



IADR

INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION

24TH ANNUAL SCIENTIFIC MEETING & 27TH ANNUAL GENERAL MEETING OF THE IADR MALAYSIAN SECTION

*Shaping the Future of Dentistry:
Intelligent Innovation for
Sustainable Global Oral Health*



Date: 18 July 2026 (Saturday)



Venue: Bangi Resort Hotel

Programme Book

Proudly
Sponsored by:

Silver Sponsors
HALEON **Kerr** **Nobel Biocare**

Bronze Sponsors
GVS **NISSIN**

Other Sponsor
IST SDI
INDRA SARI TRADING



TABLE OF CONTENTS



01 Organising Committee

Organising Leadership	04
Scientific Programme & Competition Committees	05
Registration & Finance, Logistics, Technical	06
Programme Book Committee, Publicity, Sponsorship	07

02 President's Foreword

President, IADR Malaysian Section (2024 - 2026)	09
---	----

03 Programme

Programme At A Glance	11
Venues	12

04 Speakers and Abstracts

List of Speakers	14
Presentation Schedule	26
List of Abstracts	37
Senior Oral Abstracts	44
Junior Oral Abstracts	66
Senior E-Poster Abstracts	81
Junior E-Poster Abstracts	106

05 Sponsorships

Silver Sponsors	118
Bronze Sponsor	120
Other Sponsor	121



IADR INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION



ORGANISING COMMITTEE



IADR INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION

ORGANISING LEADERSHIP



**Professor Dr Noor
Azlin Yahya**
Chairperson



**Associate Professor Dr
Jasmina Qamaruzzaman**
Vice Chairperson



Dr Sofya Zukifli
Secretary



**Dr Siti Nuramanina
Abdul Shukor**
Treasurer



IADR INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION

SCIENTIFIC PROGRAMME & COMPETITION COMMITTEES



**Professor Dr Noor
Azlin Yahya**



**Associate Professor Dr
Aiemeza Rajali**



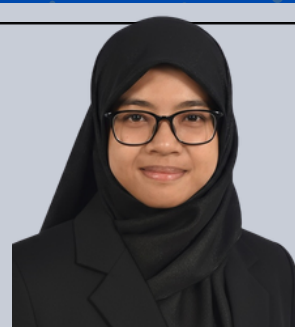
**Associate Professor Dr
Rohaida Abdul Halim**



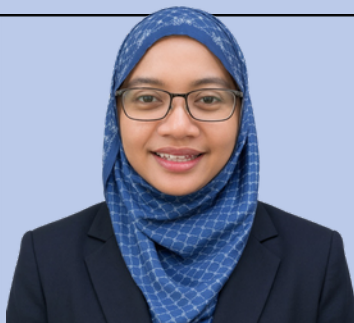
Dr Erum Zain



**Dr Nazurah Nik
Eezammuddeen**



Dr Nurhani Jauhar



Dr Nor Sharina Sahak



Dr Mazni Fatimah Md Zain



**Dr Siti Akmal Izzati
Abu Hassan**



IADR INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION

REGISTRATION & FINANCE



Dr Sofya Zulkifli



**Dr Siti Nuramanina
Abdul Shukor**

LOGISTICS



**Associate Professor Dr
Jasmina Qamaruzzaman**



**Associate Professor Dr
Safura Anita Baharin**

TECHNICAL



**Muhammad Syarifuddin
Ibrahim**



**Muhammad Irshad
Abdul Halim**



IADR INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION

PROGRAMME BOOK COMMITTEE



Dr Mariati Abdul Rahman



Dr Ooi Der Jiun



**Dr Zahirrah Begam
Mohamed Rasheed**

PUBLICITY



Dr Ooi Der Jiun

SPONSORSHIP



**Dr Hetal Ashvin Kumar
Mavani**



IADR

INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION



PRESIDENT'S FOREWORD



IADR

INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION

Prof. Dr. Noor Azlin Yahya

President
IADR Malaysian Section (2024-2026)



Dear Colleagues and Friends,

It is my great pleasure to welcome you to the 24th Annual Scientific Meeting and 27th Annual General Meeting of the IADR Malaysian Section. Each year, this meeting brings together individuals united by a shared curiosity and commitment to advancing oral health through research. Beyond the scientific presentations, it is an opportunity to reconnect with colleagues, exchange ideas, build new collaborations, and celebrate the achievements of our research community. These interactions are often where new opportunities and lasting partnerships begin.

This year's theme, "Shaping the Future of Dentistry: Intelligent Innovation for Sustainable Global Oral Health", reflects the exciting possibilities emerging across our profession. As advances in technology, artificial intelligence, biomaterials, and regenerative sciences continue to reshape dentistry, we are reminded that innovation is most meaningful when it ultimately improves the lives of the people and communities we serve.

This meeting is especially meaningful to me, as it marks my final year serving as President of the IADR Malaysian Section. It has been both an honour and a privilege to serve this remarkable community over the past two years. I have witnessed first-hand the growth, dedication, and collegiality that continue to strengthen our Section, and I am particularly encouraged by the enthusiasm and achievements of our young researchers, who represent the future of dental research in Malaysia and beyond.

Today's Annual General Meeting also marks an important milestone as we elect and appoint a new Council to lead the Section into its next chapter. I encourage all members to participate actively in this process and to continue supporting the collective efforts that have made our community vibrant, relevant, and impactful.

My sincere appreciation goes to our invited speakers, organising committee, scientific reviewers, sponsors, exhibitors, and participants for making this meeting possible. Your contributions continue to uphold the values of scientific excellence, collaboration, and service that define the IADR.

I wish you a productive and enjoyable meeting filled with meaningful discussions, fresh perspectives, and renewed inspiration.

Warm regards,
Professor Dr Noor Azlin Yahya
President
IADR Malaysian Section (2024-2026)



IADR

INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION



PROGRAMME



PROGRAMME AT A GLANCE

8:00 AM	Registration
8:30 AM	Welcome Remarks (Melur-Main hall)
	Prof. Dr. Noor Azlin Yahya, <i>President, IADR Malaysian Section</i>
	Concurrent Presentation – Poster 1 (8:30AM – 10:30AM)
8:45 AM	Keynote Sharing
	Beyond Discovery: Connecting Dental Research to Sustainable Global Oral Health Prof. Dr. Tuti Ningseh Mohd Dom, <i>Universiti Kebangsaan Malaysia</i>
9:30 AM	Symposium 1
	Bridging the Distance: Prosthodontic Solutions for Rural Populations Dr. Nor Aidaniza Abdul Muttlib, <i>Universiti Sains Malaysia</i>
	Integrating Evidence-Based Natural Oral Hygiene Practices into Modern Dentistry: A Periodontal Perspective for Sustainable Oral Health Assoc. Prof. Dr. Haslinda Ramli, <i>Universiti Sains Islam Malaysia</i>
10:30 AM	Coffee Break Poster Viewing Networking
10:45 AM	Plenary Sharing
	Regeneration from Within: Autologous Biomaterials in Sustainable Dental Tissue Engineering Assoc. Prof. Dr. Erni Noor, <i>Universiti Teknologi MARA</i>
11:15 AM	Concurrent Presentation – Oral 1 and Poster 2
12:45 PM	Lunch IADR MalSec AGM Networking
2:00 PM	Concurrent Presentation – Oral 2 and Poster 3
4:30 PM	Symposium 2
	From Innovation to Impact: Intelligent Dentistry for Sustainable Global Oral Health Prof. Dr. Zamri Radzi, <i>Universiti Malaya</i>
5:15 PM	Award and Closing Ceremony



VENUES

MAIN PROGRAMME

*Melur (Main
Hall), Level 3*



ORAL PRESENTATION

*Dahlia 2 Room,
Level 2*



POSTER PRESENTATION

*Dahlia 3 Room,
Level 2*

LUNCH

Funtasia, Level 1



IADR

INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION



SPEAKERS & ABSTRACTS



IADR
INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION

SPEAKERS

KEYNOTE



**Prof. Dr. Tuti Ningseh
Mohd Dom**

Faculty of Dentistry
Universiti Kebangsaan Malaysia



PLENARY



**Assoc. Prof. Dr.
Erni Noor**

Faculty of Dentistry
Universiti Teknologi MARA



SYMPOSIUM 1



**Dr. Nor Aidaniza
Abdul Muttlib**

School of Dental Sciences
Universiti Sains Malaysia



SYMPOSIUM 1



**Assoc. Prof. Dr.
Haslinda Ramli**

Faculty of Dentistry
Universiti Sains Islam Malaysia



SYMPOSIUM 2



Prof. Dr. Zamri Radzi

Faculty of Dentistry
Universiti Malaya





KEYNOTE



Prof. Dr. Tuti Ningseh Mohd Dom



Faculty of Dentistry
Universiti Kebangsaan Malaysia

BIOGRAPHY

Professor Dr Tuti Ningseh Mohd Dom is Dean of the Faculty of Dentistry at Universiti Kebangsaan Malaysia (UKM) and a specialist in Dental Public Health.

She sits on various national committees that shape dental curricula and accreditation standards for both undergraduate and specialist dental education. Dr Tuti has an advisory role for the Ministry of Health Malaysia (MOH), Ministry of Higher Education Malaysia and the Academy of Sciences Malaysia (ASM) on policies to improve population oral health outcomes.

She leads multidisciplinary teams and professional networks to strengthen oral-health literacy and access for vulnerable groups—including low-income families, people with disabilities, older adults, and those with chronic conditions. She also serves as a grant reviewer for the Ministry of Higher Education (MOHE), and has received several awards for her work, reflecting her commitment to enhancing oral healthcare services and education in Malaysia.

Dr Tuti currently chairs the Malaysian Dental Deans Council and is a member of the Malaysian Dental Council. She is also an active member of several professional organisations such as the Malaysian Association of Dental Public Health Specialists, the Alliance for Cavity Free Future Malaysia Chapter and the Malaysian Health Economics Association.



KEYNOTE



**Prof. Dr. Tuti Ningseh
Mohd Dom**

Faculty of Dentistry
Universiti Kebangsaan Malaysia



ABSTRACT

Beyond Discovery: Connecting Dental Research to Sustainable Global Oral Health

Dental research advances oral health through a continuum of inquiry that spans fundamental discovery, clinical investigation, and population-based research. From elucidating disease mechanisms to improving diagnosis, treatment, prevention, and care delivery, each domain plays a distinct yet complementary role. However, the pathway from scientific advancement to meaningful and sustained impact on practice, policy, and population health remains uneven.

This keynote considers how dental research can be better connected across the continuum from discovery to implementation in support of sustainable global oral health. It argues that progress depends not only on the generation of new knowledge, but also on the ability to translate evidence into interventions, services, and systems that are relevant, feasible, scalable, and equitable. Drawing on examples related to access to care, older adults, and service delivery challenges, the talk highlights the value of linking research domains so that innovation can achieve lasting benefit for both patients and populations.

**IADR**INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION**PLENARY**

Assoc. Prof. Dr. Erni Noor

Faculty of Dentistry
Universiti Teknologi MARA

BIOGRAPHY

Associate Professor Dr Erni Noor is a Consultant Periodontist, Associate Professor, Programme Director, and Senior Lecturer at the Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Malaysia. She received her Bachelor of Dental Surgery from the University of Malaya, followed by a Doctor of Clinical Dentistry in Periodontics from the University of Otago, New Zealand, and further advanced her specialist expertise through a Fellowship in Advanced Periodontology and Implant Dentistry at the University of Genoa, Italy.

Her academic and professional journey reflects a sustained commitment to excellence in periodontal science, clinical innovation, and leadership in higher education. With nearly two decades of distinguished contribution to academic dentistry, Associate Professor Dr Erni has established herself as a respected figure in specialist clinical practice, postgraduate training, and translational research. Her work is particularly centred on regenerative periodontology, biomaterials, autologous biologics, and clinical implant research, with a strong emphasis on advancing biologically guided and clinically meaningful solutions in oral healthcare.

Recognised for her dedication to academic leadership and clinical excellence, she is deeply committed to shaping the next generation of clinician-scientists through interdisciplinary collaboration, evidence-based education, and scholarly mentorship. Her broader vision is to contribute to the global advancement of regenerative dentistry while strengthening UiTM's standing as a leading centre of excellence in periodontology and implant dentistry.

**IADR**INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION**PLENARY****Assoc. Prof. Dr.
Erni Noor**Faculty of Dentistry
Universiti Teknologi MARA**ABSTRACT**

Regeneration from Within: Autologous Biomaterials in Sustainable Dental Tissue Engineering

Autologous biomaterials are emerging as a defining innovation in regenerative dentistry, offering biologically active, patient-derived, and clinically sustainable strategies for tissue engineering. Including platelet concentrates, fibrin matrices, and autologous grafting approaches, these biomaterials provide an intrinsic reservoir of growth factors, cytokines, and structural matrices that orchestrate wound healing, angiogenesis, tissue remodelling, and host integration. Their autologous origin confers important advantages in biocompatibility, safety, and alignment with the evolving principles of personalised regenerative care.

Across periodontology, implant dentistry, oral surgery, and craniofacial regeneration, autologous biomaterials are increasingly valued for their capacity to enhance both soft and hard tissue healing while advancing a more biologically guided and resource-conscious model of therapy. Their expanding clinical relevance reflects a broader shift from replacement-based intervention towards regenerative strategies that seek to harness the body's own healing potential.

Despite this promise, important challenges remain, including variability in preparation protocols, heterogeneity in biological composition, and inconsistency in clinical outcomes. Greater standardisation and stronger translational evidence are essential. This presentation will highlight the biological foundations, contemporary applications, and future promise of autologous biomaterials in shaping a more refined and sustainable future for regenerative dentistry.



SYMPOSIUM 1



Prof. Dr. Zamri Radzi

Faculty of Dentistry
Universiti Malaya



BIOGRAPHY

Professor Dr Zamri Radzi is the Deputy Vice-Chancellor (Student Affairs) at Universiti Malaya, Kuala Lumpur, Malaysia, and former Dean of the Faculty of Dentistry as well as Chairman of the Malaysian Dental Deans' Council. He obtained his specialist degree in Orthodontics from the University of Leeds, United Kingdom, and subsequently earned Membership in Orthodontics from the Royal College of Surgeons of Edinburgh and England, and Membership of the Royal College of Physicians and Surgeons of Glasgow. He was also awarded the Fellowship of the Faculty of Dentistry from the Royal College of Surgeons in Ireland, Honorary Fellowship of the Royal College of Surgeons of England, and holds a Doctorate from the University of Oxford.

He is a Fellow of the Academy of Sciences Malaysia, Honorary Professor at Tashkent State Dental Institute, and Visiting Professor at the University of the Philippines. He serves as Chairman of the Counselling Council of Malaysian Public Universities, examiner for the Royal Colleges in Glasgow and England, and has examined internationally including at the University of Otago. He is also an assessor for Malaysian and Indonesian accreditation agencies, was a member of the Malaysian Dental Council, and currently serves as Treasurer of the South East Asia Association for Dental Education and Chairman of the Malaysian Dental Specialist COPPA.

He has secured over RM9 million in research grants, was the first user of the Target 2 ISIS Pulsed Neutron Scattering Station at STFC Rutherford Appleton Laboratory, holds more than six patents, and has won over 30 international medals. His honours include the MOHE Excellent Scientist Award and the Universiti Malaya Best Administrator Award.



IADR

INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION



SYMPOSIUM 1

Prof. Dr. Zamri Radzi

Faculty of Dentistry
Universiti Malaya



ABSTRACT

From Innovation to Impact: Intelligent Dentistry for Sustainable Global Oral Health

The rapid advancement of intelligent technologies is redefining the landscape of dentistry, offering unprecedented opportunities to enhance diagnosis, personalise treatment, and improve patient outcomes. However, the true challenge lies not in innovation itself, but in translating these advancements into meaningful, scalable impact that addresses global oral health needs.

This keynote explores the evolving role of intelligent innovation—including artificial intelligence, digital workflows, and data-driven decision-making—in transforming contemporary dental practice and research. It highlights how these technologies can support early disease detection, improve preventive strategies, and enable more precise and minimally invasive interventions. Drawing on current evidence and clinical applications, the lecture will examine how innovation can be effectively integrated into routine care while maintaining ethical standards, patient safety, and professional integrity.

Importantly, the presentation will emphasise sustainability and global relevance, considering how intelligent solutions can be adapted to diverse healthcare settings, including low- and middle-income countries, where the burden of oral disease remains disproportionately high. The role of academic institutions and leadership in driving interdisciplinary research, shaping future-ready curricula, and fostering responsible adoption of technology will also be discussed.

Ultimately, this keynote advocates for a shift from technology-driven enthusiasm to impact-oriented implementation—where intelligent dentistry is leveraged not only to advance clinical excellence, but also to promote equitable, sustainable, and globally accessible oral healthcare.



SYMPOSIUM 2



Dr. Nor Aidaniza Abdul Muttlib

School of Dental Sciences
Universiti Sains Malaysia



BIOGRAPHY

Dr. Nor Aidaniza Abdul Muttlib is a Prosthodontist and Senior Dental Lecturer at the School of Dental Sciences, Universiti Sains Malaysia. She obtained her DDS from Universiti Sains Malaysia, followed by a Master of Dental Science (Prosthodontics) from the University of Dundee, UK, and MFDS (RCS Edinburgh). She has over 15 years of clinical and academic experience in prosthodontics and maxillofacial prosthetic rehabilitation.

Her research interests include community prosthodontics, complete denture rehabilitation, maxillofacial prostheses, and innovative dental materials, with numerous publications and multiple national research grants as principal investigator. She is also actively involved in biomaterials and clinical workflow innovation to improve treatment efficiency and accessibility.

Dr Nor Aidaniza has led several community-based oral health and denture outreach programmes, particularly for rural and B40 populations in Kelantan. Her work bridges academic excellence with social responsibility, emphasising equitable access to prosthodontic care through sustainable, community-focused interventions.





SYMPOSIUM 2

Dr. Nor Aidaniza Abdul Muttlib

School of Dental Sciences
Universiti Sains Malaysia



ABSTRACT

Bridging the Distance: Prosthodontic Solutions for Rural Populations

Access to comprehensive prosthodontic care remains a significant challenge for rural populations due to geographic isolation, limited resources, and reduced availability of specialised dental services. Bridging the Distance: Prosthodontic Care for Rural Populations highlights a community-based initiative aimed at restoring oral function and improving quality of life among edentulous individuals through complete denture therapy.

This programme focused on delivering patient-centred prosthodontic care within a rural community setting, emphasising affordability, accessibility, and clinical effectiveness. Patient education on denture hygiene, maintenance, and adaptation was an integral component of care. The initiative not only addressed functional and aesthetic rehabilitation but also promoted oral health awareness and community engagement.

This outreach-based complete denture programme underscores the pivotal role of community-level prosthodontic interventions in reducing oral health disparities and enhancing the well-being of underserved rural populations. The findings support the integration of prosthodontic services into community dental programmes as a sustainable approach to bridging gaps in oral healthcare delivery.



SYMPOSIUM 2



Assoc. Prof. Dr. Haslinda Ramli

Faculty of Dentistry
Universiti Sains Islam Malaysia



BIOGRAPHY

Associate Professor Dr. Haslinda Ramli obtained her Bachelor of Dental Surgery (BDS) from the Universiti Malaya (UM) in 1999 and was awarded of Master Dental Surgery (MDS) in Periodontology by the University of Hong Kong in 2010. In 2024, she successfully completed her PhD at Universiti Kebangsaan Malaysia (UKM) with distinction for her thesis.

She is currently serving as clinical lecturer and specialist in Periodontology at Faculty of Dentistry, Universiti Sains Islam Malaysia (USIM). In addition to teaching and supervising undergraduate and postgraduate students, she is actively engaged in clinical practice and research.

She currently leads funded research exploring the properties of natural oral hygiene products for potential clinical applications. Her scholarly work includes numerous publications and books in the fields of periodontology, oral microbiology, natural products, research methodology, and Fiqh in dentistry.



**IADR**INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION**SYMPOSIUM 2****Assoc. Prof. Dr.
Haslinda Ramli**Faculty of Dentistry
Universiti Sains Islam Malaysia**ABSTRACT**

Integrating Evidence-Based Natural Oral Hygiene Practices into Modern Dentistry: A Periodontal Perspective for Sustainable Oral Health

The integration of evidence-based natural oral hygiene practices into modern dentistry represents a pertinent yet underexplored dimension of periodontal care. Traditional methods, particularly the use of chewing sticks, remain widely practiced in contemporary societies, driven by cultural values, personal preferences, cost considerations, and religious beliefs. However, limited public awareness and misconceptions often contribute to negative perceptions of these practices. Concurrently, many dental professionals have insufficient exposure to natural oral hygiene modalities, which may create communication barriers during patient oral hygiene education. From a periodontal perspective, inappropriate or inconsistent use of natural oral hygiene tools has been associated with adverse effects on periodontal tissues. Nevertheless, emerging scientific evidence suggests that, when used correctly, these methods may offer beneficial outcomes. Strengthening the evidence base through rigorous research of a mixed-methods approach is therefore essential to enhance professional confidence and societal acceptance.



IADR INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION



PRESENTATION SCHEDULE



SENIOR ORAL PRESENTATION (MAIN HALL)

Start Time	Presentation ID	Title	Presenter
11.15-11.30 am	SO1	Cost Per Quit Analysis of Smoking Cessation Interventions at UiTM Dental Smoking Cessation Clinic	Nuranida Hani Ruslan
11.30-11.45 am	SO2	Flexural Strength, Monomer Release and Wear Resistance of Occlusal Splint Materials	Nurul Liyana Aminuddin
11.45-12.00 pm	SO3	Comparative Evaluation of The Implant-Prosthesis Interface Between Conventional Titanium Abutment and Abutmentless Implant Systems	Ashvin Kaur Mangat
12.00-12.15 pm	SO4	Effect of Miswak-Based Toothbrushing on the Surface Integrity of Nanohybrid Composite Resin Restorations	Noor Ayuni Ahmad Shafiai
12.15-12.30 pm	SO5	Grit and Connections: An Egocentric Social Network Analysis of Support Networks Among UiTM Dental Students	Izyan Hazwani Baharuddin
12.30-12.45 pm	SO6	Camel Bone versus Synthetic Hydroxyapatite as Glass Ionomer Cement Modifiers: Ion Release and Mechanical Strength	Malokhat Patkhiddinova
12:45 - 2:00 pm	AGM/LUNCH		
2.00-2.15 pm	SO7	Ergonomic Practices and Interventions Among Dental Healthcare Workers: A Qualitative Exploration of Experiences and Barriers	Che Julia Jailan
2.15-2.30 pm	SO8	Digital Volumetric Assessment of Residual Tooth Structure: Predictor for Survival of Endodontically Treated Posterior Teeth	Muhammad Ab Aziz

Start Time	Presentation ID	Title	Presenter
2.30-2.45 pm	SO9	Current Progress in UC-MS-C-Derived Extracellular Vesicles for Wound Healing: A Scoping Review	Zahirrah Begam Mohamed Rasheed
2.45-3.00 pm	SO10	Expression of ADP-Ribosylation Factor-Like Protein 4C (ARL4C) in the Recurrence of Ameloblastoma: A Retrospective Study	Muhammad Nazim Aiman bin Azhari
3.00- 3.15 pm	SO11	Environmental Sustainability in Dentistry: A KAP Study Among Dental School Personnel and Students in Karachi, Pakistan	Nighat Zia Jalbani
3.15- 3.30 pm	SO12	Behavioural Pathways of Parental Influences on Oral Health Practices in Children with Congenital Heart Disease	Anis Marlina Ibne Walid
3.30-3.45 pm	SO13	Patients' Perceptions of Dental Care Financing Mechanisms in Private Clinics in Malaysia: An Exploratory Study	Nur Dini Ahmad Zawawi
3.45-4.00 pm	SO14	Restoration of Bond Strength in Saliva-Contaminated Dentine Using Decontamination Protocols	Sherko Dawan Mahmood
4.00-4.15 pm	SO15	Molecularly Optimized Marine Derived Hydrogel Scaffolds: A Translational Innovation for Oral Maxillofacial Surgery and Orthodontics.	Farid Che Ghazali
4.15-4.30 pm	SO16	Designing Stable Orthodontic Mini-Implants: A Systematic Review of Surface and Geometric Determinants	Kaiyisah Kamaludin



SENIOR ORAL PRESENTATION (DAHLIA 2 @ LEVEL 2)

Start Time	Presentation ID	Title	Presenter
3.15 -3.30 pm	SO17	Topical Fluorides to Prevent Orthodontic White Spot Lesions: A Systematic Review and Meta-Analysis	Nagham Abdullah Al-Jaf
3.30-3.45 pm	SO18	Long-term Survival and Economic Burden of Minimally Invasive Restorations for MIH in children	Nicholas Li Jie Thong
3.45-4.00 pm	SO19	Anti-Adherence Potential of Lyophilized Snail Mucin (<i>Achatina fulica</i>) Against <i>Candida albicans</i> Under Simulated Oral Conditions	Mohd Shafiq Shaffa'ee
4.00-4.15 pm	SO20	Why Malaysian Young Adults start vaping and their barriers to quitting	Nur Syareena Tajuddin
4.15-4.30 pm	SO21	Comparative Evaluation of the Effect of Sandblasting of Varying Heights of TiHo Implant Abutments on the Retention and Resistance of Surface-Treated Zirconia Blocks: An In-Vitro Study	Uday Nair



JUNIOR ORAL PRESENTATION (DAHLIA 2 @ LEVEL 2)

Start Time	Presentation ID	Title	Presenter
10.30-10.45 am	JO1	Soft Tissue Facial Profile Thickness in Different Skeletal Relationships in Malay Adults	Michelle Anne Ronnie
10.45-11.00 am	JO2	Knowledge and Visual Identification of ICDAS among Clinical Year Dental Students in Malaysia	Nur Syaqqilla Putri Muhammad Nadzri
11.00-11.15 am	JO3	Small Droplets, Big Impact: Alpha-Mangostin Nano-Emulsions for Oral Inflammation	Qiao Ting Chong
11.15-11.30 am	JO4	Comparison of Gap Distance in Two Different Fabrication Methods on Denture Framework Utilizing Innovative Denture Clasp Design.	Az Zahra' Mohtar
11.30-11.45 am	JO5	Dentalox Universe: Development, Validation, and Evaluation of Immersive AI-Supported Proto-Metaverse Oral Health Education	Nuraqilah binti Syahrul Nizar Syahabuddin
11.45-12.00 pm	JO6	Knowledge, Awareness, and Perception of Digital Dentistry Education: A Nationwide Survey of Malaysian Dental Undergraduates	Hua En Chan
12.00-12.15 pm	JO7	Differential Responses of Periodontal Ligament and Dental Pulp Stem Cells to Dental Radiographic Exposure	Fathimath Thaniya
12.15-12.30 pm	JO8	Oral Hygiene During Fixed Appliance Treatment: A Tiktok and Youtube Netnography	Pavithran M.Nagarajan
12.30-12.45 pm	JO9	Antimicrobial Efficacy of Compound 4e and 2.5% Sodium Hypochlorite against Enterococcus Faecalis Biofilm	Iffah Syazwan

Start Time	Presentation ID	Title	Presenter
AGM/LUNCH			
2.00-2.15 pm	JO10	A Comparative Study on the Setting Time and Solubility of Calcium Trisilicate-Based Materials	Jasmine Leong
2.15-2.30 pm	JO11	Feasibility of Dental Practicality Index (DPI) Use Among Clinicians at Universiti Malaya: A Quasi-Experimental Study	Ting Phi
2.30-2.45 pm	JO12	Fixing Baby Teeth: What Are Parents' True Preferences About Posterior Restorations?	Nur Sarah Qistina Binti Mohd Sani
2.45-3.00 pm	JO13	Little Smiles, Big Opinions: What Kids Think About Back Tooth Fillings	Ridania Khairul Asmawi
3.00-3.15 pm	JO14	An Audit on Pathological, Aesthetic and Functional Outcome of Neck Dissection Pattern in Oral Cancer Patients	Nur Laila Abdul Halim



JUNIOR E-POSTER PRESENTATION (DAHLIA 3 @ LEVEL 2)

Start Time	Presentation ID	Title	Presenter
8.36- 8.48 am	JP1	A Micro-Costing and Cost-Recovery Study of Single-Unit Crown Fabrication in an Academic Dental Institution	Batrisyia Aini Rozali
8.48- 9.00 am	JP2	Compressive Strength and Microstructure Assessment of Hydroxyapatite-Propolis Combination: In-Vitro Study	Nur Munirah Huda Kamilizahri
9.00- 9.12 am	JP3	Emergency Management for Paediatric Dental Patients in Universiti Teknologi MARA: A Retrospective Study	Nadia Irdina Binti Saifuddin
9.12- 9.24 am	JP4	Prevalence and Characteristics of Canalis Sinuosus in Malaysian Population: A Retrospective Study using CBCT Images	Joan Lau Hui Ling
9.24- 9.36 am	JP5	Evaluation of Root Fenestration, Dehiscence, and Maxillary Sinus Proximity in Malaysians: A CBCT Study	Shelby Ngooi Xin Min
9.36- 9.48 am	JP6	Exploratory Development of a Practical Scleral Shade Guide for Custom Ocular Prosthesis Fabrication	Alya Aiman Abdul Aziz
9.48- 10.00 am	JP7	Radiographical Mapping of the Body and Ramus of Mandible for Low Cut Orthognathic Surgery	Yasmin Hairul
10.00- 10.12 am	JP8	Influence of Surface Roughness of Various Denture Lining Materials on the Growth of Candida albicans	Syed Muhamad Raziq Syed Rosli

Start Time	Presentation ID	Title	Presenter
10.12- 10.24 am	JP9	Training Beyond Dominance: Evaluating Effectiveness of Phantom Head VS Haptic Simulator Among Left-Handed Dental Students	Ai Chi Cheah
10.24-10.36 am	JP10	Efficacy of Compound 4e and 2% Chlorhexidine against E. faecalis Biofilm: An In Vitro Study	Nurul Farhanah Huzairi



SENIOR E-POSTER PRESENTATION (DAHLIA 3 @ LEVEL 2)

Start Time	Presentation ID	Title	Presenter
10.36-10.48 am	BREAK		
10.48-11.00 am	SP1	3D-Printed Hybrid Crowns: Analysis of Marginal Adaptation, Internal Fit, and Load Capacity: A Narrative Review.	Dhina Pal
11.12- 11.24 am	SP2	Mapping Emerging Frontiers of 3D Printing in Periodontal Bone Regeneration: A Bibliometric and Visualization Analysis	Farah Fadzreen Harun
11.24-11.36 am	SP3	Efficacy Of UV Light Retainer Case for Disinfection of Vacuum Form Retainer	Al Imran Shahrul
11.36-11.48 am	SP4	Proteomic Analysis of α -mangostin Reveals Multi-Target Antimicrobial Effects against Oral Microorganisms as Dental Impression Disinfectant	Nurdiena Mohamed Nasir
11.48-12.00 pm	SP5	GIS in Dentistry: Spatial Analysis of Disease Distribution and Healthcare Accessibility	Nurin Amalina Mohamed
12.00-12.12 pm	SP6	Psychophysiological Profiling of Paediatric Dental Anxiety: Integrating Heart Rate Variability and MY-ACDAS for Personalised Care	Nor Malina Manan
12.12-12.24 pm	SP7	Artificial Intelligence Applications in the Diagnosis and Management of Periodontitis: A Review	Tengku Natasha Eleena Tengku Ahmad Noor
12.24-12.36 pm	SP8	Beyond Miswak: <i>Salvadora persica</i> Formulations in Periodontal and Wound Healing Care -A Scoping Review	Zaid Sharifuddin

Start Time	Presentation ID	Title	Presenter
12.36-12.48 pm	SP9	Artificial Intelligence-Based Detection of Dental Caries and Periapical Periodontitis Using YOLOv5	Jaloliddin Patkhiddinov
12:48 - 2:00 pm	AGM/LUNCH		
2.00 -2.12 pm	SP10	Effectiveness of Immersive Technologies and Artificial Intelligence for Smoking and Vaping Cessation: An Umbrella Review	Amirul Faiz Luai
2.12- 2.24 pm	SP11	Standardisation Of Dental Trauma Splinting Protocols: A Scoping Review of Current Evidence.	Ayesha Rafi
2.24- 2.36 pm	SP12	Surface Degradation of Conventional, CAD/CAM, and 3D-Printed Denture Base Materials	Huaida Maan Khalaf
2.36- 2.48 pm	SP13	Beyond Filling: Can Bioactive Restorative Materials Protect Restoration Margins?	Ahmad Nazirul Mubin Mughni
2.48- 3.00 pm	SP14	Preliminary Development and Alpha Review of a Web-Based Training Module on Ethical Dental Advertising for Dentists	Yasmin Kamarudin
3.00- 3.12 pm	SP15	Mechanostimulation Effects on Anxiety and Measured Physiological Parameters During Injection of Intraoral Local Anaesthesia	Hany Suraya Ab Sukor
3.12- 3.24 pm	SP16	Digital and AI-Assisted Cavity Preparation Assessment in Preclinical Dental Education: A Narrative Review	Eva Shih Yi Mu
3.24- 3.36 pm	SP17	Marginal Bone Loss (MBL) in Dental Implants Post Alveolar Ridge Preservations. A Systematic Review and Meta-Analysis of Randomized Controlled Trials (RCTs).	Fatin Nadhirah Kamaludin Latifi
3.36 -3.48 pm	SP18	Achieving a Smooth Surface for 3D-Printed Ceramic Crown Material: A Literature Review	Leng Wei Wei
3.48- 4.00 pm	SP19	Evaluation of Data Integrity in NFC-Tagged Dentures Following Chemical Disinfection.	Wan Haifa Athirah Nik Mansor

Start Time	Presentation ID	Title	Presenter
4.00- 4.12 pm	SP20	Global Research Trends on Bruxism and Implant Biomechanics: A Bibliometric Analysis	Muhammad Syazwan Junoh
4.12- 4.24 pm	SP21	A Browser-Based App for Streamlined Tooth Wear Examiner Calibration Data Collection: A Pilot Study	Liyana Mohd Subri
4.24- 4.36 pm	SP22	The Association Between Sensory Processing Difficulties and Dental Anxiety Among Children with Autism Spectrum Disorder in Klang Valley	Sangithah Tamilselvam
4.36- 4.48 pm	SP23	Microplastic Liberation from Modern Denture Base Materials: A Narrative Review of Mechanisms and Clinical Implications	Muhammad Fakhruddin Zul
4.48-5.00 pm	SP24	A Cone Beam Computed Tomographic Evaluation of Root and Root Canal Morphology in Permanent Mandibular First Molars Among a Malaysian Population	Deepak Pateel



IADR INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION



PRESENTATION ABSTRACTS



LIST OF ABSTRACTS

SENIOR ORAL PRESENTATION

- | | | |
|------------|--|----|
| S01 | COST PER QUIT ANALYSIS OF SMOKING CESSATION INTERVENTIONS AT
UITM DENTAL SMOKING CESSATION CLINIC
Nuranida Hani Ruslan | 45 |
| S02 | FLEXURAL STRENGTH, MONOMER RELEASE AND WEAR RESISTANCE OF
OCCLUSAL SPLINT MATERIALS
Nurul Liyana Aminuddin | 46 |
| S03 | COMPARATIVE EVALUATION OF THE IMPLANT-PROSTHESIS INTERFACE
BETWEEN CONVENTIONAL TITANIUM ABUTMENT AND ABUTMENTLESS
IMPLANT SYSTEMS
Ashvin Kaur Mangat | 47 |
| S04 | EFFECT OF MISWAK-BASED TOOTHBRUSHING ON THE SURFACE INTEGRITY
OF NANOHYBRID COMPOSITE RESIN RESTORATIONS
Noor Ayuni Ahmad Shafiai | 48 |
| S05 | GRIT AND CONNECTIONS: AN EGOCENTRIC SOCIAL NETWORK ANALYSIS OF
SUPPORT NETWORKS AMONG UITM DENTAL STUDENTS
Izyan Hazwani Baharuddin | 49 |
| S06 | CAMEL BONE VERSUS SYNTHETIC HYDROXYAPATITE AS GLASS IONOMER
CEMENT MODIFIERS: ION RELEASE AND MECHANICAL STRENGTH
Malokhat Patkhiddinova | 50 |
| S07 | ERGONOMIC PRACTICES AND INTERVENTIONS AMONG DENTAL
HEALTHCARE WORKERS: A QUALITATIVE EXPLORATION OF EXPERIENCES
AND BARRIERS
Che Julia Jailan | 51 |
| S08 | DIGITAL VOLUMETRIC ASSESSMENT OF RESIDUAL TOOTH STRUCTURE:
PREDICTOR FOR SURVIVAL OF ENDODONTICALLY TREATED POSTERIOR
TEETH
Muhammad Ab Aziz | 52 |
| S09 | CURRENT PROGRESS IN UC-MSC-DERIVED EXTRACELLULAR VESICLES FOR
WOUND HEALING: A SCOPING REVIEW
Zahirrah Begam Mohamed Rasheed | 53 |

SO10	EXPRESSION OF ADP-RIBOSYLATION FACTOR-LIKE PROTEIN 4C (ARL4C) IN THE RECURRENCE OF AMELOBLASTOMA: A RETROSPECTIVE STUDY Muhammad Nazim Aiman bin Azhari	54
SO11	ENVIRONMENTAL SUSTAINABILITY IN DENTISTRY: A KAP STUDY AMONG DENTAL SCHOOL PERSONNEL AND STUDENTS IN KARACHI, PAKISTAN Nighat Zia Jalbani	55
SO12	BEHAVIOURAL PATHWAYS OF PARENTAL INFLUENCES ON ORAL HEALTH PRACTICES IN CHILDREN WITH CONGENITAL HEART DISEASE Anis Marlina Ibne Walid	56
SO13	PATIENTS' PERCEPTIONS OF DENTAL CARE FINANCING MECHANISMS IN PRIVATE CLINICS IN MALAYSIA: AN EXPLORATORY STUDY Nur Dini Ahmad Zawawi	57
SO14	RESTORATION OF BOND STRENGTH IN SALIVA-CONTAMINATED DENTINE USING DECONTAMINATION PROTOCOLS Ashvin Kaur Mangat	58
SO15	MOLECULARLY OPTIMIZED MARINE DERIVED HYDROGEL SCAFFOLDS: A TRANSLATIONAL INNOVATION FOR ORAL MAXILLOFACIAL SURGERY AND ORTHODONTICS. Noor Ayuni Ahmad Shafiai	59
SO16	DESIGNING STABLE ORTHODONTIC MINI-IMPLANTS: A SYSTEMATIC REVIEW OF SURFACE AND GEOMETRIC DETERMINANTS Kaiyisah Kamaludin	60
SO17	TOPICAL FLUORIDES TO PREVENT ORTHODONTIC WHITE SPOT LESIONS: A SYSTEMATIC REVIEW AND META-ANALYSIS Nagham Abdullah Al-Jaf	61
SO18	LONG-TERM SURVIVAL AND ECONOMIC BURDEN OF MINIMALLY INVASIVE RESTORATIONS FOR MIH IN CHILDREN Nicholas Li Jie Thong	62
SO19	ANTI-ADHERENCE POTENTIAL OF LYOPHILIZED SNAIL MUCIN (<i>ACHATINA FULICA</i>) AGAINST <i>CANDIDA ALBICANS</i> UNDER SIMULATED ORAL CONDITIONS Mohd Shafiq Shaffa'ee	63
SO20	WHY MALAYSIAN YOUNG ADULTS START VAPING AND THEIR BARRIERS TO QUITTING Nur Syareena Tajuddin	64
SO21	COMPARATIVE EVALUATION OF THE EFFECT OF SANDBLASTING OF VARYING HEIGHTS OF TIHO IMPLANT ABUTMENTS ON THE RETENTION AND RESISTANCE OF SURFACE-TREATED ZIRCONIA BLOCKS: AN IN-VITRO STUDY Uday Nair	65

JUNIOR ORAL PRESENTATION

J01	SOFT TISSUE FACIAL PROFILE THICKNESS IN DIFFERENT SKELETAL RELATIONSHIPS IN MALAY ADULTS Michelle Anne Ronnie	67
J02	KNOWLEDGE AND VISUAL IDENTIFICATION OF ICDAS AMONG CLINICAL YEAR DENTAL STUDENTS IN MALAYSIA Nur Syaqilla Putri Muhammad Nadzri	68
J03	SMALL DROPLETS, BIG IMPACT: ALPHA-MANGOSTIN NANO-EMULSIONS FOR ORAL INFLAMMATION Qiao Ting Chong	69
J04	COMPARISON OF GAP DISTANCE IN TWO DIFFERENT FABRICATION METHODS ON DENTURE FRAMEWORK UTILIZING INNOVATIVE DENTURE CLASP DESIGN Az Zahra' Mohtar	70
J05	DENTALOX UNIVERSE: DEVELOPMENT, VALIDATION, AND EVALUATION OF IMMERSIVE AI-SUPPORTED PROTO-METaverse ORAL HEALTH EDUCATION Nuraqilah binti Syahrul Nizar Syahabuddin	71
J06	KNOWLEDGE, AWARENESS, AND PERCEPTION OF DIGITAL DENTISTRY EDUCATION: A NATIONWIDE SURVEY OF MALAYSIAN DENTAL UNDERGRADUATES Hua En Chan	72
J07	DIFFERENTIAL RESPONSES OF PERIODONTAL LIGAMENT AND DENTAL PULP STEM CELLS TO DENTAL RADIOGRAPHIC EXPOSURE Fathimath Thaniya	73
J08	ORAL HYGIENE DURING FIXED APPLIANCE TREATMENT: A TIKTOK AND YOUTUBE NETNOGRAPHY Pavithran M.Nagarajan	74
J09	ANTIMICROBIAL EFFICACY OF COMPOUND 4E AND 2.5% SODIUM HYPOCHLORITE AGAINST ENTEROCOCCUS FAECALIS BIOFILM Iffah Syazwan	75
J010	A COMPARATIVE STUDY ON THE SETTING TIME AND SOLUBILITY OF CALCIUM TRISILICATE-BASED MATERIALS Jasmine Leong	76
J011	FEASIBILITY OF DENTAL PRACTICALITY INDEX (DPI) USE AMONG CLINICIANS AT UNIVERSITI MALAYA: A QUASI-EXPERIMENTAL STUDY Ting Phi	77

JO12	FIXING BABY TEETH: WHAT ARE PARENTS' TRUE PREFERENCES ABOUT POSTERIOR RESTORATIONS? Nur Sarah Qistina Binti Mohd Sani	78
JO13	LITTLE SMILES, BIG OPINIONS: WHAT KIDS THINK ABOUT BACK TOOTH FILLINGS Ridania Khairul Asmawi	79
JO14	AN AUDIT ON PATHOLOGICAL, AESTHETIC AND FUNCTIONAL OUTCOME OF NECK DISSECTION PATTERN IN ORAL CANCER PATIENTS Nur Laila Abdul Halim	80

SENIOR E-POSTER PRESENTATION

SP1	3D-PRINTED HYBRID CROWNS: ANALYSIS OF MARGINAL ADAPTATION, INTERNAL FIT, AND LOAD CAPACITY: A NARRATIVE REVIEW Dhina Pal	82
SP2	MAPPING EMERGING FRONTIERS OF 3D PRINTING IN PERIODONTAL BONE REGENERATION: A BIBLIOMETRIC AND VISUALIZATION ANALYSIS Farah Fadzreen Harun	83
SP3	EFFICACY OF UV LIGHT RETAINER CASE FOR DISINFECTION OF VACUUM FORM RETAINER Al Imran Shahrul	84
SP4	PROTEOMIC ANALYSIS OF A-MANGOSTIN REVEALS MULTI-TARGET ANTIMICROBIAL EFFECTS AGAINST ORAL MICROORGANISMS AS DENTAL IMPRESSION DISINFECTANT Nurdiena Mohamed Nasir	85
SP5	GIS IN DENTISTRY: SPATIAL ANALYSIS OF DISEASE DISTRIBUTION AND HEALTHCARE ACCESSIBILITY Nurin Amalina Mohamed	86
SP6	PSYCHOPHYSIOLOGICAL PROFILING OF PAEDIATRIC DENTAL ANXIETY: INTEGRATING HEART RATE VARIABILITY AND MY-ACDAS FOR PERSONALISED CARE Nor Malina Manan	87
SP7	ARTIFICIAL INTELLIGENCE APPLICATIONS IN THE DIAGNOSIS AND MANAGEMENT OF PERIODONTITIS: A REVIEW Tengku Natasha Eleena Tengku Ahmad Noor	88
SP8	BEYOND MISWAK: SALVADORA PERSICA FORMULATIONS IN PERIODONTAL AND WOUND HEALING CARE -A SCOPING REVIEW Zaid Sharifuddin	89

SP9	ARTIFICIAL INTELLIGENCE-BASED DETECTION OF DENTAL CARIES AND PERIAPICAL PERIODONTITIS USING YOLOV5 Jaloliddin Patkhiddinov	90
SP10	EFFECTIVENESS OF IMMERSIVE TECHNOLOGIES AND ARTIFICIAL INTELLIGENCE FOR SMOKING AND VAPING CESSATION: AN UMBRELLA REVIEW Amirul Faiz Luai	91
SP11	STANDARDISATION OF DENTAL TRAUMA SPLINTING PROTOCOLS: A SCOPING REVIEW OF CURRENT EVIDENCE Ayesha Rafi	92
SP12	SURFACE DEGRADATION OF CONVENTIONAL, CAD/CAM, AND 3D-PRINTED DENTURE BASE MATERIALS Huaida Maan Khalaf	93
SP13	BEYOND FILLING: CAN BIOACTIVE RESTORATIVE MATERIALS PROTECT RESTORATION MARGINS? Ahmad Nazirul Mubin Mughni	94
SP14	PRELIMINARY DEVELOPMENT AND ALPHA REVIEW OF A WEB-BASED TRAINING MODULE ON ETHICAL DENTAL ADVERTISING FOR DENTISTS Yasmin Kamarudin	95
SP15	MECHANOSTIMULATION EFFECTS ON ANXIETY AND MEASURED PHYSIOLOGICAL PARAMETERS DURING INJECTION OF INTRAORAL LOCAL ANAESTHESIA Hany Suraya Ab Sukor	96
SP16	DIGITAL AND AI-ASSISTED CAVITY PREPARATION ASSESSMENT IN PRECLINICAL DENTAL EDUCATION: A NARRATIVE REVIEW Eva Shih Yi Mu	97
SP17	MARGINAL BONE LOSS (MBL) IN DENTAL IMPLANTS POST ALVEOLAR RIDGE PRESERVATIONS. A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS (RCTS) Fatin Nadhirah Kamaludin Latifi	98
SP18	ACHIEVING A SMOOTH SURFACE FOR 3D-PRINTED CERAMIC CROWN MATERIAL: A LITERATURE REVIEW Leng Wei Wei	99
SP19	EVALUATION OF DATA INTEGRITY IN NFC-TAGGED DENTURES FOLLOWING CHEMICAL DISINFECTION Wan Haifa Athirah Nik Mansor	100
SP20	GLOBAL RESEARCH TRENDS ON BRUXISM AND IMPLANT BIOMECHANICS: A BIBLIOMETRIC ANALYSIS Muhammad Syazwan Junoh	101

SP21	A BROWSER-BASED APP FOR STREAMLINED TOOTH WEAR EXAMINER CALIBRATION DATA COLLECTION: A PILOT STUDY Liyana Mohd Subri	102
SP22	THE ASSOCIATION BETWEEN SENSORY PROCESSING DIFFICULTIES AND DENTAL ANXIETY AMONG CHILDREN WITH AUTISM SPECTRUM DISORDER IN KLANG VALLEY Sangithah Tamilselvam	103
SP23	MICROPLASTIC LIBERATION FROM MODERN DENTURE BASE MATERIALS: A NARRATIVE REVIEW OF MECHANISMS AND CLINICAL IMPLICATIONS Muhammad Fakhruddin Zul	104
SP24	A CONE BEAM COMPUTED TOMOGRAPHIC EVALUATION OF ROOT AND ROOT CANAL MORPHOLOGY IN PERMANENT MANDIBULAR FIRST MOLARS AMONG A MALAYSIAN POPULATION Deepak Pateel	105

JUNIOR E-POSTER PRESENTATION

JP1	EFFICACY OF COMPOUND 4E AND 2% CHLORHEXIDINE AGAINST E. FAECALIS BIOFILM: AN IN VITRO STUDY Huzairi NF	107
JP2	COMPRESSIVE STRENGTH AND MICROSTRUCTURE ASSESSMENT OF HYDROXYAPATITE-PROPOLIS COMBINATION: IN-VITRO STUDY Nur Munirah Huda Kamilizahri	108
JP3	EMERGENCY MANAGEMENT FOR PAEDIATRIC DENTAL PATIENTS IN UNIVERSITI TEKNOLOGI MARA: A RETROSPECTIVE STUDY Nadia Irdina Binti Saifuddin	109
JP4	PREVALENCE AND CHARACTERISTICS OF CANALIS SINUOSUS IN MALAYSIAN POPULATION: A RETROSPECTIVE STUDY USING CBCT IMAGES Joan Lau Hui Ling	110
JP5	EVALUATION OF ROOT FENESTRATION, DEHISCENCE, AND MAXILLARY SINUS PROXIMITY IN MALAYSIANS: A CBCT STUDY Shelby Ngooi Xin Min	111
JP6	EXPLORATORY DEVELOPMENT OF A PRACTICAL SCLERAL SHADE GUIDE FOR CUSTOM OCULAR PROSTHESIS FABRICATION Alya Aiman Abdul Aziz	112
JP7	RADIOGRAPHICAL MAPPING OF THE BODY AND RAMUS OF MANDIBLE FOR LOW CUT ORTHOGNATHIC SURGERY Yasmin Hairul	113

JP8	INFLUENCE OF SURFACE ROUGHNESS OF VARIOUS DENTURE LINING MATERIALS ON THE GROWTH OF <i>CANDIDA ALBICANS</i> Syed Muhamad Raziq Syed Rosli	114
JP9	TRAINING BEYOND DOMINANCE: EVALUATING EFFECTIVENESS OF PHANTOM HEAD VS HAPTIC SIMULATOR AMONG LEFT-HANDED DENTAL STUDENTS Ai Chi Cheah	115
JP10	A MICRO-COSTING AND COST-RECOVERY STUDY OF SINGLE-UNIT CROWN FABRICATION IN AN ACADEMIC DENTAL INSTITUTION Rozali BA	116



IADR

INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION

SENIOR ORAL ABSTRACTS



Cost Per Quit Analysis of Smoking Cessation Interventions at UiTM Dental Smoking Cessation Clinic

Ruslan NH^{1,2}, Md Bohari NF¹, Mohd Radzi NA¹, Jaafar MH³, Azzeri A³

¹Centre of Population Oral Health and Clinical Prevention Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia

²Oral Health Programme, Ministry of Health, Putrajaya Malaysia

³Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia, Nilai, Negeri Sembilan, Malaysia

Email: nuranidahr@gmail.com

Objectives: Smoking cessation programmes are vital for reducing tobacco-related disease burden, and assessing their economic value is important for ensuring sustainable clinical delivery. This study aimed to evaluate the cost and outcomes of smoking cessation services provided at the Smoking Cessation Clinic (SCC), Faculty of Dentistry, Universiti Teknologi MARA (UiTM). **Methodology:** A retrospective universal sampling design was used to review 341 patients treated between January 2018 and December 2023. The evaluation was conducted from the institutional perspective. Cost-effectiveness was assessed using a cost-per-quit ratio, calculated by dividing total intervention costs (MYR) by the number of patients who successfully quit smoking within each treatment module. Interventions included behavioural counselling alone or in combination with pharmacotherapy such as nicotine replacement therapy (NRT). **Results:** Out of 341 patients, 34 (10.0%) achieved smoking abstinence at their final visit. Behavioural counselling alone accounted for the largest patient group and recorded the lowest cost per quit (MYR 1,887.09), despite a relatively low quit rate (9.0%). In comparison, combined interventions incorporating counselling, motivational interviewing (MI), and NRT produced higher cessation rates but at increased costs per quitter. The counselling plus NRT (patch and gum) group showed the highest quit rate (50.0%), although this was based on a small sample size and resulted in a higher cost per quit (MYR 8,211.84). **Conclusion:** Behavioural counselling alone was the most cost-efficient option per successful quit, whereas combined pharmacological approaches were more effective but less cost efficient. These results should be interpreted with caution due to small subgroup sizes. Future prospective studies with larger cohorts are needed to strengthen economic evaluation in smoking cessation services.

Keywords: Smoking cessation, behavioural therapy, pharmacotherapy



Flexural Strength, Monomer Release and Wear Resistance of Occlusal Splint Materials

Aminuddin NL^{1,2}, Petridis H¹

¹Department of Prosthodontics, UCL Eastman Dental Institute, London, England, United Kingdom.

²Department of Restorative Dentistry, Faculty of Dentistry, University Malaya, Kuala Lumpur, Malaysia.

Email: liyanamin@um.edu.my

Objective: To evaluate the flexural strength, monomer release and wear resistance between conventional, milled polymethylmethacrylate (PMMA) and 3D-printed resins built at 90° and 60° printing angles for occlusal splints. **Methodology:** 60-rectangular and 100-disc specimens were fabricated from heat-cured PMMA (Oracryl [HP], Bracon Dental, United Kingdom), milled PMMA (Kerox Premia [KP], Kerox Dental, Hungary) and 3D-printed resins (FreePrint Splint2.0 [FS], Detax, Ettlingen, Germany, and KeySplint Hard [KS], Keystone Industries, Myerstown, USA) at 90° and 60° printing angles. Specimens for flexural strength and wear tests were immersed immediately in 37°C water for 50 hours and thermally aged for 20,000 cycles. Flexural strength was evaluated using a three-point bend test. Wear was tested using a chewing simulator for 140,000 cycles and volume loss was calculated using Autodesk MeshMixer software. Monomer release was analysed via UV spectrophotometry over seven days. Statistical analysis was performed using Shapiro-Wilk test and one-way ANOVA with Tukey's multiple comparison tests. **Results:** KP showed the highest mean flexural strength ($115.5 \pm 5.3 \text{ MPa}$, $p < 0.0001$), followed by HP ($86.6 \pm 10.8 \text{ MPa}$, $p < 0.0001$), with 3D-printed resin showed the lowest. Meanwhile 90° FS showed greater flexural strength ($60.5 \pm 3.8 \text{ MPa}$) compared to 60° FS ($p < 0.001$) and KS ($p < 0.01$). The difference between 90° and 60° KS were not statistically significant ($p > 0.05$). Monomer release peaked on Day 3 for all groups, with KS consistently showing the highest concentration ($29.7 \pm 3.6 \text{ ppm}$), followed by FS ($28.8 \pm 3.8 \text{ ppm}$), HP ($27.9 \pm 4.9 \text{ ppm}$) and lastly, KP showed the lowest concentration ($24.9 \pm 3.8 \text{ ppm}$). KP demonstrated the lowest mean volume loss ($2.5 \pm 1.3 \text{ mm}^3$, $p < 0.01$), followed by HP ($4.4 \pm 1.7 \text{ MPa}$), whereas 3D-printed resin showed the highest. No significant wear differences were observed between 90° and 60° printing angles. **Conclusion:** Milled PMMA outperformed other materials, followed by conventional PMMA, while 3D-printed resin showed inferior performance in flexural strength, wear resistance and monomer release. Printing angles significantly influenced flexural strength but not wear properties in 3D-printed resins.

Keywords: flexural strength, monomer release, occlusal splint, wear resistance.



Comparative Evaluation of The Implant-Prosthesis Interface Between Conventional Titanium Abutment and Abutmentless Implant Systems

Mangat AK¹

¹Department of Restorative Dentistry, Faculty of Dentistry, MAHSA University
Email: ashvinkm7@gmail.com

Objectives: This study evaluated and compared the vertical misfit (VM), torque loss (TL), fracture load, and failure modes of screw-retained zirconia prostheses supported by a tissue-level abutmentless implant system (TRI Matrix®) and a conventional tissue-level Ti-base implant system (TRI Octa®). **Methods:** Twenty tissue-level implants were allocated into two groups (n = 10): abutmentless implant system (TLA) and conventional Ti-base implant system (TLC). Standardised zirconia crowns were fabricated using a digital workflow and mounted according to ISO 14801:2016. Prosthetic screws were tightened according to manufacturers' recommendations (35 Ncm for TLA; 30 Ncm for TLC). VM and percentage torque loss (%TL) were measured before and after thermal ageing (5000 cycles, 5°C–55°C). Specimens were subsequently subjected to quasi-static loading at 0°, 30°, and 45° under 100 N, 300 N, and 500 N. Fracture load testing was performed at 30°. Statistical significance was set at $\alpha = 0.05$. **Results:** Following thermal aging, TLA demonstrated no detectable change in VM, whereas TLC showed a significant increase. Under quasi-static loading, TLC exhibited progressively greater VM, particularly under non-axial loading, while TLA maintained minimal changes. Both systems demonstrated significant TL after thermal aging, with greater %TL observed in TLC. The highest post-loading %TL occurred at 45°/500 N in both groups, with TLC recording higher values. Fracture load did not differ significantly between groups. Failure modes in TLA were predominantly prosthesis- and screw-related, whereas TLC mainly exhibited implant-related failures. **Conclusion:** Within the limitations of this in vitro study, the abutmentless implant system demonstrated superior maintenance of passive fit and torque stability compared with the conventional Ti-base implant system following thermal ageing and quasi-static loading, while both systems exhibited comparable fracture resistance.

Keywords: Abutmentless implant; Ti-base; Hybrid-abutment connection; Vertical misfit; Torque Loss.



Effect of Miswak-Based Toothbrushing on the Surface Integrity of Nanohybrid Composite Resin Restorations

Noor Ayuni Ahmad Shafiai¹, Helen Ng Lee Ching², Noor Azlin Yahya³

¹Department of Dental Science, Pusat Kanser Tun Abdullah Ahmad Badawi, Universiti Sains Malaysia, 13200 Kepala Batas, Pulau Pinang, Malaysia

²Biomaterial Research Laboratory, Dental Specialist & Research Tower, Faculty of Dentistry, Universiti Malaya, 50603 Kuala Lumpur, Malaysia

³Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya, 50603 Kuala Lumpur, Malaysia

Email: noorayuni@usm.my

Objectives: Miswak contains silica that aids plaque biofilm removal; however, its abrasive effect on restorative materials remains poorly studied. This study investigated the effect of miswak-based toothbrushing on the surface roughness of nanohybrid composite resin restoration. **Methods:** Ninety disc-shaped specimens (10 mm diameter × 2 mm thickness) were fabricated from three nanohybrid composite materials: Luna (LN), AB (Aura Bulk Fill), and SS (Simplishade) (n=30 each). After curing and polishing, specimens underwent simulated toothbrushing for 5,000 and 10,000 cycles using three brushing methods: miswak toothbrush, miswak stick, and conventional toothbrush with toothpaste. Surface roughness (Ra) was measured at baseline (T0), after 5,000 cycles (T1), and after 10,000 cycles (T2) using an Infinite Focus Optical 3D Measurement G4e machine. **Results:** Baseline analysis showed no significant differences in surface roughness among composite materials or toothbrush groups ($p>0.05$). Mixed-design ANOVA revealed a significant effect of brushing duration on surface roughness ($p<0.001$), with roughness increasing over time. A significant interaction was observed between brushing duration and toothbrush type ($p<0.001$), indicating that the effect varied according to brushing method. Restorative material type ($p=0.037$) and toothbrush type ($p<0.001$) significantly affected surface roughness. Post hoc analysis showed AB had significantly higher roughness than LN ($p=0.034$). Both miswak and miswak toothbrush groups produced significantly greater surface roughness than the conventional toothbrush group ($p<0.001$), while no significant difference was found between the two miswak-based methods ($p=0.233$). **Conclusions:** Miswak-based brushing significantly increased the surface roughness of nanohybrid composite restorative materials after prolonged simulated brushing, whereas conventional toothbrushing maintained roughness within clinically acceptable limits. Clinicians should consider patients' oral hygiene practices when advising individuals with composite restorations.

Keywords: Abrasion, Composite Resins, Miswak, Surface Roughness, Toothbrushing



Grit and Connections: An Egocentric Social Network Analysis of Support Networks Among UiTM Dental Students

Izzyan Hazwani Baharuddin¹, Adleena Md Yunos¹, Ahmad Danial Murad¹

¹Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Sungai Buloh Campus, 47000 Sungai Buloh, Selangor, Malaysia

Email: izyan9192@uitm.edu.my

Objective: Dental education is academically and clinically demanding, yet most studies examine grit mainly as an individual trait while overlooking students' support networks. This study aimed to examine the structure of egocentric support networks and their association with grit among undergraduate dental students. **Methods:** A cross-sectional questionnaire-based study was conducted among 197 Bachelor of Dental Surgery students from Year 1 to Year 5 at Universiti Teknologi MARA (UiTM). Participants completed demographic items, the 8-item Short Grit Scale, and egocentric network questions. Using name generator and name interpreter techniques, each student nominated up to five individuals who provided academic, practical, or emotional support. Network compositional and homophily measures were derived for each respondent. Hierarchical linear regression was performed by sequentially entering demographic, psychosocial, and egocentric network variables. **Results:** The mean grit score was 3.41 (SD = 0.57). Students nominated 408 alters, with an average of two alters per ego. Most alters were friends or peers (48.8%), followed by parents (40.4%), and emotional support was rated highest (mean = 4.43, SD = 0.80). The addition of psychosocial variables increased the adjusted R² from 17.6% to 27.3%, while the inclusion of network characteristics further improved the model to 29.8%. In the final model, lower grit was associated with being in Year 4 ($\beta = -0.27$, $p = 0.007$), higher perceived stress ($\beta = -0.21$, $p < 0.001$), monthly family interaction ($\beta = -0.30$, $p = 0.024$), and greater gender homophily within support networks ($\beta = -0.31$, $p = 0.006$). **Conclusion:** Egocentric network characteristics provided additional explanatory value beyond individual and psychosocial factors. The findings suggest that grit among dental students is shaped not only by psychological factors, but also by the structure of their support networks. Strengthening diverse, supportive peer environments may help sustain resilience and long-term effort during dental training.

Keywords: dental education; grit; egocentric social network analysis; peer support; homophily



Camel Bone versus Synthetic Hydroxyapatite as Glass Ionomer Cement Modifiers: Ion Release and Mechanical Strength

Patkhiddinova M¹, Yahya NA^{1,2}, Diab RA¹, Ubaidillah AHA¹, Khurshid Z^{3,4,5}

¹Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.

²Department of Conservative Dentistry, Faculty of Dental Medicine, Universitas Airlangga, Surabaya, Indonesia

³Department of Prosthodontics and Dental Implantology, College of Dentistry, King Faisal University, Al Ahsa, Saudi Arabia.

⁴Center of Excellence for Regenerative Dentistry, Department of Anatomy, Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand.

⁵Department of Oral and Maxillofacial Surgery, Biruni University, Istanbul, Turkey.

Email: 23070526@siswa.um.edu.my

Objective: Glass ionomer cements (GICs) offer fluoride release and chemical adhesion, yet modest mechanical strength limits their durability in stress-bearing restorations. Hydroxyapatite (HA) has been proposed as a bioactive filler, but the effect of HA origin on GIC performance remains unclear, and camel bone-derived HA (CBHA) has not previously been investigated as a GIC modifier. This study compared CBHA and synthetic HA (SHA) incorporation into commercial GIC on ion release and mechanical strength. **Methods:** CBHA and SHA microparticles were incorporated into a conventional GIC (Riva Self Cure, SDI) at 5 wt% and 10 wt%, with unmodified GIC as control. Fluoride release was measured by ion-selective electrode, and calcium and phosphorus release by ICP-OES at 1, 7, 14, and 28 days (n=3). Compressive and flexural strength were tested at 1 and 7 days (n=10). All data were analysed using repeated measures ANOVA with Turkey post-hoc (p<0.05). **Results:** Ion release declined progressively in all groups. Calcium release remained low with no significant intergroup differences. CBHA modified GICs showed significantly higher phosphorus release at day 1 and higher fluoride release at days 7 and 14 than SHA and control groups (p<0.05). Compressive and flexural strength increased significantly from day 1 to day 7 in all groups (p<0.05). At day 7, SHA-modified GICs showed higher compressive strength than control and CBHA groups, with 10% SHA reaching 162.3±29.1 MPa versus 148.6±29.8 MPa for control and 135.3±22.3 MPa for 10% CBHA (p>0.05). All HA-modified groups demonstrated significantly higher flexural strength than control at day 1 (p<0.05), with differences becoming non-significant by day 7. **Conclusion:** These findings indicate that HA origin differentially affects GIC performance: SHA tended to support greater compressive strength development, whereas CBHA promoted higher phosphorus and fluoride release, reflecting a measurable trade-off between mechanical and bioactive properties that requires further long-term evaluation.

Keywords: camel bone; glass ionomer cement; hydroxyapatite; mechanical properties



Ergonomic Practices and Interventions Among Dental Healthcare Workers: A Qualitative Exploration of Experiences and Barriers

Jailan CJ^{1,3}, Ruslan NH^{1,3}, Mohd Aris MS², Anwar DS³, Mohd Radzi NA³

¹Oral Health Programme, Ministry of Health Malaysia, Kuala Lumpur, Malaysia

²Centre of Environmental Health and Safety, Faculty of Health Sciences, Universiti Teknologi MARA (UiTM), Bandar Puncak Alam, Selangor, Malaysia

³Centre of Population Oral Health and Clinical Prevention Studies, Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Sungai Buloh, Selangor, Malaysia

Email: 2024481966@student.uitm.edu.my

Objective: Dental healthcare workers (DHCWs) face high risks of work-related musculoskeletal disorders, yet systemic barriers often hinder the adoption of effective ergonomic interventions. This study aimed to explore the experiences and perspectives of Malaysian DHCWs regarding ergonomic practices and the challenges of implementing these interventions. **Methods:** Seven focus group discussions (FGDs) were conducted with four participants per group (N=28), representing a diverse sample from almost all states across Malaysia. Groups consisted of a heterogeneous and homogeneous mix of dental officers, therapists, technologists, and surgery assistants. Qualitative data were managed and analysed thematically using NVivo software. **Results:** Thematic analysis revealed that occupational environments, task complexity, and poor body mechanics heavily contribute to work-related back pain, which severely impacts DHCWs' functional capacity, productivity, and psychosocial well-being. Participants normalized back pain due to high workloads while facing systemic organizational barriers including budget limits, staffing shortages, and a lack of formalised institutional training. Regarding interventions, participants prioritized educational training and ergonomic equipment (such as adjustable stools and loupes) over stretching exercises and participatory approaches, which were deemed less practical due to clinical workflow constraints and unsupportive feedback mechanisms. Supplemental recommendations emphasized integrating ergonomic screening into annual medical check-ups and involving end users in procurement. **Conclusion:** DHCWs face significant physical strain alongside systemic organizational barriers to ergonomic compliance. Protecting workforce well-being and clinical productivity requires institutionalizing foundational educational training, improving equipment procurement, and integrating ergonomic risk planning into national healthcare policies.

Keywords: Dental healthcare workers, Ergonomics, Qualitative research, Workplace interventions, Work-related back pain



Digital Volumetric Assessment of Residual Tooth Structure: Predictor for Survival of Endodontically Treated Posterior Teeth

Ab Aziz M^{1,2}, Rahim N², Austin R², Mannocci F²

¹Restorative Department, Faculty of Dentistry, Universiti Malaya, Malaysia

²King's College London, United Kingdom

Email: mhusaini@um.edu.my

Objective: To evaluate the association between residual coronal tooth structure and the survival of endodontically treated posterior teeth and their CAD/CAM nanohybrid ceramic–resin restorations using intraoral scanner-based volumetric assessment.

Methods: A total of 99 patients contributing 124 endodontically treated posterior teeth restored with either partial onlays or full crowns fabricated from a nanohybrid ceramic–resin CAD/CAM material (Cerasmart, GC Europe) were followed for up to 6 years. Residual tooth volume after preparation was quantified using three-dimensional intraoral digital scans and expressed as percentage volume remaining. Tooth and restoration survival were analysed using Kaplan–Meier analysis, while univariable and multivariable regression analyses were performed to identify prognostic factors associated with survival outcomes. Receiver operating characteristic analysis identified the optimal prognostic threshold for residual tooth volume. Statistical significance was set at $p < 0.05$. **Results:** At 6 years, overall restoration survival was 75.3%, with onlays demonstrating significantly higher survival than full crowns (82.3% vs 59.3%; $p = 0.009$). Overall tooth survival was 93.3%. Receiver operating characteristic analysis identified 40% residual tooth volume as the optimal threshold. Teeth with $>40\%$ residual volume demonstrated significantly improved restoration and tooth survival ($p < 0.05$). In multivariable analysis, residual tooth volume $>40\%$ remained the only consistent independent predictor of both restoration and tooth survival, while fewer than three remaining coronal walls were independently associated with restoration failure. **Conclusions:** Volumetrically quantified residual coronal tooth structure was the primary determinant of both restoration and tooth survival in endodontically treated posterior teeth. Three-dimensional intraoral scanning provides an objective and reproducible method for assessing restorability and may support more standardised prognostic evaluation and treatment planning. Within the limitations of this cohort, CAD/CAM nanohybrid ceramic–resin restorations demonstrated acceptable tooth survival over 6 years, although restoration survival was lower than that reported for several conventional indirect restorative materials.

Keywords: Endodontically treated teeth, Residual tooth volume, Intraoral scanning, CAD/CAM restorations



Current Progress in UC-MSC-Derived Extracellular Vesicles for Wound Healing: A Scoping Review

Nurul Aisya RA¹, Nurul Shaqinah N¹, **Zahirrah Begam MR¹**

¹Faculty of Dentistry, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia
Email: zahirrah.rasheed@ukm.edu.my

Objectives: This scoping review explored current technologies involving umbilical cord mesenchymal stem cell-derived extracellular vesicles (UCMSC-EVs) for wound healing applications. It also identified research gaps and limitations to support sustainable future directions and clinical translation. **Materials and Methods:** PubMed, Web of Science, and Scopus were searched from database inception to 2025. The review followed PRISMA-ScR guidelines, and data were extracted using predefined criteria. Eligible studies assessed at least one wound-healing outcome in both in vitro and in vivo models and reported EV isolation and characterisation. Studies focusing on non-wound applications or lacking either model were excluded. **Result:** Twenty-three studies met the inclusion criteria. Two studies did not adhere to MISEV 2023 recommendations on the characterisation of EV, particularly in total protein quantification. Despite strict recommendations from MISEV 2023 on protein-content-based EV characterisation, none of the analysed studies identified category 3 proteins as EV hallmarks. Most in vitro studies utilised HUVECs as a wound model, with EV doses ranging from 1.1×10^8 to 1×10^{11} particles/mL or 2.5-200 µg/mL. In vivo studies were conducted primarily in mice (n=16) and rats (n=7), with EV doses ranging from 10-200 µg per administration in mice and 40-500 µg/kg in rats. Key gaps included limited transparency regarding MSC passage numbers, EV yields, and comparative isolation methods, as well as inconsistencies in treatment dosing and administration times. **Conclusion:** UCMSC-EV technologies may enable higher EV yields, however, most studies reported no statistically significant improvement over conventionally isolated UCMSC-EVs using ultracentrifugation. Standardised protocols and scalable production strategies are needed to facilitate clinical translation.

Keywords: umbilical cord mesenchymal stem cells; extracellular vesicles; wound **healing**



Expression of ADP-Ribosylation Factor-Like Protein 4C (ARL4C) in the Recurrence of Ameloblastoma: A Retrospective Study

MNAAzhar¹, SA Inche Zainal Abidin², BSMS Siriwardena³, CC Tan¹, LF Yap², YC Goh¹, WM Tilakaratne¹

¹Department of Oral and Maxillofacial Clinical Sciences, Faculty of Dentistry, Universiti Malaya, Malaysia

²Department of Oral and Craniofacial Sciences, Faculty of Dentistry, Universiti Malaya, Malaysia

³RAK College of Dental Science, RAK Medical and Health Science University, UAE

Email: nazimaiman.na@gmail.com

Objective: Ameloblastoma is a benign epithelial neoplasm of the gnathic bones exhibiting locally aggressive behaviour and high recurrence rate following treatment. Postoperative facial and functional morbidities highlight the need for a reliable biomarker that can independently predict recurrence. ADP-ribosylation factor-like protein 4C (ARL4C) has been implicated in the tumourigenesis of ameloblastoma and is associated with shorter recurrence-free survival (RFS) in several human malignancies. Thus, this study aimed to evaluate the immunohistochemical expression of ARL4C as a biomarker in predicting recurrence of ameloblastoma. **Methods:** This retrospective study included 34 conventional ameloblastoma with no recurrence (AMNR), 20 primary tumour of ameloblastoma with known recurrence (PAMR) and 20 recurrent ameloblastoma (RAM) from the same patient as PAMR group. Immunohistochemical expression of ARL4C was assessed using the immunoreactive scoring (IRS) method and ARL4C expression between groups were subsequently compared using the Mann-Whitney and Wilcoxon signed-rank tests. Cox proportional hazards models were performed to identify independent predictors of recurrence while the Kaplan–Meier analysis was applied to analyse RFS based on the optimal IRS cut-off value derived from receiver operating characteristic (ROC) analysis. **Results:** Cytoplasmic staining of ARL4C revealed significant overexpression in PAMR compared to AMNR ($p < 0.001$), while the expression remained stable between paired PAMR and RAM samples ($p > 0.05$). Higher ARL4C expression and conservative treatment were identified as the independent risk predictors of recurrence ($p < 0.05$). $IRS \geq 9$ was significantly associated with shorter RFS ($p < 0.001$). **Conclusion:** ARL4C may play a role as an independent biomarker for predicting recurrence in ameloblastoma and may be beneficial when incorporated in the diagnostic and management framework of this tumour.

Keywords: Ameloblastoma, ARL4C, recurrence, predictor



Environmental sustainability in Dentistry: A KAP Study Among Dental School Personnel and Students in Karachi, Pakistan

Nighat Zia^{1,2}, Jennifer Geraldine Doss¹, Jacob John³, Jeneen Panezai⁴

¹Department of Community Oral Health & Clinical Prevention, Faculty of Dentistry Universiti Malaya, Kuala Lumpur, Malaysia.

²Department of Community Dentistry, School of Dentistry, SZABMU, Islamabad, Pakistan.

³Department of Restorative Dentistry, Faculty of Dentistry Universiti Malaya, Kuala Lumpur, Malaysia.

⁴A.T. Still Research Institute Centre for Oral Health Research, School: A.T. Still University Missouri School of Dentistry & Oral Health (ATSU-MOSDOH), St. Louis, Missouri, USA.

Email: nigzia22@hotmail.com

Objectives: This research aims to assess the knowledge, attitude, and practice (KAP) of dental school personnel and students regarding environmental sustainability in dentistry in clinics of all dental schools, Karachi, Pakistan. The study identifies awareness levels, comparative analysis of KAP with socio-demographic profiles and explore barriers and enablers to guide strategies for embedding sustainability into dental curricula and promoting eco-friendly practices. **Methods:** This study used a mixed-methods explanatory sequential design. Beginning with a census-based quantitative survey of 3,356 participants across 13 dental institutions, followed by qualitative purposive in-depth interviews with 10 executive-level stakeholders. **Results:** The study revealed that undergraduate and postgraduate students had the highest mean knowledge score (5.8), and attitudes were most favourable among faculty and postgraduates. Practice scores are generally fair for all target groups (with a lot of variances at domain level). The practice mean was greatest among clinical faculty (50.6), followed by postgraduates (47.6), undergraduates (43.6), and auxiliary (46.5). Overall, significant variations in KAP were found between institutions and sectors. Qualitative analysis highlighted government SDG's aligned green research initiatives, institutional support, patient awareness, and digitalisation as key enablers, while barriers included financial constraints, knowledge deficits, no formal sustainability education and leadership challenges. **Conclusion:** This study highlights notable variations in KAP across different groups. While awareness and positive attitudes toward environmental sustainability exist, systemic barriers hinder implementation. Strategies such as curriculum reform, policy development, and multi-stakeholder engagement are essential for promoting sustainability in dentistry. The findings offer strategic guidance for educators, institutional leaders, and policymakers to advance sustainable transformation within dental education and clinical practice.

Keywords: Environmental Sustainability, Dental Education, KAP Study, Eco-friendly Dentistry



Behavioural Pathways of Parental Influences on Oral Health Practices in Children with Congenital Heart Disease

Anis Marlina Ibne Walid¹, Lily Azura Shoaib¹, Nabihah Dziaruddin¹, Norazah Zahari²

¹Department of Orthodontics, Paediatric & Special Care Dentistry, Faculty of Dentistry, Universiti Malaya

²Department of Paediatrics, Faculty of Medicine, Universiti Malaya

Email: anis_marlina@yahoo.com

Objectives: Children with congenital heart disease (CHD) are medically vulnerable and experience increased risk of oral diseases and systemic complications, including infective endocarditis. This study explored behavioural pathways linking parental knowledge and attitudes with oral health practices and clinical oral health outcomes among children with CHD. **Methodology:** A multicentre cross-sectional study was conducted among 353 caregiver-child dyads recruited from seven tertiary paediatric cardiology centres in Malaysia. Caregivers completed the validated bilingual Parental Knowledge, Attitudes and Practices on Oral Health Care (PKAP-OH Care) questionnaire, while children underwent standardised oral examinations for dental caries (DMFT/dmft) and gingivitis (Lobene Modified Gingival Index). Construct reliability and convergent validity of the reflective measurement model were established prior to structural model evaluation. Partial Least Squares Structural Equation Modelling (PLS-SEM) with bootstrapping (5,000 resamples) was used to examine hypothesised behavioural pathways between parental determinants, children's oral health practices, and clinical oral health outcomes. **Results:** Children had a mean age of 5.53 years. Dental caries and gingivitis were prevalent, affecting 43.9% and 57.5% of children, respectively. The PLS-SEM model demonstrated that parental knowledge significantly predicted children's oral health practices ($\beta = 0.201$, $p < 0.001$), while parental attitudes also showed a significant positive association ($\beta = 0.250$, $p < 0.001$). Oral health practices demonstrated only a weak association with dental caries outcomes ($\beta = 0.114$, $p = 0.035$), while associations with gingivitis were not significant. Mediation analyses showed no significant indirect effects of parental knowledge or attitudes on dental caries or gingivitis through child oral health practices. **Conclusions:** Parental knowledge and attitudes are important behavioural determinants influencing oral health practices among children with CHD. However, clinical oral health outcomes appear to be shaped by broader medical, biological, and contextual vulnerabilities. Findings support integrated cardiology-dental preventive pathways that move beyond parental education alone.

Keywords: Behavioural pathways, Congenital heart disease, Oral health practices, Parental determinants, PLS-SEM



Patients' Perceptions of Dental Care Financing Mechanisms in Private Clinics in Malaysia: An Exploratory Study

Nur Dini Ahmad Zawawi^{1,2}, Ainol Haniza Kherul Anuwar¹, Aina Najwa Mohd Khairuddin¹

¹Department of Community Oral Health & Clinical Prevention, Faculty of Dentistry, University Malaya

²Department of Family Oral Health, Faculty of Dentistry, Universiti Kebangsaan Malaysia
Email: 23110205@siswa.um.edu.my

Objectives: Financial protection is a critical component of World Health Organization Universal Health Coverage. In Malaysia, private dental services are largely financed through out-of-pocket (OOP) payments, with limited coverage from employee benefit schemes or private insurance. This study aimed to explore patients' perceptions and experiences of dental care financing mechanisms, factors influencing financing preferences and decision-making, and barriers to accessing private dental services.

Methods: This exploratory qualitative study employed in-depth interviews (IDIs) using a validated semi-structured topic guide. Participants included adults from different socioeconomic backgrounds who had sought treatment in private dental clinics within the past year. Maximum variation purposive sampling was utilized. Data were transcribed verbatim and analysed thematically using Atlas.ti software. **Results:** A total of 13 participants were interviewed (OOP, n = 7; employee benefit schemes, n = 6). Emerging themes related to OOP payments included perceived limitations in payment options, affordability concerns, and value perception. Participants using employee benefit schemes described these mechanisms as convenient and valuable, but their utilisation of dental services was often dependent on benefit availability and coverage limits. Financial considerations, financial management behaviour, accessibility and convenience, time-related experiences, and perceived value influenced participants' financing preferences, decision-making, and satisfaction. Participants paying through OOP reported financial barriers that delayed or limited care-seeking, whereas those using employee benefit schemes experienced restricted utilisation due to low capped limits and pooled benefit structures, resulting in competing health priorities. Suggested strategies to address these barriers included enforcing fee schedules, introducing structured oral healthcare schemes, and implementing age-specific fee packages. **Conclusions:** To improve access and affordability of private dental care, health financing reforms should address the financial barriers associated with OOP payments and the structural limitations of employee benefit schemes through sustainable, targeted measures.

Keywords: Dental care, employee benefit, health financing, OOP, panel clinic



Restoration of Bond Strength in Saliva-Contaminated Dentine Using Decontamination Protocols

NSherko D¹, Yahya NA¹, Kusumasari C², Abdou A¹

¹Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.

²Department of Conservative Dentistry, Universitas Indonesia, Jakarta, Indonesia.

Email: 65dawan@gmail.com

Objective: Saliva exposure during adhesive procedures can compromise the adhesive bond formed between the resin composite and dentine. This study evaluated the effect of salivary contamination and different decontamination protocols on the micro-shear bond strength (μ SBS) of resin composite to mid-coronal dentine after thermocycling. **Methods:** Extracted human molars ($n = 48$) were prepared to expose mid-coronal dentine. Specimens were contaminated with fresh human saliva and randomly assigned to six groups: control (no contamination), water rinse, 70% ethanol, adhesive application, Katana Cleaner, and Papacárie Duo. Following decontamination, Universal adhesive (Beautibond Xtreme) was applied to the dentine surface for 10 seconds, then air-dried and light-cured according to the manufacturer's instructions. Resin composite micro-rods ($n = 4$ rods/teeth) were then bonded to the prepared dentine surface. Specimens were subjected to 5,000 thermocycles (5–55°C), after which μ SBS was measured using a universal testing machine. Failure modes were analysed using stereomicroscopy. Data were analysed using one-way ANOVA with significance set at $\alpha = 0.05$. **Results:** Significant differences in μ SBS were observed among groups ($p < 0.001$). The adhesive group demonstrated the highest bond strength (26.64 ± 5.84 MPa), which was significantly greater than all other groups ($p < 0.05$). Ethanol (21.72 ± 5.39 MPa), Katana Cleaner (19.38 ± 6.99 MPa), Papacárie Duo (18.42 ± 6.21 MPa), and the uncontaminated control (18.18 ± 7.48 MPa) showed comparable values. The water rinse group exhibited the lowest μ SBS (16.67 ± 7.34 MPa) and was not significantly different from the control. **Conclusion:** Adhesive application and 70% ethanol effectively restored bond strength following salivary contamination, with adhesive demonstrating superior performance. All other cleaners improved the bonding performance, while water rinsing alone was ineffective. Adhesive-as-cleaner may represent a practical and clinically relevant decontamination strategy.

Keywords: Decontamination, Dentine Bonding, Micro-shear Bond Strength, Salivary Contamination



Molecularly Optimized Marine-Derived Hydrogel Scaffolds: A Translational Innovation for Oral Maxillofacial Surgery and Orthodontics

Farid Bin Che Ghazali¹, Rasheed Abu Salam¹

¹School of Dentistry, Lincoln University College, Malaysia. Wisma Lincoln, No. 12-18, Jalan SS 6/12, 47301 Petaling Jaya, Selangor Darul Ehsan, Malaysia.

Email: faridghazali@lincoln.edu.my

Objectives: Conventional grafts in oral maxillofacial surgery fail due to structural-mechanical mismatch and limited biological signalling. We hypothesised that molecularly optimised low-molecular-weight fucosylated chondroitin sulfate (LMW-FucCS) hydrogel scaffolds derived from *Stichopus vastus* function as a bio-informational platform capable of actively orchestrating tissue regeneration. **Methods:** LMW-FucCS (<10 kDa) was synthesised via controlled depolymerisation and validated using FTIR and multi-nuclear ¹H/¹³C NMR spectroscopy, confirming sulfation and fucosylation signatures. Scaffold architecture was characterised by SEM/TEM (125±20µm porosity; ~50nm fibrillar network) and AFM mechanical mapping (25–50 kPa). In vitro cytocompatibility was assessed in L929 fibroblasts (>96.8% viability). In vivo efficacy was evaluated using Sprague-Dawley rat full-thickness excisional wound models with topical (1µg/mL) and systemic (2mg/kg) administration. **Results:** The optimised scaffolds demonstrated marked regenerative superiority. Wound contraction reached 73.61±1.39% versus 55.56±4.12% in controls (p<0.01), representing an 18% acceleration. Systemic delivery (2mg/kg) produced early kinetic dominance, achieving complete tissue bridging by Day 12. Histological analysis revealed accelerated epithelialisation, organised collagen architecture, and enhanced angiogenesis. Mechanistically, scaffolds induced a 2.4-fold increase in IL-10, reduced inflammatory cell infiltration, and activated Smad2/3 and ERK1/2 signalling pathways (p<0.01), consistent with rapid immunological transition and matrix synthesis. Structural-mechanical compatibility (25–50 kPa) prevented fibrotic signalling while sustaining cellular bioenergetics. **Conclusion:** Molecularly optimised marine-derived hydrogel scaffolds achieve dual functionality as structural matrices and bio-informational regulators of healing. By resolving structural-mechanical mismatch and driving angiogenic, immunological, and cellular signalling cascades, this platform delivers a paradigm shift from passive grafting to instruction-guided regeneration, with strong translational relevance for oral maxillofacial and orthodontic reconstruction.

Keywords: Biomaterials, Hydrogel scaffolds, Marine glycosaminoglycans, Oral maxillofacial regeneration, Orthodontics



Designing Stable Orthodontic Mini-Implants: A Systematic Review of Surface and Geometric Determinants

Kaiyisah Kamaludin¹, Maryati Md Dasor^{1,2}, Syed Bazli Alwi Syed Bakhtiar Ariffin¹, Nurul Aida Ngah³

¹Centre of Paediatric Dentistry and Orthodontic Studies, UiTM Sungai Buloh, Selangor

²School of Dentistry, Management and Science University, Shah Alam, Selangor

³Centre of Studies for Oral and Maxillofacial Surgery, UiTM Sungai Buloh, Selangor

Email: kaiyisahkamaludin6008@gmail.com

Objectives: Orthodontic mini-implants (OMIs) are widely used as temporary anchorage devices to support complex tooth movement. Despite their clinical advantages, failure remains unpredictable because stability depends on the interaction between implant design, surface characteristics, bone quality, and insertion protocol. Although numerous studies have examined surface modification, thread geometry, implant dimensions, and insertion trajectory, the evidence remains fragmented, and it is still unclear which design features enhance stability without increasing biological or anatomical risks. Therefore, this systematic review aimed to identify, analyse, and evaluate the influence of implant design and surface engineering on the primary and secondary stability of OMIs. The specific objective was to synthesize evidence on how surface texture, thread configuration, implant length and diameter, insertion depth, and site-specific planning affect stability outcomes. **Methods:** Electronic searches were conducted in Web of Science, Scopus, and PubMed up to September 2025, following PRISMA guidelines. Eligible English-language clinical, animal, and in vitro studies were critically appraised and thematically synthesized. **Results:** The findings showed that oxidized, etched, and moderately roughened surfaces improved functional stability by increasing removal torque after loading, suggesting enhanced bone-implant contact. However, excessive roughness or hydrophobicity may increase removal resistance and tissue trauma. Dual-thread and self-drilling designs improved mechanical retention, while implant length appeared more influential than small diameter changes, particularly in low-density bone. **Conclusions:** Overall, predictable OMIs stability requires a balanced design strategy that integrates moderate surface texture, appropriate thread geometry, conservative dimension selection, and site-specific planning.

Keywords: Orthodontic mini-implant, temporary anchorage devices, implant stability, implant design



Topical Fluorides to Prevent Orthodontic White Spot Lesions: A Systematic Review and Meta-Analysis

KAl-Jaf NMA¹, Zhang S², Zurin Adnan MAM¹, Adam FA³

¹Centre of Paediatric Dentistry and Orthodontic Studies, Faculty of Dentistry, Universiti Teknologi MARA, Malaysia

²Physician Dental Unit, Traditional Chinese Medicine and Mongolian Medicine Hospital, Inner Mongolia Autonomous Region, China.

³Centre of Periodontology Studies, Faculty of Dentistry, Universiti Teknologi MARA, Malaysia
Email: nagham@uitm.edu.my

Introduction: White spot lesions (WSLs) are a common side effect of orthodontic treatment. Fluoride has been shown to prevent the further development of white spot lesions. However, there is a need for an update on the effectiveness of self-applied fluoride. **Objective:** To systematically evaluate the effectiveness of fluoride toothpaste and mouthwash in preventing white spot lesions caused by orthodontic treatment.

Methodology: Multiple databases were searched (PubMed, Embase, SCOPUS, Cochrane Library, and Web of Science), for articles published between 2000 and 2024, using predetermined keywords. The main observational metric was the incidence of WSLs. Based on the abstracts, full-text papers were searched, key outcome data were extracted and risk of bias assessed. Two independent reviewers conducted the assessment, and a third investigator, who was independent of the reviewers, resolved any disagreements.

Results: Six randomized controlled trials covering 393 patients were analysed. Five studies were at low risk of bias, and one was at moderate risk of bias. All six studies provided data for the meta-analysis, and after the meta-analysis, the prevention effect was not statistically significant. **Conclusions:** Based on this review and meta-analysis, it can be concluded that topical application of fluoride does not appear to prevent the development of WSLs during orthodontic treatment. Due to the limited number of clinical trials, further research is needed to determine the type of fluoride, fluoride concentration, and frequency of use in patients undergoing orthodontic treatment to make further determinations.

Keywords: Fluorides, orthodontics, white spot lesion, systematic review



Long-term Survival and Economic Burden of Minimally Invasive Restorations for MIH in Children

Thong NLJ¹, Kherul Anuwar AH², Tengku Hamzah TNN¹

¹Department of Orthodontics, Paediatric Dentistry and Special Care Dentistry, Faculty of Dentistry, Universiti Malaya.

²Department of Community Oral Health & Clinical Prevention, Faculty of Dentistry, Universiti Malaya.

Email: xpireance@gmail.com

Objectives: Cavitated molar incisor hypomineralisation (MIH) affected molars often require repeated restorative care, contributing to treatment, family and health service burden. Evidence on long-term survival and economic implications of minimally invasive restorative strategies remains limited. This study evaluated the five-year survival and one-year economic burden of minimally invasive restorations for cavitated MIH-affected molars in children. **Methods:** An extended five-year follow-up of a randomised controlled trial was conducted involving 63 cavitated MIH-affected molars in children treated with atraumatic restorative treatment (ART), silver-modified atraumatic restorative treatment (SMART), or SMART-Papain. Restoration survival was assessed at 12-, 24-, 36-, 48-, and 60-months using ART restoration criteria. Survival outcomes were analysed using Kaplan-Meier estimates and Cox regression models were used to determine predictors of restoration failure. A societal-perspective economic evaluation was performed incorporating healthcare provider costs with patient-incurred direct and indirect costs, including travel and caregiver productivity loss, to estimate the one-year financial implication of minimally invasive MIH care. **Results:** At five years, cumulative survival was highest for SMART-Papain (76.2%), compared with ART and SMART, which showed similar survival rates of 61.9%; however, differences between groups were not statistically significant ($p=0.498$). Mean survival time was longer for SMART-Papain (58.29 months) than ART (51.77 months) and SMART (51.66 months). Female gender independently increased the risk of failure ($p=0.002$). The total one-year financial implication was RM18,613.16 for treating 63 MIH-affected molars, with indirect costs accounting for 57.4% of total costs, predominantly from caregiver productivity loss. **Conclusion:** Minimally invasive restorations demonstrated acceptable five-year survival for cavitated MIH affected molars in children, with SMART-Papain showing the most favourable survival trend. The economic burden was mainly driven by caregiver productivity loss, underscoring the broader family impact of MIH care. These approaches may serve as pragmatic interim strategies for managing MIH in resource-constrained paediatric dental settings.

Keywords: Cost analysis, Molar incisor hypomineralisation, SMART restoration



Anti-Adherence Potential of Lyophilized Snail Mucin (*Achatina fulica*) Against *Candida albicans* Under Simulated Oral Conditions

Mohd Shafiq Shaffa'ee¹, Azwatee Abdul Aziz¹, Mohd Azmi Abdul Razak¹, Selva Malar Munusamy¹, Wan Himratul Aznita Wan Harun¹

¹Faculty of Dentistry, Universiti Malaya, Malaysia
Email: mohdshafiqmcods92@gmail.com

Objectives: Denture stomatitis is a common inflammatory condition associated with removable prostheses, primarily attributed to *Candida albicans* colonization on denture surfaces. Incorporating naturally derived antimicrobial agents into denture reline materials has emerged as a promising preventive strategy to reduce candidal adherence. This study evaluated the anti adherence potential of lyophilized snail mucin (*Achatina fulica*) incorporated into hard denture reline materials against the initial adherence of *Candida albicans* under simulated oral conditions. **Methods:** Sixty disc-shaped hard denture reliner specimens were fabricated using Tokuyama Rebase II and Durabase and divided into six subgroups (n = 10) according to snail mucin concentrations of 0% (control), 5%, and 10% by powder weight ratio. Following storage in distilled water at 37°C for seven days, specimens were sterilized using ultraviolet irradiation, conditioned with artificial saliva, and immersed in a *Candida albicans* suspension at 37°C for 48 hours. Colony-forming unit (CFU) counts were determined using serial dilution and lawn culture techniques. Data were analysed using one-way ANOVA and post hoc tests with a significance level of $p < 0.05$. **Results:** Both denture reliner materials demonstrated concentration-dependent reductions in *Candida albicans* adherence with increasing snail mucin incorporation. In Tokuyama Rebase II, mean CFU counts decreased from $18.08 \pm 2.10 \times 10^6$ in the control group to $13.10 \pm 1.39 \times 10^6$ in the 10% mucin group. Similarly, Durabase exhibited a reduction from $15.54 \pm 3.12 \times 10^6$ to $6.30 \pm 1.44 \times 10^6$. Significant differences were observed among all experimental groups for Tokuyama Rebase II ($F = 19.41$, $p < 0.001$) and Durabase ($F = 54.62$, $p < 0.001$). **Conclusions:** Within the limitations of this in vitro study, lyophilized snail mucin demonstrated significant concentration-dependent anti-adherence activity against *Candida albicans*. Its incorporation into denture reline materials may represent a promising naturally derived anticandidal strategy for preventing denture stomatitis.

Keywords: *Candida albicans*, denture reliner, denture stomatitis, lyophilized snail mucin, anti adherence.



Why Malaysian Young Adults Start Vaping and Their Barriers to Quitting

Nur Syareena Tajuddin^{1,2}, Lokman Najihah¹, Jamaludin Marhazlinda¹

¹Department of Community Oral Health & Clinical Prevention, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia

²Oral Health Division, Ministry of Health, Malaysia

Email: 22082593@siswa.um.edu.my

Objectives: This study explored the reasons for the initiation of e-cigarette use among young adult vapers from private universities with health science and non-health science backgrounds, and assessed their barriers to cessation. **Methods:** Twelve focus group discussions (FGDs) involving 57 young adults (18–25 years) from private universities in Kuala Lumpur and Selangor were conducted, stratified by gender and user type (exclusive users, dual users). Participants were recruited through purposive and snowball sampling until data saturation was achieved. Data were analysed using inductive thematic analysis. **Results:** Peer influence emerged as the main driver of initiation across both groups, alongside sensory appeal, curiosity, and ease of access. Health science students associated e-cigarette use with academic distress, while non-health science students highlighted emotional distress and social media influence as contributing factors. Regarding barriers to cessation, both groups identified social influence, accessibility, withdrawal symptoms, and dependency as main challenges. Non-health science students additionally cited weak regulation, limited cessation support, and minimal risk perception as barriers to quitting. **Conclusion:** Targeted prevention strategies that address peer influence, mental health, awareness of cessation support and misconceptions surrounding e cigarette use are essential. Strengthening oral health communication and integrating tobacco control content into education curricula are also crucial. Empowering young adults through education and effective communication is key to breaking the cycle of e-cigarette use.

Keywords: young adults, e-cigarettes initiation, barriers to cessation



Comparative Evaluation of the Effect of Sandblasting of Varying Heights of TiHo Implant Abutments on the Retention and Resistance of Surface-Treated Zirconia Blocks: An In-Vitro Study

Uday GN¹, Santhosh K², Lee SB²

¹Postgraduate student, Faculty of Dentistry, MAHSA University, Malaysia

²Department of Prosthetic Dentistry, Faculty of Dentistry, MAHSA University, Malaysia

Email: dresd23116004@mahsastudent.edu.my

Objectives: The objective of this in-vitro study was to evaluate the effect of sandblasting titanium base (Ti-base) abutments of varying heights on the retention and resistance of surface-treated zirconia blocks under simulated clinical conditions. **Methods:** A total of 120 monolithic zirconia blocks were digitally fabricated and cemented onto Ti-base abutments of three different heights (3.5 mm, 4.5 mm and 5.5 mm). The samples were divided into sandblasted and non-sandblasted groups, and were subjected to thermocycling to simulate intraoral aging. Retention was assessed using a pull-out test, and resistance was evaluated using a static load test until failure, both performed with a universal testing machine. The recorded values were statistically analysed to assess the influence of abutment height and surface treatment on retention and resistance. **Results:** Pull-out testing demonstrated a statistically significant increase in retention with increasing Ti-base abutment height, with the highest retention values observed in the 5.5 mm abutment groups. Sandblasted Ti-base abutments exhibited significantly higher pull-out forces compared with non-sandblasted abutments across all tested heights. Static load testing revealed no statistically significant differences in resistance values among the different abutment heights or between sandblasted and non-sandblasted groups. Failure mode analysis indicated predominantly adhesive failures at the zirconia-cement-titanium interface during pull-out testing, whereas static load testing showed a combination of cement failure and structural failure of prosthetic components. **Conclusion:** Within the limitations of this in-vitro study, increasing Ti-base abutment height and sandblasting the abutment surface significantly improved the retention of cement-retained zirconia restorations. However, neither abutment height nor sandblasting had a significant influence on resistance to static compressive loading. These findings suggest that surface modification and abutment height play a critical role in optimizing prosthetic retention, particularly in clinical situations involving short abutments and limited interocclusal space.

Keywords: Ti-base abutments, Zirconia, Sandblasting, Abutment height, Retention, Static load.



IADR

INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION

JUNIOR ORAL ABSTRACTS



Soft Tissue Facial Profile Thickness in Different Skeletal Relationships in Malay Adults

Ronnie MA¹, Azumat MA¹, Noviaranny I², Al-Jaf NMA²

¹Faculty of Dentistry, Universiti Teknologi MARA Sungai Buloh Campus, Jalan Hospital, 47000 Sungai Buloh, Selangor, Malaysia.

²Centre of Paediatric Dentistry and Orthodontic Studies, Faculty of Dentistry, Universiti Teknologi MARA Sungai Buloh Campus, Jalan Hospital, 47000 Sungai Buloh, Selangor, Malaysia.

Email: michelleronnie03@gmail.com

Objectives: Establishing population-specific soft tissue norms is essential for accurate orthodontic and orthognathic treatment planning, yet data focusing specifically on the variations across different skeletal relationships within the Malay adult population remains scarce. The aims of this study were: 1. To measure and compare soft tissue facial thickness (STFT) at specific anatomical points among patients with Class I, Class II, and Class III skeletal relationships in a sample of Malay adults, 2. And to analyze soft tissue thickness in different skeletal relationships according to gender. **Material and Methods:** Lateral cephalograms of adult patients (≥ 17 years) were retrieved from the archives of Faculty of Dentistry, UiTM. Exclusion criteria included dentofacial deformities, history of craniofacial trauma, previous orthodontic treatment, previous prosthodontic or surgical treatment, incompetent lip closure, and poor quality of radiographs. Ten linear STFT parameters were measured based on Holdaway Soft Tissue Analysis. Data were analyzed using Two-Way ANOVA ($p < 0.05$) to evaluate the effects of skeletal classification and gender. **Results:** Significant differences in STFT were found between skeletal classifications for most parameters, except N-N', Ls-Pr, B-Lm, and Sn-A ($p = 0.737$). In the analysis between genders, males exhibited significantly greater soft tissue thickness at the glabella (G-G'), rhinion (Rh), subnasale (Sn-A), upper lip (Ls-Pr), infradentale (Li-Id), and labiomental sulcus (B-Lm) ($p = 0.031$) compared to females. **Conclusions:** STFT in Malay adults is significantly influenced by both skeletal relationship and gender. These findings highlight the necessity of utilizing population-specific soft tissue norms rather than universal standards. Clinicians should consider these variations to optimize individualized treatment planning, ensuring that the soft tissue envelope adequately supports the desired skeletal and aesthetic outcomes.

Keywords: Facial soft tissue profile; skeletal relationships; lateral cephalogram; Malay adults.



Knowledge and Visual Identification of ICDAS among Clinical Year Dental Students in Malaysia

Nor Azlina I¹, Nusima M², Ahmad Amer Mukmin MR, **Nur Syaquilla Putri MN**

¹Department of Paediatric Dentistry, Faculty of Dentistry, Universiti Sains Islam Malaysia.

²Department of Prosthodontics, Faculty of Dentistry, Universiti Sains Islam Malaysia.

Email: nrsyaquilla23@gmail.com

Objectives: This study aims to assess knowledge of International Caries Detection and Assessment System (ICDAS), identify clinical exposure to ICDAS and evaluate the accuracy of visual caries identification using ICDAS among undergraduate dental students. **Methods:** A cross-sectional questionnaire-based study conducted among Year 4 and Year 5 dental students from 6 public and 7 private dental universities in Malaysia between August to November 2025. The questionnaire consisted of three sections assessing three objectives as above. 125 Year 4 students and 117 Year 5 students participated (n=242). Data analysed using SPSS software. **Results:** Year 4 students showed higher ICDAS knowledge scores (63.25%) compared to Year 5 students (50.75%). Year 4 students reported slightly higher clinical exposure (82.25%) than Year 5 (79.75%). Both groups showed the highest accuracy in identifying ICDAS codes 0, 3 and 4 (65%) while lower accuracy for codes 1 and 2 (48%) and codes 5 and 6 (51%). **Conclusions:** Higher ICDAS knowledge levels observed among year 4 students due to recent exposure to ICDAS theory. The slightly higher clinical exposure among year 4 students related to focusing on Competency Test Examination & Diagnosis. Both groups demonstrated better accuracy in identifying ICDAS codes 0, 3, and 4 due to their clearer clinical features. In contrast, lower accuracy for codes 1 and 2 likely due to difficulty to differentiate wet and dry condition from the picture, whereas for codes 5 and 6 may be due to difficulty in differentiating the extent of cavitation and pulpal involvement.

Keywords: Caries Detection, Dental Caries, Diagnostic Accuracy, ICDAS



Small Droplets, Big Impact: Alpha-Mangostin Nano-Emulsions for Oral Inflammation

Yeap KX¹, Wong XE¹, Teoh HY¹, Lim JXY¹, Chong QT¹, Lim VYH¹, Tan YY², Choudhury M²

¹School of Dentistry, IMU University, Kuala Lumpur, Malaysia.

²Restorative Dentistry Division, School of Dentistry, IMU University, Kuala Lumpur, Malaysia.
Email: 00000033126@student.imu.edu.my

Objectives: Oral inflammation by oxidative stress is a prevalent condition. α -Mangostin (AM) offers antioxidant and anti-inflammatory potential, but poor solubility limits clinical delivery, yet nanoemulsion-based delivery strategies remain underexplored. Our objective is to develop and characterise an α -mangostin nanoemulsion (AMNE) and evaluate its cytotoxicity, antiinflammatory, and antioxidant effect on oral epithelial cells.

Methods: A nanodroplet-sized oil-in-water AMNE was synthesised using virgin coconut oil, Tween 80, Span 80, and ultrapure water via high-energy ultrasonication. Its stability, droplet size, polydispersity index (PDI), and zeta potential were assessed using dynamic light scattering (DLS) and ultracentrifugation, while entrapment efficiency (EE) was determined by UV-Vis spectrophotometry. Biological effects of AMNE were evaluated in H400 oral epithelial cells using lactate dehydrogenase (LDH) and MTS assays for cell death and proliferation respectively, sandwich ELISA for antiinflammatory effects against pro-inflammatory cytokines IL-1 β and IL-6, and cellular reactive oxygen species (ROS) assay for antioxidant potential. Experiments were performed in biological triplicates.

Results: AMNE demonstrated high stability for up to three months (mean droplet size: 32.46 nm; PDI: 0.229; zeta potential: -10.3 mV). H400 cells maintained >80% viability at concentrations up to 12.5 μ g/mL, with cell growth observed at $\leq$ 6.25 μ g/mL. AMNE selectively inhibited IL-1 β expression at $\leq$ 12.5 μ g/mL, without affecting IL-6, and reduced ROS production at $\leq$ 6.25 μ g/mL. **Conclusion:** AMNE exhibited high stability, cytocompatibility, and significant antioxidant and selective anti-inflammatory effects, particularly through IL-1 β inhibition. These findings support its potential as a targeted therapeutic strategy for oral inflammation and warrant further investigation.

Keywords: α -mangostin, anti-inflammatory, antioxidant, cytotoxic, nanoemulsion



Comparison of Gap Distance in Two Different Fabrication Methods on Denture Framework Utilizing Innovative Denture Clasp Design

Mohtar AZ¹, Yacob N², Rahimi SN², Azahari MA³, Hanafiah F⁴

¹Graduate Student, Faculty of Dentistry, Universiti Sains Islam Malaysia.

²Department of Conservative Dentistry & Prosthodontic, Faculty of Dentistry, Universiti Sains Islam Malaysia.

³Dental Technologist, Faculty of Dentistry, Universiti Sains Islam Malaysia.

⁴Consultant, Avisena Specialist Hospital

Email: zahramohtar@raudah.usim.edu.my

Objective: The fabrication of denture frameworks via Selective Laser Melting (SLM) enhances laboratory efficiency and minimizes human error compared to conventional methods. However, clasps fabricated using the SLM technique are prone to misfits, which are significantly influenced by the configuration of support structures to optimise accuracy of 3D printing. To address this issue, an innovative clasp design has been proposed for 3D printing fabrication. This study aimed to compare the gap distance in two different fabrications on component of cobalt-chrome frameworks and utilised innovative design for denture clasp. **Methods:** Twenty study model (n=20) were divided into two groups; frameworks fabricated using conventional lost wax and direct metal 3D printed methods. Each group were further divided into 3D-printed group ordinary clasp (DO) and 3D-printed innovative clasp (DI) design, and conventional ordinary clasp (CO) and conventional innovative clasp (CI) design. Each master model and frameworks were superimposed, and gap distance were measured using GOM Inspect software. Statistical analysis between groups was analysed using independent ttest. **Results:** The fitting on palate, rest and clasp component in both fabrication methods were excellent (below acceptable mean gap <0.3mm) with mean gap distance on palate was 0.068 ± 0.061 mm, rest 0.717 ± 0.234 mm and clasp 0.113 ± 0.101 mm. Between the two designs of clasp (CO and CI), the mean gap distance was only statistically significant different at shoulder of the clasp ($p < 0.05$). However, the mean gap distance on middle and tip of clasp using innovative clasp (CI) has better gap distance with 0.205 ± 0.170 mm and 0.250 ± 0.219 mm, respectively. It reflects that innovative design for a clasp produces better fit on both fabrication methods (CI & DI). **Conclusions:** Both conventional and 3D printing has clinically similar acceptable fits. Innovative clasp design has superior fit suggesting that this design modification enhance accuracy of a clasp.

Keywords: Clasp, Cobalt Chrome, Fitting, Gap Distance, 3D-printing.



Dentalox Universe: Development, Validation, and Evaluation of Immersive AI-Supported Proto-Metaverse Oral Health Education

Syahrul Nizar Syahabuddin NS¹, Samuel EA¹, Ramli NE¹, Wan JX¹, Zainal Abidin NS¹, Hazhar M¹, Tajudin JK¹, Sha'fe NA¹, Tan VX¹, Chan YX¹, Zailan NA¹, Muhamad Firdaus Onn MTOB¹, Kathirvelu AT¹, Abdul Razak FN¹, Khairudin N¹, Hue XY¹, Naing AIS², Yahya NA², Luai AF²

¹Faculty of Dentistry, Universiti Kebangsaan Malaysia

²Department of Family Oral Health, Faculty of Dentistry, Universiti Kebangsaan Malaysia

Email: a195185@siswa.ukm.edu.my

Objectives: Traditional oral health education (OHE) often relies on passive learning approaches that may not sufficiently engage younger generations. Despite growing interest in immersive technologies for health education, there is a paucity of culturally appropriate and rigorously validated metaverse-based OHE platforms designed specifically for children and early adolescents, particularly in Malaysia. Hence, this study aimed to systematically develop, validate, and evaluate an OHE module on Dentalox Universe, a Roblox-based proto-metaverse platform for children and early adolescents. **Methods:** Developed deductively via literature on gamification and immersive learning and guided by the ADDIE model, the OHE module used Allassisted content and visual design. Materials included eight digital posters, one pamphlet, two videos and interactive gamified activities, all undergoing English-Malay-English translation. Content validity for print materials were assessed by five experts via the Content Validity Index (CVI) ; videos and the Roblox game were evaluated by six dental experts. User feedback was measured using the Malay Patient Education Materials Assessment Tool (PEMAT-M). Immediate knowledge acquisition was assessed via an AI-supported quiz among 27 purposively sampled children. **Results:** Six posters and the pamphlet achieved excellent validity (S-CVI/Ave = 1.00). One poster showed good validity (0.90), while one required revision (0.70). Videos achieved acceptable scores (0.88 and 0.92), but the Roblox game scored 0.50, requiring major revision for technical issues. PEMAT-M scores were 83.3% for print and 66.7% for audio-visual/gamified content. Post-OHE evaluation showed strong immediate knowledge acquisition (mean accuracy of 85.7%). **Conclusions:** Dentalox Universe is a promising, immersive, AI-supported OHE platform. While most materials achieved favorable validity and user feedback, technical refinement and beta-testing are required prior to broader implementation.

Keywords: Artificial Intelligence, Gamification, Oral Health Education, Proto-Metaverse, Roblox



Knowledge, Awareness, and Perception of Digital Dentistry Education: A Nationwide Survey of Malaysian Dental Undergraduates

Chan HE¹, Shiew KEM¹, Zulkiffli S², Ubaidillah AHA²

¹Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia

²Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya

Email: huaenchan@gmail.com

Objectives: The rapid integration of digital technologies benefits dentistry, yet the preparedness of Malaysian clinical undergraduate dental students for this transition remains unclear. This study aimed to assess students' knowledge, awareness, and perceptions regarding digital dentistry education and the influence of their information sources. **Methods:** A crosssectional survey was conducted online from April to September 2025, targeting students from all 13 public and private Malaysian dental universities (N=318). **Results:** The majority of students demonstrated high knowledge (61.6%) and a high perception (89.0%) toward digital dentistry, while overall awareness was medium (75.8%). Significant variation was noted based on the type of institution and years of study. Crucially, utilizing more than two external information sources was significantly associated with higher scores across all domains: knowledge ($p < 0.001$), awareness ($p = 0.01$), and perception ($p = 0.009$). **Conclusions:** Clinical undergraduate dental students in Malaysia are open to digital dentistry and have a basic understanding of it. However, their overall digital literacy is highly correlated with demographics and external learning resources. These findings emphasise the crucial need for all dental institutions to review the curriculum and address institutional inequities to guarantee all graduates are sufficiently prepared for the profession's digital future.

Keywords: Clinical undergraduate dental students; Knowledge; Awareness; Perception; Digital dentistry education



Differential Responses of Periodontal Ligament and Dental Pulp Stem Cells to Dental Radiographic Exposure

Chong Sze Hien¹, H'ng Qian Jou¹, Ferdinand Fershan Ng YiYuen¹, Goh Ge Jing¹, Wee Yue Xin¹, Nicole Wong Chu Chieng¹, Fathimath Thaniya¹, Wan Eysha Zafirah Binti Wan Muzamri¹, Spoorthi Ravi Banavar², Khoo Suan Phaik², Prashanti Chippagiri², Nabil Ahmed Saleh Eid³

¹School of Dentistry, IMU University, Kuala Lumpur, Malaysia

²Division of Clinical Oral Health, School of Dentistry, IMU University, Kuala Lumpur, Malaysia

³School of Medicine, IMU University

Email: twintaniya@gmail.com

Objectives: This study investigated responses of periodontal ligament stem cells (PDLSCs) and dental pulp stem cells (DPSCs) following exposure to routine dental radiographic modalities, including intraoral periapical (IOPA), bitewing, dental panoramic tomography (DPT), and cone beam computed tomography (CBCT). **Methods:** Commercially obtained PDLSCs and DPSCs were exposed to each radiation modality with and without Histatin-1 supplementation and compared with unexposed controls. Functional responses were evaluated using fluorescencebased live/dead assay for viability, Alamar Blue for metabolic activity, and scratch assays for migration. Paracrine secretion of vascular endothelial growth factor-A (VEGF-A), insulin-like growth factor-1 (IGF-1), and hepatocyte growth factor (HGF) was quantified by ELISA at 24 h, 48 h, and during osteogenic differentiation. Osteogenic potential was assessed using alkaline phosphatase activity and Alizarin Red staining for IOPA and CBCT groups. Autophagyassociated responses were evaluated through LC3, p62, and LAMP2 immunofluorescence. **Results:** DPT significantly reduced viability in both cell types, with PDLSCs more affected (74% vs 49% variation from X-ray type; $p < 0.0001$ and $p = 0.003$, respectively), whereas IOPA and bitewing were comparable to controls. Metabolic activity showed a significant radiationhistatin interaction in PDLSCs but not DPSCs. IOPA significantly impaired PDLSC migration without Histatin-1 (14.0% vs 72.6% closure with Histatin-1; interaction $p = 0.005$), while DPSCs showed less pronounced changes. IOPA significantly reduced PDLSC mineralisation ($p = 0.031$), whereas DPSCs maintained stable osteogenic potential. DPSCs consistently secreted substantially higher HGF and VEGF-A than PDLSCs across all timepoints ($p \leq 0.008$). IGF-1 was undetectable at early timepoints but emerged during osteogenic differentiation ($p < 0.001$). DPSCs exhibited higher basal autophagy, as evidenced by increased LC3 puncta and LAMP2 expression. **Conclusions:** Routine dental radiographic exposures elicit modality-specific and cell-type-dependent responses. PDLSCs demonstrate greater functional sensitivity, particularly to IOPA and DPT. In contrast, DPSCs exhibit relative stability with higher paracrine output and autophagy-associated activity, highlighting inherent differences in regenerative capacity between these dental stem cell populations.

Keywords: Autophagy, dental pulp stem cells, dental radiography, osteogenesis, periodontal ligament stem cells



Oral Hygiene During Fixed Appliance Treatment: A Tiktok and Youtube Netnography

Nagarajan PM¹, Mohamed AMFS¹, Luai AF¹, Misran AA², Shahrul AI¹

¹Department of Family Oral Health, Faculty of Dentistry, Universiti Kebangsaan Malaysia

²Department of Restorative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia

Email: a196170@siswa.ukm.edu.my

Objectives: Maintaining good oral hygiene is essential during fixed appliance orthodontic treatment, yet patients may experience practical difficulties, uncertainty, and reduced confidence in effectively cleaning around brackets and archwires. As YouTube and TikTok are increasingly used as sources of orthodontic information, this study aimed to explore viewer comments posted on selected videos relating to oral hygiene practices during fixed appliance orthodontic treatment. **Methods:** An exploratory, focused, non-participant netnographic design was used. Publicly available comments were collected from nine videos, comprising four YouTube and five TikTok videos. The videos were selected independently by two orthodontists based on engagement and relevance to oral hygiene during fixed appliance treatment. A total of 3,061 non-empty comments were screened. Following exclusion of emoji-only, tag-only, non-English, duplicate, and low-information comments, 2,151 usable comments were analysed using inductive thematic analysis. **Results:** Five themes were identified: (1) videos as practical educational support; (2) negotiating braces hygiene routines, tools, and techniques; (3) burden and barriers to maintaining oral hygiene with braces; (4) emotional and bodily responses to braces hygiene; and (5) anticipated consequences of poor hygiene, including peer exchange of coping strategies. TikTok generated higher engagement and shorter, more reactive comments, whereas YouTube comments were generally longer and more explanatory. **Conclusion:** Viewer comments revealed persistent practical, informational, and emotional challenges in maintaining oral hygiene during fixed appliance treatment. Social media may supplement orthodontic education, but clearer, repeated, and patient-centred guidance remains important to support patients beyond the clinical appointment.

Keywords: Orthodontics; Oral Hygiene; Education; Social Media



Antimicrobial Efficacy of Compound 4e and 2.5% Sodium Hypochlorite against Enterococcus Faecalis Biofilm

Zaharuddin IS¹, Huzairi NF¹, Zakaria MN², Che Mohd Fadzilah MAF³, Che Ab Aziz ZA³

¹Faculty of Dentistry, Universiti Malaya, 50603 Kuala Lumpur, Malaysia.

²Faculty of Dentistry, Ajman University, Ajman, UAE

³Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya, 50603 Kuala Lumpur, Malaysia.

Email: iffah.syazwann@gmail.com

Background: Effective root canal disinfection is critical for endodontic success. *Enterococcus faecalis* is commonly associated with endodontic infections due to its ability to form resistant biofilms. Although sodium hypochlorite (NaOCl) is the gold standard, its limitations have prompted the search for alternative agents. Compound 4e has demonstrated antimicrobial potential, but its efficacy against endodontic biofilms remains unclear. **Objective:** To evaluate the antimicrobial efficacy of compound 4e as an endodontic irrigant against *E. faecalis* biofilms formed on dentine blocks. **Methods:** An in vitro experimental study was conducted using standardized dentine blocks prepared from extracted teeth. Specimens were sterilized and verified, and inoculated with *E. faecalis* for 14 days to allow biofilm formation. Samples were randomly assigned into treatment groups (n=15): 100 ppm (0.01%) compound 4e, 2.5% NaOCl and saline as a control. Each specimen was exposed to the respective irrigant for one minute. Biofilms were detached by vortexing and sonication, followed by serial dilution and culture on brain-heart infusion agar for colony-forming unit (CFU/mL) quantification. Data were analysed using the Kruskal-Wallis test followed by Dunn's post-hoc test with Bonferroni correction ($p < 0.05$). **Results:** Compound 4e demonstrated significantly higher bacterial counts compared with 2.5% NaOCl ($p < 0.05$) and showed antimicrobial activity comparable to saline. In contrast, NaOCl exhibited complete inhibition of bacterial growth. **Conclusion:** Compound 4e demonstrated limited antimicrobial efficacy against *E. faecalis* biofilms compared with established endodontic irrigants. Further studies are required to optimise its concentration and evaluate its biocompatibility.

Keywords: Antimicrobial efficacy, Compound 4e, *Enterococcus faecalis*, 2.5% sodium hypochlorite



A Comparative Study on the Setting Time and Solubility of Calcium Trisilicate-Based Materials

J. Leong¹, X.N Wong¹, N.H Azami², N. Ahmad Fuad²

¹Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.

²Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.

Email: jasmineleongply@gmail.com

Introduction: Calcium trisilicate-based materials such as Mineral Trioxide Aggregate (MTA) are widely used in endodontics. However, prolonged setting time and solubility can affect handling, sealing, and long-term stability. Thus, a standardised evaluation is needed to support evidence-based material selection, particularly for perforation repair.

Objectives: The objectives were: (i) to compare the initial and final setting times of MTA Angelus® and Endo-Eze™ MTAFlow™ with ProRoot® MTA as the benchmark under ISO-standardised laboratory conditions and (ii) to investigate the solubility of MTA Angelus® and Endo-Eze™ MTAFlow™ against ProRoot® MTA as the benchmark material in phosphate-buffered saline (PBS) at 1, 7, and 28 days. **Methods:** A standardised experimental design was adapted from ISO 6876:2012. Endo-Eze™ MTAFlow™ and MTA Angelus® were evaluated against ProRoot® MTA (benchmark). Setting time was measured using Vicat apparatus, and solubility was assessed following immersion in phosphate-buffered saline (PBS). The data were analysed using Mann–Whitney U and Kruskal–Wallis tests with statistical significance of $p < 0.05$. **Results:** MTA Angelus® demonstrated the shortest initial and final setting times, at 15 and 60 minutes, respectively. The post-hoc test showed a statistically significant difference between MTA Angelus® and ProRoot® MTA for both initial ($p = 0.002$) and final setting times ($p = 0.008$). At one and seven days, MTA Angelus® and Endo-Eze™ MTAFlow™ showed comparable solubility with no significant differences. Both exhibited progressive increases in negative percentage weight change over time. At 28 days, a significant difference was observed ($p = 0.019$), with ProRoot® MTA showing the greatest negative weight change (-19.96 ± 0.78).

Conclusions: MTA Angelus® demonstrated the shortest setting time, making it suitable for perforation repair procedures requiring rapid material stability and resistance to contamination. All tested materials showed comparable insolubility and favourable resistance to washout in PBS, suggesting adequate long-term stability and sealing ability for perforation repair.

Keywords: Calcium Trisilicate; Final Setting Time; Initial Setting Time; In vitro study; Solubility.



Feasibility of Dental Practicality Index (DPI) Use Among Clinicians at Universiti Malaya: A Quasi-Experimental Study

Phi YT¹, Lee Z¹, Ahmad Fuad N², Mohamed Radzi ND²

¹Faculty of Dentistry, Universiti Malaya, 50603, Kuala Lumpur, Malaysia.

²Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya, 50603, Kuala Lumpur, Malaysia.

Email: u2102881@siswa.um.edu.my

Objectives: This study evaluated the impact of the Dental Practicality Index (DPI) on tooth restorability assessment and treatment-planning decisions among dental clinicians and students, and explored user perceptions to support its refinement. DPI is expected to standardise restorability assessment, enhancing consistency in clinical decision-making.

Methodology: This study involved 89 participants, comprising Year 4 and 5 undergraduate dental students and dental officers from the Primary Care Unit, Universiti Malaya. Participants evaluated ten anonymised clinical cases and selected one of four treatment options using an online assessment form. Following a two-week interval, participants completed an eight-minute online DPI training and reassessed the same cases in a randomised order with the DPI given as a guide. Participants subsequently evaluated DPI's ease of use and clinical applicability, and provided open-ended feedback for refinement. Treatment decisions were compared with a consensus panel, and the mean scores were calculated. Data were analysed using McNemar's test, descriptive statistics, and thematic analysis. **Results:** Baseline assessment demonstrated a moderate level of tooth restorability assessment and treatment-planning performance, with the mean score increasing from 4.52 to 4.82 following DPI training. The proportion of participants changing from incorrect to correct decisions (19.1%) exceeded those changing from correct to incorrect decisions (16.1%), although the overall improvement was not statistically significant ($p = 0.142$). The majority of the participants perceived the DPI as clinically suitable (92.1%) and easy to use (77.5%). Suggested improvements included refinement of the scoring criteria and clearer clinical descriptors. **Conclusion:** The DPI demonstrates potential as a standardising framework and educational tool for tooth restorability assessment and treatment planning. Although improvements in treatment-planning accuracy were modest, strong user acceptance highlights its potential value in dental education, clinical triage, and referral decision-making. Further refinement for local practice and incorporation of hands-on training are needed to maximise its impact.

Keywords: Clinical Decision Making, Dental Education, Dental Practicality Index, Tooth Restorability Assessment, Treatment Planning



Fixing Baby Teeth: What Are Parents' True Preferences About Posterior Restorations?

M Sani NSQ¹, M Khairul Asmawi R¹, Hisham ARB^{2,3}, Roslan MAF²

¹Faculty of Dentistry, Universiti Teknologi MARA (UiTM) Sungai Buloh Campus, Jalan Hospital 47000 Sungai Buloh, Selangor, Malaysia.

²Centre of Paediatric Dentistry and Orthodontics Studies, Faculty of Dentistry, Universiti Teknologi MARA (UiTM) Sungai Buloh Campus, Jalan Hospital 47000 Sungai Buloh, Selangor, Malaysia.

³Kulliyyah of Dentistry, International Islamic University Malaysia, Jalan Sultan Ahmad Shah, Bandar Indera Mahkota, 25200 Kuantan, Pahang, Malaysia.

Email: 2022491078@student.uitm.edu.my

Objectives: To assess parental preferences regarding primary molar restorations (amalgam, composite resin, stainless steel crowns [SSCs], and Bioflex crowns) and to investigate the influence of demographic variables (income, education, and gender) on these selections. **Methods:** A cross-sectional study involving 140 parents was conducted at Universiti Teknologi MARA, following institutional ethical approval (ERC/01/2025 (ERP/4/19)(39)) and trial registration (NCT07402967). To evaluate material preferences, participants were provided with validated questionnaires and visual aids, ranking the restorative materials and detailing qualitative justifications for their choices. Quantitative data were assessed via Independent Samples t-tests, Chi-square, Fisher's Exact, and Mann-Whitney U tests ($p < 0.05$). Concurrently, thematic analysis of the qualitative data was performed using NVivo. **Results:** The participants included 140 parents ($n=80$ mothers, $n=60$ fathers). Most fathers (43.3%, $n=26$) reported a monthly household income of RM4,850–RM10,959, whereas most mothers (38.8%, $n=31$) reported RM2,500–RM4,849. The majority possessed tertiary education (fathers: 71.7%; mothers: 62.5%). Most parents had more than 3 children (40.0%, $n=56$). Demographic variables (income, education, and gender) exhibited no significant influence on material preferences ($p > 0.05$). Thematically, 'aesthetic appeal' was the foremost determinant of parental preference, with 'durability' and 'longevity' serving as key secondary considerations. **Conclusions:** Parents generally favoured the aesthetics of toothcoloured restorations, though SSCs were recognised for their durability in extensively damaged primary teeth. Ultimately, aesthetic considerations eclipse functional longevity in driving parental preferences. These findings highlight the critical role of effective communication and shared decision-making in optimising evidence-based paediatric restorative care.

Keywords: parent, paediatric dentistry, perception, primary molars, restorative materials



Little Smiles, Big Opinions: What Kids Think About Back Tooth Fillings

M Khairul Asmawi R¹, M Sani NSQ¹, Roslan MAF², Hisham ARB^{2,3}

¹Faculty of Dentistry, Universiti Teknologi MARA (UiTM) Sungai Buloh Campus, Jalan Hospital 47000 Sungai Buloh, Selangor, Malaysia.

²Centre of Paediatric Dentistry and Orthodontics Studies, Faculty of Dentistry, Universiti Teknologi MARA (UiTM) Sungai Buloh Campus, Jalan Hospital 47000 Sungai Buloh, Selangor, Malaysia.

³Kulliyyah of Dentistry, International Islamic University Malaysia, Jalan Sultan Ahmad Shah, Bandar Indera Mahkota, 25200 Kuantan, Pahang, Malaysia.
Email:2022612468@student.uitm.edu.my

Objectives: To determine children's preferences for primary molar restorations (amalgam, composite resin, stainless steel crowns [SSCs], and Bioflex crowns) and to analyze the impact of demographic characteristics (age and gender) on these material perceptions.

Methods: This crosssectional study at Universiti Teknologi MARA with ethical approval UiTM REC [ERC/01/2025 (ERP/4/19)(39)] and ClinicalTrials.gov (CT07402967) involved 140 children aged range 5–12 years old. Using validated questionnaires and visual aids, children ranked restorative materials and provided qualitative rationales. Statistical analyses included Independent T-tests, Chi-square, Fisher's Exact, and Mann-Whitney U tests ($p < 0.05$). Concurrently, qualitative data were analyzed thematically utilizing NVivo.

Results: The children included 73 males and 67 females, predominantly aged over seven years ($n=114$, 81.4%; $p=0.808$). Irregular or emergency visits were common ($n= 45$, 32.1%). Most children received dental treatment at school ($n= 101$, 72.1%). Only 4.3% ($n=6$) felt embarrassed by their fillings ($p=0.205$). A significant gender-based association regarding material preference was identified ($p=0.031$). Females predominantly favoured composite resin (59.4%), significantly preferring it in forced-ranking scenarios ($p=0.039$). Conversely, males exhibited greater acceptance of SSCs (65.8%), ranking them significantly higher ($p=0.012$). Qualitative thematic analysis highlighted 'aesthetic appeal' as the foremost determinant of material selection. **Conclusion:** Aesthetic considerations heavily influence children's expectations of dental restorations. This underscores the necessity of shared decisionmaking to support evidence-based and developmentally appropriate material selection in paediatric dentistry.

Keywords: Child, paediatric dentistry, perception, primary molars, restorative materials



An Audit on Pathological, Aesthetic and Functional Outcome of Neck Dissection Pattern in Oral Cancer Patients

Halim NLA¹, Hii JBS¹, Kadir K², Ismail SM²

¹Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.

²Department of Oral and Maxillofacial Clinical Sciences, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.

E-mail: lailahalim24@gmail.com

Aim and Objectives: Oral squamous cell carcinoma (OSCC) commonly requires neck dissection (ND) for regional disease control, with cervical lymph node metastasis being a key prognostic factor. While radical ND (RND) is associated with significant functional and aesthetic morbidity, modified radical ND (MRND) and selective ND (SND) aim to preserve function with adequate oncological clearance. Variations in ND technique and incision design may influence postoperative outcomes. This audit aimed to evaluate ND practices at Universiti Malaya, correlating documented procedures with operative findings, oncologic control and postoperative functional and aesthetic outcomes. **Methods and Materials:** This retrospective study included oral cancer patients attending the Oral Cancer Review Clinic, Faculty of Dentistry, Universiti Malaya, from November 2025 to January 2026. Inclusion criteria were histopathological confirmation of oral cancer and at least one year of follow-up after ND. Data collected included demographic details, tumour staging, ND type, incision pattern, lymph node yield (LNY), neck and shoulder range of motion (ROM), scar assessment and patient-reported outcomes. Data were analysed using SPSS version 31 and Jamovi with significance set at $p < 0.05$. **Results:** Among 27 patients, selective neck dissection (SND) was commonly performed and transverse cervical incision (TCI) was frequently used. Standard LNY predominated. Most patients had inconspicuous scars and reduction in ROM was observed across ND types, though no statistically significant differences were found. **Conclusion:** SND was predominantly performed for NO disease, whereas MRND was commonly used for N1 and above. Most cases achieved adequate LNY. TCI was the most frequent incision pattern, with generally favourable postoperative functional and aesthetic outcomes.

Keywords: Neck Dissection; Oral Cancer; Lymph Node Yield; Functional Complications; Aesthetic Complications



IADR

INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION

SENIOR E-POSTER PRESENTATION



3D-Printed Hybrid Crowns: Analysis of Marginal Adaptation, Internal Fit, and Load Capacity: A Narrative Review

NDhina Bandhu PAL¹, BEH Yew Hin¹, TEW In Meei¹, Nashrah Hani Binti JAMADON², YEW Hsu Zenn¹

¹Department of Restorative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia, Malaysia

²Department of Electrical, Electronic & Systems Engineering, Faculty of Engineering & Built Environment, University Kebangsaan Malaysia, Malaysia

Email : p161906@siswa.ukm.edu.my

Background: Digital dentistry has relied heavily on subtractive CAD/CAM to produce indirect crowns. Recently, additive manufacturing (3D printing) for indirect crowns using ceramic-filled resins has emerged as a disruptive alternative, promising reduced material waste, lower costs, and enhanced geometric flexibility. However, a comprehensive clinical and laboratory synthesis comparing their marginal accuracy and mechanical survival parameters is required to provide a comprehensive understanding of the material. **Objectives:** To provide an overview of the marginal adaptation, internal fit precision, and fracture resistance of ceramic-filled 3D-printed crowns and therefore to conclude the feasibility of its clinical use. **Methods:** Comprehensive electronic database searches were carried out across PubMed, Web of Science, and Scopus for in-vitro studies published since 2015. Studies addressing 3D-printed crowns using inorganic ceramic-filled resin compared to subtractive hybrid ceramic milling. **Results:** Additively manufactured restorations consistently demonstrate superior or clinically equivalent marginal adaptation compared to milled restorations. 3D-printed crowns achieve marginal gaps ranging as low as $14 \pm 5 \mu\text{m}$ depending on build angle orientation, while milled crowns showed values of $22 \pm 4 \mu\text{m}$ to $70 \mu\text{m}$ (Alhamoudi et al, 2024). Mechanical load profiling shows that ceramic-filled 3D-printable crowns demonstrated fracture loads between 1400 N and 1800 N, exceeding the physiological masticatory force of 800 N for the posterior region. **Conclusions:** Ceramic-filled 3D-printed crowns provide comparable marginal adaptation and mechanical strength capabilities to the subtractive techniques. They are a clinically viable methodology for single unit cuspal coverage indirect dental restorations.

Keywords: 3D printing; Hybrid ceramics; Marginal adaptation; Internal adaptation; Fracture resistance



Mapping Emerging Frontiers of 3D Printing in Periodontal Bone Regeneration: A Bibliometric and Visualization Analysis

FF Harun¹, FA Adam¹, N Baharuddin¹, F Ariffin¹

¹Centre for Periodontology Studies, Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Selangor, Malaysia.

Email: 2024814544@student.uitm.edu.my

Objectives: Bibliometric analysis is a comprehensive quantitative approach for evaluating scientific productivity, research impact, and emerging developments within a specific field. This study aimed to explore the global research landscape of three-dimensional (3D) printing in periodontal regeneration and identify evolving trends that may influence the future of regenerative dentistry. **Methods:** A comprehensive literature search was conducted using the Scopus database without restrictions on publication year or study design. Twenty-one relevant publications were identified and included for analysis. Bibliographic data were extracted and analysed using VOSviewer to generate visualization networks based on citation patterns, authorship collaborations, and keyword co-occurrence. **Results:** Citation frequencies ranged from 0 to 257, with peak publication activity observed in 2019, 2022, and 2024, reflecting growing scientific interest in this field. The Journal of Dental Research emerged as the leading publication source. **Conclusions:** Network visualization demonstrated increasing interdisciplinary collaboration and highlighted key research themes involving scaffold fabrication, tissue engineering, and regenerative applications. Although the current body of literature remains limited, the findings underscore the expanding role of 3D printing as an intelligent and promising innovation in periodontal regeneration. Future research should focus on optimizing scaffold architecture, assessing long-term clinical outcomes, and evaluating cost-effectiveness to support sustainable clinical translation and broader application in global oral healthcare.

Keywords: Periodontal regeneration, 3D printing, tissue engineering, scaffolds, bibliometric analysis



Efficacy of UV Light Retainer Case for Disinfection of Vacuum Form Retainer

FAL Imran Shahrul¹, Zaleha binti Shafiei², Siti Nor Asyikin Zakaria³, Rohaya Megat Abdul Wahab⁴

¹Department of Family Oral Health, Faculty of Dentistry, Universiti Kebangsaan Malaysia

²Department of Craniofacial Diagnostics and Biosciences, Faculty of Dentistry, Universiti Kebangsaan Malaysia

³Research Lab, Faculty of Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia

Email: alimranshahrul@ukm.edu.my

Objective: Vacuum-formed retainers (VFRs) are commonly used after orthodontic treatment to maintain tooth position. However, prolonged wear may encourage microbial accumulation. This study evaluated the effectiveness of an ultraviolet (UV) light retainer case in reducing *Streptococcus mutans* contamination on VFRs and compared it with toothpaste brushing and Retainer Brite. **Methods:** An in vitro experimental study was conducted using 50 VFRs inoculated with a standardised culture of *S. mutans*. The samples were randomly allocated into five groups: UV light retainer case, toothpaste brushing, Retainer Brite, distilled water rinse, and untreated control. Each cleaning method was performed using standardised protocols. After treatment, bacterial colonies were quantified as CFU/mL using serial dilution and culture on Brain Heart Infusion agar. Data were analysed using Kruskal–Wallis and Mann–Whitney U tests, with significance set at $p < 0.05$. **Results:** Retainer Brite showed the greatest antimicrobial effect, with no viable colonies detected. Toothpaste brushing produced the next lowest bacterial count, with a median of 1.12 CFU/mL, followed by the UV light retainer case, with a median of 2.80 CFU/mL. Distilled water rinsing showed a higher residual bacterial count, with a median of 58.50 CFU/mL. All tested methods significantly reduced *S. mutans* counts compared with the untreated control group ($p < 0.001$). **Conclusion:** Retainer Brite was the most effective method for reducing *S. mutans* contamination on VFRs, followed by toothpaste brushing and UV light exposure. Although less effective than the other active cleaning methods, the UV light retainer case demonstrated antibacterial activity and may be considered as an adjunct to routine retainer cleaning.

Keyword: Orthodontic Retainers; Disinfection; *Streptococcus mutans*



Proteomic Analysis of α -mangostin Reveals Multi-Target Antimicrobial Effects against Oral Microorganisms as Dental Impression Disinfectant

Nurdiena Mohamed Nasir¹, Noor Azlin Yahya¹, Wan Izlina Wan Ibrahim², Ros Anita Omar¹

¹Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya

²Department of Oral and Craniofacial Sciences, Faculty of Dentistry, Universiti Malaya

Email: nurdienanasir@um.edu.my

Objectives: α -mangostin has shown to have antimicrobial properties, however, the exact mechanisms behind its action remain elusive, particularly against oral microorganisms. Therefore, the objective of this study is to investigate the antimicrobial effects of α -mangostin against oral microorganisms on dental impression material and to elucidate mechanisms of how α -mangostin reacts with these microbes at protein level via proteomics and bioinformatics analyses. **Methods:** Saliva-coated alginate impression discs inoculated with *Pseudomonas aeruginosa*, *Staphylococcus aureus*, and *Candida albicans* were disinfected with α -mangostin, distilled water (negative control), and 1% MEDAPRINT™ (positive control) for 5, 10, and 15 minutes. Antimicrobial activities were determined by colony-forming unit (CFU) analysis. Proteins from α -mangostin-treated and untreated samples were extracted and subjected to label-free quantitative liquid chromatography–tandem mass spectrometry. Statistical analysis and identification of differentially expressed proteins were performed using Perseus, and protein–protein interaction (PPI) network analysis was conducted using STRING. **Results:** CFU showed time-dependent reduction following exposure to α -mangostin treatment. Proteomic analysis showed distinct responses across all three microorganisms. Downregulated proteins in *P. aeruginosa* are associated with fatty acid biosynthesis, secretion systems and carbon metabolism, and in contrast, stress-related and regulatory proteins were upregulated. In *S. aureus*, proteins involved in ribosomal function, oxidative stress response and metabolic pathways were dysregulated, which indicates disruption of bacterial homeostasis and protein synthesis. In *C. albicans*, the altered proteins are associated with cellular metabolism, membrane-associated functions, and stress adaptation, suggesting impaired fungal survival mechanisms. STRING PPI analysis showed significant interaction enrichment and interconnected functional clusters across all organisms, supporting a multi-target antimicrobial mechanism. **Conclusion:** Collectively, the findings indicate that α -mangostin induces extensive proteomic dysregulation across bacterial and fungal oral microorganisms by targeting multiple cellular pathways. The disruption of metabolic activity, stress adaptation, and cellular homeostasis supports its potential as a broad-spectrum antimicrobial agent.

Keywords: α -mangostin, antimicrobial mechanisms, dental impressions, proteomics

GIS in Dentistry: Spatial Analysis of Disease Distribution and Healthcare Accessibility

Mohamed NA^{1,3}, Ariffin F², Jamil MA^{1,3}, Mohd Radzi NA¹, Yusof N¹

¹Centre of Population Oral Health and Clinical Prevention, Faculty of Dentistry, Universiti Teknologi MARA

²Centre of Periodontology Studies, Faculty of Dentistry, Universiti Teknologi MARA

³Ministry of Health Malaysia

Email: 2024872776@student.uitm.edu.my

Objective: Oral health inequalities remain a major public health concern, particularly among rural and underserved populations with limited access to dental healthcare services. Geographic Information Systems (GIS) have increasingly been applied in healthcare research to evaluate spatial patterns of disease distribution and healthcare accessibility. However, GIS applications in dentistry remain fragmented and have not been comprehensively synthesised. This systematic review aimed to evaluate current GIS applications in dentistry, focusing on oral disease distribution, dental healthcare accessibility, and service utilisation for oral health planning. **Methods:** A systematic review was conducted according to PRISMA guidelines and registered with PROSPERO (CRD42025123868). Searches were performed in Scopus and Web of Science for studies published between 2015 and November 2025. Studies applying GIS or spatial analytical techniques to investigate oral health outcomes or dental healthcare services were included. Two reviewers independently screened studies assessed methodological quality using the SMART v1.2 tool and extracted data using a PRISMA-aligned template. Findings were synthesised narratively due to methodological heterogeneity. **Results:** Twenty-four studies met the inclusion criteria. Three major themes were identified: spatial distribution of oral diseases, accessibility to dental healthcare services, and dental service utilisation for system-level planning. GIS-based studies consistently demonstrated poorer access to dental services and higher oral disease burden among rural and disadvantaged populations. Common methodological limitations included inadequate spatial metadata reporting and insufficient robustness assessments. **Conclusion:** GIS is a valuable tool for identifying spatial inequalities in oral health and supporting evidence-based oral healthcare planning and population oral health surveillance.

Keywords: Geographic Information Systems; Oral Health; Health Services Accessibility; Spatial Analysis; Dental Public Health



Psychophysiological Profiling of Paediatric Dental Anxiety: Integrating Heart Rate Variability and MY-ACDAS for Personalised Care

Nor Malina Manan¹, Nubli Abdul Wahab², Sabri Musa¹, Liew Su Reen¹, Nor Qistina Hanum Abdul Razif¹

¹Department of Orthodontics, Paediatric and Special Care Dentistry, Faculty of Dentistry, Universiti Malaya

²Humanities Centre, Universiti Malaysia Pahang Sultan Al Abdullah

Background: Children exhibit diverse responses in dental settings, ranging from emotional fear and physiological stress to calm composure. Traditional assessment tools often fail to capture this crucial variation, highlighting the need for a deeper understanding of both emotional and physical responses to guide more effective clinical approaches. **Objective:** This study aimed to identify distinct patterns of dental anxiety among children by combining heart rate variability (HRV) data with MY-ACDAS scores. **Methods:** Forty children aged 6 to 9 were assessed. MY-ACDAS questionnaires were administered, and HRV monitoring was conducted during dental-related visual exposure. HRV parameters collected included Low Frequency (LF)/High Frequency (HF) ratio, short term variability (SD1), long term variability (SD2), SD2/SD1 ratio, and entropy. Cluster analysis and Principal Component Analysis (PCA) were employed to explore groupings based on shared traits. **Results:** Cluster analysis identified three distinct paediatric dental anxiety subtypes. Significant differences were observed among clusters for MY-ACDAS scores ($F = 31.96$, $p < 0.001$), LF/HF ratio ($F = 23.37$, $p < 0.001$), and Approximate Entropy ($F = 20.54$, $p < 0.001$). The Resilient subtype demonstrated the lowest anxiety scores (mean MY-ACDAS = 20.29), whereas the Psychologically Anxious subtype showed the highest self-reported anxiety (mean = 28.32). The Physiologically Reactive subtype exhibited markedly elevated LF/HF ratios (mean = 5.00) and lower entropy values (mean = 0.75), reflecting heightened autonomic stress responses. These findings demonstrate distinct psychological and physiological anxiety profiles among children. **Conclusion:** Integrating both MY-ACDAS and HRV provided a clearer, more nuanced view of how children experience dental anxiety. These findings support a personalised behavioural management and precision oral healthcare approach, where dental care plans can be tailored to a child's specific anxiety profile.

Keywords: dental anxiety, children, HRV, MY-ACDAS, cluster analysis



Artificial Intelligence Applications in the Diagnosis and Management of Periodontitis: A Review

Tengku Ahmad Noor TNE¹, Zohaib K^{2,3,4}, Nugraha AP⁵, Ramadhani NF⁶, Noor E¹

¹Center of Studies for Periodontology, Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Sungai Buloh, Selangor, Malaysia

²Department of Prosthodontics and Dental Implantology, College of Dentistry, King Faisal University, Al-Ahsa, Saudi Arabia

³Department of Anatomy, Faculty of Dentistry, Center of Artificial Intelligence and Innovation (CAII), Center of Excellence for Dental Stem Cell Biology, Chulalongkorn University, Bangkok, Thailand

⁴Department of Oral and Maxillofacial Surgery, Biruni University, Turkey

⁵Dental Regenerative Research Group, Orthodontic Department, Faculty of Dental Medicine, Universitas Airlangga, Surabaya, Indonesia

⁶Department of Dentomaxillofacial Radiology, Faculty of Dental Medicine, Universitas Airlangga, Surabaya, Indonesia

Background: Periodontitis is a major global health burden and leading cause of adult tooth loss. Artificial intelligence (AI), particularly machine and deep learning, shows potential to improve diagnostic accuracy, treatment planning, and progression prediction. This review synthesises AI applications across periodontal diagnosis, classification, prognosis, and monitoring. **Methods:** Following PRISMA 2020, six databases (PubMed/MEDLINE, Scopus, Web of Science, EMBASE, Cochrane, Google Scholar) were searched from January 2010 to June 2025. Original peer-reviewed studies applying AI to periodontal disease with quantitative metrics were included. Two reviewers independently screened, extracted, and appraised studies using a tool adapted from QUADAS-2 and PROBAST. Findings were synthesised narratively. **Results:** Twenty-eight studies were included. Convolutional neural networks and hybrid models dominated imaging studies, achieving 73.0–99.4% accuracy (median ≈91%) for radiographic alveolar bone loss detection. Classification and staging accuracies ranged 70–98% (median ≈87%), with stronger performance in advanced disease. Prognostic models reached 73–95% accuracy (median ≈80%); probabilistic models integrating clinical and salivary biomarkers reached AUROC 0.88. Risk of bias was high or unclear in most studies due to retrospective designs, internal-only validation, and dataset imbalance. **Conclusions:** AI performs comparably to, and sometimes exceeds, human experts in well-defined diagnostic tasks, particularly radiographic bone loss detection. However, heterogeneity and limited external validation constrain the evidence. AI is best positioned as an adjunctive decision-support tool rather than a replacement for clinical judgement. Prospective multicentre studies with standardised reporting and external validation are required for safe clinical translation.

Keywords: artificial intelligence; deep learning; periodontitis; periodontal diagnosis; systematic review



Beyond Miswak: *Salvadora persica* Formulations in Periodontal and Wound Healing CareA Scoping Review

Zaid Ahmad Sharifuddin¹, Fara Azwin Adam¹, Erni Noor¹, Nazurah Nik Eezammuddeen¹

¹Centre of Periodontology Studies, Faculty of Dentistry, Universiti Teknologi MARA, Selangor, Malaysia

Email: 2025440036@student.uitm.edu.my

Objectives: Although *Salvadora persica* has been widely used in traditional oral care, evidence on its modern oral formulations for periodontal therapy and oral wound healing remains scattered, particularly for post-operative periodontal care. This scoping review aimed to map the available evidence on *S. persica*-based oral formulations for periodontal therapy and oral wound healing, and to identify gaps relevant to post-operative periodontal management. **Methods:** Two databases, Scopus and Web of Science, were searched from inception until 20 May 2026. Records were deduplicated and screened by two reviewers through title, abstract, and full-text assessment. Eligible studies included human and preclinical investigations of *S. persica*-containing mouthwash, oral rinse, chewing gum, gel, periodontal chip, extract irrigation, or mucoadhesive formulations in periodontal therapy, gingival inflammation, periodontitis, post-treatment care, or oral wound-healing models. Data were charted by study design, formulation, comparator, clinical context, outcomes, follow-up, findings, and adverse effects. **Results:** A total of 554 records were identified. After removing 113 duplicates, 441 records were screened, 16 full-text articles were assessed, and 14 studies were included. Most human studies assessed plaque, gingival inflammation, bleeding, probing depth, clinical attachment level, microbiological outcomes, and comparisons with chlorhexidine. *S. persica*-based formulations generally showed favourable effects on plaque, gingival inflammation, bleeding control, and periodontal outcomes, although chlorhexidine was superior in some antimicrobial outcomes. Preclinical studies suggested benefits in oral ulcer, tongue wound, extraction socket, and alveolar bone healing. **Conclusions:** *S. persica*-based oral formulations may support periodontal therapy and oral wound healing. However, direct human evidence for post-operative periodontal surgical care remains limited, with only one study evaluating *S. persica* mouthwash after crown-lengthening surgery. Further randomized clinical trials are needed to investigate healing, pain, swelling, bleeding, tolerability, and patient-centred outcomes

Keywords: *Salvadora persica*, periodontal therapy, oral wound healing, oral formulations, scoping review.



Artificial Intelligence-Based Detection of Dental Caries and Periapical Periodontitis Using YOLOv5

Patkhiddinov JSh1 , Patkhiddinova MSh2 , Nik A3, Yusupalikhodjaeva SX4 , Yahya NA2 and Zamri R1

¹Department of Orthodontics, Paediatric and Special Care Dentistry, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia

²Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia

³Department of Oral and Craniofacial Sciences, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia

⁴ Department of Propaedeutic Therapeutic Dentistry, Tashkent State Medical University, Tashkent, Uzbekistan

Email:23069970@siswa.um.edu.my

Objectives: Dental caries and periapical periodontitis are highly prevalent oral diseases, and radiographic diagnosis may be subjective and time-consuming. This study aimed to develop and evaluate a YOLOv5-based deep learning model for simultaneous detection of dental caries, periapical periodontitis and tooth identification on periapical radiographs. **Methods:** A total of 2,680 periapical radiographs were collected and independently annotated by three experienced experts. The dataset was divided into training, validation, and testing groups. Image preprocessing and normalization were performed before training the YOLOv5 model. Diagnostic performance was evaluated using sensitivity, specificity, positive predictive value, negative predictive value, F1-score and ROC analysis. **Results:** The proposed model achieved F1-scores of 0.8288 for dental caries detection and 0.8283 for periapical periodontitis detection. ROC analysis demonstrated high diagnostic performance with AUC values above 0.91. AI-assisted analysis improved inter-observer agreement and showed superior performance compared with junior clinicians. **Conclusions:** The YOLOv5-based AI system demonstrated reliable automated detection of dental caries and periapical periodontitis while simultaneously identifying tooth numbers on periapical radiographs. This approach may improve diagnostic consistency and clinical efficiency in dental practice.

Keywords: Artificial intelligence, YOLOv5, dental caries, periapical periodontitis, radiographs.



Effectiveness of Immersive Technologies and Artificial Intelligence for Smoking and Vaping Cessation: An Umbrella Review

Luai AF¹, Mohd Nizar MA², Misran AA³, Roslan N⁴, Amer Nordin AS⁵, Yahya NA¹, Mohd Radzi NA⁶, Md SabriBA⁶, Abdul Kadir R⁷, Hum WL⁸

¹ Department of Family Oral Health, Faculty of Dentistry, Universiti Kebangsaan Malaysia (UKM), Kuala Lumpur, Malaysia

² Department of Craniofacial Diagnostics and Biosciences, Department of Family Oral Health, Faculty of Dentistry, Universiti Kebangsaan Malaysia (UKM), Kuala Lumpur, Malaysia

³ Department of Restorative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia (UKM), Kuala Lumpur, Malaysia

⁴ Pahang State Oral Health Division, Ministry of Health Malaysia

⁵ Department of Psychological Medicine, Faculty of Medicine, Universiti Malaya, Kuala Lumpur, Malaysia

⁶ Centre of Population Oral Health and Clinical Prevention Studies, Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Sungai Buloh, Malaysia

⁷ Department of Research Synergy, Universiti Malaya, Kuala Lumpur, Malaysia

⁸ Taylor's University, Subang Jaya, Malaysia

Email: dramirulfaiz@ukm.edu.my

Objective: Smoking and vaping remain major public health concerns worldwide. Emerging interventions based on immersive technologies and artificial intelligence (AI) have gained increasing attention for supporting tobacco cessation; however, evidence is dispersed across multiple systematic reviews with varying scopes, methodologies, and conclusions. To date, no umbrella review has comprehensively synthesised and critically appraised the overall evidence base for immersive technologies and AI-driven interventions in smoking and vaping cessation.

Methods: This umbrella review followed PRISMA guideline and was registered with PROSPERO. Five databases yielded 7,822 records. After deduplication, 7,731 records were screened, 280 reports assessed, and 24 full texts were reviewed. Quality was assessed using AMSTAR 2, and certainty using GRADE. **Results:** A total of nine systematic reviews were included. Of these, four reviews focused on immersive technologies, including virtual reality, augmented reality, and immersive environments; four reviews focused on AI-driven interventions, including conversational AI, chatbots, natural language processing agents, and virtual assistants; and one review examined broader technology-based vaping interventions with relevant immersive components. Eligible reviews addressed cessation, reduction, craving management, relapse prevention, prevention, or quit support across smoking, vaping, and broader substance-use populations. AMSTAR 2 indicated five low-confidence and four critically low-confidence reviews. Main limitations included absence of full-text exclusion lists, incomplete funding reporting, limited duplicate processes, and inconsistent integration of risk-of-bias findings. GRADE showed low-certainty evidence for AI conversational agents and very low-certainty evidence for immersive technologies. AI chatbots and conversational agents provided the clearest favourable signal for adult smoking cessation, including higher 6-month quitting in meta-analysis (RR 1.29, 95% CI 1.13 to 1.46). Certainty was reduced by attrition, risk of bias, heterogeneity, and limited biochemical validation. **Conclusions:** AI conversational tools show promising but low-certainty cessation evidence. Immersive technologies may support engagement and prevention, but cessation effectiveness remains inconclusive.

Keywords: Smoking cessation; vaping cessation; immersive technology; artificial intelligence; umbrella review.



Standardisation Of Dental Trauma Splinting Protocols: A Scoping Review of Current Evidence

Rafi A¹, Ubaidillah AHA¹, Zulkiffli S¹, Yahya NA¹

¹Department of Restorative Dentistry, Faculty of Dentistry, University Malaya.
Email: ayesha.09b@gmail.com

Introduction: Dental trauma is a frequent clinical problem that needs quick stabilisation to protect the tooth and surrounding periodontal tissues. Splinting is commonly used for this purpose, but in practice, there is much variation in the materials used, rigidity and mobility of the splints. This makes it difficult to compare studies and develop clear clinical guidelines. **Objective:** This scoping review aimed to map the available evidence on dental trauma splinting protocols, with a focus on how splint rigidity and tooth mobility are defined and measured. It also considered the types of splints used, application details, assessment methods, and inconsistencies in reporting. **Methods:** The review followed PRISMA-ScR guidelines and the Joanna Briggs Institute (JBI) framework. A search was conducted in PubMed, Scopus, and Google Scholar for studies published between 1990 and 2026. Studies included original research on dental trauma splinting techniques. Data extracted included study design, type of splint, periodontal ligament simulation, application parameters, and methods used to assess outcomes. **Results:** A total of 22 studies were included, consisting of in vitro, in vivo, and animal studies. The most commonly studied splints were wire-composite splints, titanium trauma splints, resin splints, fibre-reinforced splints, and composite splints. The Periotest was the most frequently used tool to measure tooth mobility and splint performance. Overall, flexible splints such as titanium trauma splints and thinner wire-composite splints allowed more natural tooth movement and were generally considered better for periodontal healing. In contrast, more rigid splints provided stronger immobilisation, which may be useful in more severe injuries like alveolar fractures. However, there was a lot of variation in how studies defined “flexible” and “rigid,” as well as differences in splint design and testing methods, which made comparison difficult. **Conclusion:** The evidence shows that there is no consistent approach to dental trauma splinting. Flexible and rigid splints both have advantages depending on the injury, but the lack of standard definitions and reporting makes it difficult to draw firm conclusions. More standardised methods are needed to improve research quality and guide clinical practice.

Keywords: Dental trauma, dental trauma splints, Periotest, Wire-composite splint, Titanium trauma splints.



Surface Degradation of Conventional, CAD/CAM, and 3D-Printed Denture Base Materials

Khalaf HM¹, Yahya NA¹, Radzi Z², Yap AU^{1, 3}

¹Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia

²Department of Orthodontics, Paediatric and Special Care Dentistry, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia

³Division of Dentistry and Director of Research, Ng Teng Fong General Hospital, Singapore, Singapore

Email: huaida20@gmail.com

Objectives: Digital technologies have introduced CAD/CAM-milled and 3D-printed denture base materials as alternatives to conventional polymethyl methacrylate (PMMA). Despite their growing use, evidence regarding their surface degradation under simulated oral conditions remains limited. This study evaluated the effects of different food-simulating liquids and exposure duration on the surface roughness and hardness of conventional, CAD/CAM-milled, and 3D-printed denture base materials. **Methods:** A total of 225 specimens were fabricated from three denture base materials: heat-cured PMMA, CAD/CAM-milled PMMA, and 3D-printed resin. Specimens were allocated to five testing conditions: air (control), distilled water, ethanol solution, citric acid, and heptane, representing different oral environmental challenges. Surface roughness (Ra, μm) and Vickers hardness (VHN) were evaluated after 1 week and 1 month. Data were analysed using two-way and one-way ANOVA with Tukey's post hoc test, as well as paired-samples t-tests ($p < 0.05$). **Results:** Surface degradation was significantly influenced by material type, testing medium, and exposure duration, with notable interaction effects observed. The 3D-printed resin consistently demonstrated the lowest surface roughness across all conditions, whereas CAD/CAM-milled specimens exhibited higher roughness, particularly following exposure to citric acid. Distilled water and citric acid significantly increased the roughness of conventional PMMA over time ($p < 0.05$). In terms of hardness, conventional PMMA showed the highest values overall, while CAD/CAM-milled specimens demonstrated comparatively lower hardness. Ethanol exposure markedly reduced the hardness of the 3D-printed resin, whereas heptane produced minimal changes over time. **Conclusions:** Surface properties of denture base materials are influenced by both material composition and chemical environment. While 3D-printed resins offer superior surface smoothness, conventional PMMA provides greater resistance to mechanical degradation. Acidic and alcoholic environments adversely affect material performance, highlighting the importance of considering patient dietary habits when selecting denture base materials.

Keywords: Denture base materials, CAD/CAM dentistry, 3D printing, Surface roughness, Surface degradation



Beyond Filling: Can Bioactive Restorative Materials Protect Restoration Margins?

Ahmad Nazirul Mubin MUGHNI¹, Hetal Ashvin KUMAR¹

¹Department of Restorative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia, Malaysia

Email: p161905@siswa.ukm.edu.my

Objective: This narrative review aimed to summarise current evidence on the demineralisation resistance and mechanical performance of bioactive composite restorative materials, with emphasis on ion-releasing systems used for caries prevention and marginal protection. **Methods:** A focused narrative literature search was conducted in PubMed, Scopus, Web of Science and Google Scholar for English-language articles published from 2016 to 2026. Search terms included combinations of tooth or enamel demineralisation, surface microhardness, mineral loss, glass ionomer, giomer, bioactive composite, ion-releasing restorative material and pH cycling.. The main outcomes considered were enamel or dentine demineralisation adjacent to restoration margins, pH-cycling response, surface or cross-sectional microhardness, lesion depth, ion release, flexural strength, elastic modulus, water sorption and solubility. **Results:** Current evidence suggests that bioactive and ion releasing restorative materials can reduce enamel and dentine demineralisation compared with conventional resin composites, particularly under pH-cycling models that simulate alternating acidic and neutral oral conditions. Fluoride and ion releasing materials, including glass ionomer based systems and giomers, generally demonstrate greater preservation of adjacent tooth mineral content. Recent bioactive resin composites, including ACTIVA BioACTIVE and other calcium/phosphate releasing materials, show promising remineralisation potential. However, their performance appears material dependent and the mechanical findings are variable. Some bioactive composites maintain flexural strength, elastic modulus and surface hardness comparable to conventional composites, whereas increased ion release, water sorption or solubility may affect long-term durability. **Conclusion:** Bioactive composites may contribute to secondary caries prevention by enhancing demineralisation resistance at the tooth restoration interface. However, variation in material composition, pH-cycling protocols, aging methods and mechanical testing limits direct comparison. Further standardised studies are required to clarify the balance between remineralisation potential and mechanical durability.

Keywords: Bioactive composite, Demineralisation, Mechanical properties, pH cycling.



Preliminary Development and Alpha Review of a Web-Based Training Module on Ethical Dental Advertising for Dentists

Kamarudin Y¹, Sivarajan S¹, Ripen ZM², Ahmad Fuaad AAH³, Huang B⁴, Mohd Nor NA⁵

¹Department of Orthodontics, Paediatric and Special Care Dentistry, Faculty of Dentistry, Universiti Malaya, Malaysia

²Department of Oral & Maxillofacial Clinical Sciences, Faculty of Dentistry, Universiti Malaya

³Department of Chemistry, Faculty of Science, Universiti Malaya, Malaysia

⁴School of Dentistry, University of Minnesota, Minneapolis, US

⁵Department of Community Oral Health & Clinical Prevention, Faculty of Dentistry, Universiti Malaya, Malaysia

Email: yasminkamarudin@um.edu.my

Objectives: Unethical dental advertising is increasingly prominent, raising concerns about professional responsibility and patient protection. The study aims to develop and review a web-based training module on ethical dental advertising. **Methods:** The module was developed by a six-member expert panel comprising academics, dental specialists, and an online teaching expert. Content validation was conducted throughout development using written feedback and follow-up interviews. During Alpha review, 27 dentists completed the module and evaluated it using the Website Evaluation Questionnaire (WEQ), which assessed relevance, comprehensibility, comprehensiveness, user-friendliness, structure, navigation, speed, time allocation, and layout design on a 5-point Likert scale, with open-ended feedback. Quantitative data were summarized using descriptive statistics, while qualitative feedback was analyzed thematically. **Results:** Participants (n=27) had a mean age of 36 years (range 30-44 years), and most were female (70.4%). Overall, the module was positively received. The highest-rated domains were relevance (4.35), structure (4.24), and comprehensiveness (4.17), while comprehensibility (4.06), user-friendliness (4.07), layout (4.02), time adequacy (3.87), and speed (3.69) also received favourable ratings. Navigation received the lowest score (2.11), indicating a key area for improvement. Qualitative feedback showed that participants appreciated the comprehensive content and real-life scenarios. Suggested improvements included better visual design, mobile compatibility, shorter content, improved navigation and connectivity, and clearer case examples. **Conclusions:** The web-based online module on ethical dental advertising was generally well received by dental professionals. Improvements in navigation may further enhance the overall user experience and effectiveness.

Keywords: E-professionalism, Marketing, Social Media, dental ads



Mechanostimulation Effects on Anxiety and Measured Physiological Parameters During Injection of Intraoral Local Anaesthesia

Hany Suraya Ab Sukor¹, Su Keng Tan² and Faezah Sabirin³

¹Centre of Postgraduate Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, 47000 Sungai Buloh, Selangor, Malaysia.

²Centre of Oral and Maxillofacial Surgery Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, 47000 Sungai Buloh, Selangor, Malaysia.

³Centre of Preclinical Science Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, 47000 Sungai Buloh, Selangor, Malaysia.

Email: drfaezah@uitm.edu.my

Introduction: Pain during injection of intraoral local anesthesia (LA) is common and may induces anxiety. Application of mechanical stimuli particularly vibration was used, to modulate injection pain that may also reduce anxiety and physiological parameters among the patients. **Objective:** To investigate the effectiveness of vibration in reducing anxiety and physiological parameters during painful LA injection among randomised controlled trials (RCTs) published between 2022 to 2025. **Methodology:** This systematic review and meta-analysis were conducted in accordance with Preferred Reporting Items for PRISMA guidelines. Literature search was carried out across four databases (i.e., PubMed, Web of Science, Cochrane, and Scopus). The assessment on the quality of eligible studies was performed using Cochrane risk-of-bias tool for RCTs (RoB2). Qualitative appraisal of the included studies was subsequently conducted, followed by the quantitative analysis using RevMan 5.4 software. **Results:** The shortlisted studies were predominantly presented with some concern and high risk of bias based on RoB2. Qualitatively, less than half of the included studies reported on significant reductions in anxiety with application of vibrating device during injection of intraoral LA. As for measured physiological parameters, majority of the studies demonstrated significant improvements. Quantitatively, compared to control, the physiological parameters were significantly lower in vibration group (SMD=-1.86; 95% CI=-2.11, -0.03, p=0.04). **Discussion:** Although anxiety levels were measured by scores, the SDs were not reported in the literatures thus meta-analysis could not be conducted. **Conclusion:** The findings from this appraisal suggest that the use of electronic vibration improved measured physiological parameters during LA injection.

Keywords: vibration, injection pain, anxiety, local anaesthesia, heart rate

Digital and AI-Assisted Cavity Preparation Assessment in Preclinical Dental Education: A Narrative Review

Eva Shih Yi MU¹, Siti Nuramanina Binti ABDUL SHUKOR¹, Jasmina Binti KAMARUZAMAN¹, Ting Khee HO¹, Aqilah Baseri HUDDIN²

¹Department of Restorative, Faculty of dentistry, University Kebangsaan Malaysia, Malaysia

²Department of Electrical, Electronic & Systems Engineering, Faculty of Engineering & Built Environment, University Kebangsaan Malaysia, Malaysia

Email: p161904@siswa.ukm.edu.my

Objectives: Assessment of cavity preparation is an essential component of preclinical operative dentistry training. Conventional faculty-based evaluation methods are often subjective and result in inconsistent feedback among examiners. This narrative review aims to explore current digital, virtual reality, and artificial intelligence (AI)-assisted approaches in cavity preparation assessment and evaluate their potential role in dental education. **Methods:** Relevant literature in digital dentistry, virtual reality simulation, and AI-assisted cavity preparation assessment in preclinical dental education was reviewed using electronic databases including PubMed, Scopus, and Web of Science. Studies involving digital evaluation systems, haptic simulators, machine learning, and image-based assessment tools were analysed and summarised. Emphasis was placed on the applications, advantages, limitations, and educational relevance of these technologies in undergraduate preclinical operative dentistry training. **Results:** Recent studies demonstrate increasing integration of digital technologies into cavity preparation assessment. Digital assessment systems were commonly used to compare student cavity preparations with ideal or reference models using quantitative three-dimensional analysis. Several studies reported improved standardisation and reduced examiner variability compared with conventional faculty-based assessment. Virtual reality and haptic simulation systems were also reported to improve student engagement. However, some virtual simulation systems were unable to reproduce the tactile sensation achieved in phantom head training and often required specialised equipment. Artificial intelligence-based models, including machine learning and convolutional neural networks, demonstrated accuracy in assessing cavity preparations and detecting preparation errors. Nevertheless, these studies were often based on small datasets, increasing the risk of overfitting and limiting model reliability and generalisability. Current artificial intelligence systems also primarily generate performance scores rather than transparent, parameter-based evaluations aligned with teaching criteria. **Conclusions:** Despite these challenges, digital and AI-assisted technologies continue to show potential as adjuncts in preclinical cavity preparation assessment. Further research is needed to develop practical and clinically relevant systems suitable for undergraduate dental training.

Keywords: Artificial intelligence, digital dentistry, cavity preparation, assessment.



Marginal Bone Loss (MBL) in Dental Implants Post Alveolar Ridge Preservations. A Systematic Review and Meta-Analysis of Randomized Controlled Trials (RCTs)

Fatin Nadhirah Kamaludin Latifi¹, Nazurah Nik Eezammuddeen¹, Erni Noor¹

¹ Centre of Studies for Periodontology, University Technology MARA, Sungai Buloh, Malaysia

Objectives: Alveolar ridge preservation (ARP) is an established procedure to minimize post-extraction ridge dimensional changes and facilitate implant placement in a prosthetically favorable position. However, evidence regarding its effect on marginal bone loss (MBL) around subsequently placed dental implants remains limited. This systematic review and meta-analysis aimed to evaluate the effect of ARP compared with unassisted healing (UH) on peri-implant MBL following implant placement. **Methodology:** This PRISMA-compliant systematic review was registered in PROSPERO (CRD42024598234). Randomized controlled trials (RCTs) comparing alveolar ridge preservation (ARP) and unassisted healing (UH) with reported marginal bone loss (MBL) outcomes following implant placement were included. Electronic searches were conducted in PubMed, Scopus, and Cochrane Library databases. Risk of bias was assessed using the Cochrane Risk of Bias 2 (RoB 2) tool, and a fixed-effect meta-analysis was performed to compare MBL between groups. **Results:** A total of 752 records were identified, with six randomized controlled trials (RCTs) included in the qualitative synthesis and five in the meta-analysis. Meta-analysis showed no significant difference in marginal bone loss (MBL) between alveolar ridge preservation (ARP) and unassisted healing (UH) sites one year after implant placement (MD = -0.05 mm; 95% CI: -0.17 to 0.07; p = 0.43; I² = 20%). Five studies had a low risk of bias, while one study had a high risk of bias. **Conclusion:** Within the limitations of the available evidence, ARP does not appear to significantly influence peri-implant MBL compared with UH following implant placement. These findings suggest that the clinical benefits of ARP may be primarily related to preserving ridge dimensions and facilitating implant placement rather than reducing subsequent peri-implant bone loss. Future well-designed RCTs with standardized ARP protocols, longer follow-up periods, and stratification according to biomaterial type and defect characteristics are required to clarify the long-term effects of ARP on peri-implant bone stability.

Keywords: Alveolar ridge preservation; Dental implants; Marginal bone loss; Meta-analysis; Systematic review



Achieving a Smooth Surface for 3D-Printed Ceramic Crown Material: A Literature Review

Wei LENG¹, In Meei TEW¹, Jasmina Qamaruz ZAMAN¹, Suet Yeo SOO¹

¹Department of Restorative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia, Malaysia

Email: p161837@siswa.ukm.edu.my

Background: 3D-printed ceramic-filled crown resins are increasingly used as definitive restorations in digital restorative workflows. However, layer-by-layer fabrication may produce stair-stepping, porosities and filler exposure, increasing surface roughness, plaque retention risk and extrinsic staining. Although mechanical polishing is established, the durability of time-saving alternatives such as glazing and resin coating remains insufficiently defined. **Objective:** This literature review aims to evaluate current evidence on post-printing surface treatments for 3D-printed ceramic crown materials, focusing on mechanical polishing, glazing, staining/characterisation procedures, and their influence on surface smoothness and colour stability. **Methodology:** A structured search was conducted up to December 2025 using terms related to 3D printing, ceramic crown resin, digital light processing, stereolithography, surface roughness, polishing, glazing, resin coating and colour stability. Original studies and reviews relevant to the topic were included. **Results:** Acceptable smoothness was interpreted using arithmetic mean roughness (Ra), with $Ra \leq 0.2 \mu m$ considered a commonly cited threshold associated with reduced plaque retention. Mechanical polishing remains the most established finishing approach and may improve surface smoothness when appropriate material-specific polishing systems and final polishing steps are used. Glazing, staining and resin coating can enhance surface gloss and initial smoothness by sealing surface defects. However, their long-term durability remains uncertain because thin surface layers may be removed or degraded by functional wear, toothbrushing abrasion and thermocycling. Available studies also suggest that 3D-printed ceramic crown materials may show greater roughness progression, gloss reduction and discoloration than conventional ceramics after exposure to staining media such as coffee, tea and red wine. **Conclusion:** Post-printing surface treatment is essential for improving the clinical acceptability of 3D-printed ceramic crowns. Although polishing, glazing and resin coating can enhance surface quality, current evidence remains limited and heterogeneous. Further long-term in-vitro and clinical studies are required to establish predictable protocols for durable smoothness and colour stability.

Keywords: 3D printing, colour stability, ceramic crown, mechanical polishing, surface roughness



Evaluation of Data Integrity in NFC-Tagged Dentures Following Chemical Disinfection.

Nik Mansor WHA¹, Ashar A², Harum N³, Fadly Loo MFLS¹, Ariff TFTM¹

¹Centre of Studies for Restorative Dentistry, Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Malaysia

² Department of Craniofacial Diagnostic & Biosciences, Faculty of Dentistry, Universiti Kebangsaan Malaysia (UKM), Malaysia

³Department of Computer Systems & Communication, Faculty of Information and Communication Technology, Universiti Teknikal Malaysia Melaka (UTeM), Malaysia Email: haifa.athirah@gmail.com

Objectives: This study aimed to investigate the effect of routine denture chemical disinfectants on the readability, writability and data retention of near-field communication (NFC)-tagged dentures. **Materials and Methods:** An invitro immersion study was conducted using standardised heat-cured polymethyl methacrylate (PMMA) denture specimens embedded with passive NTAG213 NFC tags via a prefabricated slot technique. Thirty specimens were fabricated and randomly allocated into three immersion groups: normal saline (control), effervescent-based denture cleanser and disinfectant-based mouthwash. Immersion procedures were performed according to the manufacturer's instructions. NFC readability, writability, signal latency, and data retention were evaluated at immediate exposure and at days 7, 14, 21 and 30 using an NFC Forum-certified reader and smartphone-compatible NFC system. Signal performance was assessed using a 3-point ordinal scoring system. **Results:** All NFC-tagged denture specimens remained functional throughout the 30-day immersion study period, demonstrating 100% readability and writability across all groups. No data corruption or complete signal failure was detected. A minor delayed reading (Score 2) was observed in a single specimen within the disinfectant-based mouthwash group at day 30. However, all specimens remained detectable and operational. Stored information remained completely retrievable throughout the study period. **Conclusions:** Routine exposure to commonly used denture chemical disinfectants did not compromise the functional performance of NFC-tagged dentures. The prefabricated slot embedding technique has maintained signal integrity and complete data retention despite repeated chemical immersion challenges. These findings support the clinical feasibility of NFC-assisted denture identification systems under routine denture-care conditions.

Keywords: denture cleanser; denture marking; digital denture identification; near-field communication; removable prosthodontics.



Global Research Trends on Bruxism and Implant Biomechanics: A Bibliometric Analysis

Muhammad Syazwan Junoh¹, Aini Hayati Abdul Rahim¹

¹Centre of Studies for Restorative Dentistry, Faculty of Dentistry, Universiti Teknologi Mara, Sungai Buloh Campus, 47000 Selangor, Malaysia

Introduction: Bruxism has a significant clinical importance in the field of implantology. Repetitive parafunctional loading may influence implant-related biomechanical behaviour, prosthetic complications, marginal bone response and long-term implant outcomes. **Objective:** To analyse global publication trends, influential authors, countries, journals, and thematic research patterns related to bruxism and implant biomechanics. **Methodology:** A comprehensive literature search was conducted in Scopus and Web of Science, using terms related to bruxism, dental implants and biomechanical outcomes. Only English-language articles and reviews relevant to the topic were included. Bibliometric analysis was performed using RStudio in conjunction with VOSviewer for network visualization and thematic mapping. **Results:** A total of 366 records from both databases were identified following preliminary screening. 127 duplicates were removed resulting in 239 publications for final bibliometric analysis. The included literature spanned 32 years (1994 – May 2026) exhibiting an annual growth rate of 8.35%. Research originated from 33 countries, led by the Brazil, United States, Sweden, Italy and China. However Sweden garnered the highest total citation, followed by the United States and Brazil. Malmö University was the most prominent affiliation. The International Journal of Oral and Maxillofacial Implants was the most prolific journal, while Chrcanovic B emerged as the most productive and influential author by publication count and h-index. Keyword analysis revealed dominant thematic clusters centered on “dental implants /dental implants,” “human/humans,” “bruxism,” “tooth implantation,” “survival” and “biomechanics” were dominant themes. **Conclusion:** Research on bruxism and dental implant biomechanics demonstrates increasing scientific production and citation impact, led by influential author and collaborative author networks. Keyword analysis demonstrates implant survival, finite element analysis, biomechanical loading, and prosthetic complications as dominant themes. This bibliometric findings highlight trends and research directions for evidence-based implant treatment in patients with bruxism.

Keywords: Bruxism; Dental implants; Implant biomechanics; Bibliometric analysis.



A Browser-Based App for Streamlined Tooth Wear Examiner Calibration Data Collection: A Pilot Study

Mohd Subri L¹, Nordin N¹, Lee WM¹, Ishak H¹, Syed Zainal Ariffin SMZ²

¹Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Sungai Buloh Campus, 47000 Sungai Buloh, Selangor, Malaysia

²Faculty of Computer and Mathematical Sciences (FSKM), Universiti Teknologi MARA (UiTM), Shah Alam Campus, 40450 Shah Alam, Selangor, Malaysia

Email: 2025474236@student.uitm.edu.my

Introduction: Tooth wear grading using the Modified Tooth Wear Index (TWI) relies on paper-based recording, which is susceptible to sequencing errors, missed entries, and time-consuming manual data transfer into statistical software, particularly in multi-patient calibration studies. **Objectives:** This pilot study aimed to develop and evaluate a browser-based digital grading companion application to standardize and streamline the TWI data collection process for examiner calibration in dental research. **Methods:** The app was developed using HTML5 and JavaScript, requiring no software installation and compatible with any internet browser on desktop, tablet, or mobile devices. It guides examiners through a structured workflow covering 28 teeth (excluding third molars) across three surfaces each - buccal/labial, palatal/lingual, and incisal/occlusal - using Modified TWI scores of 0 to 3, with X marking absent teeth. Three grading tasks were supported: intraoral photograph grading, full-colour three-dimensional digital model grading, and 30-day intra-examiner re-score for reliability testing. Built-in session and per-patient timers standardized grading duration recording, and a real-time progress tracker prevented missed entries. On completion, the app automatically exported a structured CSV file for direct import into SPSS or Python. **Results:** Pilot testing demonstrated complete data capture across all 28 teeth per participant, with no missed entries or sequencing errors recorded. **Discussion:** The elimination of manual transcription and built-in progress tracking directly address the key limitations of paper-based TWI recording, reducing the risk of data loss and improving workflow efficiency during multi-patient calibration sessions. The app's compatibility across devices and zero-cost deployment further support its feasibility in resource-limited clinical research settings. **Conclusions:** This digital tool offers a practical, zero-cost innovation that enhances data completeness, reduces examiner burden, and improves workflow efficiency in tooth wear clinical research.

Keywords: calibration, digital tool, Modified Tooth Wear Index, standardization, tooth wear



The Association Between Sensory Processing Difficulties and Dental Anxiety Among Children with Autism Spectrum Disorder in Klang Valley

Sangithah Tamilselvam¹, Najihah Lokman¹, Noor Syahidah Hisamuddin¹, Lily Azura Shoaib²

¹Department of Community Oral Health & Clinical Prevention, ²Department of Orthodontics, Paediatric & Special Care Dentistry, Faculty of Dentistry Universiti Malaya
Email: 23081330@siswa.um.edu.my

Objectives: This study aimed to identify the association between different sensory processing subtypes and dental anxiety among children with Autism Spectrum Disorder (ASD). Hypersensitivity refers to over-responsiveness to sensory stimuli, in which visual, auditory, olfactory, gustatory, tactile, vestibular, and proprioceptive input may be perceived as overwhelming, while hyposensitivity refers to under-responsiveness or reduced sensory registration, which may present as sensory-seeking behaviour or difficulty responding to environmental cues. **Methods:** A cross-sectional study was conducted among 175 children with ASD in Klang Valley. Data were collected using validated caregiver proxy assessments to identify sensory processing subtypes and dental anxiety status of ASD children. **Results:** The sensory processing subtypes were classified according to hypo-responsive and hyper-responsive patterns across the seven sensory domains, while dental anxiety was classified as anxious or non-anxious. Participants had a mean age of 8.01 years (SD = 2.05), and 62.9% were male. Dental anxiety was highly prevalent, affecting 155 children (88.6%). Dental anxiety showed a stronger association with total hyposensitivity ($r=0.512$, $p<0.001$) than total hypersensitivity ($r=0.403$, $p<0.001$). The three strongest hyposensitivity domains associated with dental anxiety were gustatory hyposensitivity ($r=0.506$, $p<0.001$), proprioceptive hyposensitivity ($r=0.499$, $p<0.001$) and visual hyposensitivity ($r=0.487$, $p<0.001$). The three strongest hypersensitivity domains were tactile hypersensitivity ($r=0.495$, $p<0.001$), auditory hypersensitivity ($r=0.461$, $p<0.001$) and gustatory hypersensitivity ($r=0.400$, $p<0.001$). Logistic regression further identified visual hyposensitivity (OR=1.05, $p=0.005$), proprioceptive hyposensitivity (OR=0.96, $p=0.016$) and proprioceptive hypersensitivity (OR=1.06, $p=0.015$) as significant predictors of dental anxiety. **Conclusions:** These findings suggest that dental anxiety in children with ASD is influenced by both sensory over- and under-responsiveness.

Keywords: Autism Spectrum Disorder; Dental Anxiety; Hypersensitivity; Hyposensitivity; Sensory Profiling.



Microplastic Liberation from Modern Denture Base Materials: A Narrative Review of Mechanisms and Clinical Implications

Zul MF¹, Kassim MZ¹, Yahaya N¹, Abdul Rahman MZ²

¹Department of Restorative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, Kuala Lumpur, Malaysia

²Department of Craniofacial Diagnostics & Biosciences, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, Kuala Lumpur, Malaysia

Email: P162451@siswa.ukm.edu.my

Objectives: The rapid evolution of digital dentistry has introduced 3D-printing and milling as efficient alternatives to traditional PMMA. However, these novel materials possess distinct polymer networks that remain largely uncharacterized regarding degradation and particle shedding. This narrative review evaluates existing evidence on the mechanisms, quantification challenges, and clinical implications of microplastic release from conventional and digital denture-base materials subjected to mechanical and thermal stressors. **Methods:** A comprehensive literature review of spanning polymer science and prosthodontics was conducted. The analysis focused on the degradation kinetics of heat-cured PMMA, high-density milled PMMA block, and 3D-printed resins under simulated oral aging conditions. Furthermore, current analytical methodologies for isolating and characterizing intra-oral debris, including chemical digestion, vacuum filtration, light microscopy, micro-FTIR spectroscopy, and SEM, were critically assessed. **Results:** While milled PMMA benefits from industrial-grade homogeneity that reduces shedding, the lower degree of conversion and interfacial vulnerabilities of 3D-printed resins inherently elevate their susceptibility to surface fatigue and micro-crack propagation under combined thermal-mechanical stress. Plus, significant methodological gaps exist, particularly regarding contamination control and the lack of standardized protocols to isolate MPs from complex biological fluids. **Conclusions:** This review bridges a critical knowledge gap by shifting focus from bulk mechanical strength to long-term biological safety in digital prosthodontics. Understanding MP release profiles enables clinicians to make evidence-based material selections. Finally, establishing standardized testing benchmarks is vital to developing bio-stable photopolymers, mitigating chronic synthetic debris ingestion, and reducing microscopic waste in the dental manufacturing lifecycle.

Keywords: Plastic Microparticles, Dental Material, 3D Printing, Biocompatibility



A Cone Beam Computed Tomographic Evaluation of Root and Root Canal Morphology in Permanent Mandibular First Molars Among a Malaysian Population

Deepak Pateel GS, Muhammad Khan Asif, Ain Najwa Mohd Hakimi, Kam Kai Rou, Siew Winnie, Shilpa Gunjal

Introduction: The mandibular first permanent molar (MFPM) is the most frequently treated tooth in endodontic practice and exhibits considerable root canal variability. Population-specific morphological data are essential, particularly in multiethnic settings where anatomical diversity may be clinically significant. **Objective:** To characterize the root and root canal morphology of MFPMs in a multiethnic Malaysian population using cone beam computed tomography (CBCT) and the Ahmed et al. (2017) classification system. **Methodology:** A retrospective review of 151 CBCT scans acquired at MAHSA University Dental Clinic between January 2023 and December 2024 was conducted. Scans were assessed in all three orthogonal planes, and canal configurations were coded using the Ahmed et al. system. Fisher's exact test examined associations between canal configuration and gender or ethnicity ($p < 0.05$). **Results:** Among 151 MFPMs, the sample comprised Malay ($n = 78$, 51.7%), Chinese ($n = 46$, 30.5%), Indian ($n = 21$, 13.9%), and other ethnic groups ($n = 6$, 3.9%). Seventy-nine percent had two roots and 11% had three roots. The most prevalent mesial configuration was M2 (70.2%), followed by M2-1 (21.2%). For the distal root, D1 predominated (49.0%), followed by D1-2 (18.5%) and D1-2-1 (16.5%). No significant gender-related differences were found (mesial $p = 0.153$; distal $p = 0.234$). A significant association between distal root canal configuration and ethnicity was identified ($p = 0.034$). **Conclusion:** Two mesial canals and a single distal canal represent the most common configuration in this Malaysian sample, yet complex distal morphologies were frequent. The significant ethnic variation in distal canal anatomy highlights the importance of population-specific morphological data to inform clinical awareness and treatment planning in Malaysian endodontic practice.

Keywords: CBCT; mandibular first permanent molar; root canal morphology; Ahmed classification; Malaysian population; ethnicity



IADR

INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION

JUNIOR E-POSTER PRESENTATION



A Micro-Costing and Cost-Recovery Study of Single-Unit Crown Fabrication in an Academic Dental Institution

Rozali BA¹, Khairullnizam NIU¹, Kherul Anuwar AH², Abdul Aziz A³

¹ Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.

² Department of Community Oral Health & Clinical Prevention, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.

³ Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.

Email: batrisyiaaini02@gmail.com

Objectives: Understanding the actual laboratory cost of crown fabrication is essential for sustainable service delivery in dental teaching institutions. This study assessed laboratory time, costs, and cost recovery of single-unit crown fabrication across materials and workflows.

Methods: A laboratory cost study was conducted at the Faculty of Dentistry, Universiti Malaya, using a provider perspective, bottom-up micro-costing approach. Direct production and capital costs were identified and valued using 2024 production data. Data sources included clinical records, laboratory logs, procurement systems, payroll records, and ethics-approved staff interviews. Total laboratory costs per crown were compared with institutional charges to assess cost recovery. One-way sensitivity analyses were performed to examine uncertainty in key cost drivers. **Results:** Mean laboratory costs ranged between RM599.99 and RM945.17 under undergraduate workflows and between RM566.62 and RM913.06 under postgraduate workflows. Personnel costs were the dominant cost driver across all crown types. At minimum and median charge levels, laboratory costs were not fully recovered for most crown types, except zirconia crowns at the highest institutional charge levels. **Conclusions:** Laboratory costs vary by material and workflow, and current charges do not fully recover production costs for most crown types. Periodic, data-driven cost evaluation is necessary to support sustainable fee-setting in dental teaching institutions.

Keywords: Cost-Recovery; Health services research; Micro-Costing.



Compressive Strength and Microstructure Assessment of Hydroxyapatite-Propolis Combination: In-Vitro Study

Nur Munirah Huda Kamilizahri¹, Nur Natalia Afiqah Mazlan¹, Nurul Ain Ramlan², Wan Nur Farhana Wan Abdul Rahman³, Ikmal Hisham Ismail³

¹Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, 47000 Sungai Buloh, Selangor, Malaysia

²Centre of Comprehensive Care Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, 47000 Sungai Buloh, Selangor, Malaysia

³Centre of Preclinical Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, 47000 Sungai Buloh, Selangor, Malaysia

Email: 2022663756@student.uitm.edu.my

Problem Statement: The influence of stingless bee propolis incorporation on the mechanical and microstructural properties of hydroxyapatite remains unclear. **Objectives:** Firstly, to assess the compressive strength of hydroxyapatite (HA) incorporated with two species of stingless bee propolis, *Heterotrigona itama* (HI) and *Tetrigona apicalis* (TA), at varying combination concentrations in comparison with mineral trioxide aggregate (MTA) and Calcium Hydroxide (Ca(OH)₂). The second objective was to analyse the surface morphology and microstructural characteristics. **Methodology:** Hydroxyapatite-propolis (HA-P) powder with 2.5%, 5%, 7.5% and 10% propolis (HI & TA) by weight was prepared and mixed with polyacrylic acid (PAA) with 1:2 ratio. Compressive strength was measured via Universal Testing Machine (UTM). Prepared set HA-P samples were examined under Scanning Electron Microscope (SEM) at 3000x magnification to evaluate the surface morphology and particle size distribution. **Results:** Compressive strength with significant differences were observed between HA-P (HI and TA) and controls ($p < 0.05$). Post hoc analysis revealed 2.5%, 5% HA-P (TA) and 2.5% HA-P (HI) were comparable to (Ca(OH)₂). The 5% HA-P (HI) group demonstrated high median compressive strength with 13.74 MPa. HA-P (TA) exhibited excessive particle aggregation, while HA-P (HI) showed controlled aggregation at lower concentrations and increased aggregation at higher levels. Moderate aggregation will strengthen it, whereas excessive aggregation makes it weaker. **Conclusion:** Stingless bee propolis species and concentration influenced the mechanical and microstructural properties of HA-P. Overall, 5% HI showed the highest compressive strength and uniform microstructure, with properties comparable to (Ca(OH)₂) and approaching that of MTA. Therefore, supporting its potential as a pulp-capping biomaterial.

Keywords: Compressive strength, *Heterotrigona itama*, Hydroxyapatite, Scanning Electron Microscope, *Tetrigona apicalis*.

Emergency Management for Paediatric Dental Patients in Universiti Teknologi MARA: A Retrospective Study

Saifuddin NI¹, Kamarulzaman NK¹, Abdul Halim R², Kamaruddin AA²

¹Faculty of Dentistry, Universiti Teknologi MARA

²Centre of Studies for Paediatric Dentistry and Orthodontics, Faculty of Dentistry, Universiti Teknologi MARA

Email: 2022622186@student.uitm.edu.my

Objective: Paediatric dental emergencies constitute a significant component of emergency dental care involving pain, infection, and traumatic dental injuries. This study examined the distribution of paediatric dental emergencies and associated treatment modalities provided at the Faculty of Dentistry, Universiti Teknologi MARA. **Methods:** A retrospective study was conducted using eligible paediatric emergency records retrieved from the Integrated Dental Record Management System (iDeRMS) at the Faculty of Dentistry, UiTM Sungai Buloh Campus, Malaysia. Records of patients aged 0–16 years who received emergency dental treatment between January 2018 and December 2024 were reviewed. Data on demographic characteristics, emergency type, and treatment modality were analysed descriptively and inferentially using Chi-square tests and Cramér's V ($\alpha = 0.05$). **Results:** A total of 324 paediatric emergency cases were included in the analysis. Children aged 6–10 years constituted the largest age group (53.4%), with an almost equal gender distribution. Pain-related conditions were the most common emergency presentation (49.1%), followed by infection-related conditions (37.0%) and traumatic dental injuries (9.3%). Medication-only management (25.9%) and extraction (25.6%) were the most frequently provided treatments. A significant association was observed between emergency type and treatment modality ($\chi^2(32) = 227.97$, $p < 0.001$; Cramér's V = 0.419), indicating diagnosis-driven emergency management. **Conclusion:** Pain- and infection-related conditions were the predominant paediatric dental emergencies managed at UiTM, with treatment approaches varying significantly according to diagnosis. These findings provide insight into the pattern of paediatric dental emergencies presented to a university-based dental emergency service and may assist in service planning and preventive initiatives.

Keywords: Emergency treatment, Paediatric dentistry, Dental infections, Dental trauma



Prevalence and Characteristics of Canalis Sinuosus in Malaysian Population: A Retrospective Study using CBCT Images

Joan Lau Hui Ling¹, Khong Jen Xi¹, Ranjeet Ajit Bapat², Prashanti Chippagiri³

¹School of Dentistry, IMU University Kuala Lumpur, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Wilayah Persekutuan Kuala Lumpur, Malaysia

²Associate Professor, Restorative Dentistry Division, School of Dentistry, IMU University Kuala Lumpur, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Wilayah Persekutuan Kuala Lumpur, Malaysia

³Senior Lecturer, Clinical Oral Health Sciences Division, School of Dentistry, IMU University Kuala Lumpur, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Wilayah Persekutuan Kuala Lumpur, Malaysia

Email: joandt122@gmail.com, 00000033361@student.imu.edu.my

Background: The canalis sinuosus (CS) is an anatomical canal in the anterior maxilla that transmits the anterior superior alveolar nerve and artery. Its identification is clinically important in procedures such as implant placement, surgical removal of impacted teeth, and Le Fort I osteotomy to prevent neurosensory complications. Despite its significance, data on CS prevalence in the Malaysian population remains limited. **Objectives:** To determine the prevalence of canalis sinuosus, describe its anatomical characteristics, and evaluate its association with demographic variables in the Malaysian population using cone-beam computed tomography (CBCT). **Materials and Methods:** A retrospective cross-sectional study was conducted using CBCT scans of 331 patients obtained from Oral Health Centre, IMU University (2023–2025). Images were analysed using Planmeca Romexis software to assess the presence, course, terminal opening location, laterality, and morphometric dimensions of CS. Statistical analysis was performed using SPSS, with Chi-square tests applied to evaluate associations with gender, age, and ethnicity. **Results:** The CS was identified in 76.4% of patients (n = 253; 95% CI: 71.8–81.0). The mean diameter was 0.85 ± 0.32 mm. Although slightly higher prevalence was observed in males and in Chinese individuals, no statistically significant association was found between CS presence and gender (p = 0.578), ethnicity (p = 0.621), age group (p = 0.801), or Chinese versus non-Chinese groups (p = 0.781). Bilateral occurrence was more common than unilateral across both genders and ethnic groups, with no significant association between laterality and demographic variables (p > 0.05). **Conclusion:** The canalis sinuosus demonstrates a high prevalence among Malaysians, with a predominantly bilateral presentation. Its occurrence appears independent of demographic factors. These findings underscore the importance of careful CBCT evaluation of the anterior maxilla to minimise potential surgical and implant-related complications.

Keywords: Anatomic variation, Canalis sinuosus, Cone beam computed tomography (CBCT), Implant dentistry, Prevalence



Evaluation of Root Fenestration, Dehiscence, and Maxillary Sinus Proximity in Malaysians: A CBCT Study

Shelby Ngooi Xin Min¹, Lee Min Hui¹, Nora Sakina Mohd Noor², Hany Mohamed Aly Ahmed²

¹Faculty of Dentistry

²Department of Restorative Dentistry Universiti Malaya, 50603 Kuala Lumpur, Malaysia.

Email: shelbynngooi@yahoo.com

Objectives: This cone beam computed tomography (CBCT) study aimed to investigate the prevalence of alveolar defects (root fenestration (RF) and dehiscence) and the anatomical relationship between maxillary posterior teeth and themaxillary sinus. **Methods:** Under certain inclusion and exclusion criteria, a total of 182 CBCT scans from a Malaysian subpopulation were evaluated, comprising 423 teeth for sinus relationship and 377 teeth for alveolar defects. Two calibrated observers performed the data collection, analyzing correlations with age, gender, and ethnicity. The Chi-Squaretest and Kruskal–Wallis tests were used for data analysis ($P=0.05$). **Results:** The overall prevalence of RF and dehiscence was 20.16% and 33.95%, respectively. RF was most frequently observed in first premolars (26.74%), followed by first molars (19.30%) and, second premolars (13.04%). Among 79 RF sites, Type I defects were the most common (44.3%), followed by Type IV defects (38.0%), indicating a predominance of apically located fenestrations. Dehiscence was identified in 128 out of 377 teeth, with the highest prevalence in first premolars (42.44%). Dehiscence distribution differed significantly by tooth group ($p < 0.001$). At the patient level, single affected tooth was the most common presentation for both RF and dehiscence. RF and dehiscence were the highest among Indian and Chinese patients, respectively. Dehiscence increased with age, whereas RF remained relatively stable. Maxillary first molars demonstratedthe highest frequency of apical protrusion into the sinus (52.5%). The incidence of lateral projection was significantlyhigher in patients over 40 years old ($P<0.05$). Additionally, apical protrusions were descriptively more frequent amongMalay patients. In maxillary first premolars, male patients showed significantly higher frequency of proximity to the sinus ($P<0.05$). **Conclusion:** The significant prevalence of alveolar defects and root protrusions into sinus highlights the importance of preoperative CBCT imaging in high-risk procedures. These findings guide risk-based treatment planning and reduce iatrogenic complications.

Keywords: Cone-Beam Computed Tomography, maxillary sinus, alveolar defect, fenestration, dehiscence, Malaysian subpopulation.



Exploratory Development of a Practical Scleral Shade Guide for Custom Ocular Prosthesis Fabrication

Abdul Aziz AA¹, Azizi NS¹, Abdul Razak MA², and Lim GS²

¹Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia

²Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia

Email: u2002248@siswa.um.edu.my; u2002238@siswa.um.edu.my; azmirazak@um.edu.my ; g.s.lim@um.edu.my

Introduction: Ocular prostheses play an important role in restoring facial aesthetics, where accurate scleral shadereplication is essential for achieving a natural appearance. However, current scleral shade selection methods remain subjective and challenging, highlighting the need to validate a newly developed practical scleral shade guide. **Objectives:** The objectives of this study are to fabricate scleral shade guides using various spoon measured powder ratios and to validate the newly developed scleral shade guide using participant photographs. **Methods:** A cross-sectional study was conducted at the Faculty of Dentistry, Universiti Malaya from October to November 2025. Twenty participants of different age groups, genders, and racial backgrounds were recruited through convenience sampling. Five scleral shade tabs were fabricated using predetermined resin ratios measured with colour-coded spoons. Standardized ocular photographs were captured using a digital camera under controlled lighting conditions. Threedental technicians independently matched participant photographs to the fabricated scleral shade tabs. Interrater reliability was evaluated using Fleiss' kappa statistic. Results: All five scleral shade tabs were utilized during shadematching, indicating that the fabricated shades represented the scleral colour variations observed among the participants. Overall interrater agreement among technicians was slight but statistically significant ($\kappa = 0.142$, $p = 0.029$). Category-specific analysis demonstrated the highest agreement for shade D2, which showed fair agreement and statistical significance ($\kappa = 0.289$, $p = 0.025$). The remaining shades demonstrated poor to fair agreement. **Conclusions:** The proposed scleral shade guide demonstrated potential to provide reproducible and standardized approach for scleral shade selection in ocular prosthesis fabrication. The use of predetermined resin ratios may improve consistency compared with conventional subjective mixing methods. Further studies with larger sample sizes and objective colour assessment methods are recommended to enhance validation and clinical applicability.

Keywords: Colour perception; Maxillofacial prosthodontics; Ocular prosthesis; Polymethyl methacrylate; Scleral shade guide.



Radiographical Mapping of the Body and Ramus of Mandible for Low Cut Orthognathic Surgery

HairulYS¹, Hairun Sulung MDD¹

¹Department of Oral Maxillofacial Surgery, Faculty of Dentistry, University Malaya Email: u2001762@siswa.um.edu.my

Objective: This retrospective study evaluated 49 CBCT scans from a diverse Malaysian cohort of Malay, Chinese, and Indian ethnicities to establish critical anatomical reference values for the mandibular lingula and inferior alveolar nerve canal in a Malaysian cohort, defining safe parameters for a low and short medial cut during Bilateral Sagittal Split Osteotomy (BSSO).

Methodology: Utilizing a cross-sectional observational design, 49 conebeam computed tomography (CBCT) scans (98 hemimandibles) from patients aged 18–60 were analyzed to measure key landmarks relative to the occlusal plane. **Results:** Findings revealed that the ML was predominantly positioned 9.34 ± 4.41 mm above the occlusal plane, while the IANC showed extreme proximity to the medial cortex, with a mean distance of only 0.21 ± 0.83 mm and direct contact in 92.9% of cases. Simulation of osteotomy cuts demonstrated that a medial cutextension of 10 mm from the anterior cortex maintained a 95.9% safety margin, whereas a 15 mm extension reduced safety to 48.0%. **Conclusion:** Low and short medial ramus cut, specifically limited to a 10 mm posterior extension, isrecommended to minimize neurosensory risks in the Malaysian population, emphasizing the necessity of individualized preoperative CBCT planning.

Keywords: Mandible; Alveolar nerve; Occlusal plane; Neurosensory; Postoperative; Radiographic; Osteotomy



Influence of Surface Roughness of Various Denture Lining Materials on the Growth of *Candida albicans*

Syed Muhamad Raziq Syed Rosli, Iffah Solehah Zulyadi, Nusima Mohamed¹, Rohazila Mohammad Hanafiah² and Nor Azlina Ismail³

¹Department of Conservative Dentistry and Prosthodontics, Faculty of Dentistry, USIM

²Department of Basic Sciences, Faculty of Dentistry, USIM

³Department of Paediatric Dentistry and Orthodontics, Faculty of Dentistry, USIM email: nusima@usim.edu.my

Objectives: Denture lining materials are commonly used as tissue conditioners and denture relining materials. Their surface characteristics may promote microbial adhesion particularly *Candida albicans*, which is associated with denture stomatitis. This study aimed to evaluate the influence of surface roughness on the adhesion and growth of *Candida albicans* on different denture lining materials. **Methods:** Standardised heat-cured polymethyl methacrylate (PMMA) specimens were relined with two soft lining materials (SOFRELINER TOUGH® M and DMG SilagumComfort) and two hard lining materials (TOKUYAMA® REBASE II and DuraBase Hard Denture Reline). The specimens were exposed to artificial saliva and a standardised *Candida albicans* suspension before incubation at 35–37°C. Surface roughness was measured using a stylus profilometer, while fungal adhesion was assessed through colony-forming unit (CFU) counts. Evaluations were conducted after 1 week, 2 weeks, and 1 month. Data were analysed using one-way ANOVA. **Results:** After one month, DMG Silagum Comfort demonstrated significantly higher fungal adhesion ($790,000 \pm 14,142$ CFU/mL) than DuraBase ($92,000 \pm 5,659$ CFU/mL) ($p < 0.05$). Although DuraBase showed the highest surface roughness at one week (7.37 ± 1.66 µm), no fungal adhesion was detected. Increased adhesion was not consistently associated with greater surface roughness. Microbial adhesion generally increased over time, suggesting that both material properties and incubation period influence fungal colonisation. **Conclusions:** Surface roughness alone was not the main determinant of *Candida albicans* adhesion. Other factors, including material composition and hydrophilicity, may play important roles. Soft lining materials may be more suitable for short-term use, while hard relining materials demonstrated better resistance to fungal adhesion over longer periods.

Keywords: *Candida albicans*, denture lining materials, microbial adhesion, surface roughness, denture stomatitis



Training Beyond Dominance: Evaluating Effectiveness of Phantom Head VS Haptic Simulator Among Left-Handed Dental Students

Ai Chi Cheah¹, Jie Yeong Levina Soon¹, Min Run Bo¹, Ting Jing Kweh², Pit Hui Lew³, Jun Ai Chong³

¹School of Dentistry, IMU University, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Bukit Jalil, Wilayah Persekutuan Kuala Lumpur, Malaysia.

² Restorative Dentistry Division, School of Dentistry, IMU University, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Bukit Jalil, Wilayah Persekutuan Kuala Lumpur, Malaysia.

³Clinical Oral Health Sciences Division, School of Dentistry, IMU University, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Bukit Jalil, Wilayah Persekutuan Kuala Lumpur, Malaysia.

Email: 00000032656@student.imu.edu.my

Objectives: Left-handed dental students face additional challenges when training in right-handed clinical environments. This study aimed to compare the effectiveness of phantom head and haptic simulator practice in improving non-dominant hand performance. **Methods:** An experimental study was conducted with 24 left-handed dental students from IMU University, who were randomly assigned to either a phantom head (n = 12) or a haptic simulator (n = 12) group. Baseline assessment involved performing the cavity preparation on a typodont tooth 46 on a phantom head evaluating both dominant and non-dominant hands. All participants underwent 3 months of self-directed practice, followed by a post-practice assessment conducted under identical conditions as baseline assessment. Baseline and post-practice assessments were graded independently by three calibrated examiners. Independent-samples and paired-samples t-tests were used for between-group and within-participant comparisons respectively. Pearson's correlation analysis examined the relationship between practice attempts and improvement scores. A p-value of < 0.05 was considered statistically significant. **Results:** Improvement was observed in non-dominant hand performance, with mean scores increasing from 3.28 ± 1.81 at baseline to 5.11 ± 2.40 post-practice ($p < 0.001$). Baseline dominant hand performance (4.32 ± 2.00) and post-practice non-dominant hand performance (5.11 ± 2.40) showed no significant difference ($p = 0.104$). The phantom head group showed significant improvement in non-dominant hand performance (2.78 ± 1.94) than haptic simulator group (0.89 ± 2.06 ; $p = 0.031$). Practice attempts were positively correlated with improvement scores ($r = 0.507$, $p = 0.011$). **Conclusion:** Non-dominant hand of left-handed dental students can be trained through phantom head and haptic simulator.

Keywords: Dental education, Haptic technology, Laterality, Simulation training



Efficacy of Compound 4e and 2% Chlorhexidine against *E. faecalis* Biofilm: An In Vitro Study

Huzairi NF¹, Zaharuddin IS¹ Zakaria MN², Che Mohd Fadzilah MAF^{3*}, Che Ab Aziz ZA^{3*}

¹Faculty of Dentistry, Universiti Malaya, 50603 Kuala Lumpur, Malaysia.

²Faculty of Dentistry, Ajman University, Ajman, UAE

³Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya, 50603 Kuala Lumpur, Malaysia.

Email: u2001568@siswa.um.edu.my

Objective: This study evaluated the antimicrobial efficacy of compound 4e as a potential endodontic irrigant against *Enterococcus faecalis* biofilms formed on dentine blocks.

Methods: An in vitro experimental study was conducted using standardised dentine blocks prepared from extracted human teeth. Specimens were sterilised and sterility was confirmed prior to inoculation with *E. faecalis*, which was incubated for 14 days to allow biofilm formation. Samples were randomly allocated into treatment groups (n=15): 100 ppm (0.01%) compound 4e, 2% chlorhexidine (CHX), and saline as the control group. Each specimen was exposed to the respective irrigant for one minute. Biofilms were detached through vortexing and sonication, followed by serial dilution and culture on brain-heart infusion agar for colony-forming unit counts (CFU/mL) quantification. Statistical analysis was performed using the Kruskal-Wallis test, followed by Dunn's post hoc test with Bonferroni correction, with significance set at ($p < 0.05$). **Results:** Compound 4e showed significantly higher bacterial counts compared with 2% CHX ($p < 0.05$), with antimicrobial activity comparable to saline. In contrast, 2% CHX Chlorhexidine demonstrated near-complete suppression of bacterial growth. **Conclusion:** Compound 4e demonstrated limited antimicrobial efficacy against *E. faecalis* biofilms compared with 2% CHX. Further studies are recommended to optimise its antimicrobial concentration and evaluate its residual antimicrobial (substantivity) for potential endodontic applications.

Keywords: Antimicrobial efficacy, compound 4e, *Enterococcus faecalis*, 2% chlorhexidine



IADR

INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION



SPONSORSHIPS



IADR INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION

SILVER SPONSOR

NEW & IMPROVED

HALON

POLIDENT

REMOVES **100x^{**}**
MORE BACTERIA
THAN TOOTHPASTE



SCIENTIFICALLY PROVEN
TO CLEAN THE HARDEST TO REACH PLACES

*vs previous Polident. **In laboratory tests, soaking only.



IADR INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION

SILVER SPONSOR



Envista

**We partner with
professionals to
Improve Lives**

Our well-known brands – which include Kerr, Metrex, Ormco, Dexis and Nobel Biocare – represent more than 130 years of dental industry excellence. We have been serving the comprehensive needs of the entire dental care community in pursuit of enhancing oral health.

For enquiry, please WhatsApp:



Ms. Kang

+60 12-483 8876

EHC Commercial Malaysia Sdn. Bhd.

Co-labs Coworking The Starling Plus.

Level 4, Uptown 7, Jalan SS21/39,

Damansara Utama 47400 Petaling Jaya,
Selangor.

**Nobel
Biocare™**

Ormco™
Driving the Future of Orthodontics
together

Metrex
INFECTION PREVENTION

DEXIS™

Kerr
RESTORATIVES

Kerr
ENDODONTICS



IADR INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION

BRONZE SPONSOR

Total solution for Dental Education

With more than 70 years of experience in the dental education field, we are dedicated to helping individuals and institutions by offering a wide variety of original dental teaching aids. Our dental simulators, training models and patient education models help deliver a dental training experience of the highest quality.



GVS SYNERGY SDN BHD.
627, Block B - Montari Business Park,
No 2, Jalan PJS 9/5, Montari Park,
46150 Petaling Jaya, Selangor.
Email: sales@gvs-synergy.com

 **NISSIN**

www.nissin-dental.net



IADR INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION

OTHER SPONSOR



IST **SDI**

AN AWARD
WINNING
COMPOSITE

DA
RESEARCH
AWARD
2025

DA
RESEARCH
AWARD
2024

SDI
STELA
PRIMER
100% ACRYLIC 5mL

**AN AWARD
WINNING COMPOSITE**

IST Dental Supplies SB / Indra Sari Trading



IADR
INTERNATIONAL ASSOCIATION
FOR DENTAL, ORAL, AND
CRANIOFACIAL RESEARCH
MALAYSIAN SECTION



www.iadrmalsec.com

*Get in touch and join us to advance
research in dental science.*