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Original Article

Endodontic Retreatment Awareness, Challenges and Practices among Libyan Dentists: A Survey-Based Study

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Abstract

Non-surgical endodontic retreatment is generally the preferred method for managing post-treatment disease. Its success rate is considered favourable especially with the introduction of advanced techniques and materials. However, treatment planning and practices may vary between specialists and general practitioners, influenced by their educational background, clinical experience, attitudes, and available resources. The aim of this study was to gather information on the awareness, attitudes, techniques, and materials used in non-surgical endodontic retreatment (NSER) among Libyan dentists. A questionnaire related to endodontic retreatment was distributed randomly via various social media platforms. The survey was structured into two sections: the first part: which included demographic details, and the second part: which consisted of a series of questions designed to assess the trends, techniques, materials, and opinion of dentists regarding endodontic retreatment. Data was gathered and statistically analyzed using SPSS version 25. Descriptive statistics were calculated to determine frequencies and percentages for each survey item. Additionally, chi-square tests were conducted to identify significant differences in practices based on speciality and other demographic factors. Out of 102 respondents, 16% were endodontists (ENs), 63% were general practitioners (GDs) and 21% were dentists from other speciality with a female predominance (79%). Persistent infection was reported as the most common cause of failed endodontic treatment. Most dentists felt that managing complications such as perforations and ledges is the most challenges face of retreatment. The most significant finding was in rubber dam usage among the dental specialties with p-value of (P = 0.002). Almost all practitioners apply both hand and rotary files for removal of old fillings. Respectively, sodium hypochlorite and calcium hydroxide were the preferred choices for irrigation and intracanal medicament. However, ENs utilize higher concentration of sodium hypochlorite. Cold lateral compaction technique was the most commonly used method for obturation. In conclusion: it has been found that although there are some variations in the trends of endodontic retreatment practices between Endodontists (ENs) and other dentists, it can be asserted that Libyan general dentists, endodontists, and dentists from other specialties demonstrate a sufficient level of awareness and adhere to similar protocols in managing retreatment cases.

Key words: *Endodontic failure, Nonsurgical endodontic retreatment, General practitioners, Endodontists, Survey***.**

Introduction

The primary goal of endodontic treatment (RCT) is to eradicate infection leading to resolution of symptoms like pain and swelling and promoting healing of periapical tissues [1-3]. Although primary endodontic treatment has a high success rate, post-treatment infection and complications remain common [4]. Managing failed endodontic treatment is carried out either by non-surgical, surgical retreatment or even extraction [5]. According to the guidelines of the American Association of Endodontics (AAE), non-surgical root canal retreatment is considered to be the first treatment option in most cases where post-treatment disease occurred [6]. However, before making a decision to perform orthograde-endodontic retreatment, it is important to consider all factors that contributed to the treatment approach including diagnosis, treatment planning, technical execution and post treatment care [7]. Furthermore, root canal retreatment presents additional challenges, including the need to address unresolved biological issues from the previous treatment, potential alterations in root canal morphology and removing of the existing restorations and posts [8].

According to previous studies, non-surgical endodontic retreatment success rate was approximately between 85% to 90% [9-12]. This indicates that when a will established diagnosis and treatment procedure is performed with introduction of new techniques and materials, the prognosis of retreatment will be favourable [13]. Nevertheless, there are differences in treatment planning and decision-making between specialists and general practitioners, influenced by educational background, clinical experience, and individual attitudes as well as available economic resources [14].

A recent systematic review by E. Monsef et al. raised concerns about adequacy of dentists' knowledge in non-surgical root canal treatment NSRCT including retreatment. They cited a total of 51 papers from 19 countries involving over 15,000 dentists that revealed a mean knowledge score of just 57% across various aspects of NSRCT. These finding suggested potential areas where knowledge gap could impact the quality of endodontic care including understanding of failure process since insufficient knowledge in this area may lead to unnecessary retreatment. Moreover, dentists have to adapt all updated information in their practice in order to provide patients with the optimal quality endodontic care and improve long-term health outcomes [15].
While several studies have investigated primary root canal treatment in term of dentist's knowledge and practice, data regarding root canal retreatment is still dearth. Therefore, this survey has been carried out to investigate awareness of Libyan dentists regarding common reasons for treatment failure, challenges faced during these procedures and weather their qualification and years of experience influence techniques and materials they use to treat failed endodontic cases.

Methods

Study design

This study was a cross-sectional survey designed to assess the practices and challenges associated with endodontic retreatment. The study seeks to gain insights into the frequency of endodontic retreatment procedures performed, the challenges encountered during these procedures, and the utilization of different tools and techniques in clinical practice among Libyan dentists.

Data collection

An online structured questionnaire was randomly distributed to (102) dentists working in private centres, public health institutions and dental schools from (August to October 2024). The questionnaire includes a series of questions focusing on the frequency of retreatment procedures, challenges faced during these procedures, the use of magnification tools, rubber dam usage, instruments for coronal disassembly, techniques for gutta-percha removal, irrigating solutions, intracanal medicaments, obturation techniques, materials for perforation repair, and the practice of single-visit endodontic retreatment.
Regarding data management, respondents were informed about the aim of the study, assured that their answers would remain confidential and would be utilized solely for research purposes. The collected data were securely stored in compliance with data protection regulations to maintain participant anonymity.

Data analysis

For data analysis, the statistical software SPSS version 25 was utilized. Descriptive statistics were calculated to determine frequencies and percentages for each survey item. Additionally, inferential statistics, specifically chi-square tests, were conducted to identify significant differences in practices based on specialty and other demographic factors, with a significance level set at $p < 0.05$.

Results

Demographic and professional characteristics

The survey revealed that out of the total respondents, 21% were male, while a substantial majority, 79% were female. Regarding professional specialization, 63% of participants identified as general dentists, with 16% specializing in endodontics and 21% belonging to other specialties. In terms of clinical experience, the distribution was as follows: 20% of respondents had less than 5 years of experience, another 20% had between 5 and 10 years, while 50% reported having between 10 and 20 years of experience. Finally, 10% of the participants had more than 20 years in the field (Figure 1).

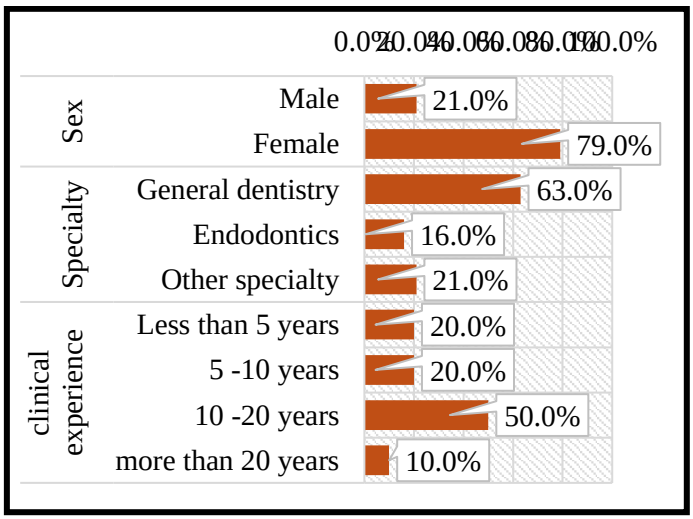

Figure 1. Participants demographic and professional characteristics

Awareness, decisions and Practices regarding retreatment procedures

According to the results, persistent infection was considered as the most common cause of failure of primary endodontic treatment for about 44% of participants; meanwhile 24% felt that missed anatomy is more important in term of failure. Inappropriate filling of root canal system was reported by 19.5% of respondents as the main cause of failed endodontic treatment. Regarding practices of retreatment procedures, results were assessed and analyzed according to specialities and years of clinical experience:

I. Endodontic retreatment practices according to specialties: General Dentistry (GD), Endodontics (EN) and Other Specialty (OS).

The overall frequency of endodontic retreatment procedures did not show statistically significant differences among the specialties, with a p-value of (P = 0.105). Similarly, while there were differences in the challenges faced by practitioners, there was no statistically significant difference among specialties, as indicated by a p-value of (P = 0.202).

One of the most significant findings was in rubber dam usage among the dental specialties. A remarkable 93.8% of Endodontists indicated that they always use a rubber dam, compared to only 41.3% of practitioners in General Dentistry (GD) and 38.1% in Other Specialty (OS). The p-value of (P = 0.002) indicates a statistically significant difference in rubber dam usage.

The types of instruments used for coronal disassembly varied among dental specialties, but no significant differences were found, with a p-value of (P = 0.230). Furthermore, there were no significant differences in gutta-percha removal techniques based on specialty, with a p-value of (P = 0.942).

In terms of irrigation practices, a notable difference was observed in the use of irrigation activating devices. A substantial 87.5% of Endodontists reported using these devices, while only 57.1% of GD practitioners and 33.3% of OS practitioners did so. This resulted in a significant p-value of (P = 0.004). Additionally, the choice of irrigating solutions showed significant differences; 39.7% of GD practitioners utilized sodium hypochlorite at lower concentrations (0.5-2.5%), whereas only 6.7% of Endodontists did, with a p-value of (P = 0.005) indicating statistical significance. Significant differences were also found in obturation techniques, particularly in the preference for lateral condensation. This method was favoured by 47.6% of GD practitioners, compared to 25.0% of Endodontists and 61.9% of OS practitioners. The p-value of (P = 0.030). Furthermore, calcium hydroxide was the predominant intracanal medicament used across all specialties, with no significant differences observed (P = 0.361). The choice of materials for perforation repair (MTA) also showed no significant differences among the specialties, with a p-value of (P = 0.703). Lastly, the differences in the percentage of practitioners performing single-visit endodontic retreatment were not statistically significant, with a p-value of (P = 0.196).

Table 1. Comparison of Endodontic Retreatment Practices Across Dental Specialties

Variable	General Dentistry	Endodontists	Other Specialty	P Value
Frequency of Endodontic Retreatment Procedures				
Rarely	30 (47.6%)	3 (18.8%)	11 (52.4%)	0.105
Occasionally	15 (23.8%)	3 (18.8%)	4 (19.0%)	
Frequently	18 (28.6%)	10 (62.5%)	6 (28.6%)	
Most Challenging Phase of Retreatment				
Coronal Disassembly	3 (4.8%)	0 (0.0%)	0 (0.0%)	
Removal of Previous Root Filling Materials	10 (15.9%)	0 (0.0%)	2 (9.5%)	
Managing complications such as perforation, ledge, and separated instrument	46 (73.0%)	16 (100.0%)	19 (90.5%)	0.212
Filling of the root canal system	4 (6.3%)	0 (0.0%)	0 (0.0%)	
Use of Magnification Tools				
Endodontic loupes	20 (31.7%)	8 (50.0%)	6 (28.6%)	0.621
Microscopes	12 (19.0%)	2 (12.5%)	3 (14.3%)	
None	31 (49.2%)	6 (37.5%)	12 (57.1%)	
Rubber Dam Usage				0.002

Always	26 (41.3%)	15 (93.8%)	8 (38.1%)	
Sometimes	15 (23.8%)	1 (6.3%)	6 (28.6%)	
Rarely	6 (9.5%)	0 (0.0%)	5 (23.8%)	
Never	16 (25.4%)	0 (0.0%)	2 (9.5%)	
Instruments for Coronal Disassembly				
Grasping instruments	14 (23.3%)	2 (12.5%)	9 (45.0%)	
Percussive instruments	6 (10.0%)	3 (18.8%)	1 (5.0%)	0.230
Active instruments	21 (35.0%)	8 (50.0%)	5 (25.0%)	
Others	19 (31.7%)	3 (18.8%)	5 (25.0%)	
Technique for gutta-percha removal during endodontic retreatment				
Hand H files	6 (9.5%)	1 (6.3%)	2 (9.5%)	
Rotary files	10 (15.9%)	2 (12.5%)	2 (9.5%)	0.942
Combination of hand and rotary	47 (74.6%)	13 (81.3%)	17 (81.0%)	
Use of Irrigation Activating Devices				
Yes	36 (57.1%)	14 (87.5%)	7 (33.3%)	0.004
No	27 (42.9%)	2 (12.5%)	14 (66.7%)	
Irrigating Solutions Used				
Sodium hypochlorite (0.5-2.5%)	25 (39.7%)	1 (6.7%)	11 (52.4%)	
Sodium hypochlorite (5.25%)	26 (41.3%)	12 (80.0%)	8 (38.1%)	0.005
Chlorohexidine gluconate (2%)	17 (27.0%)	8 (53.3%)	6 (28.6%)	
EDTA (17%)	28 (44.4%)	5 (33.3%)	5 (23.8%)	
MTAD	1 (1.6%)	1 (6.7%)	0 (0.0%)	
Intracanal Medicaments Used				
Calcium hydroxide	28 (47.5%)	10 (62.5%)	8 (42.1%)	
Triple antibiotic paste	2 (3.4%)	1 (6.3%)	2 (10.5%)	
Chlorohexidine gluconate (2%)	6 (10.2%)	3 (18.8%)	1 (5.3%)	0.361
Calcium hydroxide and iodoform	23 (39.0%)	2 (12.5%)	8 (42.1%)	
Obturation Techniques Used				
Lateral condensation	30 (47.6%)	4 (25.0%)	13 (61.9%)	
Vertical condensation	7 (11.1%)	7 (43.8%)	3 (14.3%)	0.030
Single cone	20 (31.7%)	3 (18.8%)	5 (23.8%)	
Other	6 (9.5%)	2 (12.5%)	0 (0.0%)	
Material for Perforation Repair				
MTA	58 (92.1%)	15 (93.8%)	18 (85.7%)	0.703
GIC	3 (4.8%)	0 (0.0%)	1 (4.8%)	
Biodentine	2 (3.2%)	1 (6.3%)	2 (9.5%)	

Single-visit endodontic retreatment				0.196
Yes	6 (9.7%)	4 (25.0%)	2 (9.5%)	
No	32 (51.6%)	9 (56.3%)	8 (38.1%)	
Sometimes	24 (38.7%)	3 (18.8%)	11 (52.4%)	

II. Endodontic retreatment practices based on clinical experience:

The frequency of endodontic retreatment procedures varied significantly among practitioners with a p-value of (P = 0.048), indicating significant differences based on clinical experience.

When practitioners were asked about the most challenging phase of retreatment, 60.0% of those with less than 5 years cited managing complications such as perforations and ledges. This concern increased to 85.0% for practitioners with 5-10 years of experience, 88.0% for those with 10-20 years, and 80.0% for those with over 20 years. The p-value of (P = 0.045) indicated statistically significant differences according to clinical experience.

The use of magnification tools also varied significantly among experience levels. Endodontic loupes were reported by 30.0% of practitioners with less than 5 years, 45.0% with 5-10 years, 34.0% with 10-20 years, and 20.0% with more than 20 years. In contrast, 45.0% of less experienced practitioners used microscopes, while none in the 5-10 years group did. The usage of microscopes across other experience levels was 14.0% and 10.0%, respectively. The p-value of (P = 0.006) indicated significant differences based on clinical experience.

Regarding rubber dam usage, 70.0% of practitioners with less than 5 years reported always using one, compared to 45.0% with 5-10 years, 46.0% with 10-20 years, and 30.0% with more than 20 years. However, this usage pattern was not statistically significant (P = 0.227).

Instruments used for coronal disassembly showed no significant differences, with a p-value of (P = 0.276). When examining gutta-percha removal techniques, there was no significant difference based on clinical experience. Participants with less than 5 years of experience used Hand H files, while those with 5 to 10 years preferred rotary files. The majority (75.0%) used a combination of hand and rotary techniques. The p-value was (P = 0.707), indicating no statistically significant difference.

Sodium hypochlorite (5.25%) was the most common irrigating solution among all groups, with a p-value of (P = 0.343) indicating no significant variation. The use of irrigation activating devices was reported by 65.0% of practitioners with less than 5 years, 50.0% with 5-10 years, 60.0% with 10-20 years, and 40.0% with more than 20 years, with a p-value of (P = 0.515) showing no significant differences. Calcium hydroxide was the predominant intracanal medicament used across experience levels, with no significant differences observed (P = 0.396). Lateral condensation was the most favoured obturation technique, especially among those with more than 20 years of experience (70.0%). The statistical analysis for this choice yielded a p-value of (P = 0.562), indicating no significant differences. For perforation repair, there were no significant difference among groups with p-value (P = 0.424), MTA was the preferred material for repair.

Lastly, regarding single-visit endodontic retreatment, the p-value was (P = 0.334), indicating no statistically significant differences based on clinical experience.

Table 2: Endodontic Retreatment Practices by Clinical Experience Level

Variable	< 5 years	5 - 10 years	10 - 20 years	> 20 years	P-value
Frequency of Endodontic Retreatment Procedures					0.048
Rarely	13 (65)	8 (40)	20 (40)	3 (30)	
Occasionally	6 (30)	3 (15)	12 (24)	1 (10)	
Frequently	1 (5)	9 (45)	18 (36)	6 (60)	
Most Challenging Phase of Retreatment					0.045
Coronal Disassembly	0 (0)	0 (0)	3 (6)	0 (0)	
Removal of Previous Root Filling Materials	6 (30)	3 (15)	2 (4)	1 (10)	
Managing Complications (perforation, ledge, separated instrument)	12 (60)	17 (85)	44 (88)	8 (80)	
Filling of the Root Canal System	2 (10)	0 (0)	44 (88)	8 (80)	
Use of Magnification Tools					0.006
Endodontic Loupes	6 (30)	9 (45)	17 (34)	2 (20)	
Microscopes	9 (45)	0 (0)	7 (14)	1 (10)	

None	5 (25)	11 (55)	26 (52)	7 (70)	
Rubber Dam Usage					0.227
Always	14 (70)	9 (45)	23 (46)	3 (30)	
Sometimes	6 (30)	4 (20)	9 (18)	3 (30)	
Rarely	0 (0)	3 (15)	7 (14)	1 (10)	
Never	0 (0)	4 (20)	11 (22)	3 (30)	
Instruments for Coronal Disassembly					0.276
Grasping Instruments	5 (27.8)	2 (10)	14 (29.2)	4 (40)	
Percussive Instruments	2 (11.1)	1 (5)	5 (10.4)	2 (20)	
Active Instruments	4 (22.2)	12 (60)	15 (31.3)	3 (30)	
Others	7 (38.9)	5 (25)	14 (29.2)	1 (10)	
Technique for gutta-percha removal during endodontic retreatment					0.707
Hand H files	1 (5.0)	1 (5.0)	6 (12.0)	1 (10.0)	
Rotary files	4 (20.0)	1 (5.0)	8 (16.0)	1 (10.0)	
Combination of hand and rotary	15 (75.0)	18 (90.0)	36 (72.0)	8 (80.0)	
Use of Irrigation Activating Devices					0.515
Yes	13 (65)	10 (50)	30 (60)	4 (40)	
No	7 (35)	10 (50)	20 (40)	6 (60)	
Irrigating Solutions Used					0.343
Sodium Hypochlorite (0.5-2.5%)	6 (30)	9 (47.4)	17 (34)	5 (50)	
Sodium Hypochlorite (5.25%)	11 (55)	5 (26.3)	27 (54)	3 (30)	
Chlorohexidine Gluconate (2%)	5 (25)	9 (47.4)	15 (30)	2 (20)	
EDTA (17%)	8 (40)	10 (52.6)	15 (30)	5 (50)	
MTAD	1 (5)	0 (0)	1 (2)	0 (0)	
Intracanal Medicaments Used					0.396
Calcium Hydroxide	9 (50)	8 (44.4)	26 (54.2)	3 (30)	
Triple Antibiotic Paste	1 (5.6)	0 (0)	2 (4.2)	2 (20)	
Chlorohexidine Gluconate (2%)	2 (11.1)	4 (22.2)	3 (6.3)	1 (10)	
Calcium Hydroxide and Iodoform	6 (33.3)	6 (33.3)	17 (35.4)	4 (40)	
Obturation Techniques Used					0.562
Lateral Condensation	6 (30)	9 (45)	25 (50)	7 (70)	
Vertical Condensation	5 (25)	3 (15)	9 (18)	0 (0)	
Single Cone	7 (35)	7 (35)	11 (22)	3 (30)	
Other	2 (10)	1 (5)	5 (10)	0 (0)	
Material for Perforation Repair					0.424
MTA	20 (100)	17 (85)	46 (92)	8 (80)	
GIC	0 (0)	2 (10)	1 (2)	1 (10)	

Biodentine	0 (0)	1 (5)	3 (6)	1 (10)	
Single-Visit Endodontic Retreatment					0.334
Yes	1 (5.3)	3 (15)	6 (12)	2 (20)	
No	11 (57.9)	10 (50)	22 (44)	6 (60)	
Sometimes	7 (36.8)	7 (35)	22 (44)	2 (20)	

Discussion

The practice of endodontic retreatment is primarily affected by the clinician's experience and individual preferences [14]. In our study, the majority of participants were female, more than 50% practicing dentistry for more than 10 years. About 64% of them were general dental practitioners. According to the results, 44% of responders said that persistent infection is the main reason of failed endodontic treatments. This is in accordance with the studies which stated that bacterial persistence in the root canal is regarded as the primary cause of endodontic treatment failure with Enterococcus faecalis being the most commonly identified species in post-treatment infections [16, 17]. However, a study by Aishuwariya, T et al reported that underfilled or overfilled root canals were the most common cause of failed root canal treatment [18]. Authors claimed that poor filling is associated with inadequate chemomechanical debridement which in turn leads to endodontic failure.

In the current study, most of the participants stated that managing complications such as perforations and ledges is the most challenging phase of endodontic retreatment. General dentists (GD) seemed to express greater concern regarding these complications. Moreover, the significant difference in clinical experience related to managing these complications suggests that increased clinical training is associated with enhanced self-confidence and improved skills. This was in agreement with a previous study that found a positive correlation between endodontic education level and retreatment decision-making. Authors recommended that dentists facing difficulty with endodontically treated teeth that appear to be hopeless such as those with instrument fractures, missing canals, or large periapical lesions should consult with an endodontist prior to deciding on extraction [19].

The use of rubber dam offers substantial benefits, including patient protection, a clean working field, soft tissue retraction and protection, and enhanced access and visibility; thus, it is regarded as a standard practice during root canal treatment. The rubber dam serves as an effective barrier against the aspiration of materials used during the procedure and reduces the risk of contamination of the root canal system by oropharyngeal microorganisms. The absence of rubber dam is related to poorer treatment outcomes due to compromised canal disinfection [20]. Our study revealed a significant difference in using rubber dam according to speciality. Although 93.8% of Endodontists (ENs) indicated that they always use a rubber dam, only 41.3% of General dentists (GDs) and 38.1% in Other Specialty (OS) did. These finding was not different from those found in a study conducted in Saudi Arabia where the proportion of endodontists who used rubber dam was (84.8 %) which is significantly greater than that of GDs (21.6 %) ($p < 0.001$) [21]. However, years of professional experience did not significantly influence the preference of using rubber dam during the retreatment procedure. Similar results in a survey conducted in United States found no significant difference in association with clinical experience [22].

The present study revealed that the use of magnification in endodontic retreatment is concerningly low. More than 50% of dentists reporting they never use any magnification tools for such procedures, 33.3% use loupes and 16.7% have microscopes. These findings differ from a survey of dentists in the USA, where over 80% routinely utilize magnification during retreatment [14]. However, a study conducted in four cities in Pakistan reported that 76% of participants never use any type of magnification [23]. Magnification tools enhance the dentist's visibility and provide a clearer operating field, thereby improving the efficiency and success rate of non-surgical endodontic retreatment [24]. Despite the low percentage of dentists who utilize magnification tools in their practice, the endodontic microscope appears to be the preferred choice. This may suggest that the endodontic microscope has become an essential tool for dentists who regularly perform endodontic procedures.

As shown in the study, the majority of dentists use a combination of hand and rotary files for removing root canal filling. This preference may be attributed to the advantages of rotary files, including their efficiency in preserving operational time and their proven effectiveness in retreatment cases. American Association of Endodontics (AAE) recommended using both manual and engine-driven files in removing of the previous filling [6]. Sodium hypochlorite (NaOCl) was the most preferred irrigant. The other preferences were EDTA and CHX respectively. Our survey revealed that ENs preferred higher concentration of NaOCl 5.25% compared to GDs and OSs which agree with a previous studies [25]. This is likely due to its stronger antibacterial effect compared to milder concentrations (2–2.5%) [26]. Several studies emphasized the use of agitation or activation devices, such as sonic agitation, ultrasonic activation, laser activation, and multisonic activation to enhance the effectiveness of intracanal irrigation [27]. ENs showed significantly higher percentage of using these devices highlighting the adherence to best practices among Endodontists. Calcium hydroxide was the main used intracanal medicament in this study. To improve the prognosis following canal cleaning and shaping, calcium hydroxide (CaOH2) has been shown to significantly reduce inflammatory exudates and bacterial load in endodontic infections, thereby promoting the formation of hard tissue [28].

Cold lateral compaction (CLC) was the most favored obturation technique among clinicians. This is in agreement with the previously conducted studies in which the majority of dentists preferred CLC as the most utilized method for obturation [13, 23, 24]. While it may not be the most effective method for achieving a three-dimensional seal, it remains widely preferred due to its lower risk of error and

the absence of the need for specialized equipment. Recently, introduction of calcium silicate-based bioceramic sealers have improved the process of root canal obturation [29]. The results of the present study suggested that a significant number of ENs have changed their obturation technique from cold lateral to some form of vertical compaction and single cone techniques, however, lateral condensation was the most favoured obturation technique for GDs especially those with more than 20 years of experience.

For perforation repair, MTA showed a high preference among all participants irrespective of their specialty or clinical experience. Extensive research and clinical studies have demonstrated the effectiveness of MTA as a material for sealing perforations [30, 31].

In our study, no significant difference was observed in the performance of single-visit endodontic retreatment, as a substantial proportion of dentists preferred to conduct retreatment over multiple visits. The results were close to the previous study by Nagi SE et al, [23]. These findings suggest that endodontic retreatment is a more time-consuming clinical procedure in comparison to primary endodontic treatment. Despite there is evidence indicating that single-visit and multiple-visit endodontic treatments exhibit similar clinical and radiographic outcomes, multiple visits should be considered a viable option in endodontic retreatment, as the specific circumstances of each case must be carefully evaluated [32, 33].

Conclusion

Within the limitations of this survey, it can be concluded that general dentists, endodontists and dentists from other specialities possess adequate awareness and adhere to similar protocols when managing retreatment cases, with only minor differences in their approaches. However, some general dentists have yet to adapt to the ongoing advancements in the field, such as the use of magnification during treatment, regular application of rubber dam and utilization of recent materials. To encourage these recommendations, we believe that focusing on education and raising awareness about the significance of this practice is more effective, this would be achieved by enhancing practitioners' understanding, as well as increasing educational efforts at both the undergraduate and continuing education levels. Furthermore, it is essential to establish a sound knowledge and create evidence-based guidelines for managing endodontic failures among Libyan dentists. Additionally further research is needed to clarify the relationship between residents' opinions and their decision-making abilities regarding retreatment.

Limitations

The relatively small sample size of this study, along with the variation in gender distribution within our sample, may present potential limitations. Furthermore, our survey did not include questions regarding participants' diagnosis or decision-making processes, which could also be considered as a limitation. It is anticipated that this baseline data, which provides an overview of current endodontic retreatment practices among Libyan dentists, will serve as a foundation for more rigorous, in-depth investigations. Additionally, it may help to identify critical areas for development in the design of continuing education programs.

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Conflict of interest

Authors declare that there is conflict of interest in this work.

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