their experiences in endodontic procedures. The data obtained after collecting the questionnaires were analyzed by using chi-square, Fisher's exact and Mann-Whitney U tests at the 5% significance level. **Results:** One hundred and sixteen students (64 of 72 4th and 52 of 62 5th grade students) answered the survey. The participation rate was 86.27%. The Grade-5 group felt statistically more confident about radiographic techniques, determining the working length, mechanical instrumentation and filling of the root canals (p=0.030, p=0.001, p=0.011, p=0.020). Comparing mechanical instrumentation in maxillary and mandibular molars, the Grade-4 group felt statistically significantly confident in instrumentation of the mandibular molars (p=0.000). The Grade-4 group felt statistically more confident in performing periapical radiographs of maxillary anterior teeth (p=0.000) and the Grade-5 group of mandibular molars (0.001). Additionally, students think that endodontics are more difficult than other dentistry departments (p=0.000). **Conclusion:** Within the limitation of this study, evaluating the major student difficulties during endodontic treatment may improve teaching strategies throughout preclinical and clinical education.

Keywords: Dental education; dental students; root canal preparation; root canal therapy; teaching

ÖZET Amaç: Bu çalışmanın amacı, 4 ve 5. sınıf öğrencilerinin kök kanal tedavisi aşamalarındaki deneyimleri ve güven düzeylerini karşılaştırmaktır. **Gereç ve Yöntemler:** Helsinki Deklerasyonu prensiplerine uygun olarak Kırıkkale Üniversitesi Diş Hekimliği Fakültesinde öğrenim gören 4 ve 5. sınıf öğrencilerinin katılımıyla eğitim-öğretim yılının sonunda 26 sorudan oluşan bir anket düzenlenmiştir. İlk 16 soru güven seviyeleri ile, diğer sorular ise endodontik prosedürlerdeki deneyimleriyle ilgili olup çoktan seçmeli olarak hazırlanmıştır. Anketler toplandıktan sonra elde edilen veriler ki-kare, "Fisher's exact" ve Mann-Whitney U testleri kullanılarak %5 anlamlılık düzeyinde istatistiksel olarak analiz edilmiştir. **Bulgular:** Anketi 116 öğrenci (72 4. sınıf öğrencisinin 64'ü ve 62 5. sınıf öğrencisinin 52'si) yanıtladı. Katılım oranı %86,27'dir. Beşinci sınıf öğrencileri, radyografik tekniklerin uygulanması, çalışma uzunluğunun belirlenmesi, mekanik enstrümantasyon ve kök kanallarının doldurulması konusunda istatistiksel olarak anlamlı derecede daha kendilerine güvenli bulunmuştur (p=0,030, p=0,001, p=0,011, p=0,020). Maksiller ve mandibular molarlarda mekanik enstrümantasyon karşılaştırıldığında, 4. sınıf öğrencileri mandibular molarların enstrümantasyonunda istatistiksel olarak anlamlı bir şekilde daha kendilerine güvenli bulunmuştur (p=0,000). Dördüncü sınıf öğrencileri, maksiller kesici dişlerin (p=0,000) ve 5. sınıf öğrencileri mandibular molar dişlerinin (0,001) periapikal radyografilerini alırken istatistiksel olarak kendilerine daha güvenli bulunmuştur. Ayrıca öğrenciler endodontinin diğer diş hekimliği bölümlerine göre daha zor olduğunu düşünmektedirler (p=0,000). **Sonuç:** Bu çalışmanın sınırları dâhilinde, kök kanal tedavisi sırasında öğrencilerin karşılaştığı başlıca zorlukların değerlendirilmesi, klinik öncesi ve klinik eğitim boyunca öğretim stratejilerini iyileştirebilir.

Anahtar Kelimeler: Diş hekimliği eğitimi; diş hekimliği öğrencileri; kök kanallarının şekillendirmesi; kök kanalı tedavisi; öğretim

Endodontics is a very important department of dentistry that includes the prevention, diagnosis and treatment of pulp and periapical tissue diseases. While even experienced general dental practitioners

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find endodontic procedures difficult and stressful, dentists who have just graduated are expected to have the knowledge and skills to treat most difficult conditions they may experience in private practice including root canal treatment (RCT). In such a case, the education given at the faculty should both increase the self-confidence of the students and provide them with both sufficient theorical knowledge and clinical experiences. The students educated at Kırıkkale University Faculty of Dentistry, start their preclinical practice in the 2-year of their 5-year undergraduate education and continue in their 3-year. Preclinical applications in endodontics include phantom jaw models and opening an endodontic access cavity on extracted teeth (incisors, canines, premolars and molars), determination of working length (WL), preparation of root canals and root canal filling. In the 4- and 5-years of their education, they perform RCT of patients in the clinic. Treatments are performed as part of comprehensive patient care, under the surveillance of specialist and post-graduate students. At this stage, students learn to make the correct diagnosis, apply dental anesthesia techniques, open the access cavity, determine the WL electronically and radiologically, preparation and filling of the root canals, application of medicaments between sessions, perform post-endodontic restorations, try to solve complications that may occur during and after treatment. It is aimed that students gain self-efficacy which means having the confidence that they can accomplish certain tasks successfully, in these clinical education.

In previous studies on the subject, it has been shown that many students found RCT complex, difficult and stressful and reported that to be insecure in situations such as RCT of molars.[1-3] It has also been stated that the insecurity of students in RCT practices is related to the competence they perceive from undergraduate education.[2,3] Students' perceptions of learning environments and educational experiences must be taken into account both in daily practice of a dental faculty and planning curriculum content as well.[4] The viewpoint of dental undergraduates about their educational experimentations is an substantial perspective in improving of teaching methodologies.[5,6]

The goal of this study was to get information about the experiences and self-rated confidence levels of students who completed their endodontics internship at the 4- and 5-year of Kırıkkale University Faculty of Dentistry during endodontic treatment procedures. The tested null hypothesis in this study was that there was a difference between the self-confidence levels of 4th and 5th grade students.

MATERIAL AND METHODS

For this study, ethics committee approval certificate numbered 2020.12.03 (date: January 7, 2021) of Kırıkkale University Non-Interventional Research Ethics Committee was obtained. The study was conducted in accordance with the principles set forth in the Helsinki Declaration. A total of 134 students who educated 4- (72 students) and 5-year (62 students) clinical training in Kırıkkale University Faculty of Dentistry were included in this study. An informed consent form was signed by the participants.

A survey was organized at the termination of the academic year with the association of 4- and 5-year students studying at Kırıkkale University Faculty of Dentistry. The students who had undergone endodontic procedures, were asked to answer a questionnaire regarding their perceptions, experience and self confidence levels. A questionnaire consisting of 26 questions was prepared for the students (Table 1). First 16 questions were about Likert's scoring system that explored levels of self-confidence. Participants were requested to report their perceived levels on a 5-point scale as "very confident", "confident", "neutral", "little confident" or "very little confident". Other questions were prepared as multiple-choices. Quantitave and qualitative analyses of students' perceptions of difficulties at different phases of RCT were established by its percentage in each experience level.

Statistical analysis was performed with IBM SPSS Statistics for Windows, version 23.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were obtained and the chi-square, Fisher's exact and Mann-Whitney U tests were used to test for significance of associations. The significance limit for all statistics was $p<0.05$.

TABLE 1: Survey form.

Survey Form

Female ☐ Male ☐ 4.year ☐ 5.year ☐

The perspective of dental students about their educational experiences is an important element in the development of teaching methodologies. Survey studies are one of the most effective methods to present these perspectives in the most realistic way. For this reason, we ask you to answer this text in a thoughtful and realistic way. Mark the following questions according to a scale of 1) 5.

1) very confident 2) confident 3) neutral 4) little confident 5) very little confident

1. While applying anesthesia during endodontic treatment, I feel myself ...
a) 1 **b)** 2 **c)** 3 **d)** 4 **e)** 5

2. I think my knowledge of anesthesia techniques is ...
a) 1 **b)** 2 **c)** 3 **d)** 4 **e)** 5

3. While taking periapical radiography during endodontic treatment, I feel myself ...
a) 1 **b)** 2 **c)** 3 **d)** 4 **e)** 5

4. I think my knowledge of radiography techniques is ...
a) 1 **b)** 2 **c)** 3 **d)** 4 **e)** 5

5. While opening the endodontic entrance cavity, i feel myself …
a) 1 **b)** 2 **c)** 3 **d)** 4 **e)** 5

6. While determining and removing the pulp ceiling during endodontic treatment, i feel myself …
a) 1 **b)** 2 **c)** 3 **d)** 4 **e)** 5

7. While determining root canal orifices during endodontic treatment i feel myself …
a) 1 **b)** 2 **c)** 3 **d)** 4 **e)** 5

8. While determining working length by periapical radiography during endodontic treatment i feel myself …
a) 1 **b)** 2 **c)** 3 **d)** 4 **e)** 5

9. While determining the working length with the apex locator during the endodontic treatment, I feel myself …
a) 1 **b)** 2 **c)** 3 **d)** 4 **e)** 5

10. I feel myself ... about mechanical instrumentation during endodontic treatment.
a) 1 **b)** 2 **c)** 3 **d)** 4 **e)** 5

11. I think my knowledge about mechanical instrumentation techniques is …
a) 1 **b)** 2 **c)** 3 **d)** 4 **e)** 5

12. I feel myself ... regarding the irrigation of the root canals.
a) 1 **b)** 2 **c)** 3 **d)** 4 **e)** 5

13. I feel myself ... about intracanal medicament use.
a) 1 **b)** 2 **c)** 3 **d)** 4 **e)** 5

14. I feel myself ... about the temporary restoration application.
a) 1 **b)** 2 **c)** 3 **d)** 4 **e)** 5

15. I feel myself ... about obturation of root canals.
a) 1 **b)** 2 **c)** 3 **d)** 4 **e)** 5

16. I feel myself ... about the restoration of endodontically treated teeth.
a) 1 **b)** 2 **c)** 3 **d)** 4 **e)** 5

17. The molar teeth that I feel more confident about the success of anesthesia are …
a) upper molars **b)** lower molars

18. Molar teeth that I feel more confident in finding root canal orifices are …
a) upper molars **b)** lower molars

19. The molar teeth that I feel more confident with during mechanical instrumentation are …
a) upper molars **b)** lower molars

20. Teeth that I feel more confident while taking periapical radiography are ...
a) upper anteriors **b)** upper premolars **c)** upper molars **d)** lower anteriors **e)** lower premolars **f)** lower molars

21. The teeth I feel most confident during root canal irrigation are …
a) upper molars **b)** lower molars

22. The teeth that I feel more confident during root canal obturation are …
a) upper premolars **b)** upper molars **c)** lower molars

23. After the endodontic treatment, the teeth that I feel more confident in the restoration process are …
a) upper anteriors **b)** lower anteriors **c)** upper molars **d)** lower molars

24. What can be done to make you feel more confident while applying root canal treatment?
(You can choose more than one option.)
a) Reminder laboratory practices should be done every year of education.
b) Online case series presentations should be done.
c) Reminder presentations should be made with videos.
d) Chairside demonstrations should be held in the clinic.
e) The number of patients treated in the clinic should be increased.
f) The number of patients treated in the clinic should be reduced.
g) Consumables and equipment in the clinic should be increased and updated.
h) The number of academic staff per student in the clinic and preclinic should be increased.

25. Considering other dentistry departments, endodontics is …
a) easier **b)** at the same difficulty **c)** harder

26. In general dentistry education, do you think the time allocated to endodontics training is sufficient?
a) sufficient **b)** insufficient

RESULTS

Among 134 students who were handed out the survey, 116 students answered the questionnaire.

The participation rate was 86.27%. Sixty four of 72 4-year students (89%) and 52 of 62 5-year students (84%) were returned to survey. Thirty (26%) of total respondents were male, while 86 (74%) were female.

The number and percentage distribution of the answers given by the 4- and 5-year students to the first 16 questions is given in Table 2. In the achievement of anesthesia, application of anesthesia techniques, taking periapical radiograph, access cavity preparation, removal of roof of pulp chamber, finding root canal orifices, application of enstrumentation techniques, irrigation of root canals, regarding temporary restoration and restoration of endodontically treated teeth, the most given answer was statistically significant "confident" and no significant difference was obtained between 4- and 5-year groups. Regarding the application of radiographic techniques, "self-confident" was the most given response in both groups, while the 5-year group was statistically significantly more self-confident than 4-year group (p=0.030).

The answer of the questions that determining WL with periapical radiography and the apex locator, the mechanical instrumentation and filling of root canals in both groups were statistically significant "confident". At the same time, Grade-5 group gave statistically significantly more self-confident responses than 4-year gorup (p=0.001, p=0.011, p=0.020 and p=0.011). The statistically significant response given to intra-canal medicament use was "neutral" (44%, p=0.000) for 4-year, while it was "confident" (48%, p=0.00) for 5-year.

Figure 1 summarizes the results of the self-confidence percentages of endodontic prodecures among groups of teeth. When the achievement of anesthesia in the maxillary and mandibular molars were compared, there was a statistically significant difference in both groups and they marked the maxillary teeth. When the 2 groups were compared, the 5-year group stated that they found anesthesia in the maxillary molars significantly easier than the 4-year group (p=0.034). Students in both groups stated that they felt statistically more comfortable in mandibular molars than maxillary molars under the headings of finding root canal orifices and root canal irrigation. Comparing mechanical instrumentation in maxillary and mandibular molars, the 4-year group felt statistically significantly confident in instrumentation of the mandibular molars (p=0.000), while there was no significant difference between maxillary and mandibular molars in the 5-year group (p=0.267). When mechanical instrumentation was compared in maxillary and mandibular molars, there was a statistically significant difference between 4- and 5-year groups (p=0.014). Both groups stated that mandibular molars are more difficult to make permanent restorations after RCT (p=0.000).

Figure 2 and Figure 3 shows the results of the self confidence percentages of receiving periapical radiographs and root canal filling, respectively. The Grade-4 group felt significantly more confident when taking periapical radiography of the maxillary anteriors (p=0.000). In the 5-year group, the teeth that students felt most confident when taking periapical radiography were the mandibular molars (p=0.001). Among the maxillary premolar, maxillary and mandibular molars, both groups stated that they preferred statistically significant maxillary premolars for root canal filling (p=0.000).

Figure 4 shows students' suggestions for developing the teaching of endodontic courses. As a suggestion, "The number of patients treated in the clinic should be reduced" and "The number of academic staff per student in the clinic and preclinic should be increased" were statistically significantly the most ticked option in Grade-4 and 5 groups, respectively (p=0.000, p=0.001). The 4-year group marked significantly more "decreasing the number of patients treated in the clinic and updating the equipment and materials" options in the clinic than 5-year group. The 5-year group, on the other hand, suggested significantly more "sharing more online cases, reminder presentations and increasing the number of instructors per student" options than 4-year group.

Among the responses given to comparing the perspectives on endodontics with other departments, 2 groups marked the most statistically significant "difficult"option (p=0.000) (Figure 5). Also, both groups noted that the time allocated to endodontics is often sufficient.

TABLE 2: Distribution of 4- and 5- year students' answers to the survey questions as numbers and percentages.

	4-year		5-year	
General theme	**n**	**%**	**n**	**%**
Achievement of anesthesia				
Very confident	20	32	22	35
Confident	31	48	35	56
Neutral	7	11	2	3
Little confidence	6	9	2	3
Very little confidence	0	0	1	2
Applied to anaesthetic techniques				
Very confident	6	9	9	15
Confident	44	69	41	65
Neutral	10	16	7	11
Little confidence	4	6	3	5
Very little confidence	0	0	2	2
Taking periapical radiograph				
Very confident	9	14	13	21
Confident	33	52	38	61
Neutral	9	14	6	9
Little confidence	11	17	5	7
Very little confidence	2	3	0	0
Applied to radiographic techniques				
Very confident	4	6	14	23
Confident	34	53	36	58
Neutral	17	27	8	13
Little confidence	9	14	4	6
Very little confidence	0	0	0	0
Access cavity preparation				
Very confident	11	17	13	21
Confident	35	55	29	46
Neutral	10	16	12	19
Little confidence	6	9	5	7
Very little confidence	2	3	3	5
Check and remove chamber roof				
Very confident	5	8	12	19
Confident	36	56	32	52
Neutral	18	28	10	15
Little confidence	3	5	6	9
Very little confidence	2	3	2	3
Finding root canal orifices				
Very confident	3	5	8	13
Confident	29	45	38	60
Neutral	25	39	12	19
Little confidence	5	8	2	3
Very little confidence	2	3	2	3
Determining working length with periapical radiography				
Very confident	3	5	19	30
Confident	32	50	27	44
Neutral	17	27	12	19
Little confidence	12	19	3	4
Very little confidence	0	0	1	2

continue...→

TABLE 2: Distribution of 4- and 5- year students' answers to the survey questions as numbers and percentages *(continued)*.

	4-year		5-year	
General theme	**n**	**%**	**n**	**%**
Determining working length with apex locator				
Very confident	9	14	22	36
Confident	30	47	30	48
Neutral	19	30	6	9
Little confidence	6	9	3	4
Very little confidence	0	0	1	2
Mechanical instrumentation of the canal/s				
Very confident	7	11	16	25
Confident	30	47	32	52
Neutral	22	34	7	11
Little confidence	5	8	7	11
Very little confidence	0	0	0	0
Applied to instrumentation techniques				
Very confident	5	8	6	10
Confident	30	47	40	65
Neutral	18	28	9	15
Little confidence	11	17	4	5
Very little confidence	0	0	3	3
Irrigation of root canals				
Very confident	12	17	23	36
Confident	35	55	32	52
Neutral	8	13	4	6
Little confidence	8	13	3	5
Very little confidence	1	2	0	0
Using intracanal medication				
Very confident	5	8	2	4
Confident	19	30	30	48
Neutral	28	44	20	32
Little confidence	11	16	8	13
Very little confidence	1	2	2	2
Regarding temporary restoration				
Very confident	14	22	22	34
Confident	39	61	24	38
Neutral	6	9	11	17
Little confidence	4	6	4	7
Very little confidence	1	2	1	2
Obturation of root canal/s				
Very confident	6	9	11	17
Confident	26	41	37	60
Neutral	22	34	6	9
Little confidence	10	16	7	11
Very little confidence	0	0	1	2
Restoration of endodontically treated teeth				
Very confident	8	13	12	19
Confident	28	43	24	39
Neutral	19	30	17	27
Little confidence	7	11	6	10
Very little confidence	2	3	3	

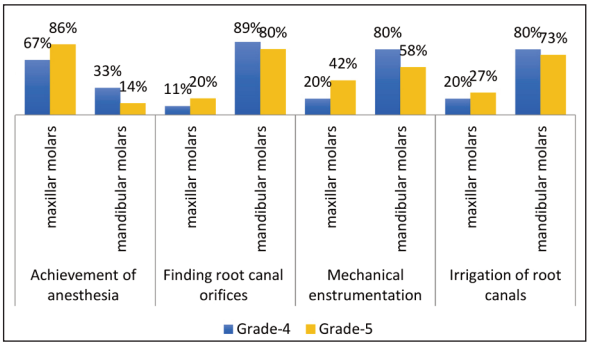

FIGURE 1: Percentage distribution of the answers given by the 4th and 5th grade students to the questions about achievement of anesthesia, finding root canal orifices, mechanical enstrumentation and irrigation of root canals.

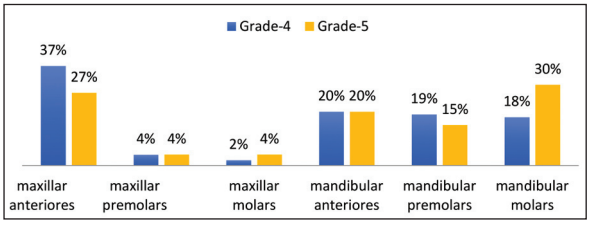

FIGURE 2: Percentage distribution of the answers given about taking periapical radiography.

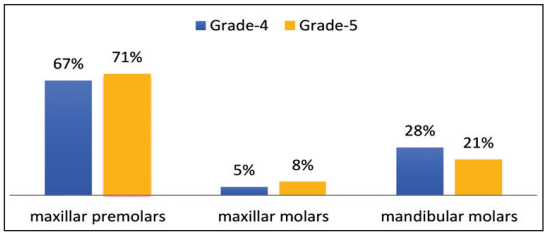

FIGURE 3: Percentage distribution of the answers given about root canal obturation.

DISCUSSION

This study aimed to understand the difficulties faced by 4- and 5-year dental students who are actively treating patients in the clinic while performing RCT. Evaluation and feedback from students are very important tools for improving education as well as collecting data for educational needs.[7,8] In the literature, response rates of survey research vary between 47% and 100%.[9,10] In this study, a high response rate to the questionnaire was provided as about 87%. This ratio is sufficient to obtain significant data.

In the first 16 questions, 5-year students marked "confident" option more than the 4-year students. Therefore, the null hypothesis was accepted. With 1 year more experience and increased self-confidence as more patients are treated, the responses of the students can be considered in direct proportion. The reason why 5-year group felt more competent than 4-year group in almost all of the questions, significantly about radiographic techniques, determining WL with radiography and apex locator, during mechanical instrumentation and filling of root canals; the fact that 5-year group has more experience may be due to the longer time spent in the clinic and therefore increased self-confidence by treating more patients. The ability to develop low self-esteem can be increased by clinical experience. This assists students acquire the necessary skills through experience.[11,12] Interestingly, it was observed that 4-year students felt more adequate about opening endodontic access cavity and temporary restoration applications than 5-year, although not statistically significant. The importance of the access cavity or the mistakes made while opening the access cavity and their results may not be well understood in the first RCT experiences.

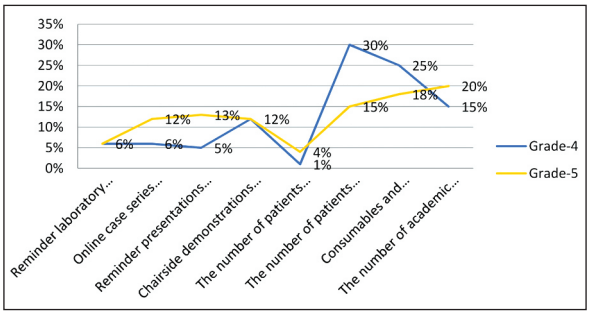

FIGURE 4: Students' suggestion for improving the teaching.

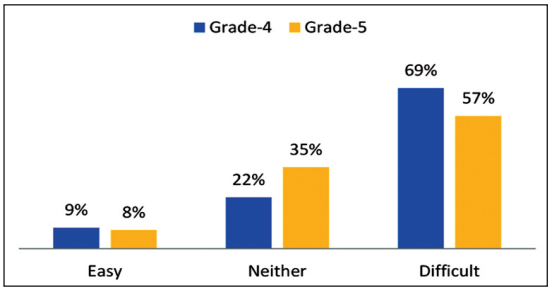

FIGURE 5: Students' perceptions of endodontics in comparison with other branches of clinical dentistry.

Because noninstrumented root canals can accommodate infected pulp tissue; it is essential to know and gain full access to the internal anatomy of teeth in order to ensure success in RCT.[13] It can be thought that as the students gain experience by knowing the problems that may occur as a result of incorrect opening of the access cavity, they actually understood that they should not be so confident about this subject.

In previous studies, the students stated that molars are the most difficult tooth to treat endodontically.[8,14] For this reason, incisors and premolars were not included as options of multiple choice questions in this study, since they would be selected directly as an option. In this study, both groups stated that they found it easier to work on the mandibulars in terms of access cavity opening and irrigation. RCT of maxillary molars may constitute difficulty. Because these teeth cannot be seen directly due to their location. It also has a morphologically complex structure.[8] Maxillary molars were also defined to be difficult teeth for procedures such as finding root canal orifices and irrigation of canals in the present study. Looking at the results, it is noteworthy that there is a significant difference between the 2 groups, especially in mechanical instrumentation. In the responses about mechanical instrumentation, 4-year group remarkably stated that they felt more confident in mandibular molars. In 5-year group, there was no statistically significant difference in confidence between shaping the mandibular and maxillary molars. This situation can be clarified as the fact that students may work more comfortably on more complex teeth as they gained clinical experience.

On the other hand, mandibular molars were demonstrated to be difficult in terms of obtaining local anesthesia by most of the students. This may be due to the fact that mandibular anesthesia is much more complex than infiltrative anesthesia. This situation is also consistent with the literature. In patients with symptomatic irreversible pulpitis, inferior alveolar nerve block failure occures with a percentage between 44% and 81%.[15-17]

When students were asked how endodontic education can be improved in order to increase their self-confidence during RCT, reducing the number of patients treated in the clinic has been one of the most marked options. Perhaps, students can gain more effective clinical experience by looking at fewer patients, increasing the time allocated to a patient. European Society of Endodontology 2001 guidelines recommends that for qualification a student must complete RCTs in 20 teeth.[18] It was reported that in 48 dental schools in the European Union, the number of treated cases required for their graduations were ranged between 3 and 80 canals, and the average was 17 canals in a previous study.[19] At Kırıkkale University, Faculty of Dentistry, minimum number of RCTs required 25 canals for 4-year, 45 canals for 5-year, which is well above the recommended number. In this case, dentistry students at Kırıkkale University interact with almost 2 times more clinical patients than the average and see more cases.

The fact that treating more patients increases experience and self-confidence is undeniable as Murray et al. stated that insufficient clinical subjection in the undergraduate curriculum diminishes the confidence that improves with clinical practice; however students' marking this option cannot be ignored.[18] It may be more beneficial for students to learn how to make a quality treatment by sparing more time for patients, without the stress of time, by discussing the case with academic staff, than the quantity of treated patients in the same period. Because an overly busy curriculum can compromise self-confidence.[20] However, this requires academic staff to devote more time to a student; this is possible with more academic staff per student, another option most marked by students.

Fifty nine percent of students in both grades think that the time allocated for endodontics education is sufficient, but the remaining 41% is not a percentage to be exceeded. Considering that 69% of 4-year and 57% of 5-year stated that endodontics is more difficult than other dentistry departments, this survey may be valuable in determining what to do in order to use the time allocated for endodontics more effectively.

CONCLUSION

To proceed developing students' educational experience, it is prominent to receive feedback from students regularly and to use this feedback to improve the points they highlight and feel lacking. Although 4- and 5-year dental students at Kırıkkale University

Faculty of Dentistry report a lower confidence in some phases of the RCT process, they are confident about RCT. Endodontic training should be enhanced by increasing preclinical and clinical sessions and using new teaching methods that introduce the latest developments in the field of endodontics in the undergraduate syllabus. Further research comprising other dentistry faculties is needed to identify the weak fields during RCT and provide solutions to impart skills better during endodontic procedures.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Ali Türkyılmaz;* ***Design:*** *Ali Türkyılmaz;* ***Control/Supervision:*** *Ali Erdemir;* ***Data Collection and/or Processing:*** *Gözde Akbal Dinçer, Deniz Erdoğan;* ***Analysis and/or Interpretation:*** *Gözde Akbal Dinçer, Deniz Erdoğan;* ***Literature Review:*** *Gözde Akbal Dinçer, Deniz Erdoğan;* ***Writing the Article:*** *Gözde Akbal Dinçer, Ali Erdemir;* ***Critical Review:*** *Ali Erdemir.*

REFERENCES

1. Seijo MO, Ferreira EF, Ribeiro Sobrinho AP, Paiva SM, Martins RC. Learning experience in endodontics: Brazilian students' perceptions. J Dent Educ. 2013;77(5):648-55. [Crossref] [PubMed]
2. Stewardson DA, Shortall AC, Lumley PJ. Endodontics and new graduates, Part 2: Undergraduate experience and course evaluation. Eur J Prosthodont Restor Dent. 2003;11(1):15-21. [PubMed]
3. Patel J, Fox K, Grieveson B, Youngson CC. Undergraduate training as preparation for vocational training in England: a survey of vocational dental practitioners' and their trainers' views. Br Dent J. 2006;Suppl:9-15. [Crossref] [PubMed]
4. Henzi D, Davis E, Jasinevicius R, Hendricson W, Cintron L, Isaacs M. Appraisal of the dental school learning environment: the students' view. J Dent Educ. 2005;69(10):1137-47. [Crossref] [PubMed]
5. Oliver R, Kersten H, Vinkka-Puhakka H, Alpasan G, Bearn D, Cema I, et al. Curriculum structure: principles and strategy. Eur J Dent Educ. 2008;12 Suppl 1:74-84. [Crossref] [PubMed]
6. Lanning SK, Wetzel AP, Baines MB, Ellen Byrne B. Evaluation of a revised curriculum: a four-year qualitative study of student perceptions. J Dent Educ. 2012;76(10):1323-33. [Crossref] [PubMed]
7. Mirza MB. Difficulties encountered during transition from preclinical to clinical endodontics among Salman bin Abdul Aziz University Dental Students. J Int Oral Health. 2015;7(Suppl 1):22-7. [PubMed] [PMC]
8. Tanalp J, Güven EP, Oktay I. Evaluation of dental students' perception and self-confidence levels regarding endodontic treatment. Eur J Dent. 2013;7(2):218-24. [Crossref] [PubMed] [PMC]
9. Davey J, Bryant ST, Dummer PM. The confidence of undergraduate dental students when performing root canal treatment and their perception of the quality of endodontic education. Eur J Dent Educ. 2015;19(4):229-34. [Crossref] [PubMed]
10. Honey J, Lynch CD, Burke FM, Gilmour AS. Ready for practice? A study of confidence levels of final year dental students at Cardiff University and University College Cork. Eur J Dent Educ. 2011;15(2):98-103. [Crossref] [PubMed]
11. Rolland S, Hobson R, Hanwell S. Clinical competency exercises: some student perceptions. Eur J Dent Educ. 2007;11(3):184-91. [Crossref] [PubMed]
12. Cardall WR, Rowan RC, Bay C. Dental education from the students' perspective: curriculum and climate. J Dent Educ. 2008;72(5):600-9. [Crossref] [PubMed]
13. Baruwa AO, Martins JNR, Meirinhos J, Pereira B, Gouveia J, Quaresma SA, et al. The influence of missed canals on the prevalence of periapical lesions in endodontically treated teeth: a cross-sectional study. J Endod. 2020;46(1):34-9.e1. Erratum in: J Endod. 2020;46(6):881. [Crossref] [PubMed]
14. Murray CM, Chandler NP. Undergraduate endodontic teaching in New Zealand: students' experience, perceptions and self-confidence levels. Aust Endod J. 2014;40(3):116-22. [Crossref] [PubMed]
15. Cohen HP, Cha BY, Spångberg LS. Endodontic anesthesia in mandibular molars: a clinical study. J Endod. 1993;19(7):370-3. [Crossref] [PubMed]
16. Claffey E, Reader A, Nusstein J, Beck M, Weaver J. Anesthetic efficacy of articaine for inferior alveolar nerve blocks in patients with irreversible pulpitis. J Endod. 2004;30(8):568-71. [Crossref] [PubMed]
17. Bigby J, Reader A, Nusstein J, Beck M. Anesthetic efficacy of lidocaine/meperidine for inferior alveolar nerve blocks in patients with irreversible pulpitis. J Endod. 2007;33(1):7-10. [Crossref] [PubMed]
18. Murray FJ, Blinkhorn AS, Bulman J. An assessment of the views held by recent graduates on their undergraduate course. Eur J Dent Educ. 1999;3(1):3-9. [Crossref] [PubMed]
19. Gatley S, Hayes J, Davies C. Requirements, in terms of root canal treatment, of undergraduates in the European Union: an audit of teaching practice. Br Dent J. 2009;207(4):165-70. [Crossref] [PubMed]
20. Lynch CD, Ash PJ, Chadwick BL. Student perspectives and opinions on their experience at an undergraduate outreach dental teaching centre at Cardiff: a 5-year study. Eur J Dent Educ. 2010;14(1):12-6. [Crossref] [PubMed]