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Compliance with Diabetes-Periodontitis Management Guideline: A Clinical Audit in a Postgraduate Periodontology Clinic

Noor Asyikin Saad[1,2], Nazurah Nik Eezammuddeen[1*]

[1]*Centre of Periodontology Studies, Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Sungai Buloh, Malaysia*
[2]*Unit Pakar Pergigian, Klinik Pergigian Baling, Baling, Kedah Darul Aman, Malaysia*

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ABSTRACT

Background: Periodontitis and diabetes mellitus (DM) have a two-way relationship, with periodontitis exacerbating systemic complications of diabetic and poor glycaemic control contributing to progression of periodontitis. **Objective:** This clinical audit was conducted to evaluate the compliance of the postgraduate (PG) students with the recommended international guideline, identify practice gaps, and provide baseline evidence for developing a standardized protocol to improve the management of periodontitis patients with DM. **Materials and Methods:** A retrospective audit was performed on periodontitis patients with DM treated between 2018 and 2022. Data retrieved from the iDerms system, included documentation of HbA1c or glycaemic status, dietary advice, education on the periodontitis-DM relationship, and referral to medical officer (MO). Compliance was analysed descriptively. **Results:** Forty-seven patients (mean age 55.2±10.3 years, range 26-74) were included in the analysis. Only 38.3% had HbA1c level documented by 56.3% of students, with the majority were recorded more than 6 months after first visit. Less than 5% of patients had documentation of dietary advice or education on the periodontitis-DM relationship. Furthermore, only 25.5% of patients were reported to have liaised with MO regarding their periodontitis-DM condition. Overall, students' compliance with recommended standards was suboptimal. **Conclusion:** These findings emphasize the need to establish a structured, evidence-based protocol, improve interdisciplinary liaison with MO, and reinforce postgraduate training to ensure guideline-based care. A re-audit following implementation of these recommendations is warranted to monitor improvement and sustain quality of patient care.

[1*] Corresponding author. *E-mail address*: nazurahnik@uitm.edu.my

1. INTRODUCTION

In consonance with the recent International Diabetes Federation (IDF) report, almost one in ten (537 million) of the adult population worldwide have diabetes (Magliano et al., 2021). The IDF Diabetes Atlas (2021) reports that 10.5% of the adult population (20-79 years) has diabetes, with almost half unaware that they are living with the condition. The number is expected to rise across the globe to 642 million by 2040 (Ogurtsova et al., 2017). Results of a study suggested a high prevalence of prediabetes (11.62%) and diabetes (14.39%) in Malaysia and the prevalence is associated with time, age, and race (Akhtar et al., 2022). There was bidirectional relationship between diabetes and periodontitis (Păunică et al., 2023). Poor glycaemic control increases the risk, extent and severity of periodontitis (Chávarry et al., 2009), while periodontal inflammation contributes to increase the incidence of diabetic complications and poorer metabolic control (Lalla & Papapanou, 2011). Diabetes mellitus (DM) is an important modifying factor of periodontitis and should be included in a clinical diagnosis of periodontitis as a descriptor. According to the new classification of periodontitis, the level of glycemic control in diabetes influences the grading of periodontitis (Papapanou et al., 2018; Tonetti et al., 2018).

International guidelines strongly recommend integrated management of periodontitis patients with DM with core components include periodontal screening of new DM patients, routine periodontal evaluation, HbA1c monitoring, personalized periodontal therapy and oral hygiene instructions, patient education on oral-systemic links, and close collaboration between dental/ periodontal and medical professionals (Sanz et al., 2020). Such integrated care is not only designed to stabilize periodontal health but also to improve metabolic control and reduce the risk of diabetes-related complications.

Ensuring compliance to the clinical recommendations is crucial in reducing the risk of diabetes-related complications, optimizing periodontal stability, and enhancing overall patient well-being. However, compliance with these recommendations remains suboptimal in many healthcare settings. Barriers include limited awareness among patients, inconsistent interdisciplinary collaboration, and lack of standardized documentation approach (Chapple, 2014; Chapple et al., 2015).

This audit addresses a critical but underexplored gap: the real-world implementation of international periodontal-diabetes care guidelines within postgraduate clinical training environments. It's aimed to identify gap in care delivery and provide evidence-based insights to strengthen interdisciplinary collaboration between dental and medical professionals. The expected outcome is to improve adherence to international standards of care, thereby enhancing both periodontal stability and systemic health.

2. MATERIALS AND METHODS

Following ethical approval from University Teknologi MARA (UiTM), a retrospective clinical audit was conducted at the Centre of Periodontology Studies, Faculty of Dentistry, UiTM Sungai Buloh, to evaluate the compliance of management of periodontitis patients with DM by postgraduate students between January 2018 and December 2022. The audit followed the standard audit cycle (Figure 1a), which included identification of the problem, establishment of criteria and standards, data collection, and comparison of practice with the standard of care in a cycle without including the implementation of recommendations and planning for re-audit. Standard of care was according to the International Diabetes Federation (IDF) and European Federation of Periodontology (EFP) guidelines (Sanz et al., 2020). The criteria assessed were

documentations of glycaemic (HbA1c) level, patient education on periodontitis-DM relationship and dietary advice, and referral or liaison with MO. Periodontitis patients with confirmed DM with available clinical record in iDerms system during audit period were included. Data were extracted from iDerms including demographic characteristic, diabetes classification, HbA1c record, dietary advice, patient education, and referrals to MO, and collected for analysis. Compliance with standard of care was analyzed descriptively, and results were presented as frequencies and percentages. Details flow of this clinical audit was presented in Figure 1b-1 and 1b-2. The implementing and monitoring of changes was not conducted in this audit.

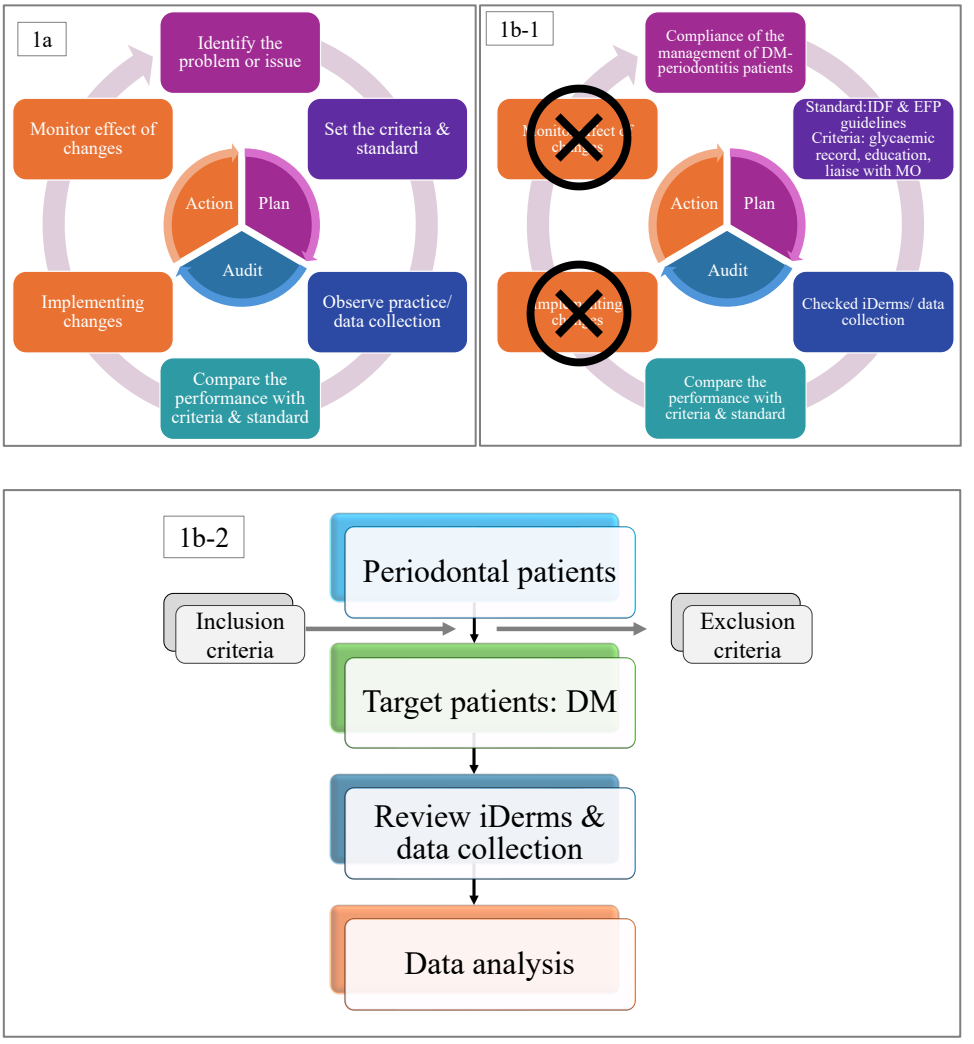


Fig. 1. Clinical audit methodology (1a) Standard clinical audit cycle (1b-1 and 1b-2) Flow of this clinical audit. This audit was performed in single cycle due to the timeline.

3. RESULTS

A total of 16 postgraduate students in Periodontology managing 47 periodontitis patients with DM were included in this clinical audit. The mean age of patients was 55.2±10.3-year-old, with range from 26 to 74 years old (Figure 2). Majority were male (59.6%), with patients comprising mainly Malays (93.6%) and a small proportion of Indians (6.4%). Most patient were diagnosed with type 2 DM (Figure 2).

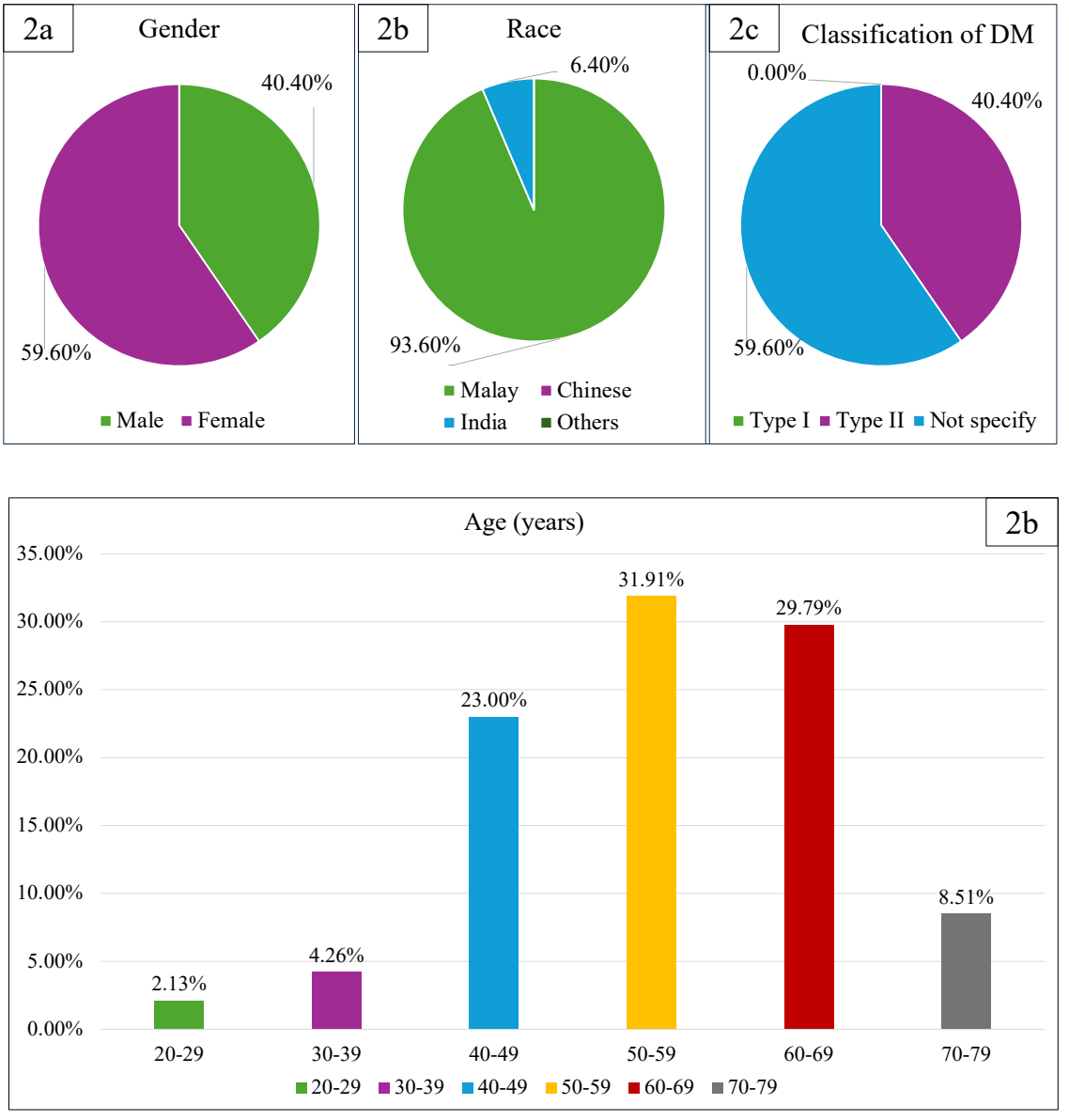


Fig. 2. Patients' demographic, n=49 (2a) Gender (2b) Race (2c) Type of DM (2d) Age distribution.

The documentation of glycaemic level was suboptimal with only 38.3% of patients had their HbA1c level recorded in the clinical notes by 56.25% students, and more than half were documented more than six months following the first visit. However, random blood sugar level was documented for 78.7% of patients.

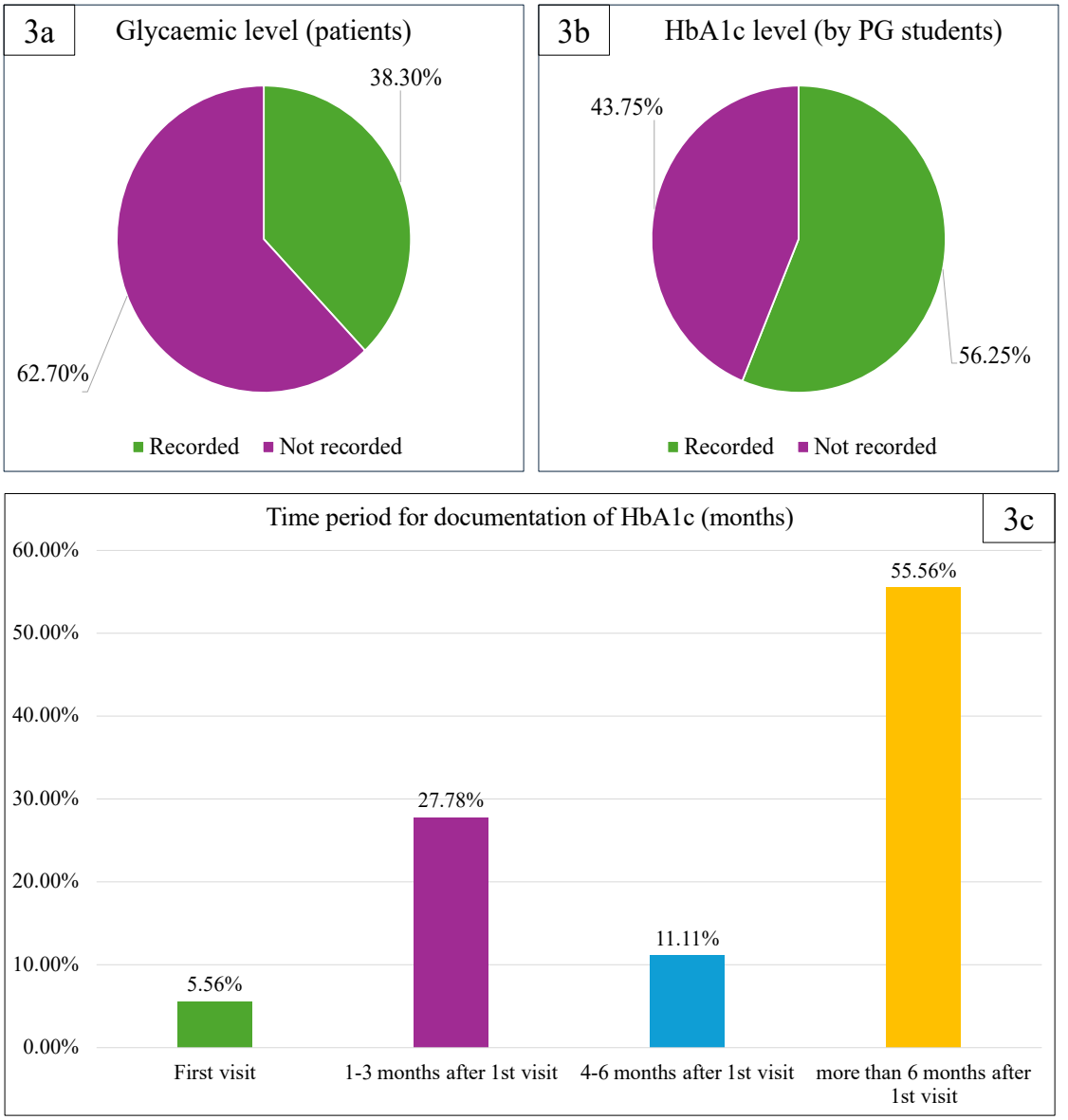


Fig. 3. Record of HbA1c level (3a) in patients' clinical report, n=49 (3b) by student, n=16 (3c) period from the first visit in periodontal clinic.

In term of education, only 4.26% of patients had documentation of receiving education regarding the dietary and relationship between periodontitis and DM, given by 12.5% postgraduate students of Periodontology. Another 10.64% of patients were recorded to receive counselling on diet from either postgraduate student

of Dental Public Health or undergraduate students of Dentistry. Liaison with medical practitioners was documented in only 25.5% of included patients by 37.5% of students.

4. DISCUSSION

This clinical audit assessed the compliance of PG students in Center of Periodontology of UiTM with the international recommendation of management of the periodontitis patients with DM. Overall, the results revealed a marked discrepancy between established guideline expectations and actual clinical practice, specifically in relation to the glycaemic status documentation, interdisciplinary collaboration with medical practitioners, and structured patient education. These deficiencies highlight an important implementation gap, rather than a lack of available evidence.

Monitoring glycaemic condition is a fundamental component of safe periodontal care in patients with DM, as poor glycaemic control may exacerbate the periodontal inflammation, impaired wound healing, and worsening the systemic complication. Although the random blood sugar was documented for the majority of patients, these values only reflect only short-term glycaemic fluctuations and not substitute for HbA1c level which indicates long-term metabolic control and inform periodontal risk stratification. Importantly, delayed or absent documentation of HbA1c and limited interdisciplinary communication represent not merely documentation gaps, but potential patient safety risks in medically compromised individuals.

Patient education is another critical component of comprehensive diabetes-periodontitis care. Evidence indicates that improving patient awareness of the bidirectional relationship between periodontitis and diabetes, alongside dietary and lifestyle modification, contributes to better periodontal and systemic outcomes (Chapple & Genco, 2013). However, the minimal documentations of patient education observed in this clinical audit recommend inconsistent delivery and limited prioritization of this component within postgraduates training. This finding underscores the need for structured and standardized educational approaches to ensure that patient counselling is delivered consistently and is auditable.

In addition, effective collaboration between dental/ periodontist with medical personals is essential for a holistic and comprehensive management. Limited documentation od referral and liaison with medical personals highlights fragmented care pathway, which may compromise coordinated treatment planning and continuity of care. Strengthening formalized referral and feedback mechanisms is therefore critical to supporting integrated, patient-centered management of patients with complex medical needs.

In response to these findings, a structured care pathway is proposed to operationalize international diabetes-periodontitis recommendations within postgraduate periodontal clinics (Table 1). This framework is built with four interrelated pillars: mandatory baseline and ongoing HbA1c documentation, standardized patient education and lifestyle counselling, formalized medical referral and feedback loops and embedded audit indicators within postgraduate clinical training.

Table 1. Proposed Structured Care Pathway for the Management of Diabetes-Periodontitis Patient.

Pillar	Key Component	Purpose/ Expected Impact	Audit Indicator
Mandatory HbA1c Documentation	○ HbA1c baseline record at initial periodontal assessment. ○ Periodic updates during treatment.	○ Accurate risk stratification. ○ Informed treatment planning. ○ Alignment with periodontitis staging and grading.	Presence and timing of HbA1c documentation.
Standardized Patient Education Checklist	○ Explanation of bidirectional diabetes-periodontitis relationship. ○ Dietary and lifestyle counselling. ○ Reinforcement of tailored oral hygiene instructions.	○ Improve patient awareness. ○ Enhance self-care behaviour. ○ Consistent delivery of education.	Completion of the education checklist in the patient's record.
Formal Medical Referral and Feedback Loop	○ Referral to medical officer for suboptimal glycaemic control. ○ Communication of periodontal diagnosis and treatment plan. ○ Documentation of medical feedback.	○ Strengthen interdisciplinary care. ○ Reduce fragmentation of care. ○ Improve systemic-oral health coordination.	Evidence of referral and medical liaison.
Embedded Audit Indicators in Clinical Training	○ HbA1c documentation field. ○ Education checklist tick-box. ○ Medical referral record.	○ Improve accountability. ○ Reinforce guideline-based practice. ○ Sustainable quality improvement.	Compliance rate per audit cycle.

As for clinical audit which is a cycle quality improvement process, re-audit is essential for completion of the cycle by assessing the results of corrective implementations. In this audit, the target corrective strategies are expected to enhance compliance with diabetes-periodontitis management guidelines. Re-audit should be conducted typically 3 to 12 months after completion of intervention implementation (Ashmore et al., 2008; Fereday, 2020). In this present study, re-audit was unable to performed due to certain limitation including frequent staff or student's turnover or rotations which may impact the effect of educational interventions, clinician related factors that may limit improvement and incomplete iDerms documentation which may underestimate true practice.

In summary, this audit revealed that improved periodontitis patients with DM management requires systematic, protocol-driven changes rather than isolated corrective care. The proposed structured care pathway provides a feasible, evidence-based strategy strengthening PG student competency, enhancing interdisciplinary care, and ensuring the consistency delivery of high-quality, guideline-driven periodontal management. Future re-audit following implementation will be essential to evaluate progress, measure sustainability, and guide ongoing improvements within postgraduate periodontal education and clinical service delivery.

5. CONCLUSION AND PRACTICE IMPLICATIONS

This audit reported the suboptimal compliance of PG students with international recommendation on management of periodontitis patients with DM, reflecting the gap between true clinical practice and evidence-based guidelines. Future efforts should highlight on standardized documentation, structured clinical protocols, targeted training into routine workflows, and strengthen the interdisciplinary collaboration. Implementation of re-audit is essential to evaluate the effectiveness of intervention and ensure continuous quality improvement of patient's care.

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7. CONFLICT OF INTEREST STATEMENT

The authors agree that this research was conducted in the absence of any self-benefits, commercial or financial conflicts and declare the absence of conflicting interests with the funders.

8. AUTHORS' CONTRIBUTIONS

Noor Asyikin Saad carried out the research, wrote and revised the article. Nazurah Nik Eezammudden conceptualised the central research idea, supervised research progress, revisions and approved the article submission.

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10. AUTHOR INFORMATION

About the Authors

Noor Asyikin Saad, holds a Doctor in Periodontology and a Master of Science in Dentistry from Universiti Teknologi MARA (UiTM). She is currently serving as a gazettement periodontology specialist under the Ministry of Health Malaysia. Her research interests focus on dentistry, periodontology, and implantology, with publications in the IIUM Journal of Orofacial Sciences and the International Journal of Medical Sciences. She is actively involved in clinical research and interdisciplinary periodontal care. She can be contacted at noorasyikin.saad@gmail.com.

Nazurah Nik Eezammuddeen, is a senior lecturer and periodontist at the Centre of Periodontology Studies, Faculty of Dentistry, Universiti Teknologi MARA (UiTM). She holds a Doctor in Periodontology and has extensive experience in periodontal research, clinical supervision, and postgraduate education. Her academic work focuses on periodontal medicine, regenerative periodontology, and interdisciplinary periodontal care, with publications in leading national and international journals. She actively mentor's postgraduate trainees and contributes to curriculum development within the department. She can be contacted at nazurahnik@uitm.edu.my.