INTERNATIONAL ASSOCIATION FOR DENTAL RESEARCH (IADR) MALAYSIAN SECTION

22nd ANNUAL SCIENTIFIC MEETING

ANNUAL GENERAL MEETING 24th MALAYSIAN SECTION

09 SEPTEMBER 2023
THE EVERLY PUTRAJAYA

THEME: WHAT'S NEXT?

FURTHERING THE DENTAL RESEARCH FRONTIER

PROGRAMME BOOK 2023

MORE INFO: IADRMALSEC@GMAIL.COM WWW.IADRMALSEC.COM

WELCOME ADDRESS

DR JASMINA QAMARUZ ZAMAN

IADR Malaysian Section President
& Scientific Meeting Chairman

Welcome!

Dear distinguished colleagues,

It is my utmost pleasure and privilege to welcome all of you to the 22nd Annual Scientific Meeting and 24th Annual General Meeting of IADR Malaysian Section. This year's conference theme- 'What's next?: Furthering the Dental Research Frontier' is dedicated to innovative technologies and methodologies for the advancement of dental research and oral health. Today's scientific meeting aims to bring together renowned experts, researchers as well as those just starting in the field namely the postgraduate and undergraduate students in an environment where the most recent research, innovations, and breakthroughs are discussed.

Today, we have a diverse lineup of speakers who are prolific clinicians and researchers in their disciplines and will be sharing the current and future research prospects in their respective fields. Thank you to Professor Wan Himratul Aznita, Associate Professor Ts Dr Mohd Hafiz Arzmi, Associate Prof Dr Nagham, Associate Prof Dr Nazimi and Dr Johari for accepting our invitation.

This year we have 78 abstract submissions, with some presenters who will be with us via a virtual platform. For the past several years the quality of research produced by our dental fraternity has advanced tremendously, and this year we want to showcase these research projects by publication in a Scopus indexed Journal - JUMMEC. As a way to show our appreciation and to give back to IADR Malaysian Section Members and participants I am happy to announce that our association will be sponsoring the article publication fees for this year.

Our heartfelt appreciation goes to our Industry Partners for their tremendous support in this year's meeting; gold sponsor - Apex Digital Dental, silver sponsors - MetaDent Academy and Premiere Dental, award sponsors Colgate and Southern Lion and last but not least Sanctuary for the samples and gifts to participants. Special acknowledgement to our Immediate Past-President Associate Prof Dr Siti Mariam for her guidance to the scientific team during the planning and execution of this year's scientific program. Lastly, my deep appreciation to all my team members for the special contributions in time, energy and ideas to organize this event despite a heavy and hectic working schedule.

Thank you and enjoy the conference!

OUR COUNCILS 2022-2024

Dr Jasmina Qamaruz Zaman
President

Assoc Prof Dr Siti Mariam Ab Ghani
Immediate Past President

Assoc Prof Dr Noor Azlin Yahya
President Elect

Dr Siti Nuramanina Abdul Shukor
Honorary Secretary

Assoc Prof Dr Rohaida Abdul Halim
Honorary Treasurer

Dr Johari Yap
Internal Auditor

Assoc Prof Ts Dr Mohd Hafiz Arzmi
Councillor

Dr Der Jiun Ooi
Councillor

Dr Erum Zain
Councillor

Dr Mariati Abdul Rahman
Councillor

ORGANIZING COMMITTEE 2023

CHAIRMAN
Dr Jasmina Qamaruz Zaman

ADVISOR
Assoc Prof Dr Siti Mariam Ab Ghani

SECRETARY GENERAL
Dr Siti Nuramanina Abdul Shukor

TREASURER GENERAL
Associate Prof. Dr Rohaida Abdul Halim.

REGISTRATION
Dr Siti Nuramanina Abdul Shukor
Associate Prof. Dr Rohaida Abdul Halim
Dr Chiam Thao Liang

PUBLICITY
Associate Prof Dr Mohd Hafiz Arzmi

SCIENTIFIC EVENT
Dr Jasmina Qamaruz Zaman

SCIENTIFIC RESEARCH COMPETITION COMMITTEE:
Assoc Prof Dr Noor Azlin Yahya
Dr Mariati Abdul Rahman

SUBCOMMITTEE
Dr Mohd Zulkifli Kassim
Dr Ainol Haniza Kherul Anuwar
Dr Beh Yew Hin
Dr Putri Ayu Jayusman
Dr Mohideen Salihu Farook
Dr Chiam Thao Liang
Mr Faris Azim
Mr Syafiee Sagi
Ms Nur Amirah Sofea Saiful Anuar
Mr Muhammad Aizat Iskandar

AWARDS & JUDGES
Assoc Prof Dr Noor Azlin Yahya
Dr Ainol Haniza Kherul Anuwar

LOGISTIC, FOOD & BEVERAGES
Assoc Prof Dr Safura Anita Baharin

SPONSORSHIP
Dr Ooi Der Jun
Dr Beh Yew Hin

TECHNICAL
Dr Mohd Zulkifli Kassim
Dr Chiam Thao Liang

PROGRAM SCHEDULE

0800 – 0830 am	Registration
0830 – 0845 am	**Welcome Remarks** Dr Jasmina Qamaruz Zaman (President, IADR Malaysian Section)
0845 – 0930 am	**Keynote** *Dimorphism: The Virulence Attribute in C. albicans* Professor Dr Wan Himratul Aznita Wan Harun Faculty of Dentistry, UM
0930 – 1015 am	**Plenary** *Challenges and Opportunities in Innovation of Technology-Driven Products for Dentistry: A Malaysian Perspective* Associate Professor Ts Dr Mohd Hafiz Arzmi Kulliyyah of Dentistry, IIUM
1015 – 1030 am	Coffee Break and Poster Viewing
1030 – 1115 am	**Symposium 1** *Deep Learning In Dentistry: Challenges And Opportunities* Associate Professor Dr Nagham Mohammed Abdullah Al-Jaf Faculty of Dentistry, UiTM
1130 – 1245 pm	**Oral session 1** Irama 5,6,7 **Oral session 2** Irama 8 **Oral session 3 (Hybrid)** Anyaman 3 **Poster session 1** Main Foyer **Poster session 2** Foyer
1245 – 1400 pm	IADR MALSEC AGM, Lunch & Poster viewing

PROGRAM SCHEDULE

1400 – 1630pm	**Oral session 1** Irama 5,6,7 **Oral session 2** Irama 8 **Oral session 3** Anyaman 3 **Poster session 1** Main Foyer **Poster session 2** Foyer
1630 – 1730 pm	**Symposium 2** *Computer-Assisted Orbital Surgery: Stretching Beyond Our Comfort Zones.* Associate Professor Dr Mohd Nazimi Abd Jabar Faculty of Dentistry, UKM *Advancing Dental Research Using Open-Source Software And Artificial Intelligence* Dr Johari Yap School of Dental Science, USM
1730 – 1800 pm	Announcement of Winners and closing remarks

KEYNOTE SPEAKER

PROFESOR DR WAN HIMRATUL AZNITA WAN HARUN
Department of Oral & Craniofacial Sciences,
Faculty of Dentistry, Universiti Malaya

DIMORPHISM: THE VIRULENCE ATTRIBUTE IN C. albicans

Abstract:

Candida albicans is an opportunistic fungus colonising the oral cavity as commensals. The dimorphism of C. albicans involves morphological switch between its ovoid budding yeast to the filamentous hyphae and is regulated in response to a range of environmental conditions that are encountered in distinct host niches. The ability to exhibit these morphological forms is important for virulence and when the immune system is compromised, it may become pathogenic and capable of causing disease. The hyphal form plays an important role in virulence and has distinct functions during the different stages of disease development. Many unique transcription factors were found to contribute to the hyphal morphogenesis transcriptional regulatory network that determines which phenotypic state will be expressed. Therefore, targeted inhibition of yeast-to-hyphae transition will possibly help in controlling diseases caused by C. albicans.

Biography:

Professor Dr Wan Himratul Aznita Wan Harun is a passionate oral microbiologist. Since year 2000, she has served as an academic staff at the Department of Oral & Craniofacial Sciences and is currently the Deputy Dean of Value Creation and Enterprise, Faculty of Dentistry, Universiti Malaya. She is a member of the Malaysian Section International Association for Dental Research (MalSec-IADR), Malaysian Society for Microbiologist (MSM) and Malaysian Society for Oral Microbiologist and Oral Immunologist (MySOMOI). Her research interest includes microbial virulence, oral biofilms, polymicrobial interactions, microbiomes, and medicinal plant extracts. She was awarded the Hitachi Fellowship Award in 2009 and flew to Japan to conduct research on the virulence of oral microorganisms. She publishes articles actively in ISI and Scopus journals and has experienced in supervising many PhD and Masters research for both local and international students including undergraduate elective projects. Throughout her service, she has secured various grants, including Fundamental Research Grants Scheme (FRGS), Ministry of Higher Education-High Impact Research Grants (MOHE-HIR), etc.

PLENARY SPEAKER

ASSOCIATE PROFESSOR TS DR MOHD HAFIZ ARZMI
Kulliyyah of Dentistry,
International Islamic University Malaysia

CHALLENGES AND OPPORTUNITIES IN INNOVATION OF TECHNOLOGY-DRIVEN PRODUCTS FOR DENTISTRY: A MALAYSIAN PERSPECTIVE

Abstract:

Being a researcher, academic, and clinician simultaneously to involve in commercialisation is indeed a massive challenge. Even though many initiatives have been done by the government and universities, however, most of the inventions end at the prototype level. Worse, many inventions end up on the shelves after billions of Ringgits were spent on the research. This session will discuss the challenges and opportunities in innovation and commercialisation, particularly in dental research. The discussion will touch on the role of academics, industries, institutions, and grant funders in supporting the research ecosystem and how the research outcome can be materialised into a product that can give benefits to the nation rather than ends at a publication stage. This session will also explain why research is preferable to be designed based on the needs of industries rather than designed based only on the interest of a researcher. It is aimed that this session will enlighten the researchers to collaboratively work across expertise and institutions to ensure the outcome of research in dentistry can be materialised and worth the investment for Research and Development in Malaysia.

Biography:

Dr Mohd Hafiz Arzmi is a passionate microbiologist, immunologist, and inventor. His expertise includes polymicrobial interactions, biofilms, microbiomes, probiotics, and oral carcinogenesis. He is currently the Deputy Director (Technology Transfer Office) at the Research Management Centre, International Islamic University Malaysia, the Honorary Fellow of Melbourne Dental School, The University of Melbourne, Australia, the executive member of the International Association for Dental Research (IADR), Malaysian Section and the full member of the Young Scientist Network Academy of Sciences Malaysia (YSN-ASM). He actively publishes in the fields of microbiology, immunology, machine learning and ethics. He secured national and international grants with a cumulative of more than RM 24 million, mostly from the local and international industries. He has over 15 IPs, including patents, trademarks, trade secrets and copyrights. He won various innovation awards, including gold medals and special awards from the Malaysia Technology Expo (MTE) 2022, Seoul International Invention Fair (SIIF) 2021, and International Expo on Invention and Innovation Expo (ITEX) 2020, among others. His successful commercialised products include synbiotic toothpaste, probiotic gummies, and probiotic cream for eczema by Jardin Pharma Berhad. In 2023, he received recognition as the top 10 MyRA contributors to IIUM

SYMPOSIUM I

ASSOCIATE PROFESSOR DR. NAGHAM MOHAMMED ABDULLAH AL-JAF
Faculty of Dentistry,
Universiti UiTM

DEEP LEARNING IN DENTISTRY: CHALLENGES AND OPPORTUNITIES

Abstract:
Deep learning is a subset of artificial intelligence that has emerged as a groundbreaking technology with immense potential in the field of dentistry that could result in a transformative effect on various aspects of oral healthcare. Deep learning algorithms have the potential to revolutionize dental diagnostics, treatment planning, and patient care. It can enhance clinical decision-making and improve treatment outcomes. Additionally, deep learning can assist in predicting patient prognosis, treatment success rates, and potential complications, allowing dentists to tailor treatment plans and provide more accurate prognostic information to patients. While deep learning in dentistry holds tremendous promise, it is crucial to address challenges such as data privacy, algorithm transparency, and the ethical use of AI. Robust data governance and collaboration between dental professionals and AI experts are essential to ensure the responsible and effective integration of deep learning in clinical practice.

Biography:
Dr. Nagham is an associate professor in orthodontics at the Faculty of Dentistry, Universiti Teknologi MARA (UiTM). Her doctoral degree is in Artificial intelligence applications in orthodontics. Her research interests are, analytical prediction and modeling using deep learning. She has won multiple research and innovation awards for using artificial intelligence algorithms for diagnosis and treatment planning in orthodontics.

SYMPOSIUM II

ASSOCIATE PROFESSOR DR. NAZIMI ABDUL JABAR
Department of Oral and Maxillofacial Surgery
Faculty of Dentistry,
Universiti Kebangsaan Malaysia

COMPUTER-ASSISTED ORBITAL SURGERY: STRETCHING BEYOND OUR COMFORT ZONES.

Abstract:
Orbital blowout fracture is one of the most prevailing maxillofacial injuries and challenging to manage. Inadequate diagnosis and lack in its surgical plan may inevitably lead to complications. The development of computer-assisted method in dentistry has long been recognized as important surgical tools or adjunct including in the management of severe maxillofacial and orbital trauma. This lecture will seek to explore what is currently known in the practice - to begin with image acquisition, pre-selection and image data processing to various novel surgical protocols, customisations and innovations that are constantly being developed. Various advanced surgical tools and role of dedicated software will also be highlighted. Importance of some of the regulatory aspects in Malaysia and on how surgeon-biomedical engineer role can be further enhanced will also be highlighted. Many roles of computer assisted method will also be discussed from the advantage and disadvantage aspects to both surgeons and patients.

Biography:
Dr. Nazimi is currently an Associate Professor and consultant oral and maxillofacial surgeon at UKM with a special interest in orbital traumatology and computer-assisted maxillofacial surgery. He was elected to serve as the 10th President of Malaysian Association of Oral and Maxillofacial Surgeons. Dr. Nazimi graduated from the University of Malaya in the year 2000 and completed his postgraduate training at University College London. He has been with UKM for the past 23 years and made numerous contributions, especially in pioneering the use of cutting-edge maxillofacial surgical technology such as VSP, navigation-assisted orbital fracture reconstruction, and the use of personalized implant and solutions in complex surgical cases. He constantly publishes scientific articles in both local and international journals and currently exploring the potential of VR, MR, and AI for orbital reconstructive procedures.

SYMPOSIUM II

DR JOHARI YAP
Craniofacial Imaging Laboratory,
School of Dental Sciences,
Universiti Sains Malaysia

ADVANCING DENTAL RESEARCH USING OPEN-SOURCE SOFTWARE AND ARTIFICIAL INTELLIGENCE

Abstract:

Artificial intelligence (AI) and machine learning (ML) are widely applied in many disciplines including medicine and dentistry. AI refers to the broader concept of creating intelligent machines or systems that can simulate human intelligence, such as problem solving and decision making. On the other hand, ML is a subset of AI that focuses on the development of algorithms and models that allow machines to learn from huge datasets. In diagnosis and treatment planning, AI algorithms can analyse dental images to aid in the diagnosis of various dental conditions. ML algorithms can learn from large datasets of labelled images to accurately detect and classify dental caries, periodontal disease, and other oral pathologies. AI and ML can help automate the diagnostic process of analysing dental images by segmenting different structures such as teeth, roots, and bone. This can assist in various tasks, including measuring tooth movement in orthodontics, assessing the quality of dental restorations, and aiding in implant placement planning.Open-source software is developed by a non-profit community or research organisation. It is free to use, distribute, and modify. Among the advantages of open-source software are the flexibility to modify features to fit the needs of the research and the ability to run experiments at a lower cost. Other researchers from other health institutions can easily reproduce similar research as the open-source software is free. This free-to-use software can hugely lower the cost of our healthcare system, seeing that we will be utilising more of these AI technologies in the near future.

SYMPOSIUM II

DR JOHARI YAP
Craniofacial Imaging Laboratory,
School of Dental Sciences,
Universiti Sains Malaysia

Biography:

Dr Johari Yap is a senior lecturer teaching Oral and Maxillofacial Radiology at School of Dental Sciences, Universiti Sains Malaysia (USM). His expertise is in craniofacial imaging and visualisation, 3D reconstruction and analysis of craniofacial deformity, 3D image processing of oral and craniofacial structures, application of open-source software for 3D reconstruction, CAD/CAM, and rapid prototyping of maxillofacial prosthesis. He has great interest in applying artificial intelligence and machine learning in dental research. Johari obtained his Bachelor of Software & Information Technology (with Honours) from Lincoln University, New Zealand; Graduate Diploma in Information & Communication Technology (Distinction) from Christchurch Polytechnic Institute of Technology, New Zealand; Master of Science in Dentistry (Oral Biology) from Universiti Sains Malaysia; and a PhD in Craniofacial Prosthesis from Universiti Sains Malaysia. His research greatly impacted patients' management and has benefited patients with cranio-maxillofacial defects and improved their quality of life.

PRESENTATION SCHEDULE

SENIOR POSTER 1

No	Paper ID	Title	Authors	Presenter	Presentation ID	Start time
1	5	Educational Experiences, Attitude and Practice of Resin Infiltration in Children Amongst Malaysian Paediatric Dentists	Muhammad Irfan Edri Muliz, Muhammad Iqbal Ramdan **Azwin A Kamaruddin,** Norashikin Abu Bakar	Azwin A Kamaruddin	P01	11.30AM
2	6	Complexity Profile of Special Care Dentistry Patients in Universiti Malaya: A Retrospective Cohort Study	**Aisyah Ahmad Fisal,** Jessica Francis, Maryani Mohamed Rohani	Aisyah b Ahmad Fisal	P02	11.45AM
3	54	Exploring Oral Health Education Program Received by the People with Disability at Rehabilitation Centres- A Qualitative Study	**Afsary Jahan Khan,** Mas Suryalis Ahmad	Afsary Jahan Khan	P03	12.00PM
4	67	Perception of Dental Personnel Regarding Specialist Preventive Dental Clinic in Alor Setar, Kedah, Malaysia	**Nurul Fahizha Fahimi,** Norashikin Yusof, Budi Aslinie Md Sabri	Nurul Fahizha Fahimi	P04	12.15PM
5	53	Exploring Extracted Human Teeth for Research Advancements: A Scoping Review	**Nurul Nadia Md Shah, Yew Hsu Zenn,** Safura A Baharin, Tew In Meei, Nurrul Shaqinah Nasruddin, Jasmina Qamaruzzaman	Nurul Nadia Md Shah	P05	12.30PM
6	15	Science Mapping of Research Clusters and Core Research Areas in Removable Partial Dentures	**Nor Faharina Abdul Hamid,** Rohana Ahmad, Farha Ariffin, Solehuddin Shuib	Nor Faharina Abdul Hamid	P06	2.00PM
7	68	Adaptation of Cobalt-Chromium Removable Partial Denture Fabricated by Selective Laser Melting	**Nosizana Mohd Salleh,** Safa Salim Elhadery, Norsiah Yunus, Norliza Ibrahim, Zubaidah Zanul Abidin	Nosizana Mohd Salleh	P07	2.15PM
8	52	Unravelling The Role of Residual Stress Distribution in The Long-Term Performance of Bilayered Zirconia Restorations	**Wen Sheng Teng**, Yew Hsu Zen, Nashrah Hani Jamadon, Jasmina Qamaruzzaman, Meor Iqram Meor Ahmad, Andanastuti Muchtar	Wen Sheng Teng	P08	2.30PM
9	41	Clear Aligner Clinical Effectiveness: A Randomised Control Trial on the Refinement Series	Noraina Hafizan Norman, **Nabilla Mohd Shukor**	Nabilla Mohd Shukor	P09	2.45PM
10	44	Resin Infiltration – A Narrative Review	**Dayang Fadzlina Abang Ibrahim,** Noren Nor Hasmun, Liew Yih Miin, Annapurna Venkiteswaran	Dayang Fadzlina Abang Ibrahim	P10	3.00PM
11	62	Feasibility and Perception of the Usage of the Index for Interceptive Orthodontics Referral: A Pilot Study	**Nisreen Nordin,** Saraswathy Devi Sinniah, Annapurny Venkiteswaran, Nagham Mohammed Abdullah Al-Jaf	Nisreen Nordin	P11	3.15PM
12	65	Pilot Study of Build Parameter for Optimum Surface Roughness in Additive Manufacturing of Denture Framework	**Muhammad Wildan Khairudin,** Aini Hayati Abdul Rahim	Muhammad Wildan Bin Khairudin	P12	3.30PM
13	25	Children's Interpretation of Emoji® in the Malay Language in Malaysia	**Dayang Fadzlina Abang Ibrahim,** Zalikha Adila Zainuren, Mohd Zulfadli Harun, Zaridah Zainal Abidin, Norsaima Ismail, Rohaida Abdul Halim, Noren Nor Hasmun, Annapurna Venkiteswaran	Dayang Fadzlina Abang Ibrahim	P13	3.45PM
14	85	Evaluation of Accuracy of Implant Placement with Guided Implant Surgery Using CBCT and Optical Scan	**Ghayathri Kanniappan,** Padmini Hari, Ravikanth H Jujare	Ghayathri Kanniappan	P14	4.00PM
15	75	Digital Versus Conventional Dental Impression Techniques in Indirect Restoration: Malaysian General Dental Practitioners' (GDP's) Perspectives	**Siti Aisyah Roslan,** Ahmad Muaz Roslan, Siti Nurarina Diyana Mohamad Zaki, Marlena Kamaruzaman	Siti Aisyah Roslan	P15	4.15PM
16	51	An Overview of Systematic Reviews in Dental Implant Surgery of Partially Edentulous Patients	**Fatima Al Khateeb**, Hazmyr Abdul Wahab, Su Keng Tan	Fatima Al Khateeb	P16	4.30PM

PRESENTATION SCHEDULE

SENIOR POSTER 2

No	Paper ID	Title	Authors	Presenter	Presentation ID	Start time
1	21	Effect of Pineapple Core Ethanol Extract as a Bleaching Solution to Tooth Enamel Micro-roughness	**Indah Puti Sabirin**, Rahmadaniah Khaerunnisa, Arief Adityo	Indah Puti IP Sabirin	P17	11.30AM
2	11	*Piper betle* Conditioned Medium Effects on Dental Pulp Stem Cell Proliferation	**Jacqueline A Allosias**, Huwaina Abd Ghani, Siti Noor Fazliah Mohd Noor, Norhayati Luddin	Jacqueline A Allosias	P18	11.45AM
3	28	Supragingival Bacterial Microbiome Around Dental Implants and the Adjacent Tooth in Patients with a History of Periodontitis	**Nicholas Sim Choo Wee,** Norul H Mohamas-Hassan, Anis Rageh Al-Maleki, Syarida Hasnur Safii	Nicholas Sim Choo Wee	P19	12.00PM
4	16	Assessment of Human Periodontal Ligament Fibroblast Attachment Toward Amniotic Membrane and Bovine Pericardium Membrane	**Siti Mardhiah Roslan,** Haslina Taib	Siti Mardhiah Roslan	P20	12.15PM
5	39	A Study Of Inflammation On Oral Regions Using Porphyromonas Gingivalis-Induced Poly-Arthritis Animal Model	**Syatirah Najmi Abdullah,** Elizabeth Farmer, Richard Logan, Neville Gully	Syatirah Najmi Abdullah	P21	12.30PM
6	46	Growth Media Effect on the Intra- and Interkingdom Biofilm Formation of *Candida* Species and *Staphylococcus Aureus*	**Wan Nur Hazirah Wan Ahmad Kamil,** Mukarramah Zainal, Nihal Bandara, Mohd Hafiz Arzmi	Wan NurHazirah WNH Wan Ahmad Kamil	P22	2.00PM
7	29	Physico-chemical, mechanical and Biological Properties of Locally Produced White Portland Cement with Reduced Particle Size	**Hoda M Elnawawy,** Muralithran G Kutty, Noor Azlin Yahya, Noor Hayaty Abu Kasim, Paul Cooper, Josette Camilleri, Hany Mohamed Aly Ahmed	Hoda M Elnawawy	P23	2.15PM
8	84	A Narrative Review on Utilizing of Plants and Herbs in Dentistry	**Nur Farhana Mat Hussin,** Siti Mariam Ab Ghani	Nur Farhana Mat Hussin	P24	2.30PM
9	73	The Effect of Glutathione-coated Gold, Silver and Bimetallic Gold-Silver Nanoclusters on *Candida Albicans* Biofilms	**Humairaa' Majdan,** Syarifah Nurhikmah Izzati Syed Nasarudin, Ricca Rahman Nasaruddin, Mohd Hafiz Arzmi	Humairaa' Majdan	P25	2.45PM
10	64	Adjunctive Effect of Autologous Platelet Concentrates in Periodontal Therapy of Intrabony Defects: A Systematic Review and Meta-Analysis	**Nik Fatin Sarah Nik Mhd Abdul Nasser,** Su Keng Tan, Erni Noor	Nik Fatin Sarah Nik Mhd Abdul Nasser	P26	3.00PM
11	77	Extraction, Characterization, and Antimicrobial Activity of F7 Biosurfactant from *Bacillus clausii* Against Oral Pathogen Key Players	**Zahra Khairunnisa,** Myrna Nurlatifah Zakaria, Wan Himratul Aznita Wan Harun, Isti Adhitya Purwasena	Zahra Khairunnisa	P27	3.15PM
12	78	Salivary Irisin as a Potential Diagnostic Biomarker for Periodontitis: A Pilot Study	**Sadia Rana,** Norsila Abdul Wahab, Wan Nazatul Shima Shahidan	Norsila Abdul Wahab	P28	3.30PM
13	79	Beyond TNM Staging: Novel Prognostic Indicators for Oral Squamous Cell Carcinoma Survival - A Retrospective Study in Malaysia	**Anand Ramanathan,** Wan Maria Nabillah Ghani, Sarah Sabrina Zakaria, Zakiah Mat Ripen, Saravanan Gopalan, Marzuki Bin Zainal Abidin, Fairuz Abdul Rahman, Samadara BMS Siriwardena, Joe Yeong, Zuraiza Mohamad Zaini, Siti Mazlipah Ismail, Wanninayake M Tilakaratne	Anand Ramanathan	P29	3.45PM
14	81	Validity and Reliability of Digital Photos as a Diagnostic Tool for Determination of Caries	**Mohd Faiz Nasruddin,** Noorharlianan Mohamed Zohdi, Siti Aisyah Roslan, Nik Mohd Mazuan Nik Mohd Rosdy	Mohd Faiz Nasruddin	P30	4.00PM
15	87	Macrophages Polarization in the Gingival Tissue of Patients with Arrested Periodontitis	**Norul H Mohamad-Hassan,**Eshamsul Sulaiman, Zuraiza Mohamad-Zaini, Wan Izlina Wan-Ibrahim, Syarida Safii	Norul H Mohamad-Hassan	P31	4.15PM

PRESENTATION SCHEDULE

SENIOR ORAL 1

No	Paper ID	Title	Authors	Presenter	Presentation ID	Start time
1	8	Physical Properties of Polyamide12 Composite Reinforced with Agriculture Biowaste's fillers as a Potential Dental Post	Nurul Syafika Atikah Babu, Rabihah Alawi, Mohd Hazwan Hussin, Mohamad Nasir Mohamad Ibrahim, Mohd Firdaus Yhaya, **Nor Aidaniza Abdul Muttlib**	Nor Aidaniza Abdul Muttlib	O01	11.30AM
2	12	Mechanical Strength Evaluation of Glass Ionomer Cement Modified with Various Calcium Phosphates	**Nozimjon Tuygunov,** Noor Azlin Yahya, Azwatee Abdul Aziz, Arief Cahyanto	Nozimjon Tuygunov	O02	11.45AM
3	33	Effects of Adhesive Materials and Polishing Techniques on Enamel Surface after Dental Trauma Splint Removal	**Zalikha Adila Zainuren,** Norashikin Abu Bakar, Annapurny Venkiteswaran	Zalikha Adila Zainuren	O03	12.00PM
4	26	In Vitro Assessment of Cutting Efficiency and Surface Roughness of Diamond Burs on Indirect Composites	Selva Malar Munusamy, Siti Fauzza Ahmad, Mohideen Salihu Farook, Zubaidah Zanul Abidin, **Yee Shien Chung**	Yee Shien Chung	O04	12.15PM
5	56	Enhancement of Antifungal Effect on Denture Base Resin Through Microcapsules Drug Delivery Technology	Zaihan Ariffin, Mariati Jaafar, Yanti Johari, Zuratul Ain Abdul Hamid, Suharni Mohamad, **Nik Nur Syahidatul Jannah Mahadi**	Nik Nur Syahidatul Jannah Mahadi	O05	12.30PM
6	76	Antimicrobial Effect of *L. Helveticus & Ruta Angustifolia* Pers. against Oral Pathogenic Microorganisms	**Husna Hazirah Bakri,** Syarifah Nur Syed Abdul Rahman, Wan Himratul Aznita Wan Harun	Husna Hazirah Bakri	O06	2.00PM
7	80	Predicting Remaining Dentine Thickness Accurately from Periapical Radiographs	**Manahil Maqbool**, Johari Bin Abdullah, Muhamad Saiful Bahri Yusoff, Tahir Yusuf Noorani	Manahil Maqbool	007	2.15PM
8	27	In-Vitro Inactivation of Surrogate SARS-COV-2 Virus in Dental Aerosol Generating Procedure	**Wendy Wan Yee Hup,** Li Yen Chang, Wen Lin Chai	Wendy Wan Yee Hup	O08	2.30PM
9	42	Microbial Diversity of Biofilm on Partial Denture Manufactured Using 3D-Printing Technology With Optimised Build Orientation	**Norlela Yacob,** Norasmatul Akma Ahmad, Syarida Hasnur Safii, Norsiah Yunus, Fathilah Abdul Razak	Norlela Yacob	O09	2.45PM
10	22	Biomaterials of Interpositional Arthroplasty – A Systematic Review & Meta-Analysis	**Wong LV,** Lim Daniel, Yusof MYPM, Shanmuhasuntharam P	Wong LV	O10	3.00PM
11	40	Antimicrobial Efficacy of 2-Hydroxyisocaproic Acid (HICA) Towards *Enterococcus Faecalis* as Alternative Intracanal Medicament	**Nuratiqah Jasmiad,** Norashikin Abu Bakar, Noorharliana Mohamed Zohdi, Nurhayati Mohamad Zain	Nuratiqah Jasmiad	O11	3.15PM
12	48	The Use of Teeth as DNA Samples for Forensic Identification Cases in Malaysia	**Rabiah Al-Adawiyah Rahmat,** Nor Aidora Saedon, Anand Ramanathan, Wan Maria Nabillah Wan Abdul Ghani	Rabiah Al-Adawiyah Rahmat	O12	3.30PM
13	49	Can A Single Tooth Be A Source Of Human Identification? Future of Forensic Dentistry	**Samiya Riaz,** Mohd Fadhli Khamis,Wan Muhamad Amir Bin Wan Ahmad, Johari Abdullah Yap, Mohammad Kharsheed Alam	Samiya Riaz	O13	3.45PM
14	7	Complications of Different Surgical Approaches for Orbital Fracture: A Systematic Review	Daniel Lim Khim Hock, Aisyah b Ahmad Fisal, **Muhamad Imran Bin Abdulah**	Muhamad Imran Abdulah	O14	4.00PM
15	58	The Effect of Vitamin D_3 on Enamel Microhardness and Surface Morphology: An In Vitro Study	**Mohd Zulfadli Harun,** Nur Aliana Hidayah Mohamed, Ilham Wan Mokhtar, Zolkapli Eshak, Alaa Sabah Hussein	Mohd Zulfadli Harun	O15	4.30PM

PRESENTATION SCHEDULE

SENIOR ORAL 2

No	Paper ID	Title	Authors	Presenter	Presentation ID	Start time
1	55	The Effect of *Candida Auris* Phenotypic Switching on Mono- And Coculture Biofilms with *Staphylococcus Aureus*	**Mukarramah Zainal,** Wan NurHazirah Wan Ahmad Kamil, Nicola Cirillo, Mohd Hafiz Arzmi	Mukarramah Zainal	O16	11.30AM
2	59	Elucidation on the Effect of *Streptococcus Salivarius* Postbiotic K12 on Candida Biofilm	**Muhammad Danial Adham Rosman,** Mohd Hafiz Arzmi	Danial A Rosman	O17	11.45AM
3	30	A Correlation of FLACC Pain Scale with Physiological Changes During Dental Injection in Pre-school Children.	**Norsaima Ismail,** Khairil Anuar Md Isa, Mohd Afiq Farhan Roslan, Zaridah Zainal Abidin, Dayang Fadzlina Abang Ibrahim, Zalikha Adila Zainuren, Mohd Zulfadli Harun, Norashikin Bakar, Ilham Wan Mokhtar	Norsaima Ismail	O18	12.00PM
4	43	Effects of Moderate-Intensity Tabata Exercise on Body Composition Among Overweight and Obese Dental Students	**Nursharlina Sharan,** Nuranis Nabilah Shaperi, Pui Yee Lee, Norsila Abdul Wahab, Nur Karyatee Kassim, Nur Syamsina Ahmad, Nurulezah Hasbullah	Nursharlina Sharan	O19	12.15PM
5	31	A Comparison Between Four Observational Anxiety Scales Rated by Postgraduate Paediatric Dental Students	**Zaridah Zainal Abidin,** Mohd Zulfadli Harun, Zalikha Adila Zainuren, Norsaima Ismail, Dayang Fadzlina Abang Ibrahim, Norashikin Abu Bakar, Annapurny Venkiteswaran, Alaa Sabah Hussien	Zaridah Zainal Abidin	O20	12.30PM
6	10	The Oral Health Workforce Distribution of Pahang's School Dental Services	**Hidir Atni,** Nor Faezah Bohari, Budi Aslinie Sabri	Hidir Atni	O21	2.00PM
7	19	Cost Analysis of Community Water Fluoridation in Kerian, Perak	**Susan Shalani Gnanapragasam,** Nor Azlida Mohd Nor, Tengku Nurfarhana Nadirah Tengku Hamzah, Sharifa Ezat Wan Puteh	Susan Shalani Gnanapragasam	O22	2.15PM
8	86	Parents Knowledge and Practice Towards Early Orthodontic Treatment in Klang Valley - A Cross-sectional Study	**Daveinthiran Thanabalan,** Prathap Chandar Mannivanan	Daveinthiran Thanabalan	O23	2.30PM
9	18	E-Professionalism and Ethics Governance in Social Media for Malaysian Dental Practitioners: A Document Review	**Noor Asilati Binti Abdul Raob,** Budi Aslinie Md Sabri, Nor Faezah Md Bohari	Noor Asilati Abdul Raob	O24	2.45PM
10	20	Feasibility to Utilising The School Dental Clinic For Providing School Dental Services in Negeri Sembilan	**Muhammad Hamidie Saari,** Zamros Yuzadi Mohd Yusof	Muhammad Hamidie Saari	O25	3.00PM
11	57	Parenting Styles of Malaysian Parents and It's Association with Children's Dental Anxiety: A Pilot Study	**Noorfarahain Othman,** Rohaida Abdul Halim, Norashikin Abu Bakar	Noorfarahain Othman	O26	3.15PM
12	47	Communication of Oral Cancer Diagnosis: Exploring Clinicians' and Patients' Perspectives in Malaysia	**Siti Nur Farhanah Mohd Desa,** Jennifer Geraldine Doss, Kathreena Kadir, Ch'ng Lay Ling, Kok Tuck Choon, Md Arad Jelon, Mohd Rosli Yahya, Rosliza Parumo, Sherrie Chong Mei Yee, Shim Cheng Kiong	Siti Nur Farhanah Mohd Desa	O27	3.30PM
13	61	Oral Health Status of Children with Autism Spectrum Disorder (ASD) at Universiti Teknologi Mara (UiTM)	**Nor Fathihah Mohd Radzuan,** Rohaida Abdul Halim, Erni Noor	Nor Fathihah Mohd Radzuan	O28	3.45PM
14	83	Economic Factors and Caries-Free Prevalence Among Schoolchildren in Malaysia	**Najihah Lokman,** Wan Zakiyatussariroh Wan Husin, Marhazlinda Jamaludin	Najihah Lokman	O29	4.00PM
15	63	Impact of Dental Caries and Pain on Children's Oral Health-related Quality of Life: Preliminary Study	**Noor Rashidah Ismail,** Su Keng Tan, Norashikin Abu Bakar, Noren Nor Hasmun	Noor Rashidah Ismail	O30	4.15PM

PRESENTATION SCHEDULE

SENIOR ORAL 3 (ONLINE)

No	Paper ID	Title	Authors	Presenter	Presentation ID	Start time
1	4	Utilisation of Clinical Session among Postgraduate Dental Students in Universiti Malaya	**Abdul Azim Asy Abdul Aziz**, Nur Atiqah binti Omar, Norasmatul Akma bt Ahmad, Selva Malar Munusamy	Abdul Azim Asy Abdul Aziz	O31	11.30AM
2	14	Translation, Validity and Reliability of Malay Epworth Sleepiness Scale for Children and Adolescents for Malaysian	**Wan Ying Lee,** May Nak Lau, Eunice Xinwei Soh, Sze Wan Yuen, Asma Ashari, Zamri Radzi	Wan Ying Lee	O32	11.45AM
3	17	Effect of Different Disinfection Method on Peel Bond Strength of PMMA and Soft Reliners- An Invitro Study	**Veena Hegde,** Ajay Yerramsetti, Vaishnavi Nayak, Kavishma Sulaya	Veena Hegde	O33	12.00PM
4	38	Elucidation on the Antibiofilm Effect of Syzygium cumini Extract on Oral Mucositis Pathogens	**Puteri Izz Khayrin Maghzan,** Susi Sukmasari, Mohd Hafiz Arzmi	Puteri Izz Khayrin Maghzan	O34	12.15PM
5	82	Identifying Effective Oral Health Interventions for Disadvantaged School Children: A Systematic Review	Tajudin ANA, Anuwar AHK, Marhazlinda J, **Yusof ZYM**	Aiman Nadiah Ahmad Tajudin	O35	12.30PM
6	50	Oral Health Attitudes and Behaviours among Undergraduate Health Science Students in IIUM Kuantan Campus	Nor'Ainaa Syahirah Nor Din, **Zurainie Abllah**	Zurainie Abllah	O36	2.00PM
7	24	Craniofacial Morphology, Malocclusion and Oropharyngeal Soft Tissues in Chinese Obstructive Sleep Apnea Population	**Wan Ying Lee,** May Nak Lau, Shih Chia Pua, Pek Ser Heng	Wan Ying Lee	O37	2.15PM

PRESENTATION SCHEDULE

JUNIOR ORAL (ONLINE & PHYSICAL)

No	Paper ID	Title	Authors	Presenter	Presentation ID	Start time
1	23	Peer Assisted Learning Approach in Dental Curriculum: The Impact on Students' Academic Performance	**Noreen Darwisyah Che Mohd Zukri,** Nik Alisa Safia Nik Ab Rahman, Mohd Amir Mukhsin Zurin Adnan, Aida Nur Ashikin Abd Rahman	Noreen Darwisyah Che Mohd Zukri	JO1 (Online)	2.30PM
2	35	Public Perception on the Use of Eco-Friendly Bamboo Toothbrush	**Adriana Syahirah Raidee,** Farah Irdina Marwilis Helmi, Mohd Azmi Abdul Razak, Noor Hayati Azami, Nor Azlida Mohd Nor	Adriana Syahirah Raidee	JO2	2.45PM
3	37	The Effects of MSC-CM on Oral Cancer Cells in 2D and 3D Culture Conditions	Kathryn Tan, Li-Gi Ong, Chia Meng Chong, **Wei Yi Brenda Lim**, Prashanti Chippagiri, Spoorthi Ravi Banavar	Wei Yi Brenda Lim	JO3	3.00PM
4	70	Comparative Evaluation of Newly Introduced Nanofilled Composite, with Two Commercially Available Composites – A Basic Toolkit	**Yi Xuan YI Ng,** Joanne SL Tan, Zi Qi Lee, Yong Yie Cheah	Yi Xuan YI Ng	JO4	3.15PM
5	36	Association Between Systemic Diseases And Severity Of Periodontal Disease	**Euvanthiran Gunalan,** Muhammad A'izat Iskandar Mohamad Shafi'an Kamal, Chia Wei Cheah, Marhazlinda Jamaludin	Euvanthiran Gunalan	JO5	3.30PM
6	71	In Vitro Analysis of Adult Enamel Crystal Orientation and Mechanical Properties After Incorporation of Strontium Fluoride	**Chew Ming Ann,** Masturina Anati, Umer Daood	Chew Ming Ann	JO6	3.45PM
7	72	Knowledge, Perception, and Practice of Covid-19 During Endemic Era Among Private Dentists in Klang Valley	**Siti Sarah Rosli**, Nur Rashidah Mahat, Laila Azwa Hassan[1], Siti Nur Farhanah Mohd Desa, John Chong Keat Hon	Siti Sarah Rosli	JO7	4.00PM
8	74	Association between Dermatoglyphics and Facial Form- An Exploratory Study in Malaysians	**Yap PM**, Tan YQ, Wee TL, Smita Nimbalkar, Kirti Saxena	Pei Mean Yap	JO8	4.15PM
9	66	Randomised Clinical Trial Comparing Remineralising Protocols A Year Post-Debond	Khairatulamirah Md. Razali, **Aina Aqilah Abdul Razak,** Wan Nurazreena Wan Hassan, Prema Sukumaran	Aina Aqilah Abdul Razak	JO9 (Online)	4.30PM

FINAL ABSTRACT

PAPER 4

Utilisation of Clinical Session among Postgraduate Dental Students in Universiti Malaya

Abdul Azim Asy bin Abdul Aziz[1], Nur Atiqah binti Omar[2], Norasmatul Akma bt Ahmad[3], Selva Malar Munusamy[3]

[1]Department of Conservative Dentistry and Prosthodontics, Faculty of Dentistry, Universiti Sains Islam Malaysia.
[2] Restorative Unit, Benut Dental Clinic, Ministry of Health Malaysia.
[3] Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya
Email: abazimasy@usim.edu.my

Objective: The clinical principles, clinical skills and communication can be obtained from clinical sessions. For conservative dentistry in Universiti Malaya, there is no data or consensus on the optimum number of patients per student for every clinical session. Based on the agreed standard at the faculty level, for each clinical session, the students should see at least two patients. The aim of this study is to evaluate utilisation of clinical session among postgraduate dental students. **Methods:** A retrospective study was conducted among six postgraduate students' cohort 2016/2020 of Master in Clinical Dentistry (Restorative Dentistry in Conservative Dentistry) in Faculty of Dentistry, Universiti Malaya. Data were retrieved from clinical attendance logbook involving their second year until the end of third year and were recorded accordingly based on number of students, total number of patients, type of treatment and utilisation of clinical session (fully utlised, semi-utilised and non-utilised). Descriptive data was analysed using SPSS version 23 software (SPSS Inc., Chicago, IL, USA). **Results:** Overall, only 14% of them called more than two patients (fully utilised) within two year of postgraduate programme and most of the students fully utilised their clinical session during third year of their study (semester 5 and 6). It is showed that, more students fully utilised morning sessions (223 sessions) more than the afternoon sessions (56 sessions). Comparing Endodontics and Prosthodontics sessions, the percentages of students planned to call for more than one patient is almost similar, 13% and 16% respectively. **Conclusion:** It is recommended that the existing standard be revised to one patient being seen for each clinical session based on the 14% compliance level to the current standard due to several factors like operator skills and man power.

Keywords: utilisation, clinical session, dental postgraduate

FINAL ABSTRACT

PAPER 5

Educational Experiences, Attitude and Practice of Resin Infiltration in Children Amongst Malaysian Paediatric Dentists

Edri MI[1], Ramdan MI[1], Kamaruddin AA[1], Abu Bakar N[1],

[1]Center of Paediatric Dentistry & Orthodontics Studies, Faculty of Dentistry, Universiti Teknologi MARA, Jalan Hospital, Sungai Buloh Campus, Sungai Buloh, Selangor 47000, Malaysia

Email: 2019614886@student.uitm.edu.my

Objectives: (i) To evaluate the educational experiences, attitude and practice of resin infiltration (RI) amongst Malaysian Paediatric Dentists (ii) to determine the relationship between their educational experiences and attitude in the practice of RI in children. **Material & Methods:** This cross-sectional study used a self-administered questionnaire distributed online to Malaysian Association of Paediatric Dentistry (MAPD) members from December 2022 to February 2023. Demographics, educational experiences, attitudes, and RI use were measured. Descriptive data, Cronbach alpha coefficient, and Pearson correlation tests were obtained. **Results:** Of the 110 members invited to participate, 30 surveys were completed, with a response rate of 27.3%. The knowledge subscale comprised 19 items (α=0.84), and the attitude/practice subscale had 11 items (α=0.77). A total of 46.7% agreed that their undergraduate training had prepared them well to use RI with paediatric patients. 93.4% of respondents felt their training in paediatric graduate programs had informed and adequately prepared them for using RI. Most respondents wanted to learn more about RI (100%) and to take a continuing education course (93.3%). The respondents positively viewed RI, especially its aesthetic benefit (100%). Only 16.7% of respondents used RI frequently, while others used it rarely (63%) or never (20%). There was no correlation between education experiences and attitude in using RI (r=0.14: p<0.46). **Conclusion:** While the correlation was insignificant, this study showed the need to incorporate RI into the dental curriculum.
Hence, expanding undergraduate, postgraduate, and continuing professional education in RI should be enforced.

Keywords: Resin Infiltration, Minimally Invasive Dentistry, Paediatric dentistry, children, dental education

FINAL ABSTRACT

PAPER 6

Complexity Profile of Special Care Dentistry Patients in Universiti Malaya: A Retrospective Cohort Study.

Ahmad Fisal A,[1] Francis J[1], Mohamed Rohani M[1]

[1]Special Care Dentistry Clinic, Department of Paediatric Dentistry & Orthodontics, Faculty of Dentistry, Universiti Malaya, 50603 Kuala Lumpur.

Email: aesya@um.edu.my

Objectives: Patients with disability and medical complexity face numerous barriers to access dental care resulting in an accumulation of unmet oral healthcare needs. This retrospective cohort study aimed to assess the complexity profile and oral health needs of patients seen during a 6-month period from January 2022 to June 2022 in the Special Care Dentistry Clinic (SCDC) of Universiti Malaya. **Methods:** Universal sampling involved all 120 electronic patient records from the SCDC electronic database. Besides demographic variables, complexity profile was examined through the British Dental Association Case Mix Scoring (BDACMS), Venham Behaviour Rating Scale (VBRS), American Society of Anesthesiologists physical status classification system (ASA) status, Clinical Frailty Scale (CFS), number of medications, and number of comorbidities. **Results:** The mean age of the sample was 43.0 years (Range 16-101, SD=22.7), 77.0% male, and 53.3% had two or more disabilities. Most were categorised as ASA 2 (35.8%). The mean BDACMS, VBRS, CFS, number of medications, number of comorbidities, and distance (SCDC–place of residence); 15.7 (Range:0–38, SD=9.47), 1.3 (Range:0–5, SD=1.6), 3.8 (Range:1–8, SD=2.0), 2.4 (Range:0–18, SD=3.0), 1.4 (Range:0–5, SD=1.3), and 15.4 km (Range:1–273, SD=32.5), respectively. Using Spearman's correlation, positive correlations were noted between age and comorbidities, age and medications, age and ASA status, age and CFS, VBRS and BDACMS, VBRS and CFS, BDACMS and VBRS, and BDACMS and number of medications ($p<0.05$). An inverse correlation was noted between age and VBRS ($p<0.05$). **Conclusions:** The patients seen in the SCDC were mostly middle-aged, of moderate complexity and varied widely in terms of medical status and distance from the clinic. Older patients tended to be more medically complex and of more manageable behaviour. Further research into complexity profiling can be used to improve the provision of holistic care and SCDC services.

Keywords: Special Care Dentistry, Special Needs Dentistry, disability, community oral health, patient profile

FINAL ABSTRACT

PAPER 7

Complications of Different Surgical Approaches for Orbital Fracture: A Systematic Review

Lim D[1], Ahmad Fisal A[2], Abdulah MI[1]

[1]Department of Oral and Maxillofacial Clinical Sciences, Faculty of Dentistry, Universiti Malaya
[2]Department of Paediatric Dentistry and Orthodontics, Faculty of Dentistry, Universiti Malaya
Email: imranabdulah89@gmail.com

Objectives: Transconjunctival, subciliary, and subtarsal are the three most common surgical approaches for the management of orbital fractures. The purpose of this systematic review is to determine the types and frequency of complications associated with each approach. **Methods:** The review was performed in accordance with PRISMA guidelines. There was an electronic search of PubMed, EBSCO, and Web of Science databases. Inclusion criteria included randomised controlled and controlled (retrospective or prospective) clinical studies comparing the three approaches to the management of orbital fractures. Using the CONSORT 2010 checklist for randomised controlled trials (RCT) and the Newcastle-Ottawa quality assessment scale for non-RCT studies, the risk of bias was evaluated. **Results:** This review included seven RCTs, five prospective studies, and twenty-three retrospective studies with a total of 2,341 orbits operated on from 1981 to 2021. Fifteen papers had a low risk, 18 with a medium risk, and two with a high risk of bias. Out of the 2,341 orbits, 365 orbits (15.59%) had complications. The subciliary and subtarsal approaches had higher ectropion rates than the transconjunctival approach. The transconjunctival rate of scleral show was the lowest, while the subciliary rate was the highest. The only approach that recorded entropion, canthal malposition, chemosis, and conjunctival granuloma was the transconjunctival approach. The subtarsal approach resulted in the least aesthetically pleasing scars, followed by the subciliary and transconjunctival approaches. **Conclusion:** In terms of total number of complications, subtarsal approach had the least number of complications (8.49%) compared to subciliary approach (19.56%) and transconjunctival approach (13.61%) but with the disadvantage of unaesthetic facial scar which affects the patient's quality of life. This review suggests that the choice of surgical approach should be based on the type of orbital fracture, the amount of access required, the surgeon's experience, and the desired outcome.

Keywords: Transconjunctival approach, subciliary approach, subtarsal approach, orbital fractures

FINAL ABSTRACT

PAPER 8

Physical Properties of Polyamide12 Composite Reinforced with Agriculture Biowaste's fillers as a Potential Dental Post

Nurul SAB[1], Rabihah A[1], Mohd HH[2], Mohamad NMI[2], Mohd FY[1], Nor AAM[1]

[1]School of Dental Sciences, Universiti Sains Malaysia
[2]School of Chemical Sciences, Universiti Sains Malaysia
Email: aidaniza@usm.my

Objectives: The use of cast metal post may lead to unfavourable fracture if failed and leads to the loss of teeth. Cast metal post was also reported to have lower aesthetic value. **Methods**: The extracted cellulose nanocrystals (CNC) from oil palm fibres and silica from rice husk (RH) were used as fillers in this study. Specimens were divided into groups with 100% polyamide 12 (PA12) (Group 1), PA12+CNC (Group 2&3), PA12+RH silica (Group 4), PA12+RH silica+CNC (Groups 5&6) and everStick post (Group 7). The flexure test and scanning electron microscopy (SEM) analysis were carried out. **Results**: The everStick post (Group 7) recorded the highest median flexural strength (227.72Mpa) while Group 5 (19%SLC+1% CNC) recorded the lowest median flexural strength (31.98 MPa). Group 3 (2% CNC) showed the highest median value (177.92Mpa) among all the experimental groups. There was no significant difference ($p>0.05$) reported between Group 3 and Group 7. Groups with RH filler (Groups 4, 5&6) showed lower median value compared to Group 1. The circular shape of CNC was seen in a cross-section view in SEM analysis. The surface topology of the sample appeared irregular and rough upon CNC incorporation with a small gaps and porousness between PA12 matrix and the CNC. RH silica was also observed in spherical shape which dispersed well in the matrix. Less porosity and gaps were observed in composite reinforced with both fillers with RH silica were observed to cover the surface of the matrix as well as coated the outer surface of CNC especially aggregated CNCs and CNCs that were found in bundles. **Conclusions**: Addition of 2% CNC filler into PA12 increased the flexure strength of experimental post closed to everStick post. However, incorporation of RH filler was found to reduce the flexure strength of PA12.

Keywords: Polyamide 12, Post and Core, Biomaterial

FINAL ABSTRACT

PAPER 10

The Oral Health Workforce Distribution of Pahang's School Dental Services

Hidir Atni[1], Nor Faezah Bohari[1], Budi Aslinie Sabri[1]

[1]Centre of Population Oral Health & Clinical Prevention Studies, Dentistry Faculty, Universiti Teknologi MARA
Email:dr.mohdhidir@moh.gov.my

Objectives: Frequently, the planning of the oral healthcare workforce is limited to the calculation of dentist-to-population ratios, nevertheless, this approach overlooks several crucial variables, such as the load of oral health needs. Workload analysis is implemented to gain a comprehensive understanding of the true oral health requirements. This study aims to enhance our comprehension of the workforce imbalance and its effect on the distribution of personnel serving School Dental Services (SDS) in Pahang. **Methodology:** To achieve standardized workforce sizing for every school, the operator-to-student ratio, that is, the ratio of a single operator to the entire student body, is utilized. The collected data is then merged and inputted into ArcGIS Pro software for geospatial analysis. Statistical analysis is conducted through the utilization of SPSS software. **Result:** In Pahang, 10% (n=72) of schools have a low operator-to-student ratio, with 47 of them located in Kuantan. There is a significant difference in DMFT mean between rural (0.74; SD=0.60) and urban (0.86; SD=0.58) schools (p=0.02). Kuantan's urban schools have a significant operator burden, with a shortage of operators compared to other districts, amplifying the workforce distribution imbalance. **Discussion:** Compared to urban areas, there is a greater ratio of one operator to the total student population in rural areas. However, schools with a higher number of students necessitate more children to be treated per operator. **Conclusion:** The necessity for a fair workload-based distribution of SDS staff is evident.

Keyword: Workforce, School Dental Service, ArcGis Pro

FINAL ABSTRACT

PAPER 11

Piper betle Conditioned Medium Effects on Dental Pulp Stem Cell Proliferation

Huwaina AG[1], Siti NFMN[2], Norhayati L[3], Jacqueline AA[1]

[1]Department of Conservative Dentistry, School of Dental Sciences, Universiti Sains Malaysia
[2]Craniofacial and Biomaterial Sciences Cluster, Advanced Medical and Dental Institute, Universiti Sains Malaysia
[3]Department of Prosthodontics, School of Dental Sciences, Universiti Sains Malaysia
Email: jacquelineann@student.usm.my

Objectives: *Piper betle L.*(PB), a plant indigenous to Southeast Asia, has been extensively studied for its antibacterial, bioactive and regenerative potential in treating dental diseases. This study aims to analyse the phytochemical compounds of PB extract using Gas Chromatography-Mass Spectrometry (GC-MS) and evaluate the effect of extract-conditioned medium towards dental pulp stem cells (DPSC) proliferation. **Methods**: The PB extract was prepared using the maceration technique and ethanol as a solvent. GC-MS analysis of the PB ethanol extract was performed to identify bioactive phytochemicals. PB-conditioned media using Dulbecco's Modified Eagle Medium (DMEM) at various concentrations were prepared (7.81, 15.63, 31.25, 62.50, 125.00, 250.00 and 500.00 µg/ml) and exposed to dental pulp stem cells. Non-treated cells were used as control. The DPSC cell's responses were assessed using the MTT (3-(4,5-Dimethylthiazol-2-yl)-2,5-Diphenyltetrazolium Bromide) assay. **Results**: GCMS analysis revealed presence of phenols, ester, ketones, carbohydrates and nucleotides. Based on the MTT assay, DPSC displayed an increasing proliferation rate when exposed to PB-conditioned media from days 1 to 2 compared to control. PB-conditioned media at concentration 31.25µg/ml was determined to be the optimal dose throughout the observation period in promoting DPSC proliferation. However, DPSC cell proliferation reduced significantly at concentrations of 250µg/ml and 500µg/ml ($p < 0.01$) compared to control. **Conclusion:** The effect of PB towards DPSC at a certain dosage revealed continuous cell proliferation over the observation period and promoted cell growth which may be contributed by the effects of the compounds identified in the PB extract namely hydroxychavicol (retention area: 70.37%) and 3-allyl-6-methoxyphenol / Chavibetol (retention area: 17.78%). Therefore, this compound may have significant potential to help in preventing dental diseases.

Keywords: *Piper betle*, phytochemicals, dental pulp stem cells, proliferation

FINAL ABSTRACT

PAPER 12

Mechanical Strength Evaluation of Glass Ionomer Cement Modified with Various Calcium Phosphates

N. Tuygunov[1], N.A. Yahya[2,3], A. Abdul Aziz[2,3] and A. Cahyanto[2,3,4]

[1]Faculty of Dentistry, Universiti Malaya, Kuala Lumpur 50603, Malaysia
[2]Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur 50603, Malaysia
[3]Biomaterials Technology Research Groups, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur 50603, Malaysia
[4]Department of Dental Materials Science and Technology, Faculty of Dentistry, Padjadjaran University, Jatinangor 45363, Indonesia
E-mail: s2157967@siswa.um.edu.my

Objectives: This study focuses on evaluating the mechanical strength in terms of Diametral Tensile Strength (DTS) of Glass Ionomer Cement (GIC) modified with different types of calcium phosphates, including tetracalcium phosphate (TTCP), nano-Hydroxyapatite (nm-HAP), micro-Hydroxyapatite (µm-HAP) and α-Tricalcium phosphate (α-TCP). **Methods:** The GIC powder was fabricated by a melt-quenching method using chemicals with weight compositions of SiO_2–35%, Al_2O_3–25%, CaF–15%, P_2O_5–5%, CaO–20%. The compositions were heated up to 1250°C in furnace at a heating rate of 10°C/min and held for 2 hours; then, the melt was quenched and crushed to obtain fluoroaluminosilicate powder. Following the fabrication process, the samples were divided into five groups, each incorporating different additives: TTCP, µm-HAP, nm-HAP, and α-TCP. GIC was modified through manual grinding using a mortar and pestle, with the following weight ratios: Group A (100% GIC), Group B (90% GIC; 10% TTCP), Group C (90% GIC; 10% µm-HAP), Group D (90% GIC; 10% nm-HAP), and Group E (90% GIC; 10% α-TCP). Mechanical strength was conducted by DTS evaluation according to ISO9917-1/2007 using a universal testing machine at a crosshead speed of 0.5 mm/min with a 5 kN load cell. **Results:** GIC modified with µm-HAP exhibited the highest DTS at 3.74 MPa, compared to the control GIC with DTS of 3.69 MPa. On the other hand, the addition of nm-HAP, TTCP, and α-TCP resulted in decreased strength, with DTS measurements of 3.12 MPa, 2.70 MPa, and 2.12 MPa, respectively. **Conclusion:** The particle size and type of calcium phosphate additives are crucial in determining the mechanical strength. Worth noting that µm-HAP particles effectively enhance the mechanical properties of GIC, making it a promising additive for dental restoratives rather than nm-HAP. On the other hand, modification with TTCP and α-TCP may not be suitable for improving the mechanical properties of GIC.

Keywords: glass ionomer cement, hydroxyapatite, tricalcium phosphate, tetra calcium phosphate, mechanical strength

FINAL ABSTRACT

PAPER 14

Translation, Validity and Reliability of Malay Epworth Sleepiness Scale for Children and Adolescents for Malaysian

Lee WY[1], Lau MN[2], Soh EX[2], Yuen SW[3], Ashari A[4], Radzi Z[2]

[1]Department of Primary Oral Health Care, Lanang Dental Clinic, Ministry of Health Malaysia, Sibu, Sarawak.
[2]Department of Paediatric Dentistry & Orthodontics, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur.
[3]Dental Specialist and Research Tower, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur.
[4]Centre for Family Oral Health, Faculty of Dentistry, the National University of Malaysia, Kuala Lumpur.
Email: yingying0723@gmail.com.my

Objectives: Epworth Sleepiness Scale for Children and Adolescents (ESS-CHAD) is a valid and reliable eight-item self-administered questionnaire for assessing excessive daytime sleepiness and screening sleep-disordered breathing for children and adolescents. The cross-sectional study aimed to translate and cross-culturally adapt ESS-CHAD into a Malay version (MESS-CHAD) for Malaysians and to assess the validity and reliability of MESS-CHAD. **Methods:** Forward-backward translation method was used to translate and cross-culturally adapt the questionnaire. Three linguistic experts and two paediatricians content validated the translated version, which was then critically appraised by an expert panel. Face validity was conducted through audio-recorded semi-structured in-depth interviews with 14 native Malay-speaking children and adolescents, followed by thematic analysis. The same expert panel critically appraised the qualitative data for revision, and a linguistic expert then proofread the questionnaire. For criterion validity, 148 eligible subjects answered the final MESS-CHAD and the Malay version of Paediatric Sleep Questionnaire (M-PSQ) concurrently. For formative construct validity, Variance Inflation Factor (VIF) and P values of model's outer weight and outer loading were analysed using SmartPLS to assess the indicator's multicollinearity and significance. Two weeks later, 40 subjects answered the final MESS-CHAD again for internal consistency and test-retest reliability. **Results:** Spearman Correlation Coefficient value of 0.789 suggested a solid positive correlation between MESS-CHAD and M-PSQ. VIF ranging from 1.109 to 1.455 indicated no collinearity problem. Intraclass Correlation Coefficient ranging from 0.798 to 0.932 and Cronbach's alpha from 0.813 to 0.932 confirmed good to excellent test-retest reliability and internal consistency, respectively. **Conclusion:** ESS-CHAD has been translated and cross-culturally adapted into Malay version for Malaysians, and found to be valid and reliable.

Keywords: Malay, ESS-CHAD, Reliability, Translation, Validity

FINAL ABSTRACT

PAPER 15

Science Mapping of Research Clusters and Core Research Areas in Removable Partial Dentures

Hamid NFA [1], Ahmad R [1,2], Ariffin F [3], Shuib S [4]

[1] Centre of Studies for Restorative Dentistry, Faculty of Dentistry, Universiti Teknologi MARA, Malaysia
[2] Integrative Pharmacogenomic Institute (iPromise) Puncak Alam, Universiti Teknologi MARA, Malaysia
[3] Centre of Studies for Periodontology, Faculty of Dentistry, Universiti Teknologi MARA, Malaysia
[4] School of Mechanical Engineering, College of Engineering, Universiti Teknologi MARA, Malaysia
Email: faharina@uitm.edu.my

Objectives. Science mapping helps provide a comprehensive review of a topic of interest based on the enormous amounts of scientific output in the academic literature. The study aims to identify research clusters, core research areas, and the highest impact terms based on the co-occurrence of keywords in removable partial dentures (RPDs) research for the past 10 years, from 2012–2022. **Methods**: The search was done using the truncated search term "removable partial denture*" OR "removable prostho*" based on the papers extracted from the Scopus database, and employing a bibliometric analysis tool to automate keyword mapping. Data analysis and visualisation were done using Biblioshiny software (RStudio Desktop) and VOSviewer (Version 1.6.18). **Results**: The search yielded 1043 articles following the refinement criteria. Data cleaning was done to remove duplication and exclude irrelevant topics, leaving 888 documents from 114 journals to be analysed. From the 679 keywords extracted, six clusters were identified, enabling researchers to find research clusters; cluster 1 (predominantly complete dentures and shortened dental arch), cluster 2 (clasp in relation to materials), cluster 3 (latest technologies in RPDs fabrication), cluster 4 (implant-related), cluster 5 (quality-of-life (QoL)) and cluster 6 (abutment teeth). For the year 2012-2022, further analysis reveals that "polyetheretherketone (PEEK)", "3D-printing" and "systematic review" were identified as the top three high-impact terms based on the annual citation and annual normalised citation scores. Research on "implant' and "oral health QoL" has been identified as primary core research areas in RPDs-related research from 2012-2017, while "CAD-CAM", "3D-printing", "clasp" and "PEEK" emerged as new areas of interest among researchers in 2018-2022. **Conclusions**: PEEK has been identified as the highest impact term for the past ten years, highlighting the possible future research interest in RPDs-related research. Incorporating digital technologies in RPDs fabrication using high-performance polymers as materials is expected to increase in the future.

Keywords: bibliometric analysis, high-impact terms, removable partial denture, prosthodontics, science mapping

FINAL ABSTRACT

PAPER 16

Assessment of Human Periodontal Ligament Fibroblast Attachment Toward Amniotic Membrane and Bovine Pericardium Membrane.

Siti Mardhiah Roslan[1], Haslina Taib[1], Zurairah Berahim[1], Azlina Ahmad[2]

[1]Periodontics Unit, School of Dental Sciences, Universiti Sains Malaysia, Health Campus, Kubang Kerian, Kelantan, Malaysia.
[2]Basic Sciences & Oral Biology Unit, School of Dental Sciences, Universiti Sains Malaysia, Health Campus, Kubang Kerian, Kelantan, Malaysia.
Email: haslinakk@usm.my

Objective: Periodontal regeneration yield a challenge to clinician thus, periodontal tissue engineering (PTE) have been proposed as one of the techniques to regenerate loss periodontal tissue. Hallmark of tissue engineering include cell, growth factor and scaffold. Amniotic membrane (AM), an allograft and bovine pericardium membrane (BPM) a xenograft, have been used as a natural scaffold which helps in cell adhesion, support, and guide the tissue growth in regeneration. Ideal scaffold for regeneration should be biocompatible to the periodontal cells as well have appropriate porosity to aid tissue vascularization and integration. This study aims to evaluate and compare the attachments of Human Periodontal Ligament Fibroblast cell (HPDLFs) to AM and BPM. **Methods**: This is an in-vitro study in which HPDLFs were seeded on AM and BPM. The cell attachment to these membranes were observed under scanning electron microscopy (SEM) at Day 1, 7, 14 and 21. **Results**: HPDLFs showed primary attachment to both membrane on Day 1. At day 7, the cells were firmly attached on AM, continued to flatten, became elongated and multiplied that became overlapping until Day 21. This similar observation was seen for the BPM until day 14 however, the cells attachment started to reduce in number until day 21. **Conclusion:** This study shows the ability of AM as a scaffold for periodontal cells attachment over BPM. This could be owing to its porosity characteristic. Further studies are required to elucidate the periodontal regenerative potential of this membrane.

Keywords: Amniotic membrane, bovine pericardium, periodontal regeneration

FINAL ABSTRACT

PAPER 17

Effect of Different Disinfection Method on Peel Bond Strength of PMMA and Soft Reliners- An Invitro Study

Veena Hegde, Ajay Yerramasetti, Vaishnavi Nayak, Kavishma Sulaya

Department of Prosthodontics, Manipal College of Dental Sciences, Manipal, MAHE
Email: veena.hegde@manipal.edu

Objective: The objective of the study was to evaluate the the effect of chemical and chemical free disinfection methods on peel bond strength between PMMA acrylic resin and soft relining materials. **Methods**: A total of 48 polymethyl methacrylate specimens (PMMA) were fabricated and divided into two groups containing 24 each which were bonded to two resilient relining materials respectively (Ufigel P and Mollosil Detax). Each group were disinfected for 7 days using 5 % chlorhexidine (CHLX) and microwave (MW) irradiation. After disinfection procedures peel bond strength was tested using universal testing machine.Data was analysed using the statistical package SPSS 22.0 (SPSS Inc., Chicago, IL) and level of significance was set at $p \leq .05$. Inferential statistics to find out the difference between the groups was done using Independent T test and Repeated measures of ANOVA followed by TUKEY'S HSD Post hoc analysis to find out the difference between any two groups. **Results**: Significant difference present with respect to CHLX and MW values where the Ufigel group reported higher values than Mollosil Detax. The significant difference was higher in the CHLX group (0.05 ± 0.01) compared to the MW group. Whereas within group analysis did not show any significant difference in bond strength in both the groups between control,chlorexidine and microwave($p > 0.05$). **Conclusion**: Both disinfection methods showed significant reduction in the peel bond strength of Ufigel when compared with control group. Whereas Mollosil Detax did not show any significant change in the peel bond strength after disinfection by two different methods.

Keywords: Disinfection, Peel bond strength, PMMA, Soft reliners

FINAL ABSTRACT

PAPER 18

E-Professionalism and Ethics Governance in Social Media for Malaysian Dental Practitioners: A Document Review

Abdul Raob NA[1], Md Bohari NF[1], Md Sabri BA[1]

[1]Centre of Population Oral Health and Clinical Prevention Studies, Faculty of Dentistry, Universiti Teknologi MARA (UiTM)
Email: dr.asilati@gmail.com

Objectives: A subset of professionalism called "e-professionalism" is defined as the application of traditional professionalism ideas to online activities. The concept of e-professionalism is nested in the ethics of healthcare. Dentists, as professionals, must adhere to the principle of ethics while using social media. To investigate the Acts, regulations, the Code of Conduct or guidelines available pertaining to social media usage among dentists in Malaysia. **Methods:** A review of relevant legislation, regulations, Codes of conduct, and guidelines for the use of social media in dentistry was conducted using the READ (Ready, Extract, Analyse, Distill) approach. **Results:** There were twenty-five (25) documents directly or indirectly related to Dental Act 2018 under the Oral Health Division, Ministry of Health Malaysia website. Only eight (8) documents were found directly or indirectly pertaining to social media usage among dental practitioners in Malaysia. Currently, there is no specific document guideline on social media usage for both private and public dental practitioners in Malaysia. All related documents on guidelines were general and not directly related to social media use and needed to be read in conjunction with other directives and guidelines by the Ministry of Health. A comprehensive guideline on social media usage was available but only for the MOH staff, including public dental practitioners. **Conclusion:** In order to advance toward good ethical behaviour in dentistry, it is necessary to offer the dental profession conducive guidelines in social media usage.

Keywords: social media, e-professionalism, ethics, dentistry

FINAL ABSTRACT

PAPER 19

Cost Analysis of Community Water Fluoridation in Kerian, Perak

Gnanapragasam SS[1,2], Mohd Nor NA[1], Tengku Hamzah TNF[3], Wan Puteh SE[4]

[1]Department of Community Oral Health & Clinical Prevention, Faculty of Dentistry, Universiti Malaya
[2]Oral Health Programme, Ministry of Health Malaysia
[3]Department of Paediatric Dentistry & Orthodontics, Faculty of Dentistry, Universiti Malaya
[4]Department of Community Health, Faculty of Medicine, Universiti Kebangsaan Malaysia
Email: susanshalani@gmail.com

Objectives: The existing study showed that the cessation of community water fluoridation (CWF) since 2012 in Pahang, Malaysia, was primarily due to the privatisation of water treatment facilities (WTF), leading to insufficient funding for continuing the CWF programme. However, little is known about the cost of CWF in Malaysia, despite its long history. Hence, this study aims to estimate the total and per capita cost of CWF programme in Kerian, Perak, from 2015 to 2019. **Methods**: This was a retrospective record review, analysing CWF expenditure data in two WTF and two dental clinics in Kerian, Perak from 2015 to 2019, using a healthcare provider perspective. The data on the population coverage of CWF in Kerian was obtained from the Perak Dental Division. Activity-based costing followed CWF guideline for implementation, operation and maintenance, monitoring, and evaluation activities. All cost items (capital, manpower, safety, maintenance, chemicals, and transportation) were presented in MYR 2015, with a 3.00% discount rate. **Results**: Over the five-year period, the cost of the CWF programme was estimated as follows: MYR 242,644.33 (20.4%) for the programme implementation, MYR 796,627.93 (66.9%) for the programme operation and maintenance, MYR 147,542.05 (12.4%) for the programme monitoring, and the remaining MYR 3,508.20 (0.3%) for the programme evaluation. The highest contributor to the CWF programme cost was the cost of the fluoride chemical; sodium fluorosilicate, at MYR 450,364.53 (37.8%). The average population that received fluoridated water was 189,015. From 2015 to 2019, the CWF programme in Kerian, Perak, incurred an estimated total cost of MYR 1,190,322.51, with a cost per capita of MYR 6.30. **Conclusion:** Cost analysis bridges the gap between oral health policy makers prioritizing fluoride levels in water and WTF authorities emphasizing the CWF programme cost. It enables WTF authorities make informed decisions about investing in CWF programme expenditure.

Keywords: Community water fluoridation; Cost analysis; Activity-based costing

FINAL ABSTRACT

PAPER 20

Feasibility to Utilising the School Dental Clinic for Providing School Dental Services in Negeri Sembilan

Saari MH[1], Mohd Yusof ZY[1]

[1]Department of Community Oral Health and Clinical Prevention, Faculty of Dentistry, Universiti Malaya
Email: s2101928@siswa.um.edu.my

Objectives: The objectives of this study were to explore the facilitators and barriers to utilising the SDC for providing School Dental Services (SDS) to primary school children in Negeri Sembilan from the perspectives of Dental Therapist (DTs). **Methods:** This study used a qualitative study design with a total sampling method. Data were collected using Focus Group Discussion (FGD) and was based on self-developed leading and probing questions. Data from the FGDs were transcribed verbatim and analysed using thematic analysis. **Results**: 4 FGDs were conducted with 27 DTs. The facilitators for utilising the SDC for providing SDS to primary school children in Negeri Sembilan were identified. Six themes emerged from the FGDs, i.e. good support from the school, support from teachers, cooperation from school children, good dental administration, distance from the main dental clinic, and positive responses from parents. The barriers to utilising the SDC in primary schools in Negeri Sembilan were represented by seven themes, i.e. of support from school, lack of support from school teachers, dental administration factors, safety issues, distance from the main clinic, language barrier, and high workload. **Conclusion**: The findings of this study provide an important insight into the facilitators and barriers to utilising the SDC for providing SDS to primary school children in Negeri Sembilan from the perspectives of DTs.

Keyword: Dental Therapist, Feasibility, School Dental Clinic, School Dental Services, School children

FINAL ABSTRACT

PAPER 21

Effect of Pineapple Core Ethanol Extract as a Bleaching Solution to Tooth Enamel Micro-roughness

Indah Puti Sabirin[1], Rahmadaniah Khaerunnisa[1], Arief Adityo[1]

[1]Faculty of Dentistry, Universitas Jenderal Achmad Yani, Cimahi, Indonesia
Email: sabirinputi@gmail.com

Objectives: Esthetic problem caused by tooth-staining is quite common for modern people. Tooth-bleaching procedure is one of a treatment to overcome it. Pineapple (*Ananas comosus* (L.) Merr) is one of a tropical fruit people consumed every time, but sometimes its core has always been wasted and not eaten because of the structure and taste. Pineapple core, however, can be utilized for remedy as it contains ingredients such as bromelain, citric acid, malic acid, and oxalic acid, and it has pH value ranged from 3.2 to 3.8. These contents are thought to have benefit to help brighten discolored teeth due to extrinsic factors. Its low pH causes demineralization process and so it can change the micro-roughness of tooth enamel. This study aims to determine the effect of pineapple core ethanol extract gel on the micro-roughness of tooth enamel with in vitro tooth-bleaching process. **Methods**: This research was conducted using a quasi-experimental laboratory method with pre and post controlled group design. 30 maxillary incisors divided into 2 control and 4 treatment groups with concentrations of 25%, 50%, 75%, and 100%. Treatment using ethanol extract gel of pineapple core was carried out for 6 hours for 14 days. Tooth enamel micro-roughness was measured using a profilometer at the beginning and the end of the study. **Results:** There was an increase in enamel micro-roughness values before and after treatment using pineapple core extract as a tooth bleaching agent, particularly on the 75% concentration. Analysis using Kruskal Wallis test ($p<0.05$) showed that there was no significant difference in enamel micro-roughness values on all groups. **Conclusion**: The conclusion of this research is ethanolic extract gel of pineapple core as a bleaching agent has no effect on the micro-roughness of tooth enamel, and it showed that in this case pineapple core extract is quite safe to be applied to tooth enamel.

Keywords: medicinal plants, micro-roughness, teeth bleaching, tooth enamel, pineapple core

FINAL ABSTRACT

PAPER 22

Biomaterials of Interpositional Arthroplasty – A Systematic Review & Meta-Analysis

Wong LV[1], Lim D[1], Yusof MYPM[2,3], Shanmuhasuntharam P[1]

[1]Department of Oral & Maxillofacial Clinical Sciences, Faculty of Dentistry, Universiti Malaya
[2]Center for Oral & Maxillofacial Diagnostics & Medicine Studies, Faculty of Dentistry, Universiti Teknologi MARA
[3]Institute of Pathology, Laboratory and Forensic Medicine (I-PPerForM), Universiti Teknologi MARA
Email: wonglingvuan@gmail.com

Objectives: This systematic literature review (SLR) and meta-analyses aimed to determine the most utilised biomaterials in TMJ interpositional arthroplasty, to identify biomaterials that can produce good maximal incisal opening post-surgery, and complications associated with the types of biomaterials used. **Methods:** The review was performed in accordance with PRISMA guidelines. An electronic search was conducted using PubMed, EBSCO, and Web of Science databases. Details reported were collected using Cochrane Collaboration (2014) data collection form, and further scrutinised using Revised Cochrane risk-of-bias tool for cluster-randomized trials (RoB 2 CRT) and Risk of Bias in Non-randomized Studies of Interventions(ROBINS-I) for randomised controlled trial (RCT) and non-RCT articles respectively. Meta-analyses were carried out using RStudio version 4.2.3-©2009-2023. **Results:** Of the total papers included, 84% were non-RCT papers and 16% were RCT papers. The reported biomaterials used were temporalis fascia / temporalis muscle, silicone block / sheet, abdominal fat, buccal fat pad, native articular disc, skin graft, costal cartilage, bone wax and porcine acellular dermal matrix and acrylic marbles. Twenty non-RCT papers that studied temporalis muscle, fat graft, and silicone were selected for meta-analyses. Overall effect of forest plot favoured treatment with these 3 biomaterials. Moderate to high heterogenicity seen in both temporalis muscle (I^2 55.8%) and silicone group (I^2 88.4%). No heterogenicity was seen in abdominal graft group. Overall post-operative mouth opening increment was 3mm to 9mm. All 3 biomaterials showed $p<0.001$. This statistically significant difference warranted us to be more cautious in results interpretation. **Conclusions:** The commonly utilised biomaterials were temporalis myofascial flap / temporalis fascia, silicone, and fat grafts (buccal and abdominal fat). This SLR highlighted that all the studied biomaterials were able to produce good post-operative mouth opening, and the most complications reported were not due to biomaterials chosen but attributed to surgical approaches and patients' non-compliance to jaw physiotherapy.

Keywords: temporomandibular joint, ankylosis, interpositional arthroplasty, biomaterials

FINAL ABSTRACT

PAPER 23

Peer Assisted Learning Approach in Dental Curriculum: The Impact on Students' Academic Performance.

Che Mohd Zukri ND[1], Nik Abdul Rahman NAS[1], Zurin Adnan MAM[2], Abd Rahman AN[2]

[1]Faculty of Dentistry, University Teknologi MARA
[2]Centre of Paediatric Dentistry and Orthodontics Studies, Faculty of Dentistry Universiti Teknologi MARA
Email: noreendarwisyah.zr@gmail.com

Objectives: To assess the impact of peer-assisted learning (PAL) on academic performance, clinical competencies, and the students' perceptions of this learning approach. **Methods:** A randomised control trial (RCT) and online cross-sectional study were conducted from March 2022 to March 2023 to assess three main domains, which were students' clinical competencies, academic performance, and students' perception towards PAL. This RCT involved 80 fourth-year dental students who were divided into two groups to observe either orthodontic impression-taking (group A) or face bow transfer (group B) procedures for six months, followed by assessments of their clinical competencies for both procedures. A pre-test and post-test were done to evaluate the academic performance of year 4 students following a seminar given by postgraduate students. A validated questionnaire was used to assess the perceptions of 190 students from year 3 to year 5 towards PAL. **Results**: There was no significant difference in clinical performance between groups following PAL sessions. There were weak correlations of students' clinical competencies between groups A (p=0.538) and B (p=0.279). However, it was found that PAL helped to improve theoretical knowledge, as observed by the increased average scores in the pre-test and post-test. Moreover, the questionnaire responses reported positive perceptions of the PAL approach. **Conclusions**: This study found no significant correlation between PAL and students' clinical performances. However, this approach was found to be beneficial in enhancing the knowledge and clinical exposure of dental students. Therefore, PAL is recommended to be implemented in dental schools.

Keywords: Peer-assisted learning, dental education, clinical competencies

FINAL ABSTRACT

PAPER 24

Craniofacial Morphology, Malocclusion and Oropharyngeal Soft Tissues in Chinese Obstructive Sleep Apnea Population

Lee WY[1], Lau MN[2], Pua SC[3], Heng PS[4]

[1]Department of Primary Oral Health Care, Lanang Dental Clinic, Ministry of Health Malaysia, Sibu, Sarawak.
[2]Department of Paediatric Dentistry & Orthodontics, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur.
[3]Department of Orthodontics, Lanang Dental Clinic, Ministry of Health Malaysia, Sibu, Sarawak.
[4]Department of Otorhinolaryngology, Sibu Hospital, Sibu, Sarawak.
Email: yingying0723@gmail.com.my

Objective: Craniofacial morphology, malocclusion, and oropharyngeal soft tissues which are closely related to upper airway obstruction can be the risk factors for obstructive sleep apnea (OSA). The main objective of this study is to investigate the association of craniofacial morphology, malocclusion, and oropharyngeal soft tissues with OSA among the Chinese population. **Methodology**: 30 Chinese adult OSA patients with Apnea-Hypopnea Index (AHI) score 5 and above were recruited in OSA Group and 30 Chinese adult with STOP-Bang Questionnaires (SBQ) score < 3, Epworth Sleepiness Scale (ESS) < 11, and without any OSA signs or symptoms were recruited in Control Group. Clinical assessments were conducted by one calibrated single operator. **Results**: 83.3% of OSA patients were obese. Among these, 63.3% had severe OSA. Mean body mass index (BMI), neck circumference (NC), and systolic blood pressure (BP) were significantly greater in the OSA Group (38.10 kg/m^2 $\pm$ 8.22; 45.22cm $\pm$ 5.40; 141.30 $\pm$ 16.80) than the Control Group (24.25kg/m^2 $\pm$ 5.30; 34.22cm $\pm$ 3.81; 120.40 $\pm$ 14.70). Compared to Control Group, OSA Group was found to have significantly more Class II skeletal relationship, retrognathic mandible, decreased Frankfort Mandibular Plane Angle, increased lower anterior face height, increased palatal width, macroglossia, tongue scalloping score 2 and 3, Friedman Tongue Position Class 4, tonsillar enlargement, narrowing of lateral pharyngeal wall grade 3 and 4, and elongated uvula. **Conclusion**: This cross-sectional study revealed features of craniofacial morphology and oropharyngeal soft tissues that associated with OSA, which are useful for dental practitioners in identifying patients with high risk of OSA for screening and timely referral to the medical practitioners for diagnosis and management.

Keywords: Chinese, Craniofacial, Malocclusion, Oropharyngeal, OSA

FINAL ABSTRACT

PAPER 25

Children's Interpretation of Emoji® in the Malay Language in Malaysia

Dayang Fadzlina AI[1], Zalikha Adila Z[1], Mohd Zulfadli H[1], Zaridah ZA[1], Norsaima I[1], Rohaida AH[2], Noren Nor H[3], Annapurny V[2]

[1] Centre of Paediatric Dentistry and Orthodontics Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, 47000 Sungai Buloh, Selangor, Malaysia.
[2] Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, 47000 Sungai Buloh, Selangor, Malaysia.
[3] Department of Oral Sciences, Faculty of Dentistry, University of Otago, P.O. Box 56, Dunedin 9054, New Zealand.
Email: dayangfadzlina3@gmail.com

Objective: Existing dental anxiety scales for pediatric patients tend to classify and identify children according to their degree of cooperation. For a better comprehension of the patient current emotional state, it is necessary to adopt a method that is more dynamic and interactive.. This study aimed to investigate children's interpretation and understanding of frequently used emoji® for the development of an emoji® based dental anxiety scale. **Method**: This online qualitative survey was conducted with 147 Malay-speaking children in Malaysia between the ages of 4 and 16. The children were asked to interpret 30 pre-selected emojis® in their own words using Malay. The preselected emojis® depict happiness, neutrality, unhappiness, sadness, and anger. The interpretations were then categorised according to their similar meanings and verified by two language experts. **Result**: The average age of the respondents was 9.2 years, and 61.2% of them were female, and 38.8% were male. Thirteen of the thirty evaluated emojis® exceeded the 60% threshold for suitability for use in evaluating dental emotion, which was defined as the minimum level of agreement among respondents. The remaining 17 emojis® were excluded due to significant variation in their interpretation, highlighting the extent of potential misinterpretation among respondents. **Discussion**: Happy, neutral, fear, dislike, unhappy, sad, anxious, and angry are among the emotions that were identified for use. Unhappy and anxious emojis® had the maximum level of agreement, whereas neutral and fear emojis® had the lowest level of agreement. **Conclusion**: Despite the universal meaning of emoji®, different communities and age groups may have varying interpretations of the emoji®. In evaluating and moulding the behaviour of paediatric dental patients, it can be a very useful tool. This tool has the potential for further development and dental behaviour management applications.

Keywords: emoji, interpretation, "Bahasa Melayu", children, communication

FINAL ABSTRACT

PAPER 26

In Vitro Assessment of Cutting Efficiency and Surface Roughness of Diamond Burs on Indirect Composites

Munusamy SM, Ahmad SF, Farook MS, Abidin ZZ, Chung YS

Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya.
Email: 17088527@siswa.um.edu.my

Objective: Diamond burs are essential cutting tools used to remove defective restorations. This study evaluated the cutting efficiency and surface roughness of diamond burs on indirect composites. **Methods:** Two different grit sizes, coarse-150 μm and medium-115 μm of flat-end parallel cylinder diamond burs were tested on indirect composites: Shofu Ceramage (CM) and CAD/CAM Lava Ultimate (LU). Cutting efficiency was determined by recording the time taken in seconds for every cut performed by the burs to transect through 2 mm thick composite specimens. Surface roughness (Ra) of diamond burs before use (baseline) and after the fifth cut (Cut-5) and tenth cut (Cut-10) was measured using 3D Optical Surface Texture Analyzer machine. **Results:** Mean cutting time of coarse-grit diamond burs was significantly faster ($p<0.05$) than medium-grit diamond burs when used on LU and CM composites at Cut-5. When coarse-grit diamond burs were used to cut LU and CM composites, no significant difference ($p>0.05$) was observed in mean total cutting time. However, medium-grit diamond burs showed significantly higher ($p<0.05$) mean total cutting time when cutting LU than CM composites. Coarse-grit diamond burs showed significantly higher ($p<0.05$) mean total Ra values than medium-grit diamond burs at baseline and after Cut-5. However, at Cut- 10, no significant differences ($p>0.05$) noted in mean cutting time and total Ra values, regardless of the types of burs used on both indirect composites. **Conclusions:** Coarse-grit diamond burs exhibited significantly higher cutting efficiency and surface roughness than medium-grit diamond burs up to Cut-5 before showing comparable results at Cut-10 when used on indirect composites. Total cutting time of coarse-grit diamond burs showed no significant differences cutting between CM and LU, whereas total cutting time of medium-grit diamond burs appeared to be higher when used on LU than CM. The cutting efficiency of diamond burs on indirect composites is material dependent.

Keywords: diamond burs, indirect composites, cutting efficiency, surface roughness

FINAL ABSTRACT

PAPER 27

In-Vitro Inactivation Of Surrogate Sars-Cov-2 Virus In Dental Aerosol Generating Procedure

Hup WY,[1] Chang LY,[2] Chai WL[1]

[1]Department of Restorative Dentistry, Faculty of Dentistry, University of Malaya, 50603 Kuala Lumpur, Malaysia.
[2]Department of Medical Microbiology, Faculty of Medicine, University of Malaya, 50603 Kuala Lumpur, Malaysia
Email: wendyhup.dayao@gmail.com

Objectives: Pre-operative mouth rinses act as an adjunct to reduce the viral transmission in dental setting. However, continuous flow of water during aerosol generating procedure (AGP) might dilute their anti-viral effect. The objective of this study is to evaluate a new approach which is to inactivate SARS-CoV-2 by introducing mouth rinse into dental unit water line (DUWL). **Methods:** Suspension and carrier tests were carried out on a surrogate virus, human coronavirus OC43 (hCoV-OC43) to assess the virucidal activity of 4 mouth rinses: 0.12% chlorhexidine digluconate (CHX), 0.07% cetylpyridinium chloride (CPC), 1% hydrogen peroxide (HP) and 0.2% povidone iodine (PVP-I) at the exposure times of 30s, 2 min and 5 min. The median tissue culture infectious dose (TCID50/mL), and the log reduction value were calculated. The most effective mouth rinse from the first part of the study was subsequently tested in a 3D aerosol model with continuous dispersion. The disinfectants were incorporated into the DUWL. Aerosol samples were collected after exposure time of 30s, 2 min and 5 min. **Results:** All mouth rinses reduced the viral load within 30s significantly. However, only PVP-I and CPC mouth rinse could achieve more than 4 $\log_{10}$ reduction. PVP-I mouth rinse was the only one show non-cytotoxic to the cells. In the aerosol test, both PVP-I and CPC showed reduced aerosolised viral loads significantly, even at 30s. as compared to the control group (distilled water). **Conclusions:** Both CPC and PVP-I mouth rinse are able to achieve more than 4 $\log_{10}$ reduction significantly, which corresponds to a 99.99% reduction in viral count, even at 30s in both suspension and aerosol models. However, only PVP-I mouth rinse demonstrated no cytotoxic effect on cells. The use of mouth rinse as DUWL disinfectants might help to reduce the aerosol transmission of SARS-CoV-2.

Keywords: SARS-CoV-2, aerosol generating procedure, mouth rinse, disinfectant, dental unit water line

FINAL ABSTRACT

PAPER 28

Supragingival Bacterial Microbiome Around Dental Implants and the Adjacent Tooth in Patients with a History of Periodontitis

Sim NCW[1] , Mohamad Hassan NH[1] , Al-Maleki AR[2] , Safii SH[1]

[1]Department of Restorative Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia
[2]Department of Medical Microbiology, Universiti Malaya, Kuala Lumpur, Malaysia
Email: nicholassimcw@live.com

Objectives: To evaluate the bacterial profiles of supragingival dental biofilm around dental implants and the adjacent tooth in subjects with a history of periodontitis. **Methods:** Subjects with a history of periodontitis and periodontally healthy subjects who fulfilled the inclusion criteria were recruited to receive dental implants (either Biomate-Plus® or Megagen AnyRidge® implant systems). Periodontal clinical measurements were recorded at baseline (V_1), 3 months after implant placement (V_4), at crown placement (V_6) and 3 months after crown placement (V_8). Supragingival plaque samples were collected around the cementoenamel junction (CEJ) of the dental implants and the adjacent tooth at V_1, V_4, V_6 and V_8 following stages (time-point) of a conventional dental implant therapy. DNA from each plaque sample was extracted using DNeasy® PowerBiofilm® kit. The hypervariable region V_3-V_4 of the 16S rRNA gene was used for the library construction of the bacterial community by Illumina MiSeq platform. Data was analyzed using QIAGEN CLC Genomics Workbench. **Results:** Alpha diversity in each group (24 groups consisting of a combination of Test, Control, ImplantA, ImplantB, AdjacenttoothA and AdjacenttoothB at V_1, V_4, V_6 and V_8) showed various diverse communities with significant differences noted between the groups (p= 0.04). PERMANOVA test yielded p= 0.005 according to Weighted unifrac distance matrix and significant differences was found between (Test-ImplantA-V8 vs Control-ImplantA-V8, p= 0.023), (Test-ImplantA-V8 vs Test-ImplantA-V6, p= 0.045) and (Test-AdjtoothA-V8 vs Test-AdjtoothA-V6, p= 0.019).**Conclusions:** Microbial ecosystem dysbiosis could be an important risk determinant for the onset of biological complications of dental implants especially among those with a history of periodontitis.

Keywords: Periodontitis, Peri-implant diseases, Bacteria, Microbiome, 16s rRNA gene sequencing

FINAL ABSTRACT

PAPER 29

Physico-chemical, Mechanical and Biological Properties of Locally Produced White Portland Cement with Reduced Particle Size

Hoda Mohamed Elnawawy[1], Muralithran G. Kutty[1], Noor Azlin Yahya[1], Noor Hayaty Abu Kasim[1], Paul Roy Cooper[2], Josette Camilleri[3], Hany Mohamed Aly Ahmed[1]

[1] Department of Restorative Dentistry, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia
[2] Department of Oral Sciences, University of Otago, Otago, New Zealand
[3] School of Dentistry, Institute of Clinical Sciences, College of Medical and Dental Sciences, University of Birmingham, Birmingham, United Kingdom.
Email: Drhoda.melnawawy@gmail.com

Introduction: White Mineral Trioxide Aggregate (WMTA) has wide dental applications, but it has drawbacks such as long setting time and high cost, Malaysian White Portland Cement (MPC) was introduced as a potential substitute. **Objective:** This research aimed to produce a radiopaque experimental Malaysian Portland cement (REPC) with reduced particle size and evaluate its properties. **Methodology:** Experimental Portland cement (EPC) was produced by ball milling then analysed using particle size analyser (PSA) and Scanning Electron Microscope (SEM). Nano-zirconium oxide was added to produce REPC. EPC and REPC were then compared to MPC and WMTA. Energy dispersive X-ray analysis (EDX) and X-ray diffraction (XRD) were performed for chemical analysis. Initial setting time was measured, pH value was recorded at 5 time-intervals and the push-out bond strength was evaluated. Cytotoxicity and cell attachment properties were tested using MTT assay and SEM on human dental pulp stem cells for 24 and 72 hours. One-way ANOVA was used for statistical analysis ($P=0.05$). **Results:** REPC had the finest particle size (354.5 ± 26.45 nm), while MPC (1147.8 ± 337.1 nm) had the largest ($P<0.05$). EDX and XRD analysis showed that all cements had similar composition except for bismuth oxide in WMTA and zirconium oxide in REPC. Mean setting time of REPC (32.7 ± 0.58 min) was significantly shorter than WMTA (131.67 ± 2.89 min). All groups showed alkaline pH at all time intervals. REPC had higher push-out bond strength compared to WMTA ($P<0.05$). MTT assay showed favourable cell viability values with no significant difference between all cements. Favourable cell attachment properties were observed for all groups. **Conclusions:** The physico-mechanical properties of MPC were improved by reducing the particle size while keeping the alkalinity and biocompatibility of the cement. REPC can be a potential cheaper substitute to WMTA.

Keywords: Biological, Malaysian Portland Cement, Particle Size, Physico-Chemical, WMTA.

FINAL ABSTRACT

PAPER 30

A Correlation of FLACC Pain Scale with Physiological Changes During Dental Injection in Pre-school Children.

Norsaima I[1], Khairil Anuar MI[2], Mohd Afiq Farhan R[1], Zaridah ZA[1], Dayang Fadzlina AI[1], Mohd Zulfadli H[1], Zalikha Adila Z[1], Norashikin AB[1], Ilham WM[1]

[1]Centre for Paediatric Dentistry & Orthodontics Studies, Faculty of Dentistry, Universiti Teknologi MARA
[2]Department of Basic Sciences, Faculty of Health Science, Universiti Teknologi MARA
Email : norsaimaismail6@gmail.com

Objective: The Face, Legs, Activity, Cry and Consolability (FLACC) is one of the widely used behavioural observation pain scales in young children. In the absence of a gold standard for comparison, multiple approaches to validation of the FLACC scale still demonstrated a paucity in terms of reliability in procedural dental settings. The study aims to correlate the FLACC pain score and physiological variations of heart rate, blood pressure, and oxygen saturation level among 4-6 years old children in assessing the intra-operative pain during local anaesthesia (LA) injection prior to dental procedure. **Methods:** Three raters assessed the behaviour of 21 recorded videos of healthy children that require LA injection for dental treatment. The subject child's blood pressure, heart rate, and oxygen saturation level were measured at three different times of the intervention. Patients' responses were scored based on each FLACC's 5 points; (F) face, (L) legs, (A) activity, (C) cry, and (C) consolability. **Results:** The mean age was 5.4 years (SD= 0.61) with 57.1% of the children received LA injection for deciduous tooth extraction while 42.9% for clamp and rubber dam placement before restoration. The inter-rater agreement was 0.94 with excellent reliability values of intra-class correlation (>0.96). Intra-operative total FLACC score revealed significantly weak correlation with the measurement of children's blood pressure ($r = 0.370$, $p = 0.03$) but moderate correlation with heart rate ($r = 0.451$, $p = 0.001$) and oxygen saturation level ($r = -0.410$, $p = 0.001$). The FLACC scale has sufficient agreement for procedural pain assessment in young children. However, overreliance on the responsiveness of behavioural indicators makes it difficult to discriminate pain from anxiety or distress in the dental setting. **Conclusion:** The present study shows significant cardiovascular changes do occur due to the pain of injection stimulus at the time of LA administration. However, the changes do not correlate with the FLACC pain scale.

Keywords: children, FLACC scale, pain assessment, physiological response

FINAL ABSTRACT

PAPER 31

A Comparison Between Four Observational Anxiety Scales Rated by Postgraduate Paediatric Dental Students

Zaridah ZA, Mohd Zulfadli H, Zalikha Adila Z, Norsaima I, Dayang Fadzlina AI, Norashikin AB, Annapurny V, Alaa SH

[1] Centre of Studies for Paediatric Dentistry & Orthodontics, Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Sungai Buloh, Selangor, Malaysia
Email: zedazz87@gmail.com

Objectives: Understanding dental fear and anxiety in young children is essential in managing their behaviour. There are several behavioural scales available, however, the reliability and correlation between the scales have not been evaluated. The aims of this study are to evaluate the reliability of the Behaviour Profile Rating Scale (BPRS), Houpt categorical rating scale (HCRS), Venham profile rating scale (VPRS) and Wrights modification of Frankl behaviour rating scale (WMFBRS) individually and the correlation between these four observations - based assessment. **Methods:** A total of 18 videos of children who underwent dental procedures were rated by 6 paediatric dentistry postgraduate students using the four scales. The videos were reevaluated after 1 month by the same raters. **Result:** The reliability test of raters showed statistically significant-excellent agreement in HCRS (r = 0.978, P <0.001), VPRS (r = 0.961, P <0.001), WMFBRS (r = 0.928, P <0.001) and BPRS (r = 0.918, P <0.001). Moreover, the intra-rater agreement showed close agreement between HCRS and VPRS in comparison to BPRS and WMFBRS, which showed moderate agreement. All four scales showed a statistically significant correlation (P-value <0.001) with BPRS and VPRS was inversely correlated with HCRS and WMFBRS. **Discussion**. HCRS and VPRS showed excellent reliability meanwhile WMFBRS and BPRS have a moderate agreement. The possible reason was WMFBRS has the ambiguity of its score, especially in scores 3 and 4 whereas BPRS composed of highly detailed observations. **Conclusion:** All four scales are reliable and have moderate to excellent reproducibility. Each scale is highly correlated with each other. The highly itemized BPRS may be beneficial for research purposes, whereas the categorical behaviour rating scale may offer quick, simple, and easy in clinical settings.
Keywords: behaviour, children, dental anxiety

FINAL ABSTRACT

PAPER 33

Effects of Adhesive Materials and Polishing Techniques on Enamel Surface after Dental Trauma Splint Removal

Zalikha Adila Zainuren, Norashikin Abu Bakar, Annapurny Venkiteswaran

Centre of Paediatric Dentistry and Orthodontics Studies, Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Malaysia.
Email: zalikhaadila@gmail.com

Objectives: The dental adhesive materials and polishing techniques used for dental trauma splints may cause iatrogenic damage to the enamel. Therefore, the aims of this study were to evaluate the effects of different dental adhesive materials and polishing techniques on Adhesive Remnant Index (ARI) and enamel loss after dental trauma splint removal. **Methods**: In this *in-vitro* study, dental trauma splints were prepared on the tooth model using 0.04 mm stainless steel wire with eight different adhesive materials consisting of resin and glass ionomer-based groups. The splints were mechanically removed using a debonding plier. The remnants of adhesive material on the enamel surface were polished using six different techniques. ARI was determined by measuring pre and post-splinting microphotographs of the enamel surfaces. The enamel loss on the labial surface was analyzed using a contact stylus profiler. Kruskal-Wallis H test and 2-way ANOVA were used to analyze ARI and enamel loss respectively. **Results**: There was a significant difference observed for both ARI and enamel loss between different types of adhesive material ($p < 0.001$). No significant difference was observed between different types of polishing techniques ($p > 0.05$; $p=0.098$). The study showed that flowable composite resin self-etch and light-cure RMGIC have the least adhesive remnant left on the enamel surface and the least enamel loss, respectively. The most adhesive remnant was observed with the packable composite resin etch-and-rinse, and the greatest enamel loss was observed with the flowable composite resin etch-and-rinse. **Conclusions**: Flowable composite resin self-etch and light-cure RMGIC could be recommended as adhesive materials for dental trauma splints because these materials may cause the least iatrogenic damage to the enamel surface after splint removal, regardless of the polishing technique.

Keywords: Dental trauma splint, Dental adhesive materials, Polishing techniques, Enamel loss, ARI

FINAL ABSTRACT

PAPER 35

PUBLIC PERCEPTION ON THE USE OF ECO-FRIENDLY BAMBOO TOOTHBRUSH

Adriana Syahirah[1] , Farah Irdina Marwilis Helmi[1], Mohd Azmi Abdul Razak[2], Noor Hayati Azami[2], Nor Azlida Mohd Nor[3]

[1]Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia
[2]Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia
[3]Department of Community Oral Health and Clinical Prevention, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia
Email: addieraidee@gmail.com

Objective: Plastic toothbrushes which are mainly made of polypropylene are one of the sources of plastic pollution. With the increased awareness of this alarming global issue, eco-friendly bamboo toothbrushes have been introduced and are becoming widely available in the market. The study aimed to explore the public's experience with bamboo toothbrushes and identify their feature preferences. **Methods:** An observational study using a qualitative approach was conducted among 10 participants aged from 18 to 40 years old without any experience using bamboo toothbrushes (based on the inclusion and exclusion criteria). A selected standard bamboo toothbrush was given to the participants and they were asked to use the bamboo toothbrush for two weeks based on the instructions provided. At the end of two weeks of usage, a one-to-one, semi-structured in-depth interview was conducted either face-to-face or online. These interviews were recorded, transcribed and analyzed using thematic analysis. **Results:** Most of the participants expressed mixed views regarding the experience of using the bamboo toothbrush in comparison to their previous conventional plastic toothbrush. The most preferred features of the bamboo toothbrush cited by the participants were related to a non-slippery handle, small-sized toothbrush and eco-friendly material. The majority of the participants have the intention to continue using the bamboo toothbrush provided some modifications to the design are made. **Conclusion:** Identifying the ideal features of a bamboo toothbrush could be a timely strategy to reduce the impact of plastic in oral health care.

FINAL ABSTRACT

PAPER 36

Association Between Systemic Diseases and Severity of Periodontal Disease.

Gunalan E[1], Mohamad Shafi'an Kamal MAI[1], Cheah CW[2], Marhazlinda J[3]

[1]Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia
[2]Department of Restorative Dentistry, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia
[3]Department of Community Oral Health & Clinical Prevention, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia
Email: euvanthiran@gmail.com

Objectives: Periodontal disorders are mainly caused by infections and inflammation of the periodontium. Numerous research has established the link between periodontal disease and systemic conditions such as diabetes mellitus (DM), hypertension, respiratory disease, and autoimmune disorders. This study aimed to determine the prevalence of systemic conditions in adult patients with periodontitis and the association between systemic diseases and the severity of periodontal disease among adult patients attending undergraduate clinics between the years 2017 to 2021. **Methods**: This secondary data analysis involved 344 patients who fulfilled the inclusion criteria. The diagnosis of periodontal disease was categorized into generalized gingivitis, mild, moderate, and severe periodontitis. All data were extracted from the Dental Information System (DEISY) record. Data obtained were analysed using SPSS version 29. **Results** Most subjects were of Chinese ethnicity (43.3%), with males (56.7%) more than females. There were eight types of systemic conditions recorded namely DM, hypertension, hypercholesterolemia, cancer, stroke, autoimmune disease, asthma, and gout. The result of Chi-Square reveals that the most prevalent systemic diseases among periodontal patients in this study are hypertension, DM, and hypercholesterolemia. Additionally, these diseases were more prevalent among patients with severe periodontitis than in gingivitis, mild and moderate periodontitis, i.e., DM (17%), hypertension (22%), hypercholesterolemia (12%), and combination of DM and hypertension (13%). **Conclusions**: The systemic diseases most prevalent among patients with periodontal diseases are hypertension, diabetes mellitus, and hypercholesterolemia, with the highest prevalent in those diagnosed with severe periodontitis. This emphasizes the importance of managing periodontal disease as early as possible as the severity of the period is associated with a higher prevalence of systemic diseases and vice versa.

Keywords: Diabetes, Hypertension, Periodontitis, Systemic conditions

FINAL ABSTRACT

PAPER 37

The Effect of MSC-CM on Oral Cancer Cells in 2D and 3D Culture Conditions.

Kathryn Tan[1], Li-Gi Ong[1], Chia Meng Chong[1], Wei Yi Brenda Lim[1], Prashanti Chippagiri[2], Spoorthi Ravi Banavar[2]

[1] School of Dentistry, International Medical University
[2] Clinical Oral Health Sciences Division, School of Dentistry, International Medical University
Email: brenda.lim@student.imu.edu.my

Objective: The effect of mesenchymal stem cell conditioned media (MSC-CM) on various cancer cells has been studied extensively. However, their effect, specifically on oral cancer cells, remain unclear.This study aims to compare the effects of Bone Marrow and Dental Pulp MSC-Conditioned Media (MSC-CM) on OECM-1 oral cancer cell proliferation in traditional 2D and 3D cell culture methods. **Methodology**: Bone marrow and dental pulp MSCs from Passage 4 (P4) were cultured for four weeks. Every third day, the culture supernatant was collected, filtered (now termed MSC-CM) and stored at -80^{0}C until further use. The oral cancer (OECM-1) cells were sub-cultured until adequate cell numbers were attained, then cultured under the influence of different concentrations of MSC-CM in monolayer (2D), spheroid and scaffold-based 3D culture methods. The proliferation of OECM-1 cells was assessed using alamarBlue assay for 2D and 3D scaffolds and ATP-based assay for 3D clumps on day 3, 5 and 7. Statistical analysis was done using one-way ANOVA and post-hoc Tukey. **Results:** The proliferation of OECM-1 cells in traditional 2D culture decreased when treated with DPSC-CM on days 3, 5 and 7 but was only significant on day 7 (P value = .004). However, when OECM-1 cells were cultured in BMMSC-CM, no significant changes were observed. Cells cultured in polyester-based scaffolds for both DPSC-CM and BMMSC-CM exhibited a reduction in the cell numbers on day 7 but were not statistically significant (P value > .05). However, in 3D spheroid cultures, a significant increase in cell proliferation was seen on days 3 and 5 when cells were treated with DPSC-CM (P values < .001), and on days 3,5 and 7 for cells cultured in BMMSC-CM (P values = .007, .003, .008). **Conclusion**: OECM-1 cells respond differently when treated with BMMSC-CM and DPSC-CM in 2D and 3D culture conditions, possibly due to interactions with their extracellular matrix when cells exist in spheroids.

Keywords: Conditioned media, Mesenchymal stem cells, OECM-1, Oral cancer cells, Conditioned media

FINAL ABSTRACT

PAPER 38

Elucidation on the Antibiofilm Effect of *Syzygium cumini* Extract on Oral Mucositis Pathogens

Puteri Izz Khayrin Maghzan[1,2], Susi Sukmasari[3], Mohd Hafiz Arzmi[1,4,5]

[1]Cluster of Cancer Research Initiative IIUM (COCRII), International Islamic University Kuantan, Pahang, Malaysia
[2]Department of Biotechnology, Kulliyyah of Science, International Islamic University Kuantan, Pahang, Malaysia
[3]Department of Paediatric Dentistry and Dental Public Health, Kulliyyah of International Islamic University Malaysia, Kuantan, Pahang, Malaysia
[4]Department of Fundamental Dental and Medical Sciences, Kulliyyah of International Islamic University Malaysia, Kuantan, Pahang, Malaysia
[5]Melbourne Dental School, The University of Melbourne, Victoria, Australia
Email: izzkhayrin.maghzan@live.iium.edu.my

Objectives: Oral mucositis (OM) is one of the most serious acute toxicities of radiation (RT) in head and neck cancer patients and could hinder oncologic treatment. *Syzygium cumini* (SC) has antioxidant, anti-inflammatory and antimicrobial effects that may aid in the prevention of OM, however, limited study was reported on its antibiofilm activity towards microorganisms predominated in OM patients. **Objective:** To determine its effect on biofilm formation of oral mucositis pathogens. **Methods**: *Candida albicans* ATCC MYA-4901 (ALT5), *Streptococcus mutans* (ATCC 25175) and *Staphylococcus aureus* (ATCC 25923) were used in the biofilm study. To determine the effect of water-based SC seed extract on monospecies biofilm of *C. albicans*, *S. mutans* and *S. aureus*, 60 µL suspension containing 6×10^6 oral mucositis pathogens, 60 µL of SC seed extract (6 mg), and 60 µL of sterile RPMI-1640 and BHI broth respectively were inoculated in the same well. Finally, a crystal violet (CV) assay was used to quantify biofilm formation by using microplate reader. **Results**: *S. aureus* exhibited a high percentage reduction of biofilm biomass when treated with SC seed extract (71.8 ± 0.2), followed by *S. mutans* (59.1 ± 0.0) and lastly *C. albicans* (14.4 ± 5.9). **Conclusions**: SC water-based extract inhibits biofilm formation of *C. albicans, S. mutans* and *S. aureus* that predominated in the oral cavity of OM patients.

Keywords: *Syzygium cumini*, oral mucositis, biofilm

FINAL ABSTRACT

PAPER 39

A study of inflammation on oral regions using *Porphyromonas gingivalis*-induced poly-arthritis animal model

Abdullah S-N[1], Farmer E-A[2], Logan R[2], Gully N[2]

[1]Department of Basic Sciences, Faculty of Dentistry, Universiti Sains Islam Malaysia, Malaysia
[2]School of Dentistry, The University of Adelaide, Australia.
Email: najmi@usim.edu.my

Objectives: *Porphyromonas gingivalis* (*Pg*) has been associated with periodontal disease (PD). Reports showed increased prevalence of moderate to severe PD in rheumatoid arthritis (RA) patients. RA and PD exhibit many similarities in disease process, pathology as well as disease progression and recent studies have shown that they are likely to be clinically and pathogenically linked. This study was done to investigate the presence of general inflammatory foci within the head regions (temporomandibular region, alveolar bone from the mandible and the maxillary region), quantitative determination of polymorphonucleocytes (PMN) in bone marrow, and osteoclasts associated with bone. **Methods:** A total of nine rats were randomly assigned into the inflammation model of polyarthritis subjected to adjuvant arthritis – heat-killed *Pg* (AA-HK*Pg*) group, AA-PBS group and control (non-treated) group. Once rats were euthanized by decapitation, decalcification of the heads was done in TEP decalcifying solution at 4°C for 28 days. The tissues harvested from the three separate areas (temporomandibular, mandible and maxillary regions) were processed using an automated tissue processor for routine histology. Tissue staining of routine haematoxylin and eosin (H&E) and tartrate-resistant acid phosphatase (TRAP) staining were carried out. The slides were examined and cell counting was carried out at 40 X magnification under light microscope. The data was analysed using statistical software by Graphpad Prism®. **Results:** There was no evidence of inflammatory infiltrate observed in the soft tissues. However, the analysis of PMN count data revealed a statistically significant increase of PMN cells in bone marrow spaces, of AA-HK*Pg* rats when compared with the same regions of AA-PBS or control rats. **Conclusion**: Even though the inflammation from the effect of AA alone was not detected, nor was any evidence of inflammation seen in the rats treated with AA-HK*Pg,* the significant increase in the number of PMN cells detected in the bone marrow in AA-HK*Pg* when compared with AA-PBS treated rats is an interesting finding. Further work is needed to determine the direct cause of this differential effect.
Keywords: *Porphyromonas gingivalis*, animal model, periodontal disease, rheumatoid arthritis.

FINAL ABSTRACT

PAPER 40

Antimicrobial Efficacy of 2-Hydroxyisocaproic Acid (HICA) Towards *Enterococcus Faecalis* as Alternative Intracanal Medicament.

Nuratiqah Jasmiad[1], Norashikin Abu Bakar[1], Noorharliana Mohamed Zohdi[2], Nurhayati Mohamad Zain[3]

[1]Centre of Paediatric Dentistry and Orthodontics Studies, Faculty of Dentistry, Universiti Teknologi MARA
[2]Centre of Comprehensive Care Studies, Faculty of Dentistry, Universiti Teknologi MARA
[3]Centre of Preclinical Science Studies, Faculty of Dentistry, Universiti Teknologi MARA
Email: iqajasmin87@gmail.com

Introduction: Antibiotics are used as intracanal medicaments in endodontic therapy but increasing antimicrobial resistance leads to researches of alternative medications. 2-hydroxyisocaproic acid (HICA), a derivative of leucine and a normal component of human plasma, has shown potential as intracanal medicament. **Objective:** To determine antimicrobial efficacy of HICA on *Enterococcus faecalis (E. faecalis)*. **Methods:** Antimicrobial activity was screened by measuring Zone of Inhibition (ZOI) using disk diffusion method, minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC). Positive control was Triple Antibiotic Paste (TAP) containing minocycline, metronindazole and ciprofloxacin. 66 teeth were prepared and canals were filled with *E. faecalis* suspension before being incubated for 21 days. Later, HICA at a concentration of 16mg/mL, TAP at 1mg/mL and saline (negative control) was introduced and further incubated for 7 days under anaerobic conditions at 37°C. Viable bacterial count in the canals was then determined as indicator of bacterial growth. **Results:** At 256mg/mL concentration, HICA exhibited ZOI of 15.72±1.60mm, and MIC and MBC were 8mg/mL and 16mg/mL, respectively. TAP, at concentration of 4mg/mL, exhibited ZOI of 30.74±0.71mm, and its MIC was equal to MBC at 0.25mg/mL. Viable bacteria count extracted from the canal were $4.33\pm0.23\log_{10}$ for saline, $4.03\pm0.21\log_{10}$ for HICA and $3.97\pm0.34\log_{10}$ for TAP. Compared to saline control, both TAP and HICA exhibited a significant difference in bacterial count ($p<0.01$). Interestingly, the efficacy of TAP and HICA was found to be similar, as indicated by a p-value of 0.79. **Discussion:** ZOI indicate HICA exhibited an antimicrobial effect. *E. faecalis* growth was repressed at 8mg/mL and cell death at 16mg/mL. At 16mg/mL, HICA showed comparable antimicrobial efficacy to 1mg/mL of TAP. **Conclusion:** HICA shows potential as an alternative intracanal medicament to eradicate *E. faecalis* in endodontic treatment.

Keywords: 2-hydroxyisocaproic acid (HICA), *E. faecalis,* Triple antibiotic paste

FINAL ABSTRACT

PAPER 41

Clear Aligner Clinical Effectiveness : A Randomised Control Trial on the Refinement Series

Norman NH[1], Mohd Shukor N[1]

[1]Centre of Paediatric Dentistry & Orthodontic Studies, Faculty of Dentistry, Universiti Teknologi MARA

Email: nabilla.ms@gmail.com

Objectives: Clear aligners may be a great alternative for people looking for a more discrete orthodontic treatment. Refinements are often overlooked throughout the treatment planning process. This, in turn, leads in a lengthening of the total treatment duration as well as a significant increase in the total cost. This randomized clinical trial evaluated the effectiveness and the refinement need between Erkodur and Zendura FLX. **Methods**: 19 adult participants were randomized (15 females and 4 males, 29.73 (SD8.44) years old) into two groups. Medit Design software (version 2.1) was used to measure the efficacy of orthodontic tooth movement by performing superimposition of predicted and achieved outcome from time of observation 1 to 6 (T1-T6). The refinement series for each material was analysed by dissecting the refinement need involved in producing similar clinical outcome. Data related to demographics, tooth movement accuracy and the related costs were recorded. **Results**: The mean accuracy of tooth movement with Erkodur and Zendura FLX was comparable with no statistical differences in horizontal movement from T1 to T6 and vertical movement from T1 to T4 with $p < 0.05$. As the treatment advanced to T5 and T6, there was a statistically significant difference between Erkodur and Zendura FLX in vertical movement, with mean differences of 0.05mm in extrusion ($p = 0.036$). **Conclusions**: Clear aligner therapy may require refinements more than half of the time, with Erkodur being twice as frequent than Zendura FLX.

Keywords: Clear aligner, clinical outcome, comparison accuracy, refinement.

FINAL ABSTRACT

PAPER 42

Microbial Diversity of Biofilm on Partial Denture Manufactured Using 3D-Printing Technology With Optimised Build Orientation.

Yacob N[1,2], Ahmad NA[3], Safii SH[3], Yunus N[3], Razak FA[4],

[1]Graduate Student, Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya
[2]Department of Conservative Dentistry & Prosthodontics, Faculty of Dentistry, Universiti Sains Islam Malaysia
[3]Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya
[4]Department of Oral and Craniofacial Sciences, Faculty of Dentistry, Universiti Malaya
Email: drnolela@usim.edu.my

Objectives: Build orientations will influence surface roughness of a 3D-printed denture. 0-degree orientation was used initially as it contributed to fast printing. However, the orientation negatively influenced accuracy of the denture fitting surface. Thus, the manufacturer recommends a 60-degree build orientation to overcome this problem. Our preliminary data showed that the surface roughness at 60-degree orientation exceeded the 0.2µm minimal requirement for a denture base resin (DBR).This study aimed to optimise the build orientation for a 3D-printed acrylic removable partial denture (RPD) and assess the microbial diversity of fitting surface denture biofilm. **Methods**: This was a preliminary *in vivo* study. Six patients wore new acrylic RPD fabricated using a 3D-printer (n=3) and conventional heat-cure (HC)(n=3) DBR. Optimisation of build orientation of 3D-printed denture fabrication was carried out using automated orientation interphase in the 3DSprint software whereby surface quality was selected as the preference parameter. Support structure was placed on the polished surface of the denture and removed after post-polymerisation procedure. Denture swabs from the fitting surfaces were collected at week-1, week-3 and week-6 following denture insertion. Microbial DNA was extracted and subjected to next-generation sequencing (NGS). The alpha diversity was statistically analysed. **Results**: At each recall visit, all patients showed no signs of mucosal inflammation. Based on alpha diversity indices, the number of bacteria on operational taxonomy units (OTUs) showed higher OTUs on 3D-printed DBR as compared to HC DBR. A more diverse community was observed on the 3D-printed DBR compared to HC DBR over 6 weeks observation based on Shannon and Simpson indices (Pairwise-Wilcoxon, p=0.01). **Conclusions**: High microbial diversity indicating healthy biofilm was observed on partial denture manufactured using 3D printing technology with optimised build orientation compared to the conventional heat cure fabrication which suggests that 3D-printed DBR may reduce the risk of denture-induced stomatitis.

Keywords: 3D printing, build orientation, denture, microbiome, oral biofilm.

FINAL ABSTRACT

PAPER 43

Effects of Moderate-Intensity Tabata Exercise on Body Composition among Overweight and Obese Dental Students

Nursharlina Sharan[1], Nuranis Nabilah Shaperi[1], Pui Yee Lee[1], Norsila Abdul Wahab[1], Nur Karyatee Kassim[1], Nur Syamsina Ahmad[2], Nurulezah Hasbullah[1]

[1]School of Dental Sciences, Universiti Sains Malaysia Health Campus,16150 Kota Bharu, Kelantan
[2]School of Health Sciences, Universiti Sains Malaysia Health Campus, 16150 Kota Bharu, Kelantan
Email: nursharlina98@student.usm.my

Objectives: Overweight and obesity are on the rise due to increased sedentary lifestyle. Dentists spend their working hours sitting, predisposing them to this lifestyle and potential risks for non-communicable diseases. This study aims to determine the effects of moderate-intensity Tabata exercise on body composition among overweight and obese dental students at Universiti Sains Malaysia (USM). **Methods:** Thirty-three overweight [BMI 23.0-27.5kg/m^2] and obese [BMI >27.5kg/m^2] dental students were recruited. They were randomly grouped into two; control (n=17) and Tabata exercise (n=16) groups. Body composition measurements were collected pre- and post-intervention. Participants' 24-hour diet recall were recorded to obtain their baseline calorie intake. The Tabata group underwent a 10-min dynamic warm-up followed by a moderate-intensity Tabata exercise, which was progressively increased in duration every four weeks. These exercises were carried out three times a week for 12 weeks. Data were analysed to evaluate the differences between the groups. **Results:** There were no significant changes in body mass index (BMI, p=0.267), body fat percentage (BFP, p=0.957), lean mass (LM, p=0.746), resting metabolic rate (RMR, p=0.589), and waist-hip ratio (WHR, p=0.631) between the control and exercise groups post-intervention. There were also no significant changes in BMI (p=0.590), BFP (p=0.833), LM (p=0.944), RMR (p=0.584), and WHR (p=0.384) within the exercise group pre- and post-intervention. This study gave unexpected findings, where BMI in the Tabata group was maintained, when it was hypothesised to reduce following the Tabata exercise. This could be due to several factors such as examinations, a stress-related factor and excessive food intake during the Eid celebration **Conclusion:** A 12-week moderate-intensity Tabata exercise did not change the body composition of overweight and obese dental students. Future studies with stricter food restrictions are required to assess the impact of moderate-intensity Tabata exercise on the body composition of dental students.

Keywords: Body composition, overweight and obese, dental students, moderate-intensity exercise, Tabata exercise

FINAL ABSTRACT

PAPER 44

Resin Infiltration – A Narrative Review

Dayang Fadzlina AI[1], Noren Nor H[2], Liew Yih Miin[3], Annapurny V[1]

[1]Centre of Paediatric Dentistry and Orthodontic Studies, Faculty of Dentistry, Universiti Teknologi Mara (UiTM) Campus Sungai Buloh, 47000 Sungai Buloh, Selangor, Malaysia.
[2]Department of Oral Sciences, Faculty of Dentistry, University of Otago, P.O. Box 56, Dunedin 9054, New Zealand.
[3]Department of Biomedical Engineering, Faculty of Engineering, University Malaya, 50603 Wilayah Persekutuan Kuala Lumpur, Malaysia.
Email: dayangfadzlina3@gmail.com

Objectives: Resin infiltration technique was introduced as one of the minimal intervention dentistry strategies for the treatment of non-cavitated enamel and other developmental enamel porosities, while sparing the tooth structure. This review aims to discuss the properties of the material and its effectiveness in terms of caries inhibition and aesthetic effect on white spot lesions and development defects of enamel. **Methods**: Electronic search of English scientific papers from 2010 to 2023 was accomplished using the Web of Science, PubMed, and Science Direct search engine. **Results**: Resin infiltration technique was found to significantly reduce the risk of caries progression for both primary and permanent teeth compared to fluoride therapy, oral hygiene instructions and diet counseling. Resin infiltration achieves the best aesthetic outcomes compared with microabrasion and remineralization therapy. The masking effect of resin infiltration is substantially greater than that of natural remineralization or routine application of fluoride varnishes. The combination of resin infiltration, bleaching, and microabrasion was found to be effective for the treatment of enamel developmental defects. **Conclusion**: Resin infiltration has emerged as one of the most effective microinvasive techniques for minimising the risk of caries progression and enhancing aesthetic appearance. To corroborate these results from experimental studies, future studies with long-term follow-up are necessary.

Keywords: resin infiltration, caries, aesthetic, non-cavitated lesions

FINAL ABSTRACT

PAPER 46

Growth Media Effect On The Intra- And Interkingdom Biofilm Formation Of *Candida* Species And *Staphylococcus Aureus*

Wan NurHazirah Wan Ahmad Kamil[1,2,3], Mukarramah Zainal[1,2,3], Nihal Bandara[4], Mohd Hafiz Arzmi[1,2,5]

[1]Department of Fundamental Dental and Medical Sciences, Kulliyyah of Dentistry, International Islamic University Malaysia, 25200 Kuantan, Pahang, Malaysia.
[2]Cluster of Cancer Research Initiative IIUM (COCRII), International Islamic University Malaysia, 25200 Kuantan, Pahang, Malaysia.
[3]Faculty of Dentistry, Universiti Teknologi MARA (UiTM), 47000 Sungai Buloh, Selangor, Malaysia.
[4]Bristol Dental School, University of Bristol, Bristol BS1 2LY, United Kingdom.
[5]Melbourne Dental School, The University of Melbourne, 3010 Victoria, Australia.
Email: wannurhazirahkamil86@gmail.com

Objective: *Candida* species and *Staphylococcus aureus* are frequent inhabitants of the oral biofilm. The production of oral biofilms is a key factor in defining oral health and disease in the oral cavity's dynamic and evolving microbial environment. Thus, the clinical importance of their coexistence within this complicated setting has been increasingly explored. This study aims to elucidate the polymicrobial interactions of six different species of *Candida* with *S. aureus* on biofilm formation in two different growth media. **Methods:** *Candida auris* (ATCC MYA-5002), *Candida albicans* (ATCC MYA-4901), *Candida lusitaniae* (ATCC 64215), *Candida dubliniensis* (ATCC MYA-2975), *Candida parapsilosis* (ATCC 22019), and *Candida glabrata* (ATCC 90030) and *S. aureus* (ATCC 25923) were cultured in RPMI-1640 and yeast extract peptone dextrose (YEPD). Meanwhile, *S. aureus* was grown in Brain Heart Infusion (BHI) broth. *Candida* spp. and *S. aureus* were inoculated into RPMI-1640 and YPD in separate vials to analyse intrakingdom biofilms. To study interkingdom biofilm, the inoculum containing individual *Candida* spp. and *S. aureus* were prepared in a single vial before being inoculated into a 96-well plate and incubated for 72 hours at 37 ℃. Finally, crystal violet assays were used to evaluate the biomass activity of biofilms. **Results:** Intra- and interkingdom biofilms biomass varied between *Candida* spp. and growth medium. Based on cut-offs, out of 26, five RPMI-grown biofilms had high biofilm biomass (HBB), whereas, in YPD-grown biofilms, 4 out of 26 were HBB. **Conclusion:** *Candida* spp. and *S. aureus* biofilm formation in intra- and interkingdom were species and growth media dependent.
Keywords: *Candida* species, *Staphylococcus aureus*, biofilm, growth medium, static

FINAL ABSTRACT

PAPER 47

Communication of Oral Cancer Diagnosis: Exploring Clinicians' and Patients' Perspectives in Malaysia

Siti NFMD[1,4], Jennifer GD[1,3*], Kathreena K[2,3], Ch'ng LL[5], Kok TC[6], Md AJ[7], Mohd RY[8], Rosliza P[9], Sherrie CMY[10] and Shim CK[11]

[1]Department of Community Oral Health and Clinical Prevention, Faculty of Dentistry, Universiti Malaya
[2]Department of Oral and Maxillofacial and Clinical Sciences, Faculty of Dentistry, Universiti Malaya
[3]Oral Cancer Research and Coordinating Centre (OCRCC), Universiti Malaya
[4]Department of Periodontology and Community Oral Health, Faculty of Dentistry, Universiti Sains Islam Malaysia
[5]Department of Oral and Maxillofacial Surgery, Hospital Seberang Jaya
[6]Department of Oral and Maxillofacial Surgery, Hospital Queen Elizabeth
[7]Department of Oral and Maxillofacial Surgery, Hospital Kuala Lumpur
[8]Department of Oral and Maxillofacial Surgery, Hospital Raja Perempuan Zainab II
[9]Department of Oral and Maxillofacial Surgery, Hospital Sultanah Aminah
[10]Department of Oral and Maxillofacial Surgery, Hospital Tengku Ampuan Rahimah
[11]Department of Oral and Maxillofacial Surgery, Hospital Umum Sarawak
Email: farhanahdesa@usim.edu.my

Objectivess: Communication is an integral component of effective healthcare delivery to patients, and this includes breaking bad news(BBN). In dentistry, clinicians are rarely exposed to life-threatening conditions, occasionally untreated dental infections and oral cancer. This study aimed to explore clinicians' and patients' perspectives on communication of oral cancer diagnosis in Malaysia. **Methods:** A descriptive-interpretive approach to a qualitative study was conducted to gather relevant information regarding clinicians' and patients' perspectives in the communication of oral cancer diagnosis in Malaysia. A total of 12 clinicians were recruited and 21 patients participated in this study. Data were collected according to participants' preferences via face-to-face or online semi-structured interviews. The audio recordings were transcribed, and a thematic analysis approach was used for data management for thematic emergence. **Results:** Themes that emerged from clinicians' practices and patients' experiences were environmental setting, communication, emotional aspects, and summarising the BBN session. The other theme emerged from clinicians' practices was preparation for BBN. The challenges faced by the clinicians were language barriers, patients in denial, patients' beliefs, frequent interruptions during BBN, and patients' health literacy. Areas of patients' satisfaction and dissatisfaction were personal ethics, communication, and interpersonal skills, whereas longer waiting times were also mentioned for patients' dissatisfaction. The themes that emerged for clinicians' and patients' suggestions for improvement were assessment of patients' backgrounds, incorporating psychological intervention, and incorporating cultural or spiritual aspects. Additionally, clinicians suggested translator assistance, the development of oral cancer education material, conducting BBN in multiple sessions, training for BBN, and the development of a protocol for BBN. Patients also suggested a shorter waiting time, the encouragement of bringing accompanying person(s), and providing them with information leaflets. **Conclusion:** Overall, most of the clinicians' and patients' perspectives in the communication of oral cancer diagnosis in Malaysia were in consensus, except for the information given to patients.

Keywords: BBN, breaking bad news, clinician-patient communication, communication, oral cancer

FINAL ABSTRACT

PAPER 48

The Use of Teeth as DNA Samples for Forensic Identification Cases in Malaysia

Rabi'ah Al-Adawiyah Rahmat[1]; Nor Aidora Saedon[2]; Anand Ramanathan[1]; Wan Maria Nabillah Wan Abdul Ghani[3]

[1]Department of Oral & Maxillofacial Clinical Sciences, Faculty of Dentistry, University of Malaya
[2]Forensic DNA Division, Forensic Science Analysis Centre, Department of Chemistry, Selangor, Malaysia.
[3]Oral Cancer Research & Coordinating Centre, Faculty of Dentistry, Universiti Malaya
Email: rabiahadaw@um.edu.my

Objectives: Teeth are known to be reliable sources of DNA when a deceased body is decomposed, skeletonised, fragmented, or burnt. This is because teeth are located in the mouth, embedded between the tongue and the facial-musculoskeletal structure. This strategic location offers substantial protection from direct impact or assault, particularly for the posterior teeth. Also, teeth are highly mineralised structures of the body. This enables DNA in teeth to survive prolonged exposure to extreme conditions such as humidity, elevated temperature and trauma. Despite that, in comparison to bones, teeth had not been used as DNA samples for forensic identification cases in Malaysia. To address the shortcoming, a collaborative effort between the Forensic DNA division, Department of Chemistry, Malaysia and the Faculty of Dentistry, Universiti Malaya aimed to investigate the potential of teeth as DNA sources for human identification has been conducted. **Methods:** Thirty human teeth of premolar and molar type ($n = 30$) were collected at the Faculty of Dentistry, Universiti Malaya, and submitted to the Forensic DNA division, Department of Chemistry, Malaysia for DNA analysis. Sound and carious teeth were included. Statistical analyses were performed using SPSS. **Results:** Preliminary results showed a significant difference in DNA contents according to the tooth condition ($p < 0.05$). However, no significant difference ($p = 0.16$) was found between premolar and molar teeth. **Conclusions:** This research highlights the potential of teeth as forensic DNA for human identification cases in Malaysia. However, a cautious selection of teeth based on the tooth condition is necessary.

Keywords: Teeth, DNA samples, human identification, Forensic DNA

FINAL ABSTRACT

PAPER 49

Can A Single Tooth Be A Source Of Human Identification? Future of Forensic Dentistry

Riaz S.[1], Khamis, M.F.[1], Ahmad W.M.A.W.[2], Yap Abdullah, J.[3], Alam M.K.[4]

[1]Unit of Oral Biology, School of Dental Sciences, Universiti Sains Malaysia
[2] Department of Biostatistics, School of Dental Sciences, Universiti Sains Malaysia
[3] Department of Craniofacial imaging, School of Dental Sciences, Universiti Sains Malaysia
[4] Department of Preventive Dentistry, College of Dentistry, Jouf University, Sakakah, Saudi Arabia
Email: samiya_80@student.usm.my

Objectives: In forensic odontology, individuality or unique features are important concepts for antemortem and post-mortem dental record comparisons. There are various studies on individuality of soft tissue and hard tissue structures like rugoscopy, cheiloscopy, enamel rod patterns, incisal edges etc. However, the data is scarce for studies specifically based on the individuality of the occlusal topography of the teeth. To determine the individuality of the occlusal topography of the maxillary first molar (M1) in the Malay population using three-dimensional (3D) dental scans. **Methods**: Maxillary M1 of 90 dental casts (45 male and 45 female) were selected for scanning. Inclusion criteria were Malay origin; age range 13-25; completely erupted healthy M1. Exclusion criteria were tooth with any anomaly or trauma obscuring the tooth occlusal morphology, restored teeth, teeth with caries, and damaged casts. Dental casts were digitized to 3D dental scans. The occlusal surface of M1 from each dental scan was trimmed off the remaining dental cast scan and saved as stl. file. The occlusal surface trim scans were then duplicated. The original and duplicate sets of scans were decoded by examiner A. Two hundred fifty pairs of occlusal surface trims of M1 were made by examiner A and superimposed by examiner B using Cloudcompare software. The pairs included matched and non-matched pairs. Paired t-test was performed for the statistical analysis. The decision for the pairs was based on root mean square (RMS) values calculated. **Results:** There was statistically significant difference between the RMS of matched and non-matched pairs. Based on the threshold of RMS value, examiner B gave the correct decision for all the pairs, and M1 showed 100% uniqueness of the occlusal surface. **Conclusions**: Maxillary first molar in the Malay population exhibits the uniqueness of occlusal surface, and thus may be used as a source of human identification.

Keywords: occlusal table, superimposition, maxillary teeth, 3D, uniqueness

FINAL ABSTRACT

PAPER 50

Oral Health Attitudes and Behaviors among Undergraduate Health Science Students in IIUM Kuantan Campus

Nor'Aina Syahirah ND[1], Zurainie A[2]

[1]Undergraduate Students, Kulliyyah of Dentistry, International Islamic University Malaysia
[2] Department of Paediatric Dentistry and Dental Public Health, Kulliyyah of Dentistry, International Islamic University Malaysia
Email: drzura@iium.edu.my

Objectives: To investigate and compare the oral health attitudes and behaviors among undergraduate health sciences students at IIUM Kuantan Campus and to evaluate between preclinical and clinical students on their oral health awareness. **Methods:** 100 respondents were recruited from each course. A modified online questionnaire assessing attitudes and behaviors towards oral health was used. Results were analysed by descriptive statistics, Kruskal Wallis test, and Mann-Whitney test. **Results:** Most respondents denied smoking habits involvement (95.8%). Half number of them have brushed their teeth and used dental floss in their daily life. Dentistry depicted the highest mean score of HU-DBI (17.92). Clinical year students showed significant difference ($p=0.044$) and depicted higher scores compared to preclinical whilst gender showed approximate similar with the scores. **Conclusion:** The outcome for oral health attitudes and behaviour among clinical dental students has the greatest score compared to other courses. Comprehensive oral health awareness programs for our young health care generations need to be stressed starting from their preclinical school.

Keywords: Oral health, attitude, behavior, undergraduate, health science

FINAL ABSTRACT

PAPER 51

An Overview of Systematic Reviews in Dental Implant Surgery of Partially Edentulous Patients

Al-Khateeb F[1], Abdul Wahab H[1], Tan SK[1*]

[1]Centre of Studies for Oral and Maxillofacial Surgery, Faculty of Dentistry, Universiti Teknologi MARA
Email: khateebf89@gmail.com

Objectives: Different dental implant surgeries could variably affect dental implant success. Therefore, this overview aims to summarise evidence from published systematic reviews of randomised controlled trials (RCTs) to determine the effect of the various surgical techniques and protocols on dental implant success in partially edentulous patients. **Methods**: PubMed, EBSCOhost, Scopus, Web of Science, Cochrane Library and the CRD database were searched without language or time restrictions. Eligible systematic reviews assessing outcomes of marginal bone loss (MBL) and dental implant success, survival and failure rates were identified and included. Meta-analyses were conducted on the RCTs reporting the same outcomes when not reported in systematic reviews. Heterogeneities were explored through subgroup analyses. **Results**: Twenty-five eligible systematic reviews pertaining to different surgical techniques and protocols were identified. Meta-analyses conducted revealed: significantly greater MBL in immediate implant placement compared to delayed placement statistically [P= 0.001, MD: -0.06; 95% CI: -0.10, -0.03]. Crestal implant placement appears to increase MBL compared to subcrestal placement clinically but not significant statistically [P= 0.06, MD: 0.04; 95% CI: -0.11, 0.20]. Implant failure rate appears to favour the two-stage placement protocol compared to the one-stage protocol [P=0.73, RR= 1.27; 95% CI: 0.33, 4.95], however, number of RCTs in related systematic reviews was very small. No eligible systematic reviews of RCTs were identified for recipient bone site quality, insertion angulation and tissue versus bone level placement comparators. **Conclusions**: Dental implant surgeries and protocols differently impact implant treatment success in partially edentulous patients. Delayed placement caused less marginal bone loss than immediate placement.

Keywords: Dental implant, implant success, implant surgery, marginal bone loss, partially edentulous

FINAL ABSTRACT

PAPER 52

Unravelling The Role of Residual Stress Distribution in The Long-Term Performance of Bilayered Zirconia Restorations

Wen Sheng Teng[1], Hsu Zenn Yew[1], Nashrah Hani Jamadon[2], Jasmina Qamaruzzaman[1], Meor Iqram Meor Ahmad[2], Andanastuti Muchtar[2]

[1]Department of Restorative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia
[2]Department of Mechanical & Manufacturing Engineering, Faculty of Engineering & Built Environment, Universiti Kebangsaan Malaysia
Email: p106717@siswa.ukm.edu.my

Bilayered zirconia restorations have gained significant popularity in modern dentistry due to their ability to combine the strength of zirconia with the natural aesthetics provided by porcelain veneers. However, the longevity and performance of these restorations can be influenced by the distribution of residual stresses within the material. This literature review aims to explore the impact of residual stress distribution on the longevity of bilayered zirconia restorations, focusing factors affecting stress levels, and potential failure modes and mechanisms. The review begins with an introduction to bilayered zirconia restorations, highlighting their composition and advantages in dental applications. Subsequently, the analysis delves into stress distribution within the restoration, emphasizing its importance in determining the restoration's mechanical behaviour. Factors influencing residual stress in bilayered zirconia are explored, material properties, sintering parameters and veneering methods. Understanding these factors is crucial for optimizing stress management during restoration fabrication. Correlations between stress distribution and potential failure modes, such as chipping, delamination, and cracking, are evaluated. In light of the influence of residual stress on restoration durability, mitigation strategies for reducing stress levels are discussed.

Keywords: Residual stress distribution, Veneering techniques

FINAL ABSTRACT

PAPER 53

Exploring Extracted Human Teeth for Research Advancements: A Scoping Review

Nurul Nadia MS[1], Yew HZ[1], Baharin SA[1], Tew IM[1], Shaqinah NN[2], Qamaruzzaman J[1]

[1]Department of Restorative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, 50300, Kuala Lumpur, Malaysia.
[2]Department of Craniofacial Diagnostic and Bioscience, Faculty of Dentistry, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, 50300, Kuala Lumpur, Malaysia
Email: p106716@siswa.ukm.edu.my

Objectives: The use of extracted human teeth (EHT) for research purposes offers valuable insights into various dental and medical studies. Ensuring proper sterilization of extracted teeth is crucial to prevent potential cross-contamination and maintain the integrity of research results. This scoping review aims to identify whether EHT is still relevant in dental research and ascertain its sterilizing and storage methods. **Methods**: Scoping review methods were adopted for the review. Relevant databases (PubMed, Scopus and Web of Science) were searched using the terms "extracted teeth" and "in vitro" to identify articles for inclusion. The most recent articles published over a five-year period (2019-2023) and those in English were included. Two reviewers independently conducted the selection process, and the decision was consensually made. **Results**: A total of 121 articles were reviewed: Endodontology (43%), Conservative Dentistry (24%), Dental Materials (11%), Prosthodontics (6%), Orthodontics (5%) and Regenerative Therapy (5%), and Periodontology (3%) and Oral Biology (3%). 80% of the reviewed papers did not report the sterilizing and storage methods for EHT. When reported, sodium hypochlorite was most commonly used, however, there was no standardization of the concentrations and immersion time. The most commonly used storage solutions to keep EHT from dehydration are saline (13%) and distilled water (12%). **Conclusions**: Extracted human teeth are still widely used in dental research, however, there is lack of standardization of the sterilizing and storage methods. Poor quality of reporting was also observed.

Keywords: Extracted Human Teeth (EHT), in vitro, scoping review, sterilization, storage solution

FINAL ABSTRACT

PAPER 54

Exploring Oral Health Education Program Received by People with Disability at Rehabilitation Centers- Qualitative Study

Khan AJ[1] and Ahmad MS[1]

[1]Faculty of Dentistry, Universiti Teknologi MARA (UiTM), 47000 Sungai Buloh, Selangor, Malaysia.
Email: afsary_dr@yahoo.com

Objective: Community-based rehabilitation (CBR) centres were established to support the enhancement of the quality of life of people with disabilities (PWDs) including health care. In Malaysia, it is unknown to what extent the CBR trainees or PWDs were taught about oral health (OH) care at CBR centres. This study investigated the level of training in OH care received by CBR workers, the current OH program for CBR trainees, and the barriers and enablers in providing OH education, care, and services for PWDs in CBR centres. **Methods:** A face to face in-depth interviews using a semi-structured interview questionnaire were conducted with the CBR managers. Seven participants were recruited from the CBR centres from 7 different districts in Kuala Lumpur and Selangor, Malaysia. Audio-recorded interviews were transcribed verbatim, and transcripts were analysed in MAXQDA software. Qualitative data were analysed via thematic analysis. **Results:** CBR Managers reported, CBR workers and trainees received dental talk, and training on OH care and treatment by the dentist assigned by the Ministry of Health. There was no specific program, training, or special course from other agencies, including the Department of Social Welfare. Several enabling and limiting factors in the provision of OH care to PWDs were noted. These include personal (e.g., parents' support, uncooperative behaviour) and professional (e.g., lack of services provided, unwillingness to treat) factors. Some also reported a lack of support from policymakers. **Conclusion:** Findings reported from this study provide information for further improvement and development of OH care services for CBR trainees.

Keywords: Oral Health Care, People with Disability, Community-based Rehabilitation (CBR), Barriers, Enabler

FINAL ABSTRACT

PAPER 55

The Effect of *Candida auris* Phenotypic Switching on Mono- and Coculture Biofilms With *Staphylococcus aureus.*

Mukarramah Zainal[1, 2, 3], Wan NurHazirah Wan Ahmad Kamil[1, 2, 3], Nicola Cirillo[4] and Mohd Hafiz Arzmi[1, 2, 4]

[1]Department of Fundamental Dental and Medical Sciences, Kulliyyah of Dentistry, International Islamic University Malaysia, 25200 Kuantan, Pahang, Malaysia.
[2]Cluster of Cancer Research Initiative IIUM (COCRII), International Islamic University Malaysia, 25200 Kuantan, Pahang, Malaysia.
[3]Faculty of Dentistry, Universiti Teknologi MARA (UiTM), 47000 Sungai Buloh, Selangor, Malaysia.
[4]Melbourne Dental School, The University of Melbourne, 3010 Victoria, Australia.
Email: zainalmukarramah@gmail.com

Objective: *Candida auris* and *Staphylococcus aureus* are implicated in nosocomial infections within the hospital environment. Phenotypic switching is one of the virulence factors of *Candida* species. However, no study was conducted to assess its effect on the biofilm formation in mono- and co-culture biofilm of the microorganisms. This study aims to determine the effect of phloxine B induced-phenotypic switching on the biofilm formation of *C. auris* with *S. aureus* in mono- and co-culture. **Methods:** Phenotypic switching of *C. auris* (ATCC MYA-5002) was induced using 5 mg/mL of Phloxine B dye to obtain four generations of *C. auris*. To determine the effect of phenotypic switching on mono-culture biofilm-forming ability, the biofilm of *C. auris* and its switched generations were grown in RPMI-1640 or YPD broth. Meanwhile, *S. aureus* (ATCC 25923) was grown in brain heart infusion (BHI) broth in a separate well of a 96-well plate. To develop a co-culture biofilm, *C. auris* and *S. aureus* were grown together in the same well. All microorganism was standardised to a final cell density of 10^6 cells mL^{-1}. The biofilms were incubated at 37°C for 72h and measured using crystal violet assay. **Results:** Monoculture biofilm of *C. auris* isolates in RPMI-1640 medium exhibited the highest biofilm biomass (0.5226 ± 0.15), followed by *C. auris* isolates in YPD medium (0.25 ± 0.17). *C. auris* 3rd switched generation isolates in RPMI-1640 medium had the least biofilm (0.0199 ± 0.01). In co-culture biofilms, the 3rd generation of *C. auris* in YPD medium had the highest biofilm biomass (0.17 ± 0.14). The monoculture biofilm biomass of *S. aureus* was recorded at 2.09 ± 1.00. **Conclusion:** The biofilm of *C. auris* biofilm in mono- and coculture was phenotypically generation and media-dependent.

Keywords: *Candida auris*, Biofilm, Phenotype switch, *Staphylococcus aureus*

FINAL ABSTRACT

PAPER 56

Enhancement of Antifungal Effect on Denture Base Resin Through Microcapsules Drug Delivery Technology

Zaihan Ariffin[1], Mariati Jaafar@ Mustapha[2], Yanti Johari[1], Zuratul Ain Abdul Hamid[2], Suharni Mohammad[1], Nik Nur Syahidatul Jannah Mahadi[1].

[1]School of Dental Science, Health Campus, Universiti Sains Malaysia
[2]School of Materials & Minerals Resource Engineering, Engineering Campus, Universiti Sains Malaysia
Email: syahidatul.jannah@student.usm.my

Objectives: The introduction of organic materials into polymethyl methacrylate (PMMA) resin has been implemented to reinforce the antimicrobial properties in oral denture bases. A new drug delivery technique using polylactic acid (PLA) microcapsules infuses with organic ingredients such as tea tree oil (TTO). When incorporated into PMMA resin, these microcapsules will provide effective antifungal effect on the denture surface. The objective is to investigate the antifungal interaction of PLA/TTO microcapsules in polymerized PMMA denture base resin against *Candida albicans*. **Methods:** An advanced encapsulation technique was performed to synthesize PLA microcapsules containing TTO. The TTO/PLA microcapsules were characterized using Ultraviolet-visible (UV-Vis), Fourier-transform Infrared (FTIR), Gas chromatography-mass spectrometry (GCMS) and scanning electron microscope (SEM). Three different concentrations of prepared microcapsules (TTO: PLA (% w/w)); 10%, 50% and 100% were incorporated into polymerized PMMA denture resin. The tested materials were subsequently evaluated for antifungal activity over a period of several weeks at intervals of 7, 14 and 30 days using the well diffusion test. Further observation through SEM was included to assess the attachment of oral microorganism to the surface of modified denture base. **Results:** From the spectroscopic analysis, the microcapsules were successfully synthesized using a new drug delivery encapsulation method. The antifungal activity of polymerized PMMA denture incorporated with TTO/PLA microcapsules demonstrated a significant effect ($p<0.05$) against *C. albicans* where the inhibition area increasing as the concentration increased. **Conclusion:** The study demonstrated that organic TTO can be encapsulated with PLA, having the potential to serve as a sustainable drug delivery vehicle for controlled release. The incorporation of TTO/PLA microcapsules into PMMA denture base can significantly enhance the antifungal effect on denture surface, offering potential usefulness for denture users in the future.

Keywords: polylactic acid microcapsules, tea tree oil, denture base resin, antifungal activity, zone of inhibition.

FINAL ABSTRACT

PAPER 57

Parenting Styles of Malaysian Parents and Its Association with Children's Dental Anxiety: A Pilot Study

Noorfarahain Othman, Rohaida Abdul Halim, Norashikin Abu Bakar

Centre of Studies for Paediatric Dentistry and Orthodontics, Faculty of Dentistry, Universiti Teknologi MARA
Email: 2022441846@student.uitm.edu.my

Objective: The development of a child, particularly concerning their behaviour and anxiety, is influenced by various factors, among which parenting styles are significant. However, little are known about the parenting styles in Asian countries, especially in Malaysia, and its effects on children's dental anxiety. This study aims to identify the types of parenting styles among Malaysian parents and to investigate the relationship between the most practiced parenting styles and children's dental anxiety. **Method:** This study involves 30 parent-child units attending the UiTM Paediatric Dental Clinic. Included were children aged between 5-12 years, while those with impaired cognitive function were excluded. Participants completed a validated 32-item self-reported questionnaire, the Parenting Styles and Dimensions Questionnaire (PSDQ), and the Malay Modified Child Dental Anxiety Scale ($MCDAS_f$). The PSDQ, based on the highest scores among its three factors, classifies parents into specific parenting styles. The child participants' dental anxiety levels were measured using the 8-item Malays $MCFDAS_f$.**Result:** Majority of the parents were mothers (90%), with half of them having tertiary education levels. The identified parenting styles were authoritative (90%) and permissive parenting (10%). $MCDAS_f$ showing 50% of the children have absence of anxiety, with 46.7% presented with presence of state anxiety. Chi square Fisher Exact test was used to analysed correlation in between different parenting styles and anxiety level of children. Result showing $p>0.05$ that indicates there is no association in between parenting styles and children dental anxiety. **Conclusion:** The pilot study indicates no direct association between parenting styles and children's dental anxiety. Additionally, there was also no comparable distribution between the absence and presence of dental anxiety among children with authoritative parents.

FINAL ABSTRACT

PAPER 58

The Effect of Vitamin D_3 on Enamel Microhardness and Surface Morphology: An In Vitro Study

Mohd Zulfadli Harun[1], Nur Aliana Hidayah[2], Ilham Wan Mokhtar[3], Zolkapli Eshak[4], Alaa Sabah Hussein[1]

[1]Centre of Paediatric Dentistry and Orthodontics Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, Jalan Hospital, 47000 Sungai Buloh, Selangor, Malaysia.
[2]Centre for Basic Medical Sciences Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, Jalan Hospital, 47000 Sungai Buloh, Selangor, Malaysia.
[3]Centre for Comprehensive Care Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, Jalan Hospital, 47000 Sungai Buloh, Selangor, Malaysia.
[4]Department of Pharmacology, Faculty of Pharmacy, Universiti Teknologi MARA, Puncak Alam Campus, Bandar Puncak Alam, 42300 Puncak Alam, Selangor
Email: drmohdzulfadli@gmail.com

Objectives: Vitamin D is essential hard tissue mineralisation and tooth formation. The purpose of this study was to to evaluate the effect of vitamin D_3 on enamel microhardness and surface morphology before and after remineralisation. **Methods**: : The 45 extracted sound premolars were sectioned longitudinally in mesiodistal and randomly divided into three groups: vitamin D_3 group, 5% sodium fluoride (NaF) group and combination vitamin D_3 and 5% NaF group. The enamel specimens were immersed in a demineralisation solution (acid buffer solution with pH 4.4) for 96 hours to create an artificial lesion on the enamel surface before being subjected to a 14-day in vitro pH cycling model with the appropriate remineralisation solution (artificial saliva with pH 7.0). All samples were subjected to evaluation with microhardness testing and Scanning Electron Microscopy (SEM). The enamel hardness was measured using the Vickers Microhardness Tester and carried out using a standard load of 200 g and a dwell time of 15s per sample. The evaluation was performed for three readings: baseline reading (before any treatment), demineralisation reading (after creation of artificial caries lesions), and remineralisation reading (after pH cycling). The data were statistically evaluated using repeated measure ANOVA within and between group. The $p<0.05$ was considered as significant. **Results**: Microhardness were significantly reduced after demineralisation and significantly higher after remineralising solution application. SEM images showed morphological changes between demineralised and post remineralised enamel surfaces. Thin new formed crystallite layer covered the enamel rod, but it still had some irregular and unstructured surface. **Conclusions**: Vitamin D_3 has an enamel remineralisation potential by improving the microhardness surface of artificially demineralised enamel carious lesion and could restore the defect of the enamel prism by displaying a relatively smooth surface and notable protection remineralisation layer.

Keywords Vitamin D, Demineralisation, Remineralisation, Enamel

FINAL ABSTRACT

PAPER 59

Elucidation on the effect *of Streptococcus salivarius* postbiotic K12 on *Candida* biofilm

Muhammad Danial Adham Rosman[1], Mohd Hafiz Arzmi[1, 2, 3,4]

[1]Department of Fundamental Dental and Medical Sciences, Kulliyyah of Dentistry, International Islamic University Malaysia, 25200 Kuantan, Pahang, Malaysia.
[2]Cluster of Cancer Research Initiative IIUM (COCRII), International Islamic University Malaysia, 25200 Kuantan, Pahang, Malaysia.
[3]Melbourne Dental School, The University of Melbourne, 3010 Victoria, Australia.
[4]Jardin Pharma Berhad, Sunway Subang Business Park, Selangor 40150 Shah Alam, Malaysia.
Email: Danialrosman14@gmail.com

Objective: Oral Candidiasis is a type of disease caused by commensal microbial that leads to opportunistic pathogens in immunocompromised persons. 90% of the cases were caused by *Candida albicans, C. glabrata, C. krusei, C. tropicalis, C. lusitaniae* and *C. parapsilosis*. Recent studies have shown that *Streptococcus salivarius* postbiotic has an antimicrobial property that might inhibit *Candida* growth. This study aimed to determine the ability of *S. salivarius* postbiotic (K12) to inhibit *Candida* biofilm. **Methods**: The biofilm of *C. albicans, C. glabrata, C. auris, and C. lusitaniea* was developed in a 96 well plate. All microorganism was standardised in brain heart infusion yeast extract (BHIYE) broth to a final cell density of 10^6 cells mL^{-1}. The biofilms were inoculated with 33% (v/v) K12 postbiotic and incubated at 37°C for 72 h. The biofilm biomass was measured using crystal violet assay. 0.12% (w/v) chlorohexidine served as the positive control. **Result**: *C. glabrata* had the least biofilm biomass (0.087±0.025) while *C. lusitaniae* had the highest biofilm biomass (0.103±0.024) when treated with K12. Only *C. albicans, C. glabrata,* and *C. lusitaniae* showed decreased biofilm when treated with K12 compared to the untreated. **Conclusion**: The potential of K12 as treatment for *Candida* infections is highly prominent as the results showed a reduced *Candida* biofilms biomass when treated with postbiotic K12.

Keywords: *Streptococcus salivarius* postbiotic K12, oral candidiasis, biofilm, CHX, BHIYE

FINAL ABSTRACT

PAPER 61

Oral Health Status Of Children With Autism Spectrum Disorder (ASD) At Universiti Teknologi Mara (UiTM)

Nor Fathihah Mohd Radzuan[1], Rohaida Abdul Halim[1], Erni Noor[2]

[1]Centre of Studies for Paediatric Dentistry & Orthodontics, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia
[2]Centre Studies for Periodontology, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia
Email: fathihahradzuan@gmail.com

Objective(s): Children diagnosed with autism spectrum disorder (ASD) does not exhibit specific oral characteristics related to ASD. However, the disorder itself could influence their oral health. This cross-sectional study aimed to assess and compare oral hygiene status, dental caries, and periodontal disease between children with and without ASD. **MethodS:** Thirty children with ASD and 39 children without ASD, aged between 3 to 16 years old, attending the paediatric dentistry clinic at the Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Sungai Buloh campus, participated in this study. Each child underwent an intraoral examination to assess periodontal health, dental caries, and developmental dental defects. Differences in mean caries experience and gingival index between these two groups were compared using independent t-test. **Results:** The mean scores of the Modified Gingival Index (MDI) were found to be higher in children with ASD (0.4 ± 0.55) compared to their counterparts (0.2 ± 0.45). Basic Periodontal Examination (BPE) were also found to be higher in children with ASD (1.2 ± 0.45) than those without (0.8 ± 0.45). The mean number of decayed teeth (DMFT) was found to be similar in between two groups. Children with ASD exhibited a higher prevalence of developmental dental defects than their counterparts without ASD. **Conclusion**: Children with ASD demonstrated a higher risk of developing dental caries, periodontal diseases, and developmental dental defects. Early detection of risk factors or the potential for developing dental caries and periodontal disease in children with ASD is imperative.

Keywords: Autism spectrum disorder, oral health, caries, periodontal disease

FINAL ABSTRACT

PAPER 62

Feasibility and Perception of the Usage of the Index for Interceptive Orthodontics Referral: A Pilot Study

Nisreen Nordin, Saraswathy Devi Sinniah, Annapurny Venkiteswaran, Nagham Mohammed Abdullah Al-Jaf

Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Sungai Buloh, Selangor, Malaysia
Email: nisreennyi@gmail.com

Objectives: This study is a continuation of our recent project. We developed and validated the Index for Interceptive Orthodontics Referral (IIOR), which is a tool designed to guide the timely referral of patients with developing malocclusions to the orthodontist. Its purpose is to help identify and refer cases that would benefit from early interceptive orthodontic treatment. This pilot study aims to assess the feasibility of using the IIOR and the user perception of IIOR. **Methods:** Thirteen participants (6 dental officers, 3 dental postgraduate students, and 4 dental therapists from UiTM, Sg Buloh) were briefed using a recorded video on the use of IIOR. Participants were asked to grade 10 study models using the IIOR with a summary of each case provided. After scoring, they answered the perception questionnaire towards the IIOR in an interactive method. The questionnaire has previously undergone content and face validation. The participant's responses were compared to the gold standard scoring of 10 study models of various malocclusion using IIOR that was established before this pilot study. **Results:** Fleiss kappa scoring by the participants resulted in moderate agreement of 0.5. A total of 79.23% of participants matched the gold standard scoring. A percentage of 92.3% of participants would prefer to have an index such as IIOR to guide and assist them during patient screening. **Conclusions:** The IIOR is feasible to be used among dental frontliners. The questionnaire can assess the use of IIOR in the population and the perception of users of the IIOR.

Keywords: Interceptive orthodontics, malocclusion, referral, mixed dentition.

FINAL ABSTRACT

PAPER 63

Impact of Dental Caries and Pain on Children's Oral Health-related Quality of Life: Preliminary Study

Ismail, N.R.[1], Tan, S.K.[2], Abu Bakar, N.[1], Hasmun, N.N.[3]

[1] Centre of Paediatric Dentistry & Orthodontics Studies, Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Malaysia
[2] Centre for Oral & Maxillofacial Surgery Studies (OMFS), Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Malaysia
[3] Department of Oral Sciences, Faculty of Dentistry, University of Otago, New Zealand
Email: noorrashidah.ismail85@gmail.com

Objective: The Malay Language Child Oral Health Impact Profile – Short Form19 (ML-COHIP-SF19) is a validated self-administered questionnaire designed to measure the impact of clinical conditions among school-aged children. The questionnaire can be used across a wide age range. The objective of this study is to investigate the associations between dental caries, dental pain, and oral health-related quality of life (OHRQoL) among school-aged Malaysian children. **Methods:** Children aged 9 to 16 years attending the Faculty of Dentistry at UiTM were invited to participate. After obtaining parental consent, participants completed the ML-COHIP-SF19 questionnaire along with a socio-demographic survey. During the clinical examination, pain scores and dental charting data were collected using the validated Faces Pain Scale-Revised and the International Caries Detection and Assessment System (ICDAS), respectively. The ML-COHIP-SF19 comprises of three domains: oral health (OH), functional well-being (FWB), and socio-emotional well-being (SEWB). The total ML-COHIP-SF19 scores range from 0-76, with higher scores indicating better OHRQoL. Data were statistically analysed using the independent t-test and multiple regression analysis. **Results:** The mean age of participants was 11.92 ± 2.06 years, with 57.6% being females. Of the 118 recruited, 83 participants had dental caries, and the pain prevalence of 60.2%. The mean total ML- COHIP-SF19 scores for those with caries was 52.13±10.19 and for controls 55.11±11.10 ($p>0.05$). However, scores for participants with caries and pain were 49.9±9.96, compared to 55.51±9.72 for controls ($p=0.013$). The multiple regression test showed that the independent variables 'pain experience', 'participant's gender', and 'participant's age' collectively accounted for 19.4% of the variability in the total scores of ML-COHIP-SF19. **Conclusions:** While the mean OHRQoL scores between participants with and without caries were not significantly different, the absence of dental pain significantly improved OHRQoL scores. Children without dental pain reported a better OHRQoL than those with dental pain. The factors of pain experience, participant's gender, and participant's age were found to be indicators of impact on OHRQoL among school-aged children.

Keywords: COHIP-SF19 questionnaire, dental caries, dental pain, oral health-related quality of life

FINAL ABSTRACT

PAPER 64

Adjunctive Effect of Autologous Platelet Concentrates in Periodontal Therapy of Intrabony Defects: A Systematic Review and Meta-Analysis

Nik Mhd Abdul Nasser NFS[1], Tan SK[2], Noor E[3]

[1]Department of Restorative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia
[2]Centre of Periodontology Studies, Faculty of Dentistry, Universiti Teknologi MARA
[3]Centre of Oral & Maxillofacial Surgery Studies, Faculty of Dentistry, Universiti Teknologi MARA
Email: nikfatinsarah@ukm.edu.my

Objective: This review aims to evaluate the adjunctive effect of APCs in the surgical management of periodontal intrabony defects. **Methods:** PubMed, Scopus, Web of Science, and Cochrane Central Register of Controlled Trials were searched for relevant studies from inception until 2022. Randomised controlled trials (RCTs) with a follow-up period of at least six months were included. Adults with periodontitis and ≥3 mm of intrabony defects treated with open flap debridement (OFD) (with or without the application of other regenerative biomaterials) and APCs were compared to those who received the same treatment without APCs. The primary outcomes assessed were clinical attachment level (CAL) gain, probing pocket depth (PPD) reduction and defect depth (DD) reduction. **Results:** 840 studies were identified and screened, and 38 RCTs were included. The risk of bias assessment revealed that 13 studies were rated as having a high risk of bias, 24 had unclear risk and one had a low risk of bias. Platelet-rich fibrin (PRF) provided adjunctive benefit in terms of CAL gain (MD,1.08mm; 95%CI,0.81-1.35; $p<0.00001$; $I^2=86\%$), PPD reduction (MD,1.01mm; 95%CI,0.82-1.21; $p<0.00001$; $I^2=73\%$) and DD reduction (MD,1.77mm; 95%CI,1.47-2.06; $p<0.00001$; $I^2=94\%$) compared to OFD. Platelet-rich plasma (PRP) combined with bone graft (BG) showed improved CAL gain (MD,0.93mm; 95%CI,0.36-1.51; $p<0.0001$; $I^2=51\%$) and DD reduction (MD,0.59mm; 95%CI,0.36-0.82; $p<0.00001$; $I^2=0\%$) compared to BG alone. The subgroup analysis showed benefits in CAL gain (MD,0.68mm; 95%CI,0.23-1.14; $p<0.003$; $I^2=32\%$) and DD reduction (MD,0.57mm; 95%CI,0.32-0.81; $p<0.00001$; $I^2=0\%$) when PRP was combined with allograft. **Conclusion:** PRF as an adjunct to OFD can be considered for treating intrabony defects. PRP, in combination with BG, may be considered. RCTs involving other advanced types of APCs are required to obtain conclusive results.

Keywords: Autologous platelet concentrate; intrabony defect; periodontal regeneration.

FINAL ABSTRACT

PAPER 65

Pilot Study of Build Parameter for Optimum Surface Roughness in Additive Manufacturing of Denture Framework

Khairudin Muhammad Wildan[1], Abdul Rahim Aini Hayati[2]

[1]Faculty of Dentistry, Universiti Teknologi MARA
[2]Center for Restorative Dentistry Studies, Faculty of Dentistry, Universiti Teknologi MARA
Email: muhdwild97@gmail.com

Objectives: Several studies on the surface roughness of denture framework fabricated using selective laser melting method have obtained a different range of surface roughness value between 3-15µm in Ra unit. However, build angle was not the parameter of interest in most of these studies. The main objective of this study is to investigate the roles of build angle towards the surface roughness value of the Cobalt Chromium denture framework in the latest ISO unit, Sa. **Methods**: This study used 3 different build angles (°) for the framework respectively toward the build platform (0,45,90). The other parameters were set fixed as the constant variable for this study, (180W laser power,1111 mm/s scan rate, 50 µm scan spacing). The sample undergo a standard finishing and polishing process. The surface roughness value was obtained using a non-contact surface profilometer (Alicona Infinite Focus). The surface roughness reading was carried out on polished and non-polished area of the frameworks. **Results**: The lowest roughness value of the denture framework is 0.698 µm and the highest value of the surface roughness is 10.538 µm. The average value for the surface roughness on the denture frameworks with 45° build angle is 3.6 µm. The roughness value on a certain part of the denture is influenced by the direction of the laser beam during the fabrication process. **Conclusion**: The build angle during the selective laser melting fabrication process for the denture framework plays a role towards the surface roughness value of the Cobalt Chromium denture framework.

Keywords: Additive manufacturing, Cobalt Chromium, denture framework, Selective Laser Melting (SLM), surface roughness.

FINAL ABSTRACT

PAPER 66

Randomised Clinical Trial Comparing Remineralising Protocols A Year Post-Debond

Md. Razali KA[1], Abdul Razak AA[1], Wan Hassan WN[2], Sukumaran P[3]

[1]Faculty of Dentistry, Universiti Malaya, 50603, Kuala Lumpur, Malaysia
[2]Department of Paediatric Dentistry & Orthodontics, Universiti Malaya, 50603, Kuala Lumpur, Malaysia
[3] Faculty of Dentistry, Oral and Craniofacial Sciences, King's College London, London, United Kingdom
Email: ainaaqilah22@gmail.com

Objective: Fluoride therapy is an effective remineralisation agent in post-debond white spot lesions (WSL).The study aimed to compare three interventions: (1) daily fluoride toothpaste monotherapy; (2) daily fluoride toothpaste therapy supplemented with daily casein phosphopeptide amorphous calcium phosphate with fluoride (CPP-ACPF); and (3) daily fluoride toothpaste therapy supplemented with three-monthly professional application of fluoride varnish, in reducing white spot lesions (WSL). **Methods:** This study was part of a randomised, three-armed parallel group, controlled clinical trial (RCT) registered with the clinicaltrials.gov (NCT04788550). The primary outcome was the optical changes (refractive index) of the WSL. Thirty patients were followed up for one year following orthodontic debonding using the measurement of A-scans and B-scans of Optical Coherence Tomography (OCT) across different enamel surface depths. Data was extracted using MATLAB. The lesion depth and integrated reflectivity were compared by paired t-test and one-way ANOVA. **Results:** The results showed that daily fluoridated toothpaste supplemented by fluoride varnish significantly reduced the lesion depth and integrated reflectivity of WSLs up to 200 microns depth. In comparison, fluoride toothpaste monotherapy showed significant differences only up to 100 microns in depth. Daily fluoridated toothpaste and CPP-ACPF combined showed no significant difference in all measured depths. There were no differences between the groups at the 12-month follow-up. **Conclusion:** Daily fluoridated toothpaste effectively reduced the lesion depth and integrated reflectivity of WSL. Professional supplementation of fluoride varnish had a greater effect in reducing the white spot lesions than daily fluoridated toothpaste alone. There was insufficient evidence to support the long-term benefit of CPP-ACPF on post-debond WSL.

Keywords: Casein Phosphopeptide-Amorphous Calcium Phosphate Nanocomplex; Dental Caries; Orthodontic Appliances; Tooth Remineralization; Optical Coherence; Fluorides

FINAL ABSTRACT

PAPER 67

Perception Of Dental Personnel Regarding Specialist Preventive Dental Clinic In Alor Setar, Kedah, Malaysia

Fahimi NF[1,2], Yusof NR[1], Md Sabri BA[1]

[1]Centre of Population Oral Health & Clinical Prevention Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh, 47000 Selangor
[2]Oral Health Programme, Ministry of Health Malaysia.
Email: nurulfahizha@gmail.com

Objective: The establishment of a preventive dental clinic in Alor Setar, Kedah, managed by dental public health specialists, by the Oral Health Programme, was due to positive findings in the National Oral Health Survey for Adults 2010. The clinic focuses on improving oral health status in Malaysia by targeting high-risk individuals. Since its inception, no assessments have been conducted. This study evaluates the perception of dental personnel managing and referring cases to the preventive clinic in Alor Setar, Kedah. **Methods**: 23 dental personnel working in government dental clinics in Alor Setar, Kedah, and 11 dental personnel managing the clinic were interviewed face-to-face or via phone based on their preferences. The interviews were conducted using validated semi-structured questionnaires with domain patient management, resources, training and suggestions. The sessions were digitally recorded before being transcribed verbatim and analysed thematically using NVivo software. **Results**: 8 dental personnel interviewed had experienced referring cases, while 15 admitted not referring due to their poor understanding of the referral criteria and patients' refusal. The cases referred include quit smoking and poor oral hygiene cases. Patient's willingness to change and unmanageable cases were factors influencing referral. Clinicians referring cases admit that the preventive clinic improves patient management. The managers consisting of dentists, dental public health specialists and dental surgery assistants, identified low attendance, lack of referrals, unfollowed cases, undertrained personnel and understaffing as the clinic's challenges. The clinic's management included smoking cessation, dental health education, diet counselling, instruction in oral hygiene, and behaviour modification. Improvement in the education material and the number of staff in the clinic could improve the function of the preventive clinic. Improvement in oral hygiene and motivation was seen in patients. **Conclusions**: Despite the difficulties and barriers encountered in managing and referring patients, there were beneficial improvements in patients' oral health habits.
Keywords: dental public health, preventive dentistry

FINAL ABSTRACT

PAPER 68

Adaptation of Cobalt-chromium Removable Partial Denture Fabricated by Selective Laser Melting

Nosizana MS[1], Safa SE[1], Norsiah Y[1], Norliza I[2], Zubaidah ZA[1]

[1]Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya.
[2]Department of Oral and Maxillofacial Clinical Sciences, Faculty of Dentistry, Universiti Malaya
Email: nosizana@um.edu.my

Objective: This in vitro study investigated the adaptation of the cobalt-chromium (Co-Cr) removable partial dentures (RPDs) framework fabricated by selective laser melting (SLM) using different build orientations and compared them to the conventional casting framework. **Material and methods:** A master cast simulating a maxillary arch of Kennedy class III modification 1 was scanned to create a virtual three-denominational (3D) cast. Four groups (n=40 total) of Co-Cr RPD frameworks were fabricated. In the 3D-printed RPDs, the Co-Cr framework was virtually designed and exported for direct SLM 3D printing. The 3D printing was done using three different build orientations as follows: 0°, 45°, and 90° (n=10 each). For the conventional RPDs, Co-Cr frameworks were constructed using conventional casting (n=10). The Co-Cr frameworks from different groups were scanned and virtually superimposed with the master die using surface matching software to measure the gap under the different points of the palatal plates from the different frameworks. Less gap indicates more surface adaptation and close contact between the palatal plate and the master cast. Data were analysed using Kruskal Wallis and Dunnett's T3 tests for pairwise comparison (α=.05). **Results:** The result showed significant differences in the adaptation of the palatal plates between the four groups (P= 0.00) except for conventional and 0°SLM printing. Furthermore, the conventional casting and 0° SLM printing exhibited the best adaptation (the least gap underneath the palatal plate of the RPD framework). **Conclusion**: Using various build orientations in the SLM printing of Co-Cr RPD will significantly affect the adaptation of the SLM-printed RPD framework. The 0° build orientation in SLM printing of the Co-Cr RPD framework can maximise the adaptation and minimise the gap under the palatal plate of the RPD framework.

Keywords: SLM, Cobalt- chromium framework, Build orientations

FINAL ABSTRACT

PAPER 70

Comparative Evaluation of Newly Introduced Nanofilled Composite, with Two Commercially Available Composites – A Basic Toolkit

Yi Xuan Ng[1], Joanne Siaw Ling Tan[1], Zi Qi Lee[1], Yong Yie Cheah[2]

[1]Department of Conservative Dentistry, MAHSA University, Selangor, Malaysia
[2]Department of Endodontics, University Sains Malaysia, Kelantan, Malaysia
Email: officejustinxv@gmail.com

Objective: During the last decade, composite resin restorative material is rapidly evolved to incorporate advance in dental material science. As a result, new products are launched by companies at a remarkable pace. Hence it is prudent to independently evaluate the clinical-relevant physical properties of these products; and compare them to established commercially available products. MerFill Nano LC is one such example of a newly introduced, restorative composite resin; and thus, needs to be investigated, and compared with Shofu Beautifil II and Dentsply Ceram. X. **Method:** Degree of conversion was evaluated using a FTIR spectrometer, n = 20 per group. Microhardness test was done with Vickers microhardness tester, n = 20 per group. Polymerization shrinkage (in terms of volume change) was tested using the buoyancy method, the mass was integrated into Archimedes' principle to calculate density of samples, n = 20 per group. **Results:** Data of the results were analysed, MerFill Nano LC has no significant difference in polymerisation shrinkage, when compared to Shofu Beautifil II and Dentsply Ceram. X. With regards to degree of conversion, Dentsply Ceram. X had a significantly greater conversion than Merfill Nano LC, and Shofu Beautifil II. Lastly, the microhardness of MerFill Nano LC was significantly lower than Dentsply Ceram. X and Shofu Beautifil II. **Conclusion:** Merfill Nano LC has comparable degree of conversion and polymerisation shrinkage, but lowest microhardness compared to Shofu Beautifil II and Dentsply Ceram. X.

Keywords: Dental Composites, Dental Materials, Nanofilled Composite, Restorative Dentistry

FINAL ABSTRACT

PAPER 71

In-vitro Analysis of Adult Human Enamel Crystal Orientation and its Mechanical Properties After the Incorporation of Strontium Fluoride

Chew Ming Ann, Masturina Anati, Dr. Umer Daood

Department of Restorative Dentistry, Faculty of Dentistry, International Medical University
Email: Chew.mingann@student.imu.edu.my

Introduction: When fluoride and strontium are incorporated together in hydroxyapatite crystals, apatite crystallinity is enhanced with decrease in the acid reactivity. It would be logical to draw the conclusion that adding fluoride and strontium to hydroxyapatite would be advantageous for the advancement of its bioactivity. This synthetic carbonated apatite resulting from the incorporation of strontium and fluoride displays structural and compositional changes which modifies the apatite behaviour. **Objectives:** To evaluate the effect of strontium fluoride incorporation inside adult human enamel to evaluate the mechanical properties mechanical properties and crystal orientation. **Methodology:** 84 human enamel blocks were prepared and were demineralised using 37% phosphoric acid for twenty seconds and then divided into seven groups. Each group was soaked in their respective solutions (1% strontium fluoride (SrF), 0.5% strontium fluoride (SrF), 1% strontium (Sr), 0.5% strontium (Sr), 1% fluoride (F), 0.5% fluoride (F), and distilled water) for 1 week. They were further analysed using SEM, Hysitron Nano indenter, Raman spectroscopy and TEM. **Result:** TEM images showed solid-like agglomerates with sizes around 100 nm in control groups. The agglomerates were larger (>650 nm) in 0.5% and 1% SrF. The typical enamel Raman spectrum presented sharp and prominent peaks at 960 cm^{-1} arising from v1 PO_4^3 bands for all groups. The bands for v1 PO_4^3 groups enabled increased intensities for 1% SrF > 0.5% SrF > 1% F > 0.5% F specimens. The SEM-EDX analysis identified a distinct increased deposit of calcium phosphate minerals and hydroxyapatite in the 0.5% SrF specimens. The Hysitron analysis demonstrated a significant trend ($p<0.05$) of higher surface hardness observed in 0.5% SrF >1% SrF > F > Sr > control groups. The mean surface hardness of the enamel for 0.5% SrF specimens was significantly higher than all groups ($p<0.05$) **Conclusion:** The elemental composition of minerals in enamel changed after SrF treatment (mainly 0.5% concentration) resulting in enhanced enamel remineralisation and increased mean enamel hardness. The results are suggestive of a potent formulation which can be successfully used inside orthodontic adhesives.

Keywords: Dental enamel, enamel crystal orientation, fluoride, strontium, tooth remineralization,

FINAL ABSTRACT

PAPER 71

In-vitro Analysis of Adult Human Enamel Crystal Orientation and its Mechanical Properties After the Incorporation of Strontium Fluoride

Chew Ming Ann, Masturina Anati, Dr. Umer Daood

Department of Restorative Dentistry, Faculty of Dentistry, International Medical University
Email: Chew.mingann@student.imu.edu.my

Introduction: When fluoride and strontium are incorporated together in hydroxyapatite crystals, apatite crystallinity is enhanced with decrease in the acid reactivity. It would be logical to draw the conclusion that adding fluoride and strontium to hydroxyapatite would be advantageous for the advancement of its bioactivity. This synthetic carbonated apatite resulting from the incorporation of strontium and fluoride displays structural and compositional changes which modifies the apatite behaviour. **Objectives:** To evaluate the effect of strontium fluoride incorporation inside adult human enamel to evaluate the mechanical properties mechanical properties and crystal orientation. **Methodology:** 84 human enamel blocks were prepared and were demineralised using 37% phosphoric acid for twenty seconds and then divided into seven groups. Each group was soaked in their respective solutions (1% strontium fluoride (SrF), 0.5% strontium fluoride (SrF), 1% strontium (Sr), 0.5% strontium (Sr), 1% fluoride (F), 0.5% fluoride (F), and distilled water) for 1 week. They were further analysed using SEM, Hysitron Nano indenter, Raman spectroscopy and TEM. **Result:** TEM images showed solid-like agglomerates with sizes around 100 nm in control groups. The agglomerates were larger (>650 nm) in 0.5% and 1% SrF. The typical enamel Raman spectrum presented sharp and prominent peaks at 960 cm^{-1} arising from v1 PO_4^3 bands for all groups. The bands for v1 PO_4^3 groups enabled increased intensities for 1% SrF > 0.5% SrF > 1% F > 0.5% F specimens. The SEM-EDX analysis identified a distinct increased deposit of calcium phosphate minerals and hydroxyapatite in the 0.5% SrF specimens. The Hysitron analysis demonstrated a significant trend ($p<0.05$) of higher surface hardness observed in 0.5% SrF >1% SrF > F > Sr > control groups. The mean surface hardness of the enamel for 0.5% SrF specimens was significantly higher than all groups ($p<0.05$) **Conclusion:** The elemental composition of minerals in enamel changed after SrF treatment (mainly 0.5% concentration) resulting in enhanced enamel remineralisation and increased mean enamel hardness. The results are suggestive of a potent formulation which can be successfully used inside orthodontic adhesives.

Keywords: Dental enamel, enamel crystal orientation, fluoride, strontium, tooth remineralization,

FINAL ABSTRACT

PAPER 72

Knowledge, Perception, And Practice Of Covid-19 During Endemic Era Among Private Dentists In Klang Valley

Siti Sarah Rosli, Nur Rashidah Mahat, Laila Azwa Hassan[1], Siti Nur Farhanah Mohd Desa[2], John Chong Keat Hon[3]

[1]Department of Restorative Dentistry and Prosthodontic, Faculty of Dentistry, Universiti Sains Islam Malaysia (USIM)
[2]Department of Periodontology and Community Oral Health, Faculty of Dentistry, Universiti Sains Islam Malaysia (USIM)
[3]Department of Oral Maxillofacial Surgery, Pathology, and Medicine, Faculty of Dentistry, Universiti Sains Islam Malaysia (USIM)
Email: drjohn@usim.edu.my

Introduction: Dentists are at risk of contracting COVID-19 due to the nature of work that exposed to aerosols containing saliva. Thus, it is critical to assess current practices to set up safe practices for dental professionals. The information on the practice of dentists towards COVID-19 in Malaysia is still scarce. **Objective:** This study aimed to assess the knowledge, perception, and practice of private dentists in Klang Valley during COVID-19 endemic era. **Methods:** This cross-sectional study used a validated online self-administered questionnaire and a Likert scale was used to employ the questionnaires. Descriptive analysis and correlation tests were used to analyse data and the significance level was set at $p < 0.05$. **Results:** A total of 120 private dentists participated in this study. 89% of dentists are aware of the Clinical Practising Guidelines (CPG). Most dentists perceived their profession exposed them more to COVID-19 which is a serious health issue. 90.8% of dentists think that COVID-19 has an impact on dental attendees. Only one-third of dentists consider that patients are required to do COVID-19 tests prior to treatment. A significant number of vaccinated dentists work with vaccinated staff and use effective infection control measures. **Conclusion:** Private dentists showed poor knowledge of symptoms and medium transmission of COVID-19. Only less than 15% of dentists apply perfect practice of COVID-19 management. Hence, it is strongly recommended that CPG should be reinforced among dentists to raise dental care quality and lower the probability of COVID-19 transmission.
Keywords: COVID-19, knowledge, perception, practice, dentistry

FINAL ABSTRACT

PAPER 73

The Effect of Glutathione-Coated Gold, Silver and Bimetallic Gold-Silver Nanoclusters on *Candida albicans* Biofilms

Humairaa' Majdan[1,4], Syarifah Nurhikmah Izzati Syed Nasarudin[1,2], Ricca Rahman Nasaruddin[3], Mohd Hafiz Arzmi[1,4,5]

[1]Cluster of Cancer Research Initiative IIUM (COCRII), International Islamic University Malaysia, Kuantan, Pahang, Malaysia
[2]Department of Biomedical Science, Kulliyyah of Allied Health Science, International Islamic University Malaysia, Kuantan, Pahang, Malaysia
[3]Department of Biotechnology Engineering, Kulliyyah of Engineering, International Islamic University Malaysia, Gombak, Kuala Lumpur, Malaysia
[4]Department of Fundamental Dental and Medical Sciences, Kulliyyah of Dentistry, International Islamic University Malaysia, Kuantan, Pahang, Malaysia
[5]Melbourne Dental School, The University of Melbourne, 3053 Victoria, Australia
Email: humairaamajdan99@gmail.com

Introduction: *Candida albicans* has been reported to associate with dental caries development, among many other oral diseases. One of the recent advancements in therapeutic agents against *Candida* infection is the nanocluster, a nanoparticle less than 2 nm in size. **Objectives**: To elucidate the effect of gold nanoclusters (AuNC), silver nanoclusters (AgNC) and bimetallic gold-silver nanoclusters (AuAgNC) on the biofilm of *Candida albicans*. **Methods**: Autistic child caries-isolate *C. albicans* AC01, normal child caries-isolate *C. albicans* C36T and reference strain *C. albicans* ALT5 were used. The biofilm-forming ability of *C. albicans* ALT5, AC01 and C36T was assessed towards 0.12% (w/v) chlorhexidine (CHX), 2 mM gold nanocluster (based on Au atom), 2 mM silver nanocluster (based on Ag atom) and 2 mM bimetallic nanocluster (based on AuAg atom) with glutathione served as the ligand. The biofilm biomass and the total cell count were determined. **Results**: The biofilm of all *C. albicans* exhibited strains and media dependent with *C. albicans* AC01 treated with AuAgNC in YPD broth had the highest biofilm biomass (1.25 ± 0.01) while no biofilm formed in all *C. albicans* strains treated with 0.12% CHX in RPMI-1640. The total cell count of *C. albicans* AC01 treated with AuNC ($79.83 \pm 34.76 \times 10^7$ cells/mL) in RPMI-1640 was the highest, while the untreated *C. albicans* ALT5 cultured in RPMI-1640 had the lowest with ($1.42 \pm 0.42 \times 10^7$ cells/mL). **Discussion:** Glutathione has been reported to increase the resistance of *C.albicans* to fluconazole suggested, the similar may occur with the nanoclusters. **Conclusion:** Glutathione ligand in AuNC, AgNC and AuAgNC increased the biofilm of *C. albicans.*

Keywords: Gold Nanoclusters (AuNC), Silver Nanoclusters (AgNC), Bimetallic Gold-Silver Nanoclusters (AuAgNC), *Candida albicans*, Biofilm

FINAL ABSTRACT

PAPER 74

Association between Dermatoglyphics and Facial Form- An Exploratory Study in Malaysians

Yap PM[1], Tan YQ[1], Wee TL[1], Smita Nimbalkar[2], Kirti Saxena[2]

1
School of Dentistry, International Medical University, Kuala Lumpur, Malaysia
1
School of Dentistry, International Medical University, Kuala Lumpur, Malaysia
[1] School of Dentistry, International Medical University, Kuala Lumpur, Malaysia
2
Division of Clinical Oral Health Sciences, School of Dentistry, International Medical University, Kuala Lumpur, Malaysia
2
Division of Clinical Oral Health Sciences, School of Dentistry, International Medical University, Kuala Lumpur, Malaysia
2
Division of Clinical Oral Health Sciences, School of Dentistry, International Medical University, Kuala Lumpur, Malaysia
[2] Division of Clinical Oral Health Sciences, School of Dentistry, International Medical University, Kuala Lumpur, Malaysia
Email: yap.peimean@student.imu.edu.my

Objective: Dermatoglyphics is the study of dermal ridge configurations on the palmar and plantar surfaces of the hands and feet. These unique dermal ridge patterns develop in the same period as the dentition and palate during intraurine life. Hence, dermatoglyphic patterns could play an important role as genetic determinants in the diagnosis of conditions with possible genetic etiology such as facial form, skeletal and dental malocclusion etc. To evaluate the association between dermatoglyphic patterns and euryprosopic, mesoprosopic, and leptoprosopic facial form by comparing and evaluating the palmar digital dermatoglyphic patterns. **Methods:** A cross-sectional study was conducted among 200 Malaysian individuals, between 18 to 40 years who fulfilled predetermined inclusion and exclusion criteria. Written informed consent was obtained prior to facial form determination and collection of fingerprint records. The facial form of participants was determined using the facial index formula. Fingerprints of all digits were recorded and interpreted according to the method by Cummins and Midlo. **Results:** Out of 200 subjects, 52 were identified as mesoprosopic facial form, 73 were identified as euryprosopic facial form and 75 were identified as leptoprosopic facial form. Among the three facial form, loops is the most common fingerprint pattern(56.8%) followed by whorls (37.0%), and arches is the rarest(6.3%). No statistically significant association was observed between three dermatoglyphic patterns and facial forms. ($P>0.05$). **Conclusion:** Loops is the most observed fingerprint pattern among Malaysian individuals exhibiting mesoprosopic, euryprosopic and leptoprosopic facial form.

Keywords: Dermatoglyphics; facial form; fingerprint patterns; genetics

FINAL ABSTRACT

PAPER 75

Digital Versus Conventional Dental Impression Techniques in Indirect Restoration: Malaysian General Dental Practitioners' (GDP's) Perspectives

Roslan SA[1] , Roslan AM[1] , Kamaruzaman M[1] , Mohamad Zaki SND[1] , Baharudin IH[1,2]

[1]Faculty of Dentistry, Universiti Teknologi MARA
[2]Department of Public Health Medicine, Faculty of Medicine, Universiti Teknologi MARA
Email: aisyah3140@uitm.edu.my

Objectives: Conventional impressions technique taking, associated with multiple steps and material manipulation has an inevitable degree of error. Therefore, accurate impressions with high dimensional stability for indirect restoration fabrication is crucial. Currently, intraoral scanners (IOS) are used as digital impression-technique have the accurate acquisition, high precision, cost, and time efficient for that purpose. This study aims to assess the preference towards impression techniques in indirect restorations among Malaysian general dental practitioners (GDP) and the contributing factors regarding their preferred dental impression techniques when performing indirect restoration. **Methods**: This cross-sectional study used a validated questionnaire distributed via online survey to Malaysian GDPs from November 2022 to May 2023. Four prosthodontics specialists and 10 GDPs validated the questionnaire to ensure adequate reliability. The survey measured the participants' demographics, educational experiences, attitudes, and impression techniques. The descriptive data are compared using a Chi-square test based on the type of impression techniques and preference variables. **Results**: 30 responses were collected. Seven respondents are digital technique users, while 23 respondents are conventional technique users. All respondents are interested in learning or improving their knowledge and skills in IOS (100%). They agree that integrating theoretical and practical modules on digital impression techniques for undergraduate dental students would be beneficial. Discussion: To utilise IOS for digitised impression-taking, GDPs require training and technical expertise. The technique depends on the level of expertise, the technology at hand and the complexity of the restoration. To match dental graduates' skills with the current impression-taking method, it should be considered to integrate the use of IOS into undergraduate dentistry curriculum. There is a need to establish generally accepted digital standards of education. **Conclusions**: Most respondents use conventional impression techniques, but they favour using intraoral scanners when fabricating indirect restoration. **Keywords**: Dental impression technique, General dental practitioners, Indirect restoration

FINAL ABSTRACT

PAPER 76

Antimicrobial effect of *L. helveticus* & *Ruta angustifolia* Pers. against oral pathogenic microorganisms.

Husna Bakri, Syarifah Nur Syed Abdul Rahman, Wan Himratul Aznita Wan Harun

Department of Oral & Craniofacial, Faculty of Dentistry, Universiti Malaya
Email: husnahazirahb@um.edu.my

Objectives: Periodontitis, dental caries and candidiasis has become a global health problem. Numerous studies have been published to clarify the role of probiotics, especially Lactobacillus spp., such as *Lactobacillus helveticus*, as an adjunct to conventional periodontal treatment. Additionally, *Ruta angustifolia* Pers. is traditionally used for the treatment of various diseases notably for microbial infections. The objective of this study is to evaluate the antimicrobial effect of *L. helveticus* and *Ruta angustifolia* Pers. against *Porphyromonas gingivalis, Streptococcus mutans Streptococcus mitis* and *Candida albicans*. **Methods**: The minimum inhibitory concentration of *L. helveticus* & *Ruta angustifolia* Pers. against the selected oral microbes were carried out using the well diffusion method. The following objectives were focused on the effects of *L. helveticus* and *Ruta angustifolis* Pers. on *P. gingivalis*. Assessment of biofilm biomass was performed by using crystal violet staining & a fluorescence microscopy analysis was utilized to assess *L. helveticus* and *Ruta angustifolia* Pers. against *P. gingivalis* by using live/dead cell viability assay. **Results**: All tested strains are more susceptible to *Ruta angustifolia* Pers. than *L. helveticus* with variable degrees of antimicrobial inhibition. *Ruta angustifolia* Pers. has a highest inhibition towards *S. mitis,* followed by *P. gingivalis, C. albicans & S. mutans* by using well diffusion method. The minimum inhibitory concentration of *Ruta angustifolia* Pers. is 12.5 mg/mL. The addition of *Ruta angustifolia* Pers. reduced biofilm formation in *P. gingivalis* ranging from 12.5 mg/mL to 100 mg/mL. In the live/dead cell viability assay, an incubation at 72 hours showed the highest percentage of *P. gingivalis* cells were killed. **Conclusion**: Further studies should be carried out to implement the use of *L. helveticus* & *Ruta angustifolia* Pers. as treatment for oral diseases. This therapy could serve as a useful alternative to periodontal treatment.

Keywords: *Ruta angustifolia* Pers., probiotics, antimicrobial properties, periodontitis, *Lactobacillus helveticus*

FINAL ABSTRACT

PAPER 77

Extraction, Characterization, and Antimicrobial Activity of F7 Biosurfactant from *Bacillus clausii* Against Oral Pathogen Key Players

Khairunnisa Z[1], Zakaria MN[1], Himratul-Aznita WH[2], and Purwasena IA[3]

[1]Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya
[2]Department of Oral & Craniofacial Science, Faculty of Dentistry, Universiti Malaya
[3]Department of Microbiology, School of Life Science and Technology, Institut Teknologi Bandung, Indonesia
Email: zkhairunnisa50@um.edu.my

Objectives: Biosurfactants are surface-active molecules produced by various microorganisms. It holds exceptional properties, including its capacity to lower surface tension, antiadhesive activity, non-toxicity, biodegradability, and antimicrobial activity. This study investigated the production, characteristics, and antimicrobial potential of biosurfactants extracted from *Bacillus clausii*, isolated from a crude oil sample obtained from a natural oil reservoir. **Methods**: Biosurfactant was extracted using the chloroform-methanol extraction method. Characterizations were assessed through Fourier-transform infrared (FTIR) spectroscopy, determination of surface tension, critical micelle concentration (CMC), and emulsification index. Antimicrobial activity was determined by the minimum inhibitory concentration (MIC) evaluation against *Streptococcus mutans* ATCC 25175, *Enterococcus faecalis* ATCC 24212, and *Candida albicans* ATCC 14503 using the microdilution method. The incubation time was determined according to the growth kinetics of each microorganism. **Results**: The biosurfactant extraction yielded at 1665 µg mL^{-1}, and was labelled as F7 biosurfactant. FTIR analysis revealed that the F7 biosurfactant belonged to the lipopeptide group, as evidenced by the presence aliphatic chain (CH_3 and CH_2). It exhibited a surface tension of 12.0 mN m^{-1}, a CMC of 157.5 mg L^{-1}, and an emulsification index of 56.5%. The MIC for each tested organism was 832.5 µg/mL^{-1}, with inhibition percentages of 7.9%, 10%, and 17.8% against *C. albicans*, *E. faecalis*, and *S. mutans*, respectively. **Conclusions**: The antimicrobial activities of the F7 biosurfactant demonstrated dose dependence. Higher F7 biosurfactant concentrations correlated with greater inhibition percentages. These findings suggest that increasing the F7 biosurfactants concentration could lead to a more effective antimicrobial effect, making it a potential antimicrobial agent for oral applications.

Keywords: Antimicrobial agents, Biosurfactants, *Bacillus clausii*, Oral pathogen, Minimum Inhibitory Concentration.

FINAL ABSTRACT

PAPER 78

Salivary Irisin as a Potential Diagnostic Biomarker for Periodontitis: A Pilot Study

Sadia Rana [1,2], Norsila Abdul Wahab [1], Wan Nazatul Shima Shahidan [1]

[1]School of Dental Sciences, Universiti Sains Malaysia Health Campus, 16150 Kubang Kerian, Kota Bharu, Kelantan, Malaysia
[2]Sharif Medical and Dental College, Lahore, Pakistan
Email: sadiarana@student.usm.my

Objective: Periodontitis and gingivitis are the common forms of periodontal disease; these disorders are caused by disruption to normal homeostatic processes by numerous bacterial species found in subgingival dental plaque and are modified by environmental and genetic factors. Periodontitis is time-consuming and expensive to treat and, therefore, prevention, early detection, and management of extent of the disease are critical issues. To determine the potential diagnostic biomarker for periodontitis by evaluating changes in the level of irisin in patients with periodontitis. **Methodology**: This study was conducted at Sharif Medical and Dental College, Lahore, Pakistan. Participants were divided into two groups. Group 1 comprised of 35 patients without periodontitis and was considered as control. Group 2 had 35 patients with periodontitis. Periodontitis was assessed based on the community periodontal index (CPI) criteria. About 5 ml of unstimulated whole saliva was collected, which was used for quantification of irisin protein using enzyme-linked immunosorbent assay (ELISA). Xerostomia status was also evaluated using Shortened Xerostomia Index (SXI). Data were analysed using SPSS, where an independent sample t-test was used to compute the differences in irisin levels between the two groups and Pearson correlation coefficient was performed to determine the association between SXI and irisin levels in both groups. **Results**: Irisin expression in Group 2 (22.39 ng/ml) was significantly higher than controls (13.69 ng/ml), $p<0.001$. There was no significant correlation between xerostomia status and irisin levels in both groups. **Conclusion**: Salivary irisin was increased in patients with periodontitis, which shows that salivary irisin can potentially be a diagnostic biomarker for periodontitis.
Keywords: Periodontitis, irisin, biomarker, saliva, Shortened Xerostomia Index (SXI).

FINAL ABSTRACT

PAPER 79

Beyond TNM Staging: Novel Prognostic Indicators for Oral Squamous Cell Carcinoma Survival - A Retrospective Study in Malaysia

Ramanathan A[1,2,3], Ghani WMN[2], Zakaria SS[1], Ripen ZM[1], Gopalan S[4], Abidin MZ[4], Rahman FA[5], Siriwardena BSMS[3,6], Sheng JYP[7], Zaini ZM[1,2], Ismail SM[1,2], Tilakaratne WM[1,2].

[1]Department of Oral & Maxillofacial Clinical Sciences, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.
[2]Oral Cancer Research & Coordinating Center, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.
[3]Center for Research in Oral Cancer, Faculty of Dental Science, University of Peradeniya, Sri Lanka.
[4]Department of Oral Maxillofacial Surgery, QE Hospital, Kota Kinabalu, Sabah, Malaysia.
[5]Department of Oral Medicine & Pathology, QE Hospital, Kota Kinabalu, Sabah, Malaysia.
[6]Department of Oral Pathology, Faculty of Dental Science, University of Peradeniya, Sri Lanka.
[7]Institute of Molecular Cell Biology (IMCB), Agency Of Science, Technology And Research (ASTAR), Singapore.
Email: drranand@um.edu.my

Objectives: The 5-year survival rate for oral cancer remains low, with oral squamous cell carcinomas (OSCC) accounting for about 95% of cases. The TNM staging system is currently the most widely used model for predicting prognosis in oral cancer. However, there is a need for further improvements in the staging system to benefit patients. This research aimed to identify socio-demographic, clinical, and histopathological characteristics that could serve as independent prognostic indicators of overall survival (OS) in OSCC, beyond the TNM staging system. **Method:** A retrospective study was conducted using data from the Malaysian Oral Cancer Database and Tissue Bank System (MOCDTBS) coordinated by the Oral Cancer Research and Coordinating Centre (UM-OCRCC), Faculty of Dentistry, Universiti Malaya. Socio-demographic and clinical parameters of 159 OSCC cases were obtained from the database, and histopathological parameters were derived from haematoxylin & eosin-stained slides. To analyse the association between individual variables and overall survival (OS), univariate and multivariate Cox regression were employed. All statistical analyses were conducted using SPSS 23.0 for Windows (SPSS Inc., Chicago, IL). **Results:** The 7th ($p=0.001$) and 8th ($p=0.006$) editions of the American Joint Commission on Cancer (AJCC) staging were shown to be significantly associated with poor OS in univariate analysis. After controlling for confounding factor, perineural invasion (PNI) ($p=0.006$), PNI at the tumour centre (TC) ($p=0.004$), intra-neural invasion at TC ($p=0.014$), number of tumour buds ($p=0.011$), and high activity tumour budding ($p<0.001$) emerged as independent prognostic factors for OS among OSCC patients. **Conclusion:** Histopathological characteristics, particularly PNI and tumour budding parameters, have the potential to serve as valuable independent prognostic indicators for OS in OSCC. These findings suggest the possibility of refining the current TNM staging system to improve treatment outcomes for oral cancer patients. Further validation and research are needed before integrating these findings into clinical practice.

Keywords: Oral squamous cell carcinoma, Overall survival, Perineural invasion, Prognostic indicators, TNM staging, Tumour budding.

FINAL ABSTRACT

PAPER 80

Predicting Remaining Dentine Thickness Accurately from Periapical Radiographs

Manahil Maqbool[1], Johari Bin Abdullah[2], Muhamad Saiful Bahri Yusoff[3], Tahir Yusuf Noorani[4]

[1]Paediatric Dentistry Unit, School of Dental Sciences, Universiti Sains Malaysia
[2]Dental Radiology Unit, School of Dental Sciences, Universiti Sains Malaysia
[3]Department of Medical Education, School of Medical Sciences, Universiti Sains Malaysia
[4]Conservative Dentistry Unit, School of Dental Sciences, Universiti Sains Malaysia
Email: manahil.maqbool@gmail.com

Objectives: The amount of remaining dentine thickness after a deep carious exposure, is key in determining the underlying pulpal health, as well as in curating an effective treatment plan for patients. The aim of this study was to compare remaining dentine thickness measurements obtained using digital periapical radiographs, cone beam computed tomographic (CBCT) scanning and Hirox microscopy, and to introduce a formula to predict remaining dentine thickness accurately from a digital periapical radiograph. **Methods**: This in vitro experimental study was carried out on seventy extracted permanent molars and premolars with deep caries, which were collected from the Oral Surgery unit at School of Dental Sciences, Universiti Sains Malaysia. The remaining dentine thickness of the teeth was measured on digital periapical radiographs, CBCT scans, and histological tooth sections using Hirox microscope. The remaining dentine thickness measurements were taken by two independent investigators and repeated after an interval of two weeks [ICC: 0.998 (95% CI:0.997-0.999)]. One-way ANOVA complemented with post-hoc test was used for statistical analysis with significance level set at p=0.05. **Results**: An approximate overestimation of remaining dentine thickness by 20% was seen in digital radiographs as compared to CBCT and histological sections. There was no significant difference in remaining dentine thickness measurements taken using CBCT and Hirox. There was a significant difference (p<0.05) between digital radiographs and CBCT, as well as between digital radiographs and Hirox. Based on the analysed data, a formula was developed to predict the actual remaining dentine thickness from the measurements obtained with a digital periapical radiograph. **Conclusions**: Digital radiograph overestimated the amount of remaining dentine thickness. The formula introduced can help in predicting the accurate remaining dentine thickness from a digital periapical radiograph during diagnosing and treatment planning.

Keywords: Digital periapical radiography, cone beam computed tomography, Histological section, remaining dentine thickness, deep caries.

FINAL ABSTRACT

PAPER 81

Validity and Reliability of Digital Photos as a Diagnostic Tool for Determination of Caries

Nasruddin MF[1], Mohamed Zohdi N[1], Roslan SA[1], Nik Mohd Rosdy NMM[2]

[1]Centre of Comprehensive Care Studies, Faculty of Dentistry, Universiti Teknologi MARA
[2]Centre of Oral & Maxillofacial Diagnostics & Medicine Studies, Faculty of Dentistry, Universiti Teknologi MARA
Email: drfaiz@uitm.edu.my

Objectives: The impact of COVID-19 on dental care and the adoption of tele-dentistry for caries detection needs investigating. The pandemic led to the use of digital photography, including DSLR cameras and smartphones, for remote dental operations. Literature suggests that use of digital images was found to enhance caries detection sensitivity compared to visual examination. The study aims were 1) to compare the reliability of visual inspection and digital photographs for caries diagnosis among dental clinicians and 2) to compare between use of full ICDAS score and modified ICDAS score for caries classification, with potential implications for dental practices. **Methods**: The research involved 45 postgraduate dental students examining 45 extracted permanent teeth using full ICDAS scores and modified ICDAS scores in three phases (Full Visual ICDAS, Digital ICDAS and Combination of Visual and Digital ICDAS). Kappa scores, sensitivity, specificity and Area Under the Curve (AUC) readings between participants answers and benchmark answers were determined. **Results**: Statistical analysis revealed that introducing digital images reduced inter-rater agreement, however modified ICDAS codes utilization showed comparable results between visual and digital methods. Intra-rater agreement for visual and modified ICDAS was high, while digital images showed moderate agreement. Sensitivity for caries detection was around 93% for visual and digital methods, and specificity ranged from 67% to 80%. The AUC values indicated good performance (0.89) for both full and modified ICDAS with visual examination and lower values for digital examination (0.81-0.82). **Discussion:** Results were consistent with prior studies however this research highlights video/image efficacy, emphasizing validity, reliability, and improved clinician planning using modified ICDAS. **Conclusion:** Use of digital photographs for caries diagnosis were promising and the use of modified ICDAS codes were comparable to conventional use of full ICDAS codes. Overall, the study demonstrated the potential benefits of digital methods in dental caries diagnosis and tele-dentistry practices.
Keywords: Diagnosis, Digital images, International Caries Detection Assessment System (ICDAS), Reliability and Validity.

FINAL ABSTRACT

PAPER 82

Identifying Effective Oral Health Interventions for Disadvantaged School children: A Systematic Review

Tajudin ANA[1], Anuwar AHK[1], Marhazlinda J[1], Yusof ZYM[1]

[1]Department of Community Dentistry and Clinical Prevention, Faculty of Dentistry, Universiti Malaya
Email: 17201931@siswa.um.edu.my

Objectives: Children from rural and low socioeconomic backgrounds face persistent inequalities in oral health, specifically dental caries, and periodontal diseases. This review aimed to identify effective interventions for promoting oral health and preventing oral diseases for primary schoolchildren from rural and low socioeconomic backgrounds. **Methods:** We conducted a comprehensive search using PubMed, MEDLINE and CINAHL via EBSCOhost, Cochrane Library, Web of Science, and Dentistry and Oral Sciences databases for English publications from 2000 to 2022. We included both randomised and non-randomised controlled trials that evaluated promotive and preventive oral health interventions targeting primary schoolchildren from rural and low socioeconomic backgrounds. Measured outcomes encompassed dental caries, periodontal disease, oral hygiene status/practices, sugar consumption, or smoking behaviours. Two reviewers independently screened the articles, performed data extraction using a standardised form, and assessed the risk of bias using the Cochrane RoB 2 and ROBINS-I tools. Given the substantial heterogeneity, a narrative analysis was undertaken. **Results:** From 35 included studies, the identified interventions were health and oral health education (n=20), establishment of school/community health policies (n=5), fissure sealants (n=4), professionally applied topical fluoride (n=10), supervised toothbrushing (n=7), provision of free toothbrush and toothpaste (n=1), and fluoride mouth rinse (n=2). The interventions were found to be effective in addressing caries (n=15), periodontal disease (n=2), oral hygiene (n=2), sugar consumption (n=6) and tobacco use (n=2). However, many included studies exhibited high risk of bias. **Discussion:** Despite the high risk of bias, the findings from this review represent the best available evidence at present and can provide insights into the effective interventions for disadvantaged schoolchildren. Future well-designed studies are required to provide high-quality evidence. **Conclusion:** The findings indicate that a comprehensive intervention involving both clinical prevention and oral health promotion can positively impact the oral health of primary schoolchildren from rural and low socioeconomic backgrounds.

Keywords: children, intervention, low socioeconomic, oral health, rural

FINAL ABSTRACT

PAPER 83

Economic Factors and Caries-Free Prevalence among Schoolchildren in Malaysia

Najihah L[1], Wan Husin WZ[2], Marhazlinda J[1]

[1]Department of Community Oral Health and Clinical Prevention, Faculty of Dentistry, Universiti Malaya
[2]Mathematical Science Studies, College of Computing, Informatics and Media, Universiti Teknologi MARA Cawangan Kelantan, Machang
Email: najihah@um.edu.my

Objective: Dental caries is a costly condition to treat, leaving an enormous burden on socially disadvantaged populations. The economic situation affects oral health-seeking behaviour, diet preference and oral health practices which may lead to oral health disparities between social classes. This study compared the association between the economic factors and caries-free prevalence among schoolchildren across states in Malaysia. **Methods**: It was a secondary data analysis of caries-free prevalence and economic factors among 16-year-old schoolchildren attending government schools from 1996 to 2019. The association between household income and relative poverty incidence and caries-free prevalence in six states was analysed using multiple linear regression. In unmet assumptions event, polynomial regression analysis or regression with ARMA errors were employed. **Results**: The states with the highest household income in this study, Selangor and Malacca, reported a higher caries-free prevalence among 16-year-old schoolchildren than states with lower household income, such as Sabah and Kelantan. Household income was a significant cariesfree associated factor in Sabah, Malacca, and Pahang, influencing more than 55% variation of caries-free prevalence in these states. Poverty was a significant caries-free associated factor in Selangor and Kelantan, explaining a 63% variation in caries-free among schoolchildren in these states. An increasing poverty trend in Selangor resulted in slow increment of caries-free prevalence. None of the economic factors were significant in Terengganu. **Discussion:** Evidence of socioeconomic inequalities in schoolchildren's oral health may reflect the accessibility to oral healthcare and the availability and affordability of healthy food and fluoride toothpaste in certain states. **Conclusions**: Impacts of economic factors on caries-free prevalence among schoolchildren differ between states. Thus, considering the oral health status of schoolchildren in these underprivileged states is crucial in planning resource allocation.

Keywords : Caries-free, economic factor, school children, household income, poverty

FINAL ABSTRACT

PAPER 84

A Narrative Review On Utilizing Of Plants And Herbs In Dentistry

Nur Farhana Mat Hussin[1], Siti Mariam Ab Ghani[1], Hazem Mofreh Dakhilallah Altarawneh[1], Wan Noor Nazayan Bt Wan Nik[2], Mohd Hafiz B Arzmi[3], Azlini Bt Ismail[3]

[1]Centre of Restorative Dentistry Studies, Faculty of Dentistry, UiTM
[2]Department of Prosthodontics, Kuliyyah of Dentistry, IIUM
[3]Department of Fundamental Dental and Medical Sciences, Kuliyyah of Dentistry, IIUM
Email: nurfarhanahussin@gmail.com

Objectives: Traditional herbs has increased attention due to their therapeutic and general health-improving qualities as reported in the literature. This review paper aimed to describe various herbal products that are currently used in dental care including their sources, active compounds, applications and effectiveness. **Methodology**: A literature search was conducted using WoS, Pubmed and Scopus with the search term 'herbal' AND 'dentistry' AND 'alternative treatment'. Review articles, in-vitro studies and clinical study from the past 15 years were included. **Result**: Among the 421 articles extracted from the search, 158 articles regarding traditional herbal have been identified with their dental applications. 68 review article, 64 in-vitro experiment, 19 clinical study, 3 case reports and 3 questionnaires were selected for the review. Herbals such as Propolis, green tea, ginger, *Zataria multiflora*, chitosan, garlic, Artemisia, *Schinus terebinthifolius* Raddi, *Uncaria tomentosa*, *Punica granatum*, and *Ricinus communis* were reported to be useful in the treatment of denture stomatitis. *Rhizoma Imperatae* extract has been added to oral care products, which showed excellent effect on reducing gingivitis. While *Pistacia atlantica* Var. mutica extract mouthwash was reported that effective against dental plaque bacteria and subgingival microorganisms. **Conclusion**: The safety, toxicity and effectiveness of these traditional herbs are well reported in in-vitro experiments but with limited clinical study. Thus, more comprehensive clinical studies are recommended to assess the therapeutic effect of these herbs for clinical applications.

Keywords: Natural product, bioactive chemicals, dental health.

FINAL ABSTRACT

PAPER 85

Evaluation of Accuracy of Implant Placement with Guided Implant Surgery using CBCT and Optical Scan

Kanniappan G[1] , Hari P[1] , Jujare RH [1]

[1] Department of Postgraduate, Faculty of Dentistry, MAHSA University
[2] Department of Periodontology, Faculty of Dentistry, MAHSA University
[3] Department of Prosthodontics, Faculty of Dentistry, MAHSA University
Email: ghayathri2393@gmail.com

Objectives: To compare the accuracy of fully guided and free hand implant surgery. To compare the accuracy of the final implant position using CBCT and optical scan. To correlate the accuracy of guided implant surgery for anterior and posterior edentulous space. **Methods:** An in-vitro randomised experimental study was designed. Mandibular implant surgical models simulating D2 bone with missing lower two lateral incisors and first molars on left and right side were used for implant placement. Four implants -2 anterior and 2 posteriors on either side were randomly placed according to the two groups of implant placement protocol; fully guided and free hand implant placement. Implant placement protocol were completed on models fixed in mannequins to simulate the clinical situation and accuracy of placed implant was evaluated by measuring vertical, horizontal deviation and angular deviation from the planned positions using CBCT and intraoral scanner. **Results:** With the exception of vertical deviation, the fully guided placement was more accurate than the freehand placement for both anterior and posterior implant placement. Mean differences between the optical scanning and CBCT measurements were comparable. Posterior teeth depicted higher deviations compared to anterior teeth. **Conclusions:** Within the limits of this in vitro study, a significantly more accurate implant position with Fully Guided placement, followed by freehand placements. Optical scanner can be used to evaluate the post operative implant position whenever needed thereby minimizing the need for post op CBCT radiation to the patients.

Keywords: guided implant surgery, freehand implant surgery, CBCT, optical scan, angular deviation

FINAL ABSTRACT

PAPER 86

Parents Knowledge And Practice Towards Early Orthodontic Treatment In Klang Valley - A Cross-Sectional Study

Dr Daveinthiran T [1], Assoc. Prof. Dr. Prathap CM[2]

[1]Private Dental Practitioner, Klinik Pergigian Ti, Bandar Rimbayu
[2]Faculty of Dentistry, MAHSA University
Email: daveinthiran91@gmail.com

Objectives: The primary aim of this study is to measure the level of parental knowledge and practice concerning their children's malocclusion and the need for orthodontic treatment. **Methods**: A cross-sectional survey was conducted involving parents attending private dental clinics around Klang Valley, Malaysia. Demographic data on parents, along with knowledge and practice on their understanding and were gathered. A maximum attainable mean score of 1.0 was assigned to both knowledge and practice aspects. **Results**: The survey received responses from 265 participants. The collective mean scores for parental knowledge and practice were recorded as 0.40 and 0.46, respectively. Statistical analysis showed no significant variance based on gender, age, parental history of orthodontic treatment, education, or income levels. Notably, females exhibited higher awareness than males regarding the potential impact of malocclusion on their children's self-esteem ($p = 0.004$). Conversely, individuals from lower and middle-income brackets demonstrated lesser awareness of the heightened risk of injuries associated with prominent incisors ($p = 0.001$) and the diverse range of orthodontic devices available ($p = 0.004$). While 80% of parents expressed a willingness to encourage their children towards orthodontic treatment based on professional advice, 40.5% and 34% of those from lower and middle-income groups, respectively, were inclined to await publicly funded services, even if their child required urgent treatment ($p < 0.000$). In contrast, only 18% of the higher-income group shared a similar view. **Conclusions**: The findings revealed a moderate to high level of parental knowledge and practice was seen. Parents with a more favorable socioeconomic status displayed greater awareness and proactive behavior compared to their counterparts. The outcomes emphasize the necessity for public health services to consider parental socioeconomic status when allocating resources for orthodontic treatment among children and adolescents.

Keywords: Children, Orthodontics, Parental knowledge , Practice, Klang valley

FINAL ABSTRACT

PAPER 87

Macrophages polarization in the gingival tissue of patients with arrested periodontitis.

Mohamad-Hassan NH[1], Sulaiman E[1], Mohamad-Zaini Z[2], Wan-Ibrahim WI[3], Safii S[1]

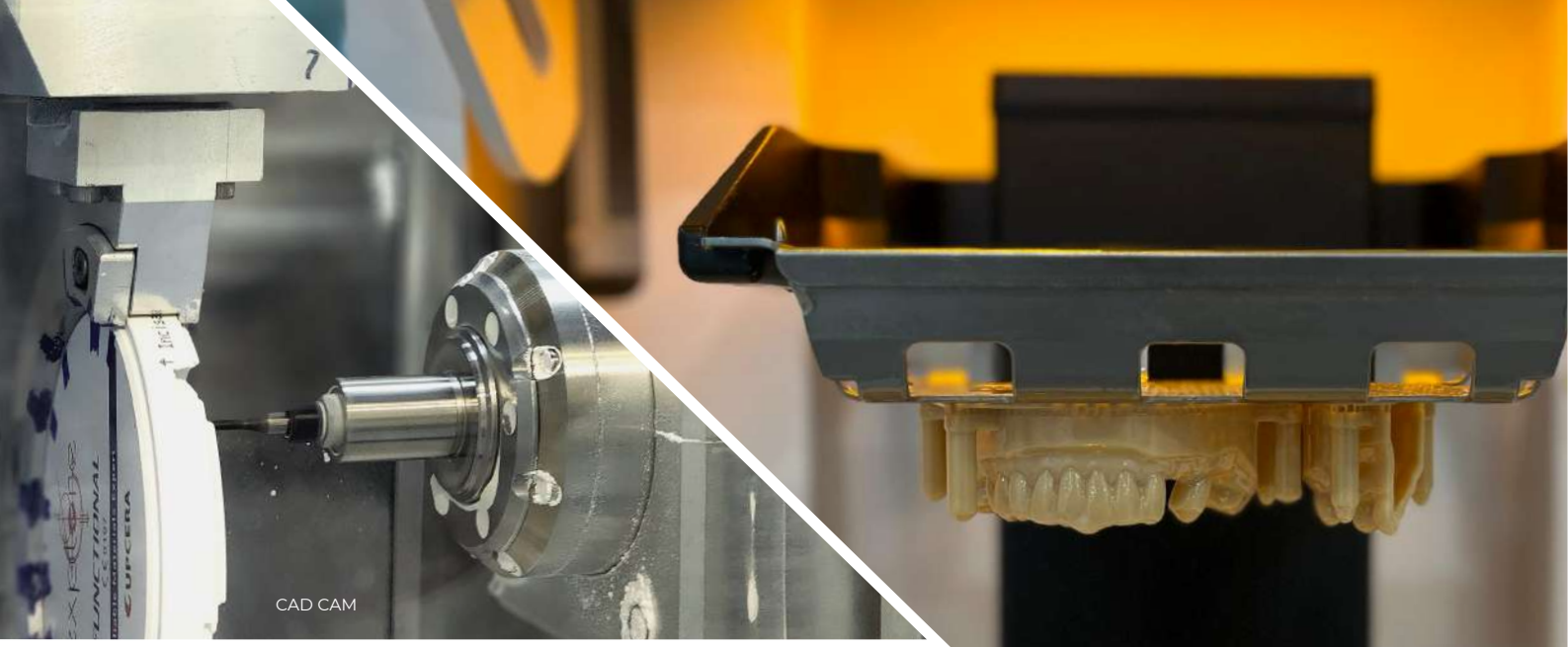
[1] Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya
[2]Department of Oro-Maxillofacial Surgical and Medical Sciences, Universiti Malaya
[3]Department of Oral and Craniofacial Sciences, Universiti Malaya
Email: norulhusna.mh@um.edu.my

Objective: History or presence of periodontitis has been established as a risk factor for peri-implantitis. Recent studies also revealed an increased interest in evaluating osteoimmunology-driven dental implant osseointegration. Among the components of the immune system thought to play a role in the inflammatory response crucial to ensure successful osseointegration are macrophages which mainly polarized into M1- (resident, pro-inflammatory) and M2- (activated, anti-inflammatory) phenotypes. Periodontitis and peri-implantitis-infected tissue were shown to be dominated by M1-macrophages.To evaluate the macrophages polarization in the gingival tissue (GT) of patients with arrested periodontitis and its shifts following dental implant placement. **Method:** Patients receiving first dental implant were recruited and divided into those with (test) and without (control) history of periodontitis. Periodontal status was defined using the new 2017 classification of periodontal condition. GT at the implant site were harvested during the first (pre-operative) and second stage (post-operative) implant surgery, fixed in formalin and embedded in paraffin prior to analysis. M1- and M2-macrophages were identified using double-stained immunofluorescent markers. Images acquired using a fluorescent microscope and quantified using image analysis software. **Results:** GT from 25 subjects (12 control, 13 test; mean age: 48.56) were harvested and analysed. Both macrophages were detected on all samples. M1-macrophages were lesser in pre-operative gingival tissue compared to M2-macrophages. However, higher expression of M2-macrophages was mostly seen in test group in both pre- and post-implant placement. **Conclusions:** As the implants were submerged, diseased condition was not likely to occur resulting in lower expression of pro-inflammatory macrophages seen in all tissue samples. This study revealed that the gingival inflammatory condition of both groups was similar pre-operatively. Higher expression of M2-macrophages could be due to the gingival inflammation occurring in subjects in both groups instead of the influence from the implant placement, with more significance in subjects with history of periodontitis.

Keywords: dental implant, periodontitis, gingival tissue, macrophages, immunofluorescence

APEX
DIGITAL DENTAL
MODERN Dental Group

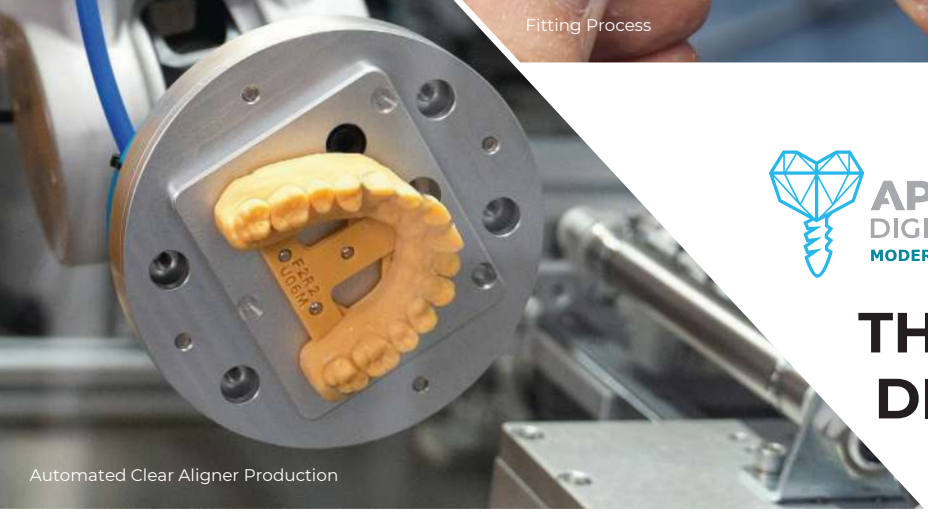
GOLD SPONSOR



CAD CAM

3D Printing Models

Fitting Process



Automated Clear Aligner Production

APEX
DIGITAL DENTAL
MODERN Dental Group

THE FUTURE OF DIGITAL DENTISTRY

Center of Dental Education (CDE)

Dental Technicians Team

+60 10-228 8323 info@apexdental.com.my
www.apexdigitaldental.com
Wisma Bentley Music, Lot 2.01 A-B, Level 2, Jalan PJU 7/2, Mutiara Damansara, 47820 Petaling Jaya, Selangor.

SILVER SPONSOR

PREMIERE DENTAL

Sanctuary®

Sanctuary®

Distributed by:

ACME
MD GLOBAL SDN BHD

Dental Dam System

✓ Powder-Free Dental Dam ✓ Dental Dam Accessories ✓ Light-Cured Liquid Dam

Sanctuary Dental | Sanctuary Dental Official | info@sanctuaryhealth.com.my | www.sanctuary-dental.com