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Original article

Knowledge and Attitude about Management of Endodontically – Treated Teeth (ETT): A Survey Amongst Dental Practitioners in Benghazi, Libya

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ABSTRACT

Background and aims. *Restoration of endodontically treated teeth is a controversial area, because the loss of structural integrity, leads to a higher possibility of fracture. Dentists should follow techniques to perform successful and durable prostheses by updating their knowledge about the new materials conducted to enhance their use and get the experience. The aim of this study was to evaluate the knowledge and attitude about the treatment of endodontically treated teeth among dental practitioners of Benghazi in Benghazi, Libya.* ***Methods****. Data collected through a self-administrative questionnaire designed to assess the knowledge of dentists in Benghazi about the management of endodontically treated teeth from a fixed prosthodontics restoration point of view. 150 questionnaires distributed among targeted dentists, and only 103 responded, with the required answers. All statistical analyses carried out at a significance level of $P < 0.05$. Results analyzed and compared using the ONE-WAY ANOVA.* ***Results****. The total sample was 103 which 69.9% were female dentists. About 31% of the dentists were aged between 35-39 years. About 30% of participants have an average of experience years between 10 to 14 in their field. There were no significant differences in all tested variables.* ***Conclusion****. The dental practitioners of Benghazi displayed a good level of knowledge and attitude about the management of endodontically treated teeth. For further proficiency, efforts made the practitioners to be aware of the advances in fixed prosthodontics practice through continuing education programs.*

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INTRODUCTION

Endo-treated teeth have different mechanical structures than vital teeth [1,2]. Different studies demonstrated that the anterior endo-treated teeth subjected more to shearing forces in comparison with posterior teeth [3]. Excessive dental hard tissue loss causes problems with subsequent prosthetic restorations. There is a wide range of materials used to rebuild the damaged tooth structure of endo treated teeth. The quantity of remaining tooth structure is the most determining factor in deciding the restorative option. So, the ferrule effect is a collar encircling the cervical part of the crown not less than 1.5 to 2mm height above the margin. Moreover, it plays an important role to reinforce the endo treated teeth. In addition, it prevents the root's shattering and provides resistance to dislodgement and fracture [4, 5].
The post's primary purpose is to retain the core in a tooth when there is a significant loss of the coronal tooth structure. Although the preparation of the post space considered increasing the risk of weakening the teeth, subsequently it may lead to their failure in several years. For that reason, the post used only when it is indicated not for all endo treated teeth [6]. Among dentists, the use of post & core is still an area of great discussion. According to the dentist's preference, some prefer to uses custom-made cast posts, other prefer the prefabricated posts [7]. The custom-made posts are indicated to use in canals that have an extreme taper or a non-circular cross-section. They exhibit superior adaptation to

all root channel configurations. Nevertheless, there disadvantages are that they require two appointments, temporary treatment, and a laboratory fee, alternatively, in some clinical conditions, they provide benefits. When multiple teeth need posts, for example, making one impression and fabricating multiple cast posts and core instead of building them up individually. However, enlarging the canals to a pre-fabricated post can result in weakening the root and sometimes leads to perforation.

The esthetic revolutions of non-metal posts are more preferred to use in the anterior teeth especially with ceramic restoration. These posts can function clinically but have some disadvantages. Which is that the metal post is much stronger; therefore, a thicker post needed, which may involve the removal of an additional structure of the radicular tooth structure. Ceramic materials separated from the remaining post by grinding away Burr stuff [8, 9]. The study aimed to evaluate the knowledge and attitude about the management of endo treated teeth amongst dental practitioners in Benghazi.

METHODS

Study design

A descriptive cross-sectional study done amongst the dental practitioners of Benghazi, Libya in 2022. One hundred and three dentists selected randomly (from public and private dental clinics and dental schools).

Data collection

A self-administrative questionnaire composed of 10 open and multiple-choice questions was used in this study. The questionnaire was prepared in English and comprised questions to assess the knowledge, attitude, and practice of management of endodontically treated teeth amongst dental practitioners (DP's) of Benghazi. All the respondents informed about the aims and objectives of the study. After eliciting their consent to participate, the questionnaires were distributed.

The questionnaires consisted of three parts. The first part measured gender, age, and number of years of practicing experience. The second part evaluated the knowledge of standard guidelines to follow by the practitioner in restoring endodontically treated teeth either as basic information or as their idea about advanced materials in the market. The third part of the questionnaire was assisting the dentists in understanding the basic information through their practical application of them. The questionnaire consists of ten questions. Each question scored zero, 1, 2. The score 2 (means the correct answer whether true or false according to the question). The score 1 (means incorrect answer). A score of zero means no answer.

Data analysis

The collected data analyzed using the variance (ONE-WAY ANOVA) test and the Chi-square tests. From the first question to the fifth question in assessing the basic dentist's information. In the last question, a comparison made between the means of responses by using the F-test. Hence, there are no statically significant differences between the means of the responses.

RESULTS

The first compartment of the questionnaire was age, gender, and years of experience data tabled for surveying in the form of frequency and their percent, which is useful for the research. One hundred and three dentists participated in the study; 72 (69.9%) were females while 31 (30.1%) were males. (Table 1).

Table 1. The distribution of dentist's gender

Gender	Frequency
F	72
M	31
Total	103

Form table 2, it is clear that the largest age interval was (35-39) years has 31.0% of the sample, while 0.97% of the sample is the smallest sample age (55-60) year's intervals.

Table 2. The distribution of dentist's age

Age Intervals	Gender		Frequency	Percent
	F	M		
25-29	6	6	12	11.7
30-34	12	6	18	17.5
35-39	21	11	32	31.0
40-44	8	0	8	7.8
45-49	14	5	19	18.4
50-54	11	2	13	12.6
55-60	0	1	1	0.97
Total	72	31	103	100

Table 3 shows that the largest number of dentists targeted in the research had experience in their field between 10 to 14 years, at a rate of 33%.

Table 3. The distribution of dentist's experience years

Experience's Years Intervals	Gender		Frequency	Percent
	F	M		
0-4	9	3	12	11.7
5-9	6	7	13	12.6
10-14	23	11	34	33
15-19	14	5	19	18.4
20-24	14	3	17	16.5
25-29	6	1	7	6.8
30-37	0	1	1	0.97

The suggestion toward attitude and awareness about using post in endo treated teeth or crowning it was shown in table 4. Only 37.9% were got the correct answer regarding crowning the endodontically treated teeth or not. While 57.3% of the responders agree that, the post is not mandatory for every ETT. Either the post reinforcing the tooth or no 52.4% of the dentists go with wrong answer, while 45.6% believed that the post is not reinforced the tooth, which is the right answer.

Table 4. Attitude and awareness about using post in endo treated teeth or crowning it

Quires		Number (percent)
EET always need to be covered with crowns	Never Not always Always	2(1.9) 62(60.2) 39(37.9)
The post core is mandatory	Never Not always Always	19(18.4) 25(24.3) 59(57.3)
The posts reinforcing the ETT	Never Not always Always	2(1.9) 54(52.4) 47(45.6)
The post design play important role in retention	Never Not always Always	4(3.9) 15(14.6) 84(81.6)
Ferrule is a critical factor in post selection	Never Not always Always	9(8.7) 2(1.9) 92(89.3)
Ceramic posts have less extensive fractures	Never Not always Always	43(42.7) 25(24.3) 34(33)
The selection of the post material depends on type of restoration	Never Not always Always	13(12.6) 27)26.2) 62(60.8)

Table 5 exhibited information's about using post in anterior or posterior teeth. The result showed that 63.2% thought of prefabricated posts as mostly common type of posts, while 10.7%. For management of the EET anterior 57.3% with custom made post& core that means the selection of wrong one. Beside that 65.0% of the dentists who selected the prefabricated posts for posterior teeth.

Table 5. Information's about using post in anterior or posterior teeth

Quires		Number (percent)
Common types of post	Cast post core Prefabricated Both	11(10.7) 63(63.2) 28(27.9)
Anterior tooth case treatment	Cast post core Prefabricated Both	59(58) 43(41.7)
Posterior tooth case treatment	Cast post core Prefabricated Both	35(35) 67(65)

DISCUSSION

Durre Sadaf, in his study, found that the time of placement of final restoration is the most critical factor affecting the long-term survival of teeth after root canal treatment. Sadaf compared the success rate of endodontically treated teeth (ETT) after placement of crown or composite with eight-year follow-up and found that teeth that received crowns were more likely to need extraction than those with composite [10]. The majority of participants in the current study indicated that ETT always requires being crowned 60.2%. There was a correlation between the times of placement of the final restoration. Extraction of ETT in 25% occurred when the final restoration placed 15-59 days after completion of RCT and 73% when the final restoration placed after 60 days.

In this survey, about 24.3% said that post and core are mandatory for all endo treated teeth. While 52.4% believed that, the post reinforce the endo treated teeth. [11]. On the other hand, Isaac Pratt et al., proved the difference in their 8-year retrospective study; they compared endo-treated teeth restored with crowns, and the others restored with either composite or amalgam. They concluded that endo-treated teeth that received composite/amalgam buildup were 2.29 times more likely to extracted compared with endo-treated teeth that received crowns. Moreover, teeth that received a crown four months after endo-treatment were almost three times more likely to extracted, compared with teeth that received a crown.

Patrick Sequeira-Byron et al. compared endo teeth restored with fiber post and composite core or fiber post and crown, and concluded that there was no statistical difference in success rate at three years [12] this is in agreement with David McReynolds et. Al., how stated that insufficient evidence existed to assess the effects of crowns compared to conventional fillings of the restoration [13]. Sadullah Uctasli et. Al., compared anterior teeth restored with core, fiber posts, and crown; they state that endo-treated with fiber posts had higher load-bearing capacity than restorations without fiber posts [14]. However, even root canal-treated teeth that received short fiber-reinforced composite cores presented more repairable failures. It is in agreement with in vitro study on bovine teeth by Lippo Lassila et al, who concluded that using X Flow composite, as core material with fiber-post is promising to strengthen structurally compromised incisors. As shown from our participants 52.4 % of them indicated that post needed to reinforce the endo-treated teeth [15].

The preservation of tooth structure is critical to the survival of root canal-treated teeth, more commonly at the ferrule. In the current study, the majority answered (89.3%) that the ferrule plays an important role in the selection of post type, while only 1.9 indicated that it is not important. Adhesive techniques allow the clinician to preserve rather than remove dentine; it is in agreement with previous studies [1,16]. The ideal technique to restore root canal-treated teeth is pondered. Loss of dentine structure is the main factor that affects the survival rate of ETT [17].

Indirect restorations have been the solution for these teeth because those teeth need cuspal coverage restorations. In addition, direct restorations such as amalgam were used and showed acceptable long-term survival rates [18]. Although resin-based composite exhibits more wear-resistant in molars root canal-treated teeth [19], it is in agreement with previous study which concluded that a minimally invasive treatment could be considered as an alternative treatment in restoring a posterior tooth, to reduce the cost, single visit restoration, and preservation of tooth structure, it is agreed with our results who answered that not all ETT need crowns [20].

Earlier study reported that crown restorations indicated for posterior root canal treated teeth to avoid extraction of them [21]. The traditional custom-made post and core showed excellent fitness to flare and elliptical canals, requiring minimum removal of tooth structure. Custom posts work well with tapered or non-circular cross-sectional-shaped canals. However, the modulus of elasticity is about ten times larger than dentin, which may cause stress concentration [22]. In addition, it required two visits, more financial effort [22]. Another drawback of metal custom-made post and core is that it is aesthetically less, and causes discoloration. Alternative options for ready post and core systems are developed [23]. Terry and Swift stated that advanced materials, and techniques for post and core should be evaluated first, in each clinical situation [23, 24]. The result of our study stated that (57.3%) of the participants agreed that the custom-made posts and core is the best in restoring anterior teeth, and 41.7% prefer using ready-made posts and cores. Regarding posterior root canal-treated teeth, 34% of participants prefer custom posts 65% prefer using ready-made posts for posterior teeth.

CONCLUSION

Within the limitations of this study, we can conclude that the dental practitioners of Benghazi displayed an acceptable level of knowledge and attitude toward the management of endo treated teeth. We recommend that more surveys should be to encourage the practitioners to be aware of the advances in fixed prosthodontic practice through continuing education programs.

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