

Perceived effectiveness about endodontic practice among private general dental practitioners in Riyadh city, Saudi Arabia

Afra Hassan Elrashid¹, Khalid Jamal Alderaa², Hamad Abdulaziz Alissa²,
Waad Hamad Almadhi³, Hadeel Salem Bawazir⁴, Sarah Saleh Alsougi⁴,
Sulaiman Ali Alraffa²

¹Department of Restorative Dentistry, College of Dentistry, Riyadh Elm University, Riyadh, ²Dental Student, King Saud bin Abdulaziz University for Health Sciences (KSAU-HS), Riyadh, ³Dental Intern, Riyadh Elm University, Riyadh, ⁴Dental Student, King Saud University (KSU), Riyadh, Saudi Arabia

ABSTRACT

Background: Application of newer techniques in endodontics improves the prognosis and reduces the time to operate patients; hence, the present study was conducted to determine the characteristics of endodontic practice and to compare these characteristics between General Dental Practitioners (GDPs) and endodontists with regards to their years of experience in Riyadh city, Saudi Arabia. **Materials and Method:** A cross-sectional study was conducted among GDPs and endodontists working in private sector in Riyadh. Study subjects were chosen from 5 areas of Riyadh by stratified random sampling. A structured, pretested, closed-ended, and self-administered questionnaire consisting of 36 items was employed. Questionnaire identified different aspects of endodontic practice among participants. Information related to their behavior and perceived effectiveness, and demographic data were also collected. **Results and Discussion:** A total of 259 practitioners participated in the present study. The mean behavior and perceived effectiveness scores were 5.73 (71.63%) and 1.16 (58%), respectively. A total of 64 respondents (24.7%) used magnification, while 167 (64.5%) employed digital radiography/cone-beam computed tomography. Rotary instruments were employed by 170 participants (65.64%) and adjunctive activator during irrigation was utilized by 50 (19.30%) of respondents. A majority of 217 respondents (83.80%) reported that they need further training. Correlation analysis revealed that gender was significantly associated with perceived effectiveness ($r = 0.136$, $P = 0.029$). **Conclusions:** Behavior and perceived effectiveness of practitioners is far from satisfactory and a majority of practitioners identified the need for further training. There was a statistically significant correlation between gender and perceived effectiveness.

Keywords: Endodontic practice, general dental practitioners, perceived effectiveness

Introduction

The main rationale for endodontic treatment is the complete elimination of the infection and prevention of microorganisms

from infecting or re-infecting the root or peri-radicular tissues.^[1] This goal can only be achieved by the skill of the dental practitioners, use of good quality materials, and specific endodontic techniques and instruments.^[2]

Address for correspondence: Dr. Afra Hassan Elrashid, Assistant Professor, Department of Restorative Dentistry, College of Dentistry, Riyadh Elm University, Riyadh - 11681, Saudi Arabia. E-mail: afra@riyadh.edu.sa

Received: 20-01-2020

Revised: 13-03-2020

Accepted: 26-03-2020

Published: 31-05-2020

The field of endodontics is continuously growing with the introduction of new materials, equipment, and techniques resulting in a quality care with higher success rate of endodontic

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

Access this article online

Quick Response Code:



Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc_129_20

How to cite this article: Elrashid AH, Alderaa KJ, Alissa HA, Almadhi WH, Bawazir HS, Alsougi SS, *et al.* Perceived effectiveness about endodontic practice among private general dental practitioners in Riyadh city, Saudi Arabia. *J Family Med Prim Care* 2020;9:2426-30.

treatment, thereby reducing the possibility of tooth extractions.^[3,4] On the contrary, published results also suggested that some General Dental Practitioners (GDPs) adhered to the endodontic techniques taught during undergraduate level and used techniques that have no proved clinical effectiveness.^[5]

In Saudi Arabia, most of the root canal treatments were performed by GDPs in private clinics due to their high number. On the other hand, endodontists practice in government-run dental clinics, dental schools, and some of the specialized dental centers.^[6] Studies have shown higher success rate of endodontic treatment carried out by the endodontist than the GDPs.^[3,7] A thorough knowledge of the technical part of the endodontic treatment is one of the prerequisites for successful root canal treatment.^[6]

The previous studies reported limited aspect of endodontic practice profile in Saudi Arabia by different authors in various cities and highlighted that the majority of the dental practitioners did not use rubber dam, relied on radiographic working length determination, used step back technique of canal preparation, preferred sodium hypochlorite and normal saline for canal irrigation, and nearly half of the respondent used IRM as a temporary filling material. In addition, the previous study reported that most of the practitioners did not take preoperative radiograph and ignored the assessment of pulp vitality during root canal treatment.^[6,8-10]

Recent availability of the continuing education programs in endodontics to the dental professionals has created much awareness about the latest development within the field of endodontics including newer materials, technologies, and techniques. However, until now inadequate evidence is gathered regarding the present status of endodontic practice profile among dental practitioners serving in private sector. Hence, there is a need for a further comprehensive exploration of endodontic practice characteristics among GDPs and endodontists working in private sectors in Riyadh city, Saudi Arabia. This study helps to identify the lacunae in current endodontic practices compared to the prescribed quality standards in endodontics.

Hence, this study aimed to determine the characteristics of endodontic practice among private sector dental practitioners and to compare these characteristics between GDPs and endodontists with regards to their years of experience in Riyadh city, Saudi Arabia.

Material and Methods

The present study was conducted among dental health professionals in Riyadh, Saudi Arabia. Riyadh city was divided into five areas according to the city municipality zones. Private dental clinics from each district were chosen by using stratified random sampling. Sample size was estimated based on alpha error of probability of 0.05, power of 0.95, effect size of 0.258 (small), degrees of freedom 3, and Chi-square value of 7.814. Study proposal was submitted to the research center,

Riyadh Elm University and ethical approval was obtained RC/IRB/2018/1076 on 05-07-2018. Informed consent was obtained from all the study participants.

A cross-sectional study was undertaken by employing structured, pretested, self-administered, close-ended questionnaires to the study participants. Questionnaire was developed by considering pertinent theoretical aspects, findings from published research, and reflection and inputs from subject experts. The questionnaire was pretested using a pilot survey and refined for clarity before being distributed to the study participants. The questionnaire consisted of two parts: first part elicited information about the type of dental practitioner (general dental practice or endodontist) and second part consisted of 35 items examining about the various aspects of the endodontic treatment. A total of 8 items examined the behavior of respondents and included questions which explored the isolation method used, obtaining working length radiographs, and actions taken in cases of accidental mishaps. Perceived effectiveness was assessed by 2 items.

Statistical analysis

Descriptive statistics are reported with frequencies being calculated. Chi-square test was employed to compare the study groups on the basis of the type of practice and the years of experience. Correlation analysis was performed to assess the correlation between demographic variables and behavior and perceived effectiveness of participants. Level of significance was kept at 5%.

Results

Overall, 259 dentists participated in the present study. A total of 59.1% ($n = 153$) of the respondents were males and 40.9% ($n = 106$) were females. The majority of the participants were GDPs 93.4% ($n = 242$). Regarding the years of professional experience, 44.6% ($n = 115$) participants had 1–5 years of professional experience [Table 1].

Results of Fischer's exact test revealed that type of practice was significantly associated with isolation method ($P = 0.004$), magnification ($P < 0.001$), use of periapical test ($P < 0.001$), method of preparation of root canal ($P < 0.001$), and use of adjunctive activator for irrigation ($P < 0.001$) [Table 2]. It was also observed that year of experience was significantly associated with number of RCTs per week ($P = 0.026$), isolation method ($P = 0.001$), use of magnification ($P = 0.008$), use of periapical test ($P = 0.016$), and type of radiographs employed ($P < 0.001$) [Table 3]. Correlation analysis revealed that there was a statistically significant correlation between gender and perceived effectiveness scores ($r = 0.136$, $P = 0.029$) [Table 4].

Discussion

The present study is the first study to ascertain behavior and perceived effectiveness of practitioners pertaining to endodontic practice among GDPs in Saudi Arabia.

Table 1: Demographic characteristics of study participants

Variables		Number	Percentage
Gender	Male	153	59.1
	Female	106	40.9
Type of practice	General dental practitioners	242	93.4
	Endodontists	17	6.6
Experience	1-5 years	115	44.6
	6-9 years	49	18.8
	10-13 years	42	16.2
	>13 years	53	20.4
Total		259	100

Table 2: Comparison of percentage of responses on the basis of type of practice

Variables		GDPs	Endodontist	P
Isolation method	Rubber dam	35	76	0.004
	Cotton roll	4	0	
	Suction	1	6	
	Suction and cotton roll	50	6	
	Others	14	12	
Magnification	None	79	18	<0.001
	Loupes	19	35	
	Microscopes	0	19	
	Others	2	28	
Periapical test	Palpation	5	0	<0.001
	Percussion	43	24	
	Tooth sloth (biting)	3	0	
	None	3	0	
	Others	46	76	
Prepare the canal (s)	Stainless steel hand file	20	0	<0.001
	Nickel-titanium hand file	11	18	
	Endosonic instrumentation	2	0	
	Rotary nickel-titanium files	45	47	
	Others	22	35	
Adjunctive activator for irrigation	Yes	16	59	<0.001
	No	84	41	

Most of the respondents had 1–5 years of experience due to a considerable increase in the number of graduate dentists in recent years.^[11,12] Overall, 93.4% of the practitioners performed endodontic practice in private clinics were GDPs which is in agreement with the findings reported by Al-Fouzan in Saudi Arabia.^[6]

The results of the present study showed that many of the respondents seldom obtained informed consent prior endodontic treatment. Quality guidelines for endodontic treatment provided by European Society of Endodontology revealed that the patient should agree to the treatment and its cost, and it should be recorded within the patient file.^[13]

A total of 35.26% ($n = 85$) of the GDPs used rubber dam isolation in the present study, which is higher than those previously reported by various investigators.^[6,8,10] The authors also noticed that most endodontists 76.47% ($n = 13$) used rubber dam isolation, so specialists are more likely to use a rubber dam.

A total of 19.58% ($n = 47$) GDPs used loupes for the magnification purposes in the present study, which is higher than those reported by Mathew and Alnafea among practitioners in Riyadh, Saudi Arabia.^[10]

Periapical tests are necessary to determine the periapical condition and are helpful in the diagnosis of endodontic diseases. Applying multiple tests is more specific in the diagnosis of periapical diseases.^[14] Less than half 42.32% ($n = 102$) of the GDPs used percussion test alone in the diagnosis of periapical condition. However, most of the endodontists performed all three tests (palpation, percussion, and tooth sloth) to ascertain appropriate diagnosis. Digital radiograph is faster than conventional radiographs and reduces the X-ray dosage that the patient receives.^[15] Most of the practitioners in our study reported employing digital radiographs in their endodontic practice.

Preoperative radiographs may be helpful in showing some periapical changes, canal calcification, root curvature, and the number of roots.^[16] Most of the respondents in this study always took a preoperative radiograph, which is higher than the other previously reported investigations.^[17,18] Majority of the practitioners in this study took three radiographs during the endodontic treatment, which is in agreement with those reported by Ahmed *et al.* among Sudanese practitioners.^[19]

Due to the properties of flexibility and resistance to torsional fracture, nickel-titanium rotary files have been considered as the substitute to the stainless-steel files.^[20] In the present study, 47% ($n = 8$) of the endodontists and 45% ($n = 109$) of GDPs used nickel-titanium rotary files to prepare the canal. This finding is higher than the previously reported studies from Denmark, Australia, and Saudi Arabia.^[10,17] Sodium hypochlorite was the most popular choice of irrigant during canal preparation in the present study, which is contrasting to studies in different countries which have reported the use of local anesthetic solution and normal saline.^[5,21]

Needle irrigation devices do not deliver the irrigating solutions much beyond the tip of the needle. Therefore, to enhance the efficiency of irrigating solutions, it is important to use an adjunctive activator with irrigation, especially in the most complex area in the root canal system which is the apical third.^[22,23] The use of activator with irrigation is limited in this study especially by GDPs, with 18.9% ($n = 49$) of the participants reporting its use.

In order to provide a tight seal and to maximize the outcome of endodontic treatment, sealer is used in combination with obturation material.^[24] This study results showed a noticeable preference on using resin-based sealer (AH26, AH+) among

Table 3: Comparison of responses on the basis of experience

Variables		1-5 years	6-9 Years	10-13 Years	> 13 Years	P
Root canal therapies per week	0-5 teeth	54	38	22	36	0.026
	6-10 teeth	22	39	39	36	
	11-15 teeth	16	8	27	17	
	16-20 teeth	3	8	5	8	
	21 or above	5	12	7	4	
Isolation method	Rubber dam	55	22	32	23	0.001
	Cotton roll	6	0	2	2	
	Suction	2	2	0	2	
	Suction and cotton roll	26	71	56	62	
	Others	11	5	10	11	
Use of magnification	No	77	76	80	66	0.008
	Loupes	20	24	12	26	
	Microscopes	1	0	0	8	
	Others	2	0	8	0	
Periapical test	Palpation	9	2	0	4	0.016
	Percussion	36	50	58	34	
	Tooth sloth	3	0	3	4	
	None	2	2	0	8	
	Others	50				
Radiographs	Conventional	23	41	49	53	<0.001
	Digital	71	55	41	28	
	CBCT	3	2	2	9	

Table 4: Correlation analysis between different variables

Variables	Gender		Type of practice		Experience		Behavior		Perceived effectiveness	
	r	P	r	P	r	P	r	P	r	P
Gender	-	-								
Type of practice	-0.063	0.313	-	-						
Experience	-0.120	0.055	0.143	0.022	-	-				
Behavior	0.040	0.519	0.027	0.669	-0.047	0.453	-	-		
Perceived effectiveness	0.136	0.029	0.055	0.376	0.060	0.337	0.055	0.382	-	-

GDPs and endodontists in contrast to other study wherein zinc oxide-eugenol sealer was commonly used by the practitioners.^[25]

In our study, the most the GDPs used Cavit 43.7% as a temporary restoration, which is similar to the findings reported in earlier studies.^[17,26]

Type of practice was significantly associated with isolation method, magnification, periapical test, prepare the canal (s), and adjunctive activator for irrigation. As specialists undertaking endodontic practice, they may be more likely to use magnification, periapical tests, and adjunctive activator for irrigation compared to GDPs.

Correlation analysis also showed that the experience of the participants showed a significant association with root canal therapies per week, isolation method, and the use of magnification, periapical test, and radiographs.

Results of the present study indicate that there was a significant association between gender and

perceived effectiveness. Sociocultural factors might play an important role in the findings of the present study. Correlation analysis also showed a significant correlation between experience and type of practice. It has been reported by one of the studies that more the dental undergraduates perform root canal treatment, more self-confidence they develop.^[27]

Limitations of the study include the cross-sectional nature of the study and self-administered questionnaire. The present study did not include endodontic treatment prognosis between GDPs and specialists.

For the prevention of complications, improving the prognosis, reducing the patient discomfort, and improving the patient compliance after the treatment, it is very important to apply the newer techniques in the treatment. Applications of newer techniques have all the potential to give patients a favorable experience and in turn just not prevent the pain and anxiety toward the treatment but also encourage the patient to undergo certain preventive treatments and may also help to reduce the burden of oral diseases in the society and nation at large.

Conclusions and Future Implications

Majority of the GDPs and few endodontists were providing endodontic treatment to the patients in private clinics of Riyadh city, Saudi Arabia. Type of practice was significantly associated with isolation method, magnification, periapical test, prepare the canal (s), and adjunctive activator for irrigation. Results of the present study also indicated that there was a significant association between gender and perceived effectiveness. There are several critical areas of endodontic practice that needs to be addressed to further enhance the quality of endodontic practice.

Declaration of participant consent

The authors certify that they have obtained all appropriate participant consent forms. In the form, the participants have given their consent for their images and other clinical information to be reported in the journal. The participants understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

- Narayanan LL, Vaishnavi C. Endodontic microbiology. *J Conserv Dent* 2010;13:233-9.
- Chan AW, Low D, Cheung GS, Ng R. A questionnaire survey of endodontic practice profile among dentists in Hong Kong. *Hong Kong Dent J* 2006;3:80-7.
- Lazarski MP, Walker WA, Flores CM, Schindler WG, Hargreaves KM. Epidemiological evaluation of the outcomes of nonsurgical root canal treatment in a large cohort of insured dental patients. *J Endod* 2001;27:791-6.
- Mustafa NS, Kashmoola MA, Abdul Majeed KR, Qader OAJA. Assessment of the success rate of endodontically treated patients attending outpatient polyclinic. *Eur J Dent* 2018;12:540-5.
- Jenkins SM, Hayes SJ, Dummer PM. A study of endodontic treatment carried out in dental practice within the UK. *Int Endod J* 2001;34:16-22.
- Al-Fouzan KS. A survey of root canal treatment of molar teeth by general dental practitioners in private practice in Saudi Arabia. *Saudi Dent J* 2010;22:113-7.
- Alley BS, Kitchens GG, Alley LW, Eleazer PD. A comparison of survival of teeth following endodontic treatment performed by general dentists or by specialists. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2004;98:115-8.
- Iqbal A, Akbar I, Qureshi B, Sghaireen MG, Al-Omiri MK. A survey of standard protocols for endodontic treatment in North of KSA. *ISRN Dent* 2014;2014:865780.
- Natto ZS. A survey of root canal treatment in Saudi Arabia: A pilot study. *Oral Health Dent Manag* 2014;13:354-8.
- Mathew ST, AlNafea M. An evaluation of the current endodontic trends among the general dental practitioners and specialist in Riyadh, KSA. *Int J Innov Educ Res* 2015;3:8-19.
- AlBaker AA, Al-Ruthia YSH, AlShehri M, Alshuwairikh S. The characteristics and distribution of dentist workforce in Saudi Arabia: A descriptive cross-sectional study. *Saudi Pharm J* 2017;25:1208-16.
- Alsalleeh F, Alohal M, Alzeer M, Aloseimi M, Almufflehi N, Alshiha S, *et al.* Analyzing private dental clinics in Riyadh City, Saudi Arabia. *Saudi Dent J* 2018;30:70-3.
- European Society of Endodontology. Quality guidelines for endodontic treatment: consensus report of the European Society of Endodontology. *Int Endod J* 2006;39:921-30.
- Walton RE, Torabinejad M. *Endodontics: Principles and Practice*. St. Louis: Saunders Elsevier; 2008.
- Bansal GJ. Digital radiography. A comparison with modern conventional imaging. *Postgrad Med J* 2006;82:425-8.
- Sherwood IA. Pre-operative diagnostic radiograph interpretation by general dental practitioners for root canal treatment. *Dento Maxillo Facial Radiol* 2012;41:43-54.
- Gaikwad A, Jain D, Rane P, Bhondwe S, Taur S, Doshi S. Attitude of general dental practitioners toward root canal treatment procedures in India. *J Contemp Dent Pract* 2013;14:528-31.
- Alrahabi M, Ahmad M. Knowledge regarding technical aspects of non-surgical root canal treatment in Al-Madinah Al-Munawarah private dental centers. *Saudi Endod J* 2015;5:155-60.
- Ahmed MF, Elseed AI, Ibrahim YE. Root canal treatment in general practice in Sudan. *Int Endod J* 2000;33:316-9.
- Nishijo M, Ebihara A, Tokita D, Doi H, Hanawa T, Okiji T. Evaluation of selected mechanical properties of NiTi rotary glide path files manufactured from controlled memory wires. *Dent Mater J* 2018;37:549-54.
- Ravanshad S, Sahraei S, Khayat A. Survey of endodontic practice amongst Iranian dentists participating restorative dentistry congress in Shiraz, November 2007. *Iran Endod J* 2008;2:135-42.
- Bharti R, Tikku AP, Chandra A, Shakya VK, Yadav S. Depth and percentage of resin-based sealer penetration inside the dentinal tubules using EndoVac, EndoActivator, Navi tip FX irrigation system: A confocal laser scanning microscope study. *J Conserv Dent* 2018;21:216-20.
- Shalan LA, Al-Huwaizi HF. Cleaning efficiency of root canal after irrigation with new irrigation technique: A scanning electron microscopic study. *Iran Endod J* 2018;13:102-7.
- Gatewood RS. *Endodontic materials*. *Dent Clin North Am* 2007;51:695-712, vii.
- Unal GC, Kaya BU, Tac AG, Keceli AD. Survey of attitudes, materials and methods preferred in root canal therapy by general dental practice in Turkey: Part 1. *Eur J Dent* 2012;6:376-84.
- Kaptan RF, Haznedaroglu F, Kayahan MB, Basturk FB. An investigation of current endodontic practice in Turkey. *ScientificWorldJournal* 2012;2012:565413.
- Baaij A, Ozok AR, Væth M, Musaeus P, Kirkevang LL. Self-efficacy of undergraduate dental students in endodontics within Aarhus and Amsterdam. *Int Endodontic J* 2020;53:276-84.