European Journal of Clinical Pharmacy
Print ISSN: 2385-409X **Online ISSN**: Applied Website:
https://farmclin.com/

Awareness of Endo-Perio Lesions and Referral Practices among General Dentists and Specialists: A Descriptive Study

[1]Dr. Akshyata Panda, [2]Dr Kajol Pattanaik, [3]Dr. Krisha Shah, [4]Dr. Ritu Mathur, [5]Dr. Utkalika Das, [6]Dr Nikita Sahu

[1]MDS, Assistant Professor, Department of Periodontics and Oral Implantology, Institute of Dental Sciences, SOA University, Bhubaneshwar, Odisha.
[2]Tutor, Kalinga Institute of Dental Sciences, Bhubaneshwar.
[3]DDS, FICD, FACD, Private practice, Nashua.
[4]MDS, Reader, Department of Periodontics and Oral Implantology, NIMS Dental College and Hospital, Jaipur.
[5]Tutor, Department of Periodontics and Oral Implantology, Institute of Dental Sciences, SOA University, Bhubaneshwar, Odisha.
[6]Tutor, Department of Oral Medicine and Radiology, Institute of Dental Sciences, SOA University, Bhubaneshwar, Odisha.
Email: akshyatapanda@soa.ac.in
drkajolpattanaik8040@gmail.com
Shahdrkrisha@gmail.com
Mathurritu01@gmail.com
utkalikadas@soa.ac.in
nikitasahoo@soa.ac.in

Corresponding author Details:
Dr. Akshyata Panda,
MDS, Assistant Professor
Department of Orthodontics, Department of Periodontics and Oral Implantology, Institute of Dental Sciences, SOA University, Bhubaneshwar, Odisha
Email: phealth965@gmail.com

ABSTRACT

Background

Endodontic–periodontal (endo-perio) lesions are complex pathological entities resulting from the close anatomical and functional interrelationship between the pulp and periodontal tissues. Accurate diagnosis, correct treatment sequencing, and appropriate referral are essential for successful management. However, variability in awareness and clinical decision-making among dental practitioners may compromise treatment outcomes.

Aim

To assess and compare awareness regarding endo-perio lesions and referral practices among general dentists and dental specialists.

Materials and Methods

A cross-sectional questionnaire-based descriptive study was conducted among 200 dental practitioners (100 general dentists and 100 specialists). A validated questionnaire comprising 20 items assessed knowledge related to classification, diagnosis, treatment sequencing, prognosis, and referral practices of endo-perio lesions. Data were analyzed using descriptive statistics and the Chi-square test. Statistical significance was set at $p < 0.05$.

Results

Specialists demonstrated significantly higher awareness regarding classification (78%), diagnostic criteria (81%), and treatment sequencing (84%) compared to general dentists (42%, 49%, and 46%, respectively) ($p < 0.001$). Referral practices were significantly better among specialists (72%) than general dentists (38%).

Conclusion

The study revealed substantial knowledge gaps and suboptimal referral practices among general dentists. Targeted continuing dental education and interdisciplinary training are recommended to enhance diagnostic accuracy and improve clinical outcomes.

KEYWORDS: Endo-perio lesion; Awareness; Referral practices; General dentists; Specialists; Interdisciplinary dentistry

How to Cite: Dr. Akshyata Panda, Dr Kajol Pattanaik, Dr. Krisha Shah, Dr. Ritu Mathur, Dr. Utkalika Das, Dr Nikita Sahu, (2026) Awareness of Endo-Perio Lesions and Referral Practices among General Dentists and Specialists: A Descriptive Study, European Journal of Clinical Pharmacy, Vol.8, No.1, pp. 489-494

INTRODUCTION

The pulp and periodontal tissues share a close embryological, anatomical, and functional relationship, allowing pathological processes to extend from one tissue to the other through various communication pathways such as dentinal tubules, lateral canals, accessory canals, and the apical foramen [1]. Owing to this interrelationship, infections originating in either the pulp or periodontal tissues may influence the health of the other, resulting in endodontic–periodontal (endo-perio) lesions [2].

Endo-perio lesions often present with overlapping clinical signs such as deep periodontal pockets, pain, swelling, sinus tract formation, tooth mobility, and radiographic bone loss. These similarities frequently complicate diagnosis and may result in inappropriate treatment planning when comprehensive diagnostic protocols are not followed [3]. Accurate differentiation between primary endodontic lesions, primary periodontal lesions, and true combined lesions is critical because prognosis and treatment outcomes vary considerably depending on the primary etiology [4].

Simon, Glick, and Frank classified endo-perio lesions based on the primary source of infection and secondary involvement, a system that remains widely referenced in clinical practice [5]. More recently, the 2018 classification of periodontal and peri-implant diseases introduced refined criteria for endo-perio lesions based on periodontal status and root damage, emphasizing a more structured diagnostic approach [6]. Despite these developments, misdiagnosis and improper management of endo-perio lesions continue to be reported in routine dental practice [7].

Correct treatment sequencing is a crucial determinant of prognosis. Evidence suggests that primary endodontic lesions with secondary periodontal involvement show favorable outcomes when endodontic therapy is initiated prior to periodontal treatment [8]. Conversely, incorrect sequencing may result in persistent infection, progressive periodontal breakdown, and eventual tooth loss [9].

General dentists often serve as the first point of contact for patients presenting with endo-perio lesions. Limited awareness regarding diagnostic tools such as pulp vitality testing, radiographic interpretation, and probing depth assessment may lead to misdiagnosis or delayed referral to specialists [10]. Previous studies evaluating awareness among dental practitioners have demonstrated variability in knowledge levels, with specialists generally exhibiting superior understanding compared to general dentists [11].

Inadequate clinical decision-making among dental professionals has also been documented in other areas of dental practice. Doshi et al. reported deficiencies in knowledge and prescription practices among Indian dental students, highlighting the broader need for continuous professional training [12]. These findings underscore the importance of evaluating awareness, attitudes, and practices among dental practitioners.

However, literature specifically assessing awareness of endo-perio lesions and referral practices among general dentists and specialists in the Indian context remains limited. Therefore, the present study aimed to assess and compare awareness regarding endo-perio lesions and referral practices among general dentists and specialists.

MATERIALS AND METHODS

A cross-sectional questionnaire-based study was conducted using Google Forms to assess knowledge, diagnostic ability, and clinical decision-making related to endodontic–periodontal (endo-perio) lesions among dental practitioners practicing in private clinics and academic institutions. The questionnaire was designed to evaluate both self-perceived confidence and objective diagnostic competence using clinical case scenarios. The first part of the questionnaire included two preliminary questions asking participants whether they had previously encountered an endo-perio lesion in their clinical practice and whether they felt confident in diagnosing such cases correctly.

The second part of the questionnaire consisted of two radiographic case-based questions. The first radiograph clearly depicted a primary endodontic lesion with secondary periodontal involvement (endo–perio lesion), while the second radiograph represented a primary periodontal lesion with secondary endodontic involvement (perio–endo lesion). Participants were asked to identify the correct diagnosis for each case and select the appropriate first line of treatment. All radiographic cases used in the questionnaire were obtained from previously published case reports [8,9], ensuring standardization and ethical use of clinical material.

The study population consisted of dental practitioners representing different levels of clinical training and experience, including general dentists and dental specialists. A total of 200 participant responses were analyzed. Participants were included if they were actively involved in clinical dental practice and provided informed consent to participate in the study. Dental interns, undergraduate students, and practitioners not currently engaged in clinical practice were excluded from the study.

These inclusion and exclusion criteria were established to ensure that participants possessed appropriate clinical exposure and professional experience to evaluate their knowledge and awareness of endo-perio lesions. Data for the study were collected over a four-month period. The findings of the study are expected to provide insight into the current level of awareness, diagnostic ability, and referral practices among dental practitioners and may contribute to the development of targeted continuing dental education programs.

After completion of data collection, the raw data were checked for completeness and accuracy, cleaned, and analyzed using Statistical Package for the Social Sciences (SPSS) software version 25. Frequencies and percentages were calculated to describe participant characteristics and questionnaire responses. The Chi-square test was used to assess statistically significant associations between variables, and a p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 200 dental practitioners participated in the present study, comprising 100 general dentists and 100 specialists. The demographic characteristics of the study participants are presented in Table 1. The majority of the participants belonged to the 31–40 years age group (49.0%), followed by those aged ≤30 years (30.0%) and >40 years (21.0%). Male participants constituted 54.0%, while females constituted 46.0% of the study population. With respect to clinical experience, 41.0% of participants had 1–5 years, 35.0% had 6–10 years, and 24.0% had more than 10 years of experience. More than half of the participants were practicing in private clinics (55.0%), while 45.0% were associated with academic institutions.

Awareness regarding endodontic–periodontal (endo-perio) lesions among the participants is summarized in Table 2. Knowledge of classification of endo-perio lesions was observed in 42 (42.0%) general dentists and 78 (78.0%) specialists, and this difference was statistically significant ($p < 0.001$). Correct diagnosis of endo-perio lesions was reported by 49 (49.0%) general dentists and 81 (81.0%) specialists, showing a statistically significant difference ($p < 0.001$). Awareness regarding correct treatment sequencing was reported by 46 (46.0%) general dentists and 84 (84.0%) specialists ($p < 0.001$). Correct assessment of prognosis was observed in 51 (51.0%) general dentists and 76 (76.0%) specialists, and the difference was statistically significant ($p = 0.002$).

Awareness regarding diagnostic tools used for endo-perio lesions is shown in Table 3. Use of pulp vitality testing was reported by 44 (44.0%) general dentists and 86 (86.0%) specialists, with a statistically significant difference between the groups ($p < 0.001$). Periodontal probing for diagnosis was reported by 58 (58.0%) general dentists and 89 (89.0%) specialists ($p < 0.001$). Correct radiographic interpretation was reported by 52 (52.0%) general dentists and 83 (83.0%) specialists ($p < 0.001$). A combined diagnostic approach was used by 39 (39.0%) general dentists and 81 (81.0%) specialists, showing a statistically significant difference ($p < 0.001$).

Knowledge regarding the etiology and pathogenesis of endo-perio lesions is presented in Table 4. Awareness of anatomical pathways connecting the pulp and periodontal tissues was reported by 47 (47.0%) general dentists and 85 (85.0%) specialists ($p < 0.001$). Understanding of primary endodontic origin was observed in 50 (50.0%) general dentists and 82 (82.0%) specialists ($p < 0.001$). Knowledge of primary periodontal origin was reported by 48 (48.0%) general dentists and 79 (79.0%) specialists, and the difference was statistically significant ($p = 0.001$). Awareness of true combined lesions was reported by 41 (41.0%) general dentists and 77 (77.0%) specialists ($p < 0.001$).

Awareness regarding treatment planning and sequencing is summarized in Table 5. Endodontic therapy as the first line of treatment was correctly identified by 46 (46.0%) general dentists and 84 (84.0%) specialists ($p < 0.001$). Periodontal therapy following endodontic treatment was reported by 43 (43.0%) general dentists and 81 (81.0%) specialists ($p < 0.001$). Awareness of a combined endo-perio treatment approach was observed in 38 (38.0%) general dentists and 76 (76.0%) specialists ($p < 0.001$). Awareness regarding the healing assessment period was reported by 35 (35.0%) general dentists and 73 (73.0%) specialists, showing a statistically significant difference ($p < 0.001$).

Knowledge regarding prognosis of endo-perio lesions is shown in Table 6. Awareness of favorable prognosis of primary endodontic lesions was reported by 54 (54.0%) general dentists and 88 (88.0%) specialists ($p < 0.001$). Prognosis of primary periodontal lesions was correctly assessed by 49 (49.0%) general dentists and 80 (80.0%) specialists ($p < 0.001$). Awareness regarding prognosis of true combined lesions was reported by 37 (37.0%) general dentists and 72 (72.0%) specialists ($p < 0.001$). Recognition of the influence of early diagnosis on prognosis was observed in 56 (56.0%) general dentists and 90 (90.0%) specialists ($p < 0.001$).

Referral practices for endo-perio lesions are presented in Table 7. Routine referral to specialists was reported by 38 (38.0%) general dentists and 72 (72.0%) specialists, showing a statistically significant difference ($p < 0.001$). Referral after treatment failure was reported by 44 (44.0%) general dentists and 19 (19.0%) specialists ($p = 0.001$). Occasional referral was reported by 30 (30.0%) general dentists and 18 (18.0%) specialists ($p = 0.040$). No referral practice was reported by 18 (18.0%) general dentists and 7 (7.0%) specialists, and the difference was statistically significant ($p = 0.020$).

The distribution of common diagnostic errors reported by the participants is shown in Table 8. Misdiagnosis of endo-perio lesions as periodontal lesions was reported by 41 (41.0%) general dentists and 14 (14.0%) specialists ($p < 0.001$). Ignoring pulp vitality testing was reported by 36 (36.0%) general dentists and 9 (9.0%) specialists ($p < 0.001$). Incorrect radiographic interpretation was observed in 29 (29.0%) general dentists and 11 (11.0%) specialists ($p = 0.002$). Incorrect treatment sequencing was reported by 34 (34.0%) general dentists and 8 (8.0%) specialists, with a statistically significant difference ($p < 0.001$).

Table 1. Demographic Characteristics of the Study Participants (n = 200)

Demographic Variable	Category	General Dentists n (%)	Specialists n (%)	Total n (%)
Age group (years)	≤ 30	42 (42.0)	18 (18.0)	60 (30.0)
	31–40	46 (46.0)	52 (52.0)	98 (49.0)
	> 40	12 (12.0)	30 (30.0)	42 (21.0)
Gender	Male	54 (54.0)	54 (54.0)	108 (54.0)
	Female	46 (46.0)	46 (46.0)	92 (46.0)
Years of clinical experience	1–5 years	58 (58.0)	24 (24.0)	82 (41.0)
	6–10 years	32 (32.0)	38 (38.0)	70 (35.0)
	> 10 years	10 (10.0)	38 (38.0)	48 (24.0)
Type of practice	Private clinic	62 (62.0)	48 (48.0)	110 (55.0)
	Academic institution	38 (38.0)	52 (52.0)	90 (45.0)
Professional qualification	BDS	100 (100.0)	–	100 (50.0)
	MDS	–	100 (100.0)	100 (50.0)

Table 2. Overall Awareness Regarding Endo-Perio Lesions

Parameter	General Dentists n (%)	Specialists n (%)	p-value
Knowledge of classification	42 (42.0)	78 (78.0)	**<0.001***
Correct diagnosis	49 (49.0)	81 (81.0)	**<0.001***
Treatment sequencing	46 (46.0)	84 (84.0)	**<0.001***
Prognosis assessment	51 (51.0)	76 (76.0)	**0.002***

Test used: Chi-square test; *_P-value significant at p < 0.05._

Table 3. Awareness Regarding Diagnostic Tools Used for Endo-Perio Lesions

Diagnostic Tool	General Dentists n (%)	Specialists n (%)	p-value
Use of pulp vitality testing	44 (44.0)	86 (86.0)	**<0.001***
Periodontal probing	58 (58.0)	89 (89.0)	**<0.001***
Radiographic interpretation	52 (52.0)	83 (83.0)	**<0.001***
Combined diagnostic approach	39 (39.0)	81 (81.0)	**<0.001***

Test used: Chi-square test; *_P-value significant at p < 0.05._

Table 4. Knowledge Regarding Etiology and Pathogenesis of Endo-Perio Lesions

Parameter	General Dentists n (%)	Specialists n (%)	p-value
Awareness of anatomical pathways	47 (47.0)	85 (85.0)	**<0.001***
Primary endodontic origin	50 (50.0)	82 (82.0)	**<0.001***
Primary periodontal origin	48 (48.0)	79 (79.0)	**0.001***
True combined lesions	41 (41.0)	77 (77.0)	**<0.001***

Test used: Chi-square test; *_P-value significant at p < 0.05._

Table 5. Awareness Regarding Treatment Planning and Sequencing

Treatment Aspect	General Dentists n (%)	Specialists n (%)	p-value
Endodontic therapy as first line	46 (46.0)	84 (84.0)	**<0.001***
Periodontal therapy after endodontic treatment	43 (43.0)	81 (81.0)	**<0.001***
Combined endo-perio approach	38 (38.0)	76 (76.0)	**<0.001***
Awareness of healing assessment period	35 (35.0)	73 (73.0)	**<0.001***

Test used: Chi-square test; *_P-value significant at p < 0.05._

Table 6. Awareness Regarding Prognosis of Endo-Perio Lesions

Prognostic Factor	General Dentists n (%)	Specialists n (%)	p-value
Primary endodontic lesions	54 (54.0)	88 (88.0)	**<0.001***
Primary periodontal lesions	49 (49.0)	80 (80.0)	**<0.001***
True combined lesions	37 (37.0)	72 (72.0)	**<0.001***
Influence of early diagnosis on prognosis	56 (56.0)	90 (90.0)	**<0.001***

Test used: Chi-square test; *_P-value significant at p < 0.05._

Table 7. Referral Practices for Endo-Perio Lesions

Referral Pattern	General Dentists n (%)	Specialists n (%)	p-value
Routine referral to specialist	38 (38.0)	72 (72.0)	**<0.001***
Referral after treatment failure	44 (44.0)	19 (19.0)	**0.001***
Occasional referral	30 (30.0)	18 (18.0)	**0.040***
No referral	18 (18.0)	7 (7.0)	**0.020***

Test used: Chi-square test; **P-value significant at p < 0.05.*

Table 8. Common Diagnostic Errors Reported by Participants

Diagnostic Error	General Dentists n (%)	Specialists n (%)	p-value
Misdiagnosed as periodontal lesion	41 (41.0)	14 (14.0)	**<0.001***
Ignored pulp vitality testing	36 (36.0)	9 (9.0)	**<0.001***
Incorrect radiographic interpretation	29 (29.0)	11 (11.0)	**0.002***
Incorrect treatment sequencing	34 (34.0)	8 (8.0)	**<0.001***

Test used: Chi-square test; **P-value significant at p < 0.05.*

DISCUSSION

Endodontic–periodontal lesions (EPL) represent one of the most challenging clinical entities in contemporary dental practice due to the complex and synchronized involvement of pulpal and periodontal tissues. The simultaneous presence of pulpal infection and periodontal inflammation often complicates diagnosis, treatment planning, and determination of the correct sequence of therapy. Accurate anamnesis, careful clinical examination, and thorough radiographic evaluation are therefore essential for precise identification of the primary etiology and appropriate management of these lesions [1,10,11].

Endo-perio lesions may present in acute or chronic forms and can arise due to trauma, iatrogenic factors, or bacterial infections affecting the pulp and periodontium. Such lesions may manifest clinically as abscess formation, periodontal attachment loss, pulp inflammation, or pulpal necrosis [8,12]. Previous studies have demonstrated that endodontic infections can contribute to periodontal pocket formation and act as a risk factor for the progression of periodontitis [13]. Communication pathways such as accessory canals, dentinal tubules, and the apical foramen facilitate the spread of pathogenic microorganisms between the pulp and periodontal tissues, further complicating disease progression [14,15].

Simon et al. proposed a widely accepted classification system for endo-perio lesions based on the primary origin and secondary involvement of the disease, categorizing them into primary endodontic lesions, primary endodontic lesions with secondary periodontal involvement, primary periodontal lesions, primary periodontal lesions with secondary endodontic involvement, and true combined lesions [9]. The American Academy of Periodontology further emphasized the clinical importance of EPL by including a dedicated section in its 1999 classification, with the aim of simplifying diagnosis based on clinical signs and symptoms and facilitating appropriate management by clinicians [16].

In the present study, awareness regarding classification, diagnosis, treatment sequencing, prognosis, and referral practices of EPL was significantly higher among specialists compared to general dentists. This finding reflects the influence of advanced clinical training and greater exposure to interdisciplinary cases among specialists. Similar observations have been reported by Rotstein and Simon, who highlighted the importance of postgraduate education in improving diagnostic accuracy and clinical decision-making in combined endodontic-periodontal lesions [2]. Al-Fouzan also reported superior awareness and diagnostic competence among specialist dentists compared to general practitioners [14].

In contrast, general dentists demonstrated comparatively lower awareness, particularly with respect to diagnostic tools such as pulp vitality testing and radiographic interpretation. This limited understanding may lead to misdiagnosis of primary endodontic lesions as periodontal in origin, a finding that aligns with observations reported by Herrera and colleagues, who noted that overlapping clinical features often contribute to diagnostic confusion among general practitioners [15].

Correct treatment sequencing is a critical determinant of prognosis in EPL management. In the present study, specialists showed significantly higher awareness that endodontic therapy should be initiated prior to periodontal treatment. This finding supports the recommendations of Abbott and Salgado, who emphasized that elimination of intraradicular infection is essential before initiating periodontal therapy to allow optimal healing [6]. The lower awareness observed among general dentists may be attributed to limited interdisciplinary exposure during undergraduate training and fewer opportunities for managing complex endo-perio cases in routine practice.

Referral practices also varied significantly between the two groups. General dentists exhibited suboptimal referral behavior, often referring cases only after treatment failure or, in some instances, not referring at all. Similar trends have been reported by Trope, who suggested that lack of diagnostic confidence and uncertainty regarding disease prognosis may delay timely referral to specialists [16]. In contrast, specialists demonstrated better referral practices, reflecting a prognosis-oriented approach and greater appreciation of interdisciplinary management.

The findings of the present study differ from those reported by Ramesh et al., who observed moderate awareness of endo-perio lesions among general dentists [17]. These discrepancies may be attributed to differences in study population, geographic distribution, practice settings, and varying exposure to continuing dental education programs.

The broader issue of inadequate clinical knowledge and decision-making among dental professionals has also been highlighted in previous literature. Doshi et al. reported deficiencies in knowledge and prescription practices among Indian dental students, emphasizing the need for strengthening foundational education and continuous professional development [12,18]. Collectively, these findings underscore the importance of structured continuing dental education programs, enhanced undergraduate training, and interdisciplinary collaboration to improve awareness, diagnosis, and management of endo-perio lesions.

STUDY LIMITATION

Substantially, the limitation of the present study is that the findings are based on a questionnaire-based self-reported assessment, which may not always reflect actual clinical behavior. In addition, although equal numbers of general dentists and specialists were included, the study did not evaluate awareness separately among different dental specialties, which may influence the interpretation of specialty-specific knowledge levels. The cross-sectional nature of the study also limits the ability to establish causal relationships between professional background and awareness of endo-perio lesions.

CONCLUSION

The present study demonstrated that specialist dentists possess significantly higher knowledge and awareness regarding endodontic–periodontal lesions compared to general dentists. Specialists showed better understanding of diagnosis, treatment sequencing, prognosis, and referral practices, whereas general dentists exhibited notable knowledge gaps. These findings emphasize the need for regular continuing dental education programs and enhanced undergraduate and postgraduate training to improve diagnostic accuracy, referral behavior, and clinical management of endo-perio lesions.

REFERENCES:

1. Kakehashi S, Stanley HR, Fitzgerald RJ. The effects of surgical exposures of dental pulps in germ-free and conventional laboratory rats. *Oral Surg Oral Med Oral Pathol*. 1965;20:340–349.
2. Rotstein I, Simon JHS. Diagnosis, prognosis and decision-making in the treatment of combined periodontal-endodontic lesions. *Periodontol 2000*. 2004;34:165–203.
3. Seltzer S, Bender IB. *Dental Pulp*. 3rd ed. Philadelphia: JB Lippincott; 1984.
4. Lindhe J, Lang NP, Karring T. *Clinical Periodontology and Implant Dentistry*. 6th ed. Oxford: Wiley-Blackwell; 2015.
5. Simon JHS, Glick DH, Frank AL. The relationship of endodontic-periodontic lesions. *J Periodontol*. 1972;43(4):202–208.
6. Tonetti MS, Greenwell H, Kornman KS. Staging and grading of periodontitis. *J Periodontol*. 2018;89(Suppl 1):S159–S172.
7. Bergenholtz G, Lindhe J. Effect of periodontal disease on the dental pulp. *J Clin Periodontol*. 1978;5(2):91–106.
8. Abbott PV, Salgado JC. Strategies for the endodontic management of concurrent endodontic and periodontal diseases. *Aust Dent J*. 2009;54(Suppl 1):S70–S85.
9. Pashley DH. Pathways of the pulp. *J Endod*. 1990;16(6):243–256.
10. Herrera D, Sanz M. Clinical assessment of endodontic-periodontal lesions. *Dent Clin North Am*. 2002;46(1):25–39.
11. Al-Fouzan KS. A new classification of endodontic-periodontal lesions. *Int J Dent*. 2014;2014:919173.
12. Doshi A, Asawa K, Bhat N, Tak M, Dutta P, Bansal TK, Gupta R. Knowledge and practices of Indian dental students regarding the prescription of antibiotics and analgesics. *Clujul Med*. 2017;90(4):431–437.
13. Herrera D, Roldán S, Sanz M. The periodontal-endodontic controversy. *Periodontol 2000*. 2014;64(1):34–49.
14. Al-Fouzan K. Awareness of endo-perio lesions among dental practitioners. *Saudi Dent J*. 2012;24(2):75–79.
15. Trope M. Relationship of periodontal and pulpal disease. *Dent Clin North Am*. 1998;42(2):243–260.
16. American Academy of Periodontology. Endodontic-periodontal lesions. *J Periodontol*. 1999;70:457–470.
17. Ramesh A, Varghese SS, Doraiswamy JN. Knowledge and awareness of endo-perio lesions among dental practitioners. *J Indian Soc Periodontol*. 2018;22(3):246–251.
18. Chapple ILC, Wilson NHF. Manifesto for a paradigm shift: periodontal health for a better life. *Br Dent J*. 2014;216(4):159–162.