

An Evaluation Of The Current Endodontic Trends Among The General Dental Practitioners And Specialist In Riyadh, Ksa.

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Abstract

Objective:

The aim of this study was to investigate about the quality and quantity of root canal treatments performed by general dental practitioners and specialists and an insight to their knowledge and attitude towards the recent innovative materials and techniques employed in the field of endodontics.

Material and methods;

A well-structured, questionnaire was framed and distributed among 150 general practitioners and specialists working both in private and governmental clinics, hospitals and universities. The collected data was statistically analyzed using SPSS version 18 software.

Results:

Out of the 1345 respondents,45.2% performed more than 5 root canal treatments per week,54.1% get an informed consent, 27% take pre-operative radiographs,51% complete treatment in multiple visits, 14.7% used rubber dam isolation,22.2% used rotary instruments, 16.3% are aware of the recent advancements in endodontics. And 77.2% of them feel satisfied with their routine endodontic treatments.

Conclusion:

There need to be an increase in the awareness of the standard guidelines and procedure to be followed during routine treatment, to improve the quality of treatment delivered.

Clinical significance:

This study signifies that most of the specialists and general dental practitioners deviated from the standard guidelines in the root canal treatment such as use of pre-operative radiographs, rubber dam isolation, appropriate armamentarium, for the procedure, and standardized techniques. So, it is essential to promulgate the current concepts and technique in endodontics through continuing dental education programs and conferences.

Introduction:

Standard of practice as defined by the American association of endodontists is the acceptable level of performance or an expectation for professional intervention, formulated by professional organizations based upon current scientific knowledge and clinical expertise. Nowadays root canal therapy is considered as a highly

prevalent treatment option in the fast growing dental practice¹. It involves the introduction of innovative instruments, materials and techniques. Successful endodontic treatment depends on obtaining a fluid tight seal which is attained by adequate preparation and obturation of root canal system². This can be achieved by maintain the standard quality of root canal treatment. Various studies were carried out to explore the standard root canal treatment carried out by practitioners. The attitude and approaches of general dental practitioner and specialists and their skills, expertise all reflect the quality of root canal treatment conducted in a country. For an improved ethical and standard clinical practice, a minimum level of competence and an eagerness for continued learning must be encouraged in the graduates during their training period in dental schools³. Standard endodontic treatment is very important in preventing disparities in endodontic treatment, carried out by general practitioners and specialist in a country.

An undergraduate curriculum guideline for endodontology was published in 2001 by the European society of endodontology to standardize the quality and quantity of dental education and clinical experience, in Europe³. Several studies have revealed that most of the dental practitioners failed to follow the guidelines for a quality root canal treatment, 4^{5,6} in western countries like Denmark, UK, Belgium⁷ and USA. On the other hand very few studies investigate the treatment modalities and quality of standard treatment made by general practitioners and specialists in Riyadh, KSA.

Therefore the aim of this survey, was to investigate about the quality and quantity of root canal treatments performed and also to find out about their knowledge and attitude towards the recent innovative materials and techniques employed, in order to improve the quality of the current practice by general practitioners and specialists in Riyadh. KSA, and also to attain an proper understanding about the potential problems faced by them that could explain the present standard of root canal treatments.

Materials And Methods:

The study was registered with the research centre of Riyadh colleges of dentistry and pharmacy and was given a registration number FRP/2015/154.

Sample selection:

A random sampling method was used. The hospitals and private clinics in Riyadh, KSA was chosen. All the doctors both general practitioners and specialists were then administered the questionnaire to assess the quantity and quality of root canal treatment performed.

Design:

A survey among the general dental practitioners and specialists was carried out to investigate the above mentioned objective. A self-administered questionnaire was designed and framed for the study. The questionnaire included 45 close ended questions. These questioned were grouped as represented in table: 1.

Distribution:

The self-administered questionnaire was distributed among 150 general practitioners and specialists working in both private and governmental clinics, hospitals and universities. The respondents were asked to return the completed questionnaire to the concerned staff, without any assistance from the staff who handed over the forms. The collected data was entered in a personal computer and analyzed by using SPSS version 18 software to get the results. Descriptive statistics were used together with chi-square test. The level of significance was set at $p < 0.05$. Unanswered questions were considered as missing values.

Results:

Of the 150 questionnaires distributed, 135 completed response were received which is a response rate of 90% . This high response rate can be considered as a true representation of the standard protocols of endodontic treatment followed by the dentists in Riyadh, capital of KSA.

Practice profile:

From the total of 135 respondents, 71%(n=96) were from private and 28% (n=37) from government health care practice, 2% (n=2) were from university schools. Among which 67% (n=90) were specialists and 33% (n=44) were general practitioners. With regards to the years of experience is represented in Table-2.

With regards to the number of root canal treatment performed in a week it was found that 3% (n=4) performed 21 or more root canal treatments per week and 45.2% (n=65) performed at least 5 root canal treatments per week. Among which 64.4 % (n=87) performed root canal treatments on multirouted teeth and 29.6% (n=40) performed single rooted RC treatments. 4.4 % (n=6) performed retreatment cases. When the results were statistically analyzed with respect to the qualification and number of root canal treatments performed in a week, it was found a significant difference (p=0.000) between them. But was found no statistical insignificant difference between the qualification and the type of teeth performed (p=0.230). With regards to the retreatment cases, it was found that retreatment cases was done only mostly by specialists. With regards to the question whether they felt dental school training in endodontic therapy was adequate, there was no significant difference between the general practitioners and specialists (p=0.010) .

Patient preparation:

It was observed that 54.1% (n=73) of the practitioners get an informed consent from the patient prior to the root canal treatment and 43.7% (n=59) did not; among which 53 were specialists and 19 general practitioners which showed a significant difference(p=0.002) between the two.

Approximately 27.4% (n=37) always take a preoperative radiograph before root canal treatment but surprisingly 37 % (n=50) never take a preoperative radiograph. Among which who never take a preoperative radiograph were 38 specialists and 12 general practitioners but does not have a significant difference between the two as represented in Table -13 and Table-14. With regards to the question for checking the vitality of the involved tooth, 24.4%(n=33) always checked the vitality before starting the procedure but it was found that 37.8 % (n=51) never did so. On statistical analysis, between the qualification and checking the vitality of the involved tooth, there was no significant difference between the two (p=0.138), which had 38 specialists and 13 general practitioners who never checked the vitality . With regards to the sterilization of endodontic files, 98.5% (n=133) sterilized by autoclave.

Local anesthetics:

Around, 80.7% (N=109) always applied topical anaesthesia before injecting local anesthetics, 15% often and 3% never did so. Around 65.2 % (n=88) used 27 gauge needle for administration, and 18 gauge was used by 12.6%(n=17).

Number of visits:

Approximately 51% (n=69) preferred to finish the RCT in multiple visits and 48.9%(n=66)completed in single visit endodontics. On statistical analysis, by Pearson chi-square, it was found a significant difference between the qualification and number of visits to complete endodontic treatment (p=0.039).

Armamentarium used:

It was observed that 64.7 % (n=91) still never used rubber dam for isolation during endodontic treatment, only 14.7%(n=20)did so. Which showed a statistical difference (p=0.001) between specialists and general dental practitioners. 70 of the specialists and 21 of the general practitioners never used rubber dam isolation. There was no relationship between its use and years of practice. With regards to the use of loupes or microscopes for

locating canals, it was found, 73.3 % (n=99) never used them, 16.3% often used and 3.7% always used it. With regards to the type of endodontic instruments used, only 22.2 % (n=30) used rotary instruments and 77.8% (n=105) are still using hand instruments. On statistical analysis, it was found, only 22 of the specialists and 7 of the graduates used rotary instruments and 68 of the specialists and 39 dental practitioners still used stainless steel hand instruments. But did not show a significant differences between the two (p=0.092). Again there was no relationship between its use and years of professional practice. Among the practitioners, 88.1% (n=119) used barbed broaches for pulp extripation, 3.7 % (n=5) used H-file and 1.5% (n=2) used Gates Glidden. There was a significant difference (p=0.002) between the specialists and general practitioners in the use of barbed broaches as represented in Table-19. Among the practitioners 80.7 % (n=109) used barbed broach as the first endodontic instrument to put in the canal. K-files were the most popular instruments. Root canal preparations done solely with K-files were 14.8% and 4.4% used H-file and the remaining in combination with the other instruments.

Sodium hypochlorite was the most popular choice as a root canal irrigating solution with 94.8 % (n=128) of the respondents using it. And the most preferred concentration was 2.5% by 25.9 % (n=35) and there was found no relation between the years of professional experience and the type of irrigants used. With regards to the number of endodontic files used per canal, 54.8 % (n=74) used in 12 canals per file while 31.9% (n=43) used in more than 12 canals per file. 5.2 % (n=7) used as single use. On statistical analysis, it was found to have a significant difference between the specialists and general dental practitioners use of files per canal (p=0.000). Approximately 41.5 % (n=56) often used Gates Glidden drill for canal orifice widening, 39.3% used occasionally, 8.9% always used but 8.1% (n=11) never used it. There was no significant difference between the specialists and general practitioners with regards to the use of Gates Glidden.

Working length determination:

Conventional x-ray radiography was the most commonly used method for working length determination (40.7%) followed by the use of tactile method 35.6% and apex locators 23.7%. There was a tendency among practitioners working for more than 10 years towards using tactile sensation to estimate working length (37.25%). This decreases as years of experience decreases.

Cleaning, shaping and obturation of root canals :

Around 61.5 % (n=83) used step-back method for canal preparation, 19.3% (n=18) used crown down technique and 5.2% (n=7) used hybrid method of canal preparation. There was no significant difference between the qualification and years of experience for cleaning and shaping to the methods used . In this survey, it was found that 45.2 % (n=61) did not use any inter-appointment medicament, 36.3% (n=49) used calcium hydroxide and 18.5% (n=25) used formocresol dressing. 45 of the specialists, and 15 of the general practitioners from a total of 61, did not use any medicament while 33 of the specialists and 16 of the dental practitioners among 49, used calcium hydroxide. Formocresol was used by 12 of the specialists and 13 of the graduates among 25 of the respondents, which did not show any statistical significance.

It was observed that 50.4% (n=68) used calcium hydroxide based root canal sealer followed by 23.7% (n=32) used resin based sealers and 15.6% (n=21) used zinc oxide based sealer and 7% (n=10) used other root canal sealers for obturation. There was a significant difference between the qualification and type of sealer used. 55 of the specialists and 13 of the general practitioners out of 68 used calcium hydroxide based sealers, 20 of the specialists and 11 of the general practitioners out of 32 used resin-based sealers and 10 of the specialists and 11 of the general practitioners out of 21 used zinc oxide based sealer. There was no relationship between the years of experience and types of sealers used.

The vast majority of the respondents used lateral condensation obturation technique (87.4%). Few of the practitioners used vertical condensation technique.

Procedural accidents:

63% of the respondents would inform the patient and continue the treatment, whereas, 25.2% would not inform the patient, 5.9% refer to an endodontists, and 3% extract the teeth. Majority of the specialists, affirmed to inform the patient and continue the treatment or not inform the patient and continue. Referral to an endodontists was found very less by the general dental practitioners.

Post obturation access restoration:

Approximately 41.5% of the practitioners claimed to do occlusal reduction after the root canal treatment and there was found to be a significant difference ($p=0.000$) between qualification and occlusal reduction after root canal treatment. With regards to the timing for post obturation filling, 52.6% ($n=71$) affirmed of placing the filling on the same day, followed by 25.2% ($n=34$) after 24 hours, 17.8% ($n=24$) after 7 days, and it was found that 54.8% ($n=74$) used composite as post obturation or final restoration followed by 12.6% glass ionomer, 7.4% amalgam filling. Years of professional experience had no influence on the choice of final restoration. 55.6% ($n=75$) affirmed that they would advise the patient to place a crown after 7 days of root canal treatment.

Radiography:

With regards to the selection of master cone radiographs, 54.1% ($n=73$) never took a master cone radiograph before starting of obturation. There was a significant difference ($p=0.000$) between the qualification and taking master cone radiographs. 55.6% of the respondents claimed to take only 2 radiographs, while 30.4% took 3 radiographs and 8.9% took 4 radiographs. With regards to the question for the type of radiography used, 59.3% of the practitioners still rely on conventional x-rays and 35.6% rely on digital radiography. 4% used cone beam computed tomography.

Emergency situation:

51.1% ($n=69$) would do a root canal opening then prescribe analgesics and antibiotics in case of emergency appointments and 46.7% ($n=63$) first prescribe analgesics and antibiotics followed by root canal openings once acute symptoms subside. There was statistically significant difference ($p=0.026$) between the qualification and management of emergency appointment. But no significant difference between the years of experience and management of emergency, Table-24. Majority of the dentist (75%) never opt for an open dressing in case of emergencies.

Use of systemic antibiotics:

39.3% never prescribed antibiotics routinely while 3% prescribed them routinely.

Using innovative materials and methods:

Approximately 34.8% ($n=47$) used carrier based obturation systems, (Table-26). There was a statistically significant difference ($p=0.004$) between the qualification and the newer systems used as in Table-27. With regards to the newer rotary instruments used, only 16.3% ($n=22$) used wave-1 rotary system, 3.7% used one-shape systems, and the remaining have not heard about these. With regards to the frequency of attending conference and workshops, it was observed that only 41.5% occasionally attend these programmes.

Enhancing knowledge:

Majority of the practitioners occasionally (41.5%) attended conferences or CE programs, 34.1% often attended, 7.4% never attended.

Attitude of practitioners towards endodontic treatment:

Majority of the specialists (80%) and 77.2% of the general practitioners feel happy and satisfied with the routine root canal treatment. 19.3% ($n=26$) affirmed that it needs to be improved (Table-2). Our aim was mainly to

gather information about the quality and quantity of root canal treatment performed by practitioners and their knowledge and attitude towards endodontic treatment. Thus the information gathered is important and useful as it relates to the advancement in the field of endodontics in dental practice.

Discussion:

The overall response rate was 90%, in the present study which is higher when compared to different other survey conducted in Turkey ⁸, Jordan ⁹, India ¹⁰, KSA ¹¹. This study is first of its kind that gathered information on different standard procedures and techniques in endodontics and also investigates the quality and quantity of root canal treatment performed by dental practitioners. With regard to their knowledge, about the recent innovations in the field of endodontics in Riyadh, capital of KSA. Previous studies that were done was on the adoption of new endodontic technique by general practitioners in KSA in 2011 ¹¹ and another one which evaluates the molar root canal treatment by general practitioners in 2010 ¹². But to date, there are no information that gathers data about the quality and quantity of root canal treatment and the dental practitioners attitude (both general practitioners and specialists) to the recent innovations and technologies. This result of the present study revealed the quality and quantity of root canal treatment performed by general practitioners and specialists and their use and knowledge regarding the newer innovations in the field of endodontics. To prevent low types of response rate, the data was collected personally by meeting and visiting the dental service.

Practice profile:

This study showed that the number of root canal treatment performed in a week ranged from 16-20 teeth by 5.2% and 11-15 teeth by 8.9%, 6-10 teeth by 33.3%, till 5 teeth by 45.2%. There was a statistically significant difference with respect to the qualification and number of root canal treatments performed in a week. This result is in agreement with a study done by Shrestha et al in 2013, where similar results were found ¹³. The present study shows that only 34% of the general practitioners were completing root canal treatments in single visits where as majority of them ie; 65.9% were completing in multiple visits and 55.5% of the specialists performed in a single visit where as 44.4% in multiple visits. These results in agreement with the study done by Flemish dentists ⁵ and also in USA, 34% of dentists completed the root canal treatments in one visit, which showed a high percentage of single visit root canal treatments. Whitten et al (1996) found that endodontists preferred single visits therapy, whereas general practitioners preferred multiple ¹⁵. Single visit treatments have appeared to gain more popularity and increased credibility in the preclinical teaching model in America and Europe. In comparison to the specialists, the general practitioners performed more of multiple visits than single visits. This observation was in agreement with the study undertaken by Tronstad et al (2000) ¹⁶ in Sudan. With regards to the success rate, Iftikhar et al in 2013 found that one visit endodontic treatment was as successful as two visit endodontic treatments as evaluate by the rate of flare ups in asymptomatic molar teeth with Periapical radiolucency ¹⁷. In the present study approximately 69.6% of the practitioners felt that they had adequate dental school training. These results are in agreement with a study done by Ibrahim AlShahrani et al, ¹⁸ where they found majority of the general dental practitioners acquired adequate dental school training.

Patient preparation:

This study also found a statistically significant difference between the general practitioners and specialists in obtaining an informed consent prior to the treatment. 58.5% of the specialists get an informed consent while only 43% of the general practitioners do so. This is in agreement with a study done in Bulgaria where only 54% of the respondents get a written informed consent ¹⁹. The importance of obtaining a written consent was underlined by a research done by Spanish study which was found that in 78% of the cases of dental malpractice, there was no written consent. For accurate diagnosis and preoperative assessments of difficult cases, high quality radiographs are insistent. Despite its importance, in the present study, it showed that 24.7% always took

preoperative radiographs and surprisingly 37% of the respondents never took a preoperative radiograph, among which 38 were specialists and 12 general practitioners. This figure was considerably low compared to the data released by Orafi and Rushton²⁰, Palmer et al²¹ and Ravenshad et al²² who stated that 83.9%, 98.5% and 72% of the participants used preoperative radiographs. As performing root canal treatment without a preoperative radiograph is below the standard of care, it appears that the participants are not complying with endodontic guidelines²³. With regards to the type of radiography used, it was found that 59.3% still rely on conventional x-rays. This is in agreement with a similar study done by Hamid Razavian et al in 2014 where it was found that it might be due to the diagnostic potential of conventional x-ray system for the detection of voids and for the preoperative diagnostic purpose was superior to digital imaging system. The number of radiographs exposed during treatment varied from two to four, with more than half of the practitioners (60% of the specialists and 45.4% of the general practitioners) relied on a total of only 2 radiographs. This is in agreement with the study done by Ravanshad et al in 2008, where majority of dentuists took 2 radiographs²⁴. With regards to the sterilization of endodontic files, in this study it was found that 98.5% of respondents sterilized their files before treatment while 1.5% often did so. This findings was in agreement with the study done by Talha M et al²⁵ in 2015, there it was found 93.3% sterilized by autoclaving. Endodontic files if not sterilized properly might pose the threat of transmission risks of Creutzfeldt-Jakob disease infectivity, which is incurable, fatal disease and the causative agent an abnormal Prion protein resistant to conventional sterilization procedures²⁶.

Local anesthetics:

In a present study, it was observed that 80.7% applied topical anesthesia before injecting local anesthetics and 3% never did so. This is in agreement with a study done by Kavita et al²⁷ in (2000) where it was found 86% of the respondents used topical anesthesia before injecting local anesthesia. However, the perception on effectiveness of topical anesthetics' varied. 65.2% of the respondents used 27 gauge needle for local anaesthetic administration. This is in agreement with the study done by Kavita et al where 53% used 27 gauge needles for injection. 27 gauge needles are advisable for all injection techniques if the aspiration percentage is low, according to Malamad²⁸. A study by Terry et al 2006, it was found that when it comes to injection pain and needle gauge size does not matter²⁹.

Armamentarium used:

Rubber dam isolation is considered as a standard of care in endodontics³⁰. In spite of the well-known advantages of rubber dam, the majority of the dentists do not always use a rubber dam during operative and endodontic procedures^{31,32}. Unfortunately, in the present study it was observed that 64.7% still never used rubber dam for isolation during endodontic treatment. Among which 7 were specialists and 21 general practitioners. There was no relation between the use of rubber dam between specialists and general practitioners, indicating that its use is declining. These results are very much similar to the results of other international studies^{33,34,35}. Similar findings were found in Sudan (2%) and among Flemish dentists (3.4%)³⁶. This results also in agreement with a study done in KSA where only 3% of the respondents were using rubber dam for isolation. This can directly affect the standard of root canal treatment and decreases the success rate (Christein 1994)³⁷. To promote the use of rubber dam, there has to be an emphasis in education and increased awareness of the importance of rubber dam in daily practice. Majority of the dentists (77.8%) in the present study were using stainless steel hand instruments for root canal preparations and only 22.2% used nickel titanium rotary instruments. This is in agreement with a study done in KSA by Azhar et al (2014)³⁸ where similar findings were observed. 41.5% often used Gates Glidden burs to aid entrance into the canal orifice while 8% never did so.

Irrigation:

Clinicians are deprived of a proper method or instrumentation technique to obtain complete debridement of the root canal due to the complex canal anatomy³⁹. Sodium hypochlorite has proven to be a effective antimicrobial

agent (Bystrom and Sundqvist 1983)⁴⁰. Thus an antimicrobial irrigating solution is needed to debride the canals by chemical means. In the present study, 94.8% used sodium hypochlorite with 2.5% concentration as an irrigating solution. The same results were shown among dentists of Switzerland⁴¹. 62% used diluted sodium hypochlorite for irrigation purpose, this might be due to the reason that dilute concentration reduces the caustic effects of sodium hypochlorite on oral and periapical tissues. These results confirm that sodium hypochlorite is still considered as the gold standard for irrigation^{42, 43}.

Working length determination:

Determination of working length is the most crucial step in endodontics. In the present study, only 40.7% of the participants used conventional radiographs for working length determination while it was disappointing that 35.6% of the respondents relied on tactile method and 23.7% on apex locators. Unfortunately this result shows that the armamentarium used is not in par with the present day modern endodontic practice. This is in agreement with the study done by Azhar et al³⁸ in KSA, where it was found majority of the practitioners used radiographs and tactile sensation for determination. Palmer et al found that 57.3% of the practitioners in north west of England use radiographs as the only method for establishing working length²¹. The use of tactile sensation to determine working length cannot be recommended because, the instrument may bind against the canal walls at any position along their length or perforate apically. (Dummer et al 1984)⁴⁶. An accurate working length could be achieved by the combination of conventional radiographic techniques with modern electronic apex locators⁴⁷.

Cleaning, shaping and obturation:

The step back method of canal preparation was the most commonly used (61.5%) among the practitioners. In a study by the Flemish dentists used the step back technique⁴⁸. But still 13.3% of the practitioners still used the standardized method. In another study 60.4% of Flemish dentists used standardized filling technique. (oral health). The standard technique has some disadvantages like overpreparation, which could result in incomplete obturation of the root canal system. Even though, Calcium hydroxide being recognized as the standard intra canal medicament for inert-appointment dressing⁴⁹, in the present study calcium hydroxide was used by only 36.3% of the respondents which was slightly less than Flanders (Belgium) 69% and 63% in North Jordan, but 45.2% did not use any medicament. 18.5% used formocresol. These findings are in consistent with the previous findings by Sudanese dentists, Iranian dentists, were 37% used calcium hydroxide⁴⁹. The use of calcium hydroxide as an intracanal medicament has to be encouraged among practitioners. It has been found to be the material of choice by the western worlds.

In the current study, almost 67% of the specialists and 27.2% of the general practitioners recorded no use of radiography to determine the master cone position. This is in agreement with a study done by Ashwini et al 2013 that found only 15.8% used master cone determination radiograph⁵¹.

The most popular root canal sealer among the practitioners was calcium hydroxide sealers which among these more were the specialists 50.4%, 23.7% resin based sealers and 15.6% zinc oxide eugenol based sealers. Numerous methods have been advocated to obturate the root canal system, each claims of their ease, its efficiency and superiority. Majority of the practitioners used lateral condensation obturation techniques (87.4%). This is one of the universally acknowledged and most commonly used technique⁵². The finding of this study is in agreement with the finding by K Fouzan which found 65% used cold lateral condensation¹². In a survey of Qualtrough et al 1999 cold lateral condensation remained the most popular undergraduate teaching technique⁵². With regard to the timing of placement of post obturation filling, 52.6% affirmed placing it on the same day.

54.8% claimed of using composite as a final access restoration material. Post operative pain is a common finding after root canal treatment. In the present study 41.5% of the practitioners claimed to do occlusal reduction after root canal treatment. Pain after endodontic treatment is of serious concern both to dentists and patients. These are two schools of thought regarding this issue. In a study by Rosenberg P A ,1998⁵⁴, it was found that occlusal reduction should prevent post-operative pain in these patients whose teeth initially exhibit pulp vitality, percussion sensitivity, preoperative pain and absence of periradicular radiolucency. But in another study by Shama et al 2014⁵⁵, it was found that occlusal reduction did not provide any reduction in post-operative pain in teeth with irreversible pulpitis, and mild tenderness to percussion. So it can be concluded that this procedure is dependent upon the case being treated with. The present study 52.6% affirmed of placing the post obturation permanent access restoration on the same day 25.2% after 24 hours, 17.8% after 7 days. These results are in agreement with the study done in South Africa⁵⁶ that showed 41% immediately restored with the permanent restorative material. 38% waited for 1 week, 47% for 2- 6 weeks. As per the ESE quality guideline⁵⁷ the tooth should be completely restored to prevent any bacterial recontamination of the canal. The present study results stated that 54.8% used composite restoration, 12.6% glass ionomer cements, 7.4% amalgam filling. These results were similar to a study done in 2012 where majority of the practitioners used composite final restoration. Economic consideration might be a reason for practitioners using cheaper resin composites instead of onlay restorations. To prescribe antibiotics for an endodontic case that has endodontic infection and should have a systemic involvement ie; high grade fever, swelling, lymphadenopathy, timing; otherwise antibiotics is not justified. In the present study 39.3% never prescribed antibiotics, but 34.8% occasionally and 20.7% often prescribe them. With consideration to the qualification, it was found that general dental practitioners often prescribe antibiotics for routine endodontic cases. This is in par with the previous study done in Spain, India and US, 31% and 37.6% of respondent practitioners prescribed antibiotics⁵⁸. Thus the practitioners should not ignore the scientific basis of antibiotics prescription and should not neglect the current guideline for antibiotic prescription.

Emergency situation:

The prior management of an abscess developed from acute apical Periodontitis should be to relieve the pressure first then continue with the endodontic therapy. The immediate management should be to relieve the pressure and then carry on with endodontic therapy. In the present study 46.7% of the respondents still first prescribe antibiotics and analgesics for such emergency situations. Systemic antibiotics provide no additional benefit over drainage of the abscess⁵⁹. This is prescribed only when drainage cannot be achieved. A large majority of practitioners (75%), do not leave the tooth open for draining. Alfred Walker was the first dentist to advice against the practice of leaving teeth open for drainage. Ha asserted, this method is as unscientific as it is antiquated⁶⁰.

Use of innovative methods:

In the present study only 16.3% used wave 1 rotary instruments, 3.7% used one shape systems, and the remaining have not heard about this. This results is similar to another study done by Khalid S in 2010¹², were 97% of the practitioners were still using stainless steel hand instruments.

Endodontic treatment satisfaction:

It was interesting to observe that 80% of the specialists and 77.2% of the general dental practitioners feel happy and satisfied with their routine endodontic treatments. But 19.3% still affirmed that it needs to be improved. This is in agreement with a study done by Ibrahim et al 2014, which found similar findings. A number of studies (Pit ford et al 1983⁶², Saunder et al 1997⁶³, De Moor et al 2000⁶⁴), have revealed that much of the endodontic provisions fall below the international standards of care.

Conclusion:

This study investigated the current status of endodontic treatment practiced by general dental practitioners and specialists. Considering the high response rate, this study can give a true picture of the current scenario in endodontic practice. Based on the results of our study, it can be concluded that most of the general dental practitioners and specialists apply methods not accepted by contemporary dental profession and are still not following the standards of endodontic treatment. There need to be an increase in the awareness of the standard guidelines and procedure to be followed during routine treatment, to improve the quality of treatment delivered. And most importantly improving the knowledge about the newer materials and technique by attending the continuing dental education programs in endodontics to improve the standard of treatment. However a future surveys and studies are needed to re-evaluate these trends.

References:

- 1) Chan AWK, Low D, Cheung GSP, Ng RPY: A questionnaire survey of endodontic practice profile among dentists in Hong Kong. *Hong Kong Dental Journal*, 2006;3(2):80-87.
- 2) C. Lost, "Undergraduate curriculum guidelines for endodontology," *International Endodontic Journal*, 2001;34(8)574-580 .
- 3) C. Löst, "Quality guidelines for endodontic treatment: consensus report of the European Society of Endodontology," *International Endodontic Journal*, 2006;39(12) 921-930.
- 4) Weiger R, Hitzler S, Hermle G, Löst C: Periapical status, quality of root canal fillings and estimated endodontic treatment needs in an urban German population. *Endod Dent Traumatol* 1997, **13**:69-74
- 5) Slaus G, Bottengerg P: A survey of endodontic practice amongst Flemish dentists. *Int Endod J* 2002, **35**:759-767
- 6) Whitten BH, Gardiner DL, Jeansonne BG, Lemon RR: Current trends in endodontic treatment: report of a national survey.
- 7) 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.
- 8) Kaptan RF, Haznedaroglu F, Kayahan MB, Basturk FB. An investigation of current endodontic practice in Turkey. *Sci World J* 2012;1-6.
- 9) Al-Omari WM. Survey of attitudes, materials and methods employed in endodontic treatment by general dental practitioners in North Jordan. *BMC Oral Health* 2004;4:1.
- 10) Mehta N, Raisingani D, Gupta S, Sharma M. Endodontic trends: Where we are and where we should be-A survey report. *People's J Sci Res* 2013;6:30-7
- 11) Solaiman M. Al-Hadlaq^a et al: Adoption of new endodontic technology by dental practitioners in Saudi Arabia. *King Saud University Journal of Dental Sciences* .2011; 2(1) 7-11
- 12) Khalid S. Al-Fouzan .A survey of root canal treatment of molar teeth by general dental practitioners in private practice in Saudi Arabia. **The Saudi Dental Journal* 2010; 22, 113-117
- 13) Shrestha D1, Dahal M2, Karki S3 An endodontic practice profile amongst general dental practitioners in Kathmandu: A questionnaire survey *Journal of College of Medical Sciences-Nepal*, 2013; 9(4); 40-50
- 14) Whitten, B.H., Gardiner, D.L., Jeansonne, B.G., Lemon, R.R. Current trends in endodontic treatment: report of a national survey. *Journal of the American Dental Association*.1996; 127, 1333-1341
- 15) Tronstad L, Asbjørnsen K, Doving L, Pedersen I, Eriksen HM: Influence of coronal restorations on the periapical health of endodontically treated teeth. *Endodontic & Dental Traumatology*, 2000;16(5):218-221.

- 16) A .Iftikhar, I.Azhar,Omiri M. Flare up rate in molars with periapical radiolucency in one visit vs two visit endodontic treatment.. JCDP.2013;14(3);414-14
- 17) S.Ibrahim, T Rafi, S Sadatullah. Recent graduate perspectives of bachelors of dental surgery program in KKU college of dentistry,KSA. Areport. World journal of dentistry.2014;5(3);174-79
- 18) Nadia Avramova¹, Krassimira Yaneva. Patients' Informed Consent in Dental Practice in Bulgaria . OHDM 2011;10(2)
- 19) Orafi I, Rushton VE. The use of radiography and the apex locator in endodontic treatment within the UK: a comparison between endodontic specialists and general dental practitioners. Int Endod J.2013;46(4):355-64.
- 20) Palmer NO, Ahmed M, Grieveson B. An investigation of current endodontic practice and training needs in primary care in the north west of England. Br Dent J. 2009;206(11):E22; 584-5.
- 21) 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(4):135-42.
- 22) Simon S, Machtou P, Adams N, Tomson P, Lumley P. Apical limit and working length in endodontics. Dent Update. 2009;36(3):146-53.
- 23) Shohreh Ravanshad¹, Saied Sahraei, Akbar Khayat¹Survey of Endodontic Practice amongst Iranian Dentists Participating Restorative Dentistry Congress in Shiraz, November 2007 IEJ.2008; 2(4)
- 24) Talha M Siddiqui, Aisha Wali, Azka Anwar Attitudes, Techniques And Trends In Endodontic Treatment By The House Surgeons In Dental Institutes – Karachi International Journal of Contemporary Dental and Medical Reviews (2015), Article ID 060115
- 25) Arun Aslam,et al. Knowledge and attitude of endodontic postgraduate students toward sterilization of endodontic files: A cross-sectional study. Saudi Endodontic Journal . 2014;4(1)
- 26) Kavita Kohli DDS Peter Ngan DMD Richard Crout DMD, PhD Christopher C. Linscott DDSA survey of local and topical anesthesia use by pediatric dentists in the United States American Academy of Pediatric Dentistry Pediatric Dentistry .2001; 23:3
- 27) Malamed, SF: The Needle. In the Handbook of Local Anesthesia. 4th Ed. SF Malamed, St. Louis: Mosby Co., 1997, 85-88.
- 28) Terry Flanagan, MPH | Michael J. Wahl, DDS | Margaret M. Schmitt, DMD | Jean A. Wahl, DMD Size doesn't matter: Needle gauge and injection pain. n General Dentistry. 2007
- 29) Gul Celik Unal, Bulem Ureyen Kaya, Ali Gurhan Tac, and Ayse Diljin Kececi. Survey of attitudes, materials and methods preferred in root canal therapy by general dental practice in Turkey: Part 1 Eur J Dent. 2012;6(4): 376–384.
- 30) Peters OA, Peters FC. Ethical principles and considerations in endodontic treatment. ENDO (Lond Engl) Endodontic Practice Today 2007;1:101-108.
- 31) Faculty of General Dental Practitioners (UK). Clinical Standards in General Dental Practice: Self-Assessment Manual and Standards. London: Faculty of General Dental Practitioners, Royal College of Surgeons of England 1991
- 32) Lynch CD, McConnell RJ. Attitudes and use of rubber dam by Irish general dental practitioners. Int Endod J 2007;40:427-32.
- 33) Udoye CI, Jafarzadeh H. Rubber dam use among a subpopulation of Nigerian dentists. J Oral Sci 2010;52:245-9
- 34) Marshall K, Page J. Use of rubber dam in the UK. A survey. Br Dent J 1990;169:286-91
- 35) Ahmed MF, Elseed AI, Ibrahim YE: **Root canal treatment in general practice in Sudan.** *Int Endod J* 2000, **33**:316-319.
- 36) Christensen, G.J., 1994. Using rubber dams to boost quality, quantity of restorative services. Journal of the American Dental Association 125, 81–82.

- 37) Azhar Iqbal The evaluation of opinions and attitudes of dentists towards the use of rubber dam during operative and endodontic procedures. *Journal of Dental and Medical Sciences*.2014;13(12); 62-65
- 38) L. L. Kirkevang and P. Horsted-Bindslev, "Technical aspects of treatment in relation to treatment outcome," *Endodontic Topics*,2002;2;89–102
- 39) Bystrom, A., Sundqvist, G., Bacteriologic evaluation of the effect of 0.5% sodium hypochlorite in endodontic therapy. *Oral Surgery, Oral Medicine and Oral Pathology*,1983; 55, 307–312.
- 40) Barbakow F. The status of root canal therapy in Switzerland in 1993. *J Dent Assoc S Afr* 1996;51:819-22.
- 41) Peters OA, Roehlike JO, Baumann MA. Effect of immersion in sodium hypochlorite on torque and fatigue resistance of nickel-titanium instruments. *Journal of Endodontics*. 2007; 33: 589-593.
- 42) Schafer E. Irrigation of the root canal. *ENDO*. 2007; 1: 11-27
- 43) Dummer, P.M.H., McGinn, J.H., Rees, D.G., 1984. The position and topography of the apical canal constriction and apical foramen. *International Endodontic Journal* 17, 192–198.
- 44) Kim E, Marmo M, Lee CY, Oh NS, Kim IK. An in vivo comparison of working length determination by only root-ZX apex locator versus combining root-ZX apex locator with radiographs using a new impression technique. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2008;105(4):e79-e83.
- 45) Hommez GM, Braem M, De Moor RI. Root canal treatment performed by Flemish dentists. Part I. Cleaning and shaping. *Int Endod J*. 2003;36:166-73.
- 46) Chong BS, Pitt Ford TR. The role of intracanal medication in root canal treatment. *Int Endod J*.1992;25:97-106.
- 47) Ashwini Gaikwad et al. Attitude of general practitioners towards root canal procedures in India. *Journal of contemporary dental practice*.2013;14(3);528-31
- 48) Qualtrough, A.J.E., Whitworth, J.M., Dummer, P.M.H., Preclinical endodontology: an international comparison. *International Endodontic Journal*.1999; 32, 406–414.
- 49) Rosenberg PA, Babick PJ, Schertzer L, Leung A The effect of occlusal reduction on pain after endodontic instrumentation .*J Endod*. 1998 ;24(7):492-6...
- 50) Shama Asghar .Occlusal Reduction Reduces Postoperative Pain After Endodontic Instrumentation . *Pakistan Oral & Dental Journal*.2014;34(3)
- 51) Lushen MN. A survey of attitudes, materials and techniques used in endodontic treatment by South African Dentists. M.Sc. Thesis.2006. School of Oral Health Science, University of the Witwatersrand, Johannesburg
- 52) European Society of Endodontology. Quality guidelines for endodontic treatment: Consensus report of the European Society of Endodontology. *Int Endod J* 2006;39:921-30.
- 53) Yingling NM, Byrne BE, Hartwell GR. Antibiotic use by members of the American Association of Endodontics in the year 2000: report of a national survey. *J Endod*. 2002;28:396-404
- 54) Evidence-Based Dentistry (2004) 5, 7–11; Clinical practice guideline on emergency management of acute apical periodontitis (AAP) in adults. Anne-Marie Glenny¹ and Terry Simpson
- 55) Siqueira JF, Jr. Microbial causes of endodontic flare-ups. *International Endodontic Journal*. 2003; 36: 453-463.
- 56) Pitt Ford, T.R., Stock, C.J.R., Loxley, H.C., 1983. A survey of endodontics in general practice in England. *British Dental Journal* 154, 222–224.
- 57) Saunders, W.P., Saunders, E.M., Sadiq, J., Cruickshank, E., 1997. Technical standard of root canal treatment in an adult Scottish sub-population. *British Dental Journal* 182, 382–386.
- 58) De Moor, R.J.G., Hommez, G.M.G., De Boever, J.G., Delme, K.I.M., Martens, G.E.I., 2000. Periapical health related to the quality of root canal treatment in a Belgian population. *International Endodontic Journal* 33, 113–120