

ISSN 1738-8937

IJOH

The International
Journal of Oral Health



The official journal of the Asian Academy of Preventive Dentistry



Volume 17

September 2025

THE INTERNATIONAL JOURNAL OF ORAL HEALTH

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Message From Editor-in-Chief



Dear Readers,

I hope this message finds you well. It is my great pleasure, as Editor-in-Chief of the International Journal of Oral Health (IJOH), to welcome you to this issue. I would like to extend my deepest gratitude to our authors, reviewers, editors, and dedicated support team whose expertise, commitment, and passion have made this publication possible.

The strength of IJOH lies in its mission to serve as a trusted platform for the exchange of knowledge in dentistry—where research innovation meets clinical relevance. Each contribution represents not only scientific advancement, but also a shared vision to improve oral health and reduce disparities across communities.

This issue is published in conjunction with the Asian Academy of Preventive Dentistry (AAPD) Conference 2025 in Bali, Indonesia, a gathering that brings together leading experts, young researchers, and practitioners across Asia and beyond. In these pages, you will find a diverse selection of topics ranging from child oral health, epidemiology, and preventive strategies, to advancements in innovative dental materials. We believe these articles will stimulate reflection, inspire dialogue, and enrich clinical and public health practice worldwide.

As IJOH continues to grow, I am confident that AAPD will play an even greater role in shaping the future of preventive dentistry and making tangible differences in oral health.

Thank you for your continued trust and support. I wish you insightful reading.

Sincerely,

Dr. Melissa Adiatman

Editor-in-Chief, International Journal of Oral Health (IJOH)

**Proceedings of the
17th International
Conference of the Asian
Academy of Preventive
Dentistry**

**1st to 4th
September
2025
Bali Indonesia**

**Innovations in Dental Public Health and Preventive
Dentistry: Bridging Gaps for Better Oral Health**

Asian Academy of Preventive Dentistry

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Keynote & Invited Lecture Abstracts

Day 1 – Workshop 1

Title: Designing Maternal and Child Oral Health (MCOH): Policy, Practice, People

Speaker: Dr. Hyewon Lee, DrPH DMD

Affiliation: Seoul National University



Abstract

Background and Objectives

Maternal and child oral health represents a critical yet often overlooked component of comprehensive MCH healthcare delivery. This interactive workshop aims to foster collaborative dialogue and design MCOH policies, programs, and advocacy campaigns to improve oral health outcomes for mothers and children in specific contexts. The session combines evidence-based knowledge sharing with hands-on design thinking to address the multifaceted challenges in MCOH implementation.

Flow

The workshop employs a mixed-format approach integrating didactic presentation, international case study sharing, and collaborative group work. Participants will engage in structured activities designed to translate theoretical knowledge into actionable strategies across policy, practice, and advocacy domains. The session includes real-time documentation and recording to facilitate knowledge dissemination and future publication.

Biography

Hyewon Lee is a board-certified pediatric dentist in the U.S. and Kenya, currently directing the Global Maternal and Child Oral Health Center at Seoul National University. From 2021 to 2024, she has chaired the World Federation of Public Health Associations (WFPHA) Oral Health Workgroup, fostering collaborations among national public health associations to integrate oral health into primary healthcare. Her major achievement included the launch of the Global Maternal and Child Oral Health Initiative with more than 50 endorsements from international and national public health organizations, including ministries of health.

Her expertise bridges clinical practice and public policy. Previously, as a public health officer at the U.S. Department of Health, she worked with public health experts in developing national oral health guidelines and oral health indicators, with particular focus on maternal oral health. Recently, she secured a South Korea's Ministry of Affairs grant to strengthen Kenya's primary healthcare workforce capacity in maternal and child oral health promotion.

Dr. Hyewon holds a dental degree from Harvard School of Dental Medicine and earned both master's (health communication) and doctoral degrees in public health (health policy and management) from Johns Hopkins School of Public Health

Day 1 - Satellite Symposium 1

Title: From Chairside to Community: Scaling Up the Benefits of Fluoride Varnish

Speaker: Dr. Atik Ramadhani, DDS, PhD

Affiliation: Universitas Indonesia



Abstract

Dental caries remains one of the most prevalent chronic conditions globally, disproportionately affecting children and vulnerable populations. Among the available preventive strategies, fluoride varnish has emerged as a simple, safe, and highly effective intervention to reduce caries incidence. Traditionally applied chairside in clinical practice, its utility has extended far beyond the dental office, with growing evidence supporting its integration into public health initiatives, school-based programs, and community outreach. This presentation explores the dual role of fluoride varnish in strengthening both individualized preventive care and population-level oral health promotion.

Recent systematic reviews and large-scale implementation studies demonstrate that professionally applied fluoride varnish significantly reduces caries progression, particularly in high-risk groups. Importantly, fluoride varnish application is cost-effective, requires minimal equipment, and can be delivered by a broad range of trained health personnel, enabling scalability in resource-limited settings. In line with the WHO Global Oral Health Action Plan and the Bangkok Declaration, fluoride varnish is a strategic intervention to narrow inequalities in oral health, linking evidence-based dentistry with broader health system goals.

This session will discuss the latest clinical evidence, highlight models of successful community-based fluoride varnish programs, and outline strategies for integrating varnish into school health initiatives and primary care. By bridging the gap between chairside practice and community-level implementation, fluoride varnish has the potential to transform preventive dentistry, reduce oral health disparities, and contribute to achieving universal oral health coverage.

Biography

Dr. Atik Ramadhani, DDS, PhD is an Assistant Professor at the Department of Dental Public Health and Preventive Dentistry, Faculty of Dentistry, Universitas Indonesia, where she also serves as Head of the Master's Program in Community Dentistry. She obtained her PhD in Dental Science from Kagoshima University, Japan, and her DDS from Universitas Indonesia.

Her academic and research interests focus on oral health promotion, special care dentistry, dental service utilization, and preventive strategies for vulnerable populations, particularly children and older adults. Dr. Ramadhani has led and contributed to multiple nationally funded research projects and has published widely in international peer-reviewed journals such as *Gerodontology*, *BMC Oral Health*, and the *European Journal of General Dentistry*.

She has presented her work at numerous international conferences across Asia and has received several prestigious awards, including recognitions from IPKESGIMI and SEADE. Dr. Ramadhani is deeply committed to advancing oral health equity and community-based prevention in Indonesia.

Day 1 - Satellite Symposium 2

Title: Clinical and Preventive Applications of 450 nm and 650 nm Diode Lasers in Dentistry

Speaker: Dr. RM.Norman Trikusumo Indro, MSc, Sp.Perio

Affiliation: Universitas Prof. Dr. Moestopo (B)



Abstract

Background: Lasers have emerged as a minimally invasive alternative to conventional dental procedures, offering improved precision, reduced discomfort, and enhanced patient outcomes. Among various laser systems, diode lasers with visible blue (450 nm) and red (650 nm) wavelengths are gaining attention for their applications in clinical and preventive dentistry. **Objective:** This review aims to highlight the clinical significance and preventive roles of 450 nm and 650 nm diode lasers in daily dental practice. **Methods:** Literature from the last decade was reviewed to evaluate the effectiveness, mechanism of action, and clinical indications of 450 nm and 650 nm diode lasers in dentistry.

Biography

Dr. Norman is a passionate periodontist and lecturer at the Department of Periodontology, Universitas Prof. Dr. Moestopo (Beragama), Jakarta. With a strong commitment to education and innovation, he brings a unique blend of clinical expertise and creative energy to the field of periodontal therapy and digital dentistry.

He holds a Mastership in Laser Dentistry (MSc) from RWTH Aachen University, Germany, and a Periodontology Specialist degree from Universitas Gadjah Mada. He is known for his engaging communication skills, entrepreneurial mindset, and advocacy of dental photography and soft tissue management.

Actively involved in continuing dental education, Dr. Norman has been a speaker in various national dental forums, including the Perio Terkini Symposium, Aceh Dental Forum, and Pepsodent Dental Expert Webinar. His hands-on workshops are appreciated for their interactive and practical approaches, empowering dental professionals to integrate periodontal excellence into daily practice.

Day 1 - Satellite Symposium 3

Title: Reframing Sensitivity: Integrating Empathy, Evidence, and Everyday Behavior in Community-Based Oral Health Programs

Speaker: Dr. Gilang Rasuna S.W., M.Kes., FISDPH., FISPD

Affiliation: Universitas Airlangga



Abstract

Dental hypersensitivity, often overlooked in strategic public health discourse, represents more than a minor clinical symptom. For many individuals, daily experiences of sensitivity lead to reduced brushing frequency, avoidance of nutritious foods, and delays in seeking care—behaviors which, when aggregated across communities, contribute to a greater burden of oral disease. This symposium reframes sensitivity as both a behavioral barrier and an entry point for innovative oral health promotion.

Grounded in the PRECEDE–PROCEED model and insights from the newly published Designing Oral Health Promotion Program: A Behavioral Approach (one of seven books released by IPKESGIMI for AAPD 2025), the session highlights how lived experiences of pain, anxiety, and discomfort intersect with knowledge and motivation to shape oral health behaviors. By addressing sensitivity, oral health professionals can foster comfort, reinforce self-efficacy, and encourage preventive behaviors across populations, particularly among vulnerable groups such as mothers, older adults, and adolescents.

The discussion will illustrate how clinically validated sensitivity-relief formulations (e.g., potassium nitrate with fluoride) can act as enabling factors within comprehensive health promotion strategies—without reducing interventions to product distribution alone. Instead, these products are positioned as facilitators of behavior change, embedded within frameworks of education, empowerment, and reinforcement.

The symposium will close with a critical reflection on ethical integration, distinguishing between promotional tactics and participatory health design, and will call on dental professionals to serve as facilitators of trust, comfort, and dignity in advancing community oral health.

Biography

Dr. Gilang Rasuna Sabdho Wening, DDS, MPH, PhD, FISDPH, FISPD is an Assistant Professor at the Department of Dental Public Health and Preventive Dentistry, Faculty of Dental Medicine, Universitas Airlangga. He earned his DDS, MPH, and PhD at Universitas Airlangga, completing his doctoral studies in health promotion and behavioral sciences with the distinction of Best Graduate in 2021.

Dr. Gilang's expertise spans oral health promotion, behavioral sciences, preventive dentistry, maternal and child oral health, and digital health communication. He has authored books and numerous scientific publications, and his doctoral dissertation on maternal oral health literacy contributed significantly to community-based caries prevention strategies.

Beyond academia, Dr. Gilang has been widely recognized for impactful community empowerment initiatives, including programs for mothers, older adults, and people living with HIV/AIDS. His leadership roles include serving as General Secretary of IPKESGIMI. His work reflects a strong commitment to advancing oral health equity and preventive care in Indonesia.

Day 1 - Hands-on 1

Title: Complete Step by Step Layering Technique for Anterior Composite Restoration

Speaker: Dr. Yusuf Pamungkas, Sp.KG

Affiliation: Senior Specialist in Conservative Dentistry



Abstract

This intensive hands-on session presents a predictable, biomimetic workflow for restoring anterior teeth with direct composite—covering Class III/IV/V lesions and diastema closure. Participants will be guided through each stage: case selection and shade mapping (hue, chroma, value, translucency) under neutral light; isolation and conservative preparation with bevel design; adhesive strategy (selective enamel etch vs. total-etch with universal adhesives); and creation of a palatal shell using a silicone index derived from a mock-up. Step by step, attendees will layer dentin masses to sculpt mamelons, control opacities with tints/opaquers, and finalize enamel layers to reproduce opalescence and the incisal halo. The session concludes with anatomical contouring (primary/secondary/tertiary anatomy), finishing and polishing sequences to match natural surface texture and gloss, and checks for proximal contact, line angles, and occlusion. Troubleshooting will address white lines, marginal staining, shade mismatch, voids, and surface dullness, alongside light-curing protocols (increment thickness and curing distance/time).

By the end, participants will be able to:

- Execute a palatal-index layering protocol that reliably recreates natural incisal effects.
- Select and sequence composite shades/opacities based on structured shade mapping.
- Achieve invisible margins and durable gloss with reproducible finishing/polishing steps.

Biography

Dr. Yusuf Bagus Pamungkas is a specialist in Conservative Dentistry (Operative and Endodontics) based in Surabaya, Indonesia. A graduate of Universitas Airlangga, he brings over a decade of experience in both clinical dentistry and dental education. Dr. Yusuf is actively involved as a Key Opinion Leader (KOL) for prominent dental brands including VOCO Indonesia, GC Indonesia, and CJ Optic Microscope, where he advocates for precision and innovation in restorative dentistry. He maintains a thriving private practice and frequently lectures on advanced restorative techniques, microscope-enhanced dentistry, and adhesive protocols. His dedication to excellence and clinical mastery makes him a sought-after trainer and speaker in Southeast Asia.

Day 1 – Hands-on 3

Title: Root Canal Management with Bioceramic sealer in Modern Endodontic Treatment

Speaker: Dr. Dewa Made Sutajaya, Sp.KG

Affiliation: Senior Specialist in Conservative Dentistry



Abstract

Advancements in endodontics have shifted the focus toward minimally invasive yet biologically driven approaches that ensure long-term tooth preservation. One of the most significant innovations is the application of bioceramic sealers, which provide superior sealing ability, bioactivity, and biocompatibility compared to conventional sealers.

This hands-on session is designed to introduce participants to contemporary root canal management protocols that integrate bioceramic sealers into clinical practice. The program covers case selection, canal preparation using modern rotary instrumentation, irrigation protocols for effective disinfection, and the role of hydraulic condensation techniques in optimizing the adaptation of bioceramic sealers. Emphasis will be placed on handling properties, setting reactions, and the biological advantages of these materials, including their ability to form hydroxyapatite and promote periapical healing.

Participants will perform practical exercises on simulated canals to gain proficiency in obturation techniques using bioceramic sealers. Troubleshooting common challenges such as overfilling, sealer extrusion, and retreatment considerations will also be discussed.

By the end of the session, attendees will be able to:

- Understand the properties and clinical advantages of bioceramic sealers.
- Apply step-by-step root canal preparation and obturation techniques in line with modern endodontic standards.
- Integrate bioceramic-based obturation into daily practice for predictable and biologically favorable outcomes.

Biography

Dr. Dewa Made Sutajaya is a respected endodontist and restorative dentistry expert from Bali, Indonesia. A graduate and faculty member of Universitas Mahasaraswati Denpasar, he is widely recognized for his clinical expertise and engaging approach to dental education. With a strong focus on microscope-assisted endodontics, adhesive restorations, and contemporary techniques in conservative dentistry, Dr. Dewa is frequently invited to conduct workshops and hands-on training sessions across Indonesia. As a passionate educator and hands-on demonstrator, he seamlessly blends evidence-based practice with practical skills, making complex procedures accessible and impactful for practitioners.

Title: Invisible Restorations**Speaker: Dr. Mirza Mangku Anom, Sp.KG****Affiliation:** Senior Specialist in Conservative Dentistry**Abstract**

Achieving truly “invisible restorations” is the ultimate goal in contemporary restorative dentistry, where clinical success is measured not only by function but also by seamless esthetics. Direct composite restorations have advanced significantly, allowing clinicians to reproduce the natural optical properties of enamel and dentin with remarkable accuracy when guided by the correct layering protocols, shade selection, and finishing techniques.

This hands-on session is designed to provide participants with a comprehensive, step-by-step workflow for creating invisible anterior and posterior restorations. Key topics include shade mapping and analysis under controlled lighting, selection of composite systems with varying opacities and translucencies, and incremental layering strategies that mimic natural tooth structure. Participants will practice anatomical sculpting, secondary and tertiary characterization, and surface texture reproduction to achieve lifelike esthetic integration. Special emphasis will be placed on finishing and polishing protocols that ensure long-lasting gloss and color stability.

Clinical tips will also address common challenges, such as margin blending, avoiding demarcation lines, and managing cases with complex shade mismatches. Through guided exercises on typodonts, participants will gain practical skills and confidence to deliver restorations that are indistinguishable from natural dentition.

- By the end of the session, attendees will be able to:
- Perform accurate shade selection and mapping for optimal esthetics.
- Apply layering and sculpting techniques to replicate natural tooth morphology.
- Achieve seamless margins, texture, and gloss for restorations that are both functional and invisible.

Biography

Dr. Mirza Mangku Anom, Sp.KG is a Specialist in Conservative Dentistry with expertise in restorative dentistry and endodontic treatment. He completed his dental degree and professional training at Universitas Gadjah Mada (UGM), where he also pursued his specialization in Conservative Dentistry. Currently, Dr. Mirza practices as a restorative and endodontic specialist at RS JIH Yogyakarta and Klinik Utama Syaify Dental, as well as serving at RSGM UGM Prof. Soedomo.

With a strong passion for clinical excellence and education, Dr. Mirza is also active as a certified national speaker (TPK Kemkes) and dental health educator, utilizing both professional forums and social media platforms to promote evidence-based dental practices. His clinical focus lies in esthetic restorative procedures, endodontics, and patient-centered treatment strategies that combine precision, function, and esthetics. Dedicated to advancing the field of conservative dentistry, Dr. Mirza continues to share his knowledge through workshops, lectures, and hands-on training for dental professionals across Indonesia

Day 2 - Keynote Lecture 1

Title: Global health in crisis and opportunity.

From Bangkok to action: Time to deliver on global oral health commitments

Speaker: Dr. Benoit Varenne

Affiliation: WHO Headquarter



Abstract

The global health landscape is facing unprecedented challenges—from climate emergencies to geopolitical instability and economic pressures. These crises are reshaping priorities and straining health systems. Yet, amid this turbulence, the momentum behind the global oral health agenda continues to grow. This paradox highlights the resilience and relevance of oral health as a vital component of public health. It also calls for innovation and adaptability to ensure oral health remains a priority and is effectively integrated into broader health strategies for upcoming years.

The WHO Resolution on Oral Health (WHA74.5), adopted in 2021, mandated the integration of oral health into NCD and universal health coverage (UHC) frameworks. The WHO Global Oral Health Status Report (2022) provided a stark overview of the burden, prompting a wave of policy action. This was followed by the Global Strategy and Oral Health Action Plan 2023–2030 (GOHAP), which outlines 11 global targets, 6 strategic objectives, and 100 actions for Member States, WHO, and partners.

Regional efforts, especially in the Asia-Pacific region, have underscored the disproportionate burden of oral diseases and the need for tailored interventions. The Bangkok Global Oral Health Meeting in 2024 brought together over 100 countries and 35 UN agencies, culminating in the Bangkok Declaration: “No Health Without Oral Health”. This reaffirmed global commitment and issued a clear call to action.

The focus is now shifting from policy development to implementation. Funding is a critical enabler of this transition, alongside cross-sector collaboration among UN agencies, NGOs, academia, and the private sector to operationalize the GOHAP. Oral health programmes across regions and countries stand at a pivotal juncture. Innovation and agility will be essential to navigate the evolving global health context and ensure oral health is no longer overlooked—but fully embedded within the global health agenda.

With robust policy foundations, expanding partnerships, and targeted investments, the coming years will be decisive in translating global commitments into measurable outcomes at the country level.

Biography

Dr. Benoit Varenne currently serves as the Technical Lead for Oral Health at the World Health Organization (WHO), Geneva. With over seven years of leadership in global oral health governance, he has led the integration of oral health into Universal Health Coverage (UHC), championed the WHO Global Oral Health Action Plan (2023–2030), and steered international collaborative efforts on antimicrobial resistance (AMR), sustainability, and public health education. His expertise spans dental public health, epidemiology, and global health diplomacy, grounded in interdisciplinary knowledge and field-based policy implementation.

Day 2 – Keynote Lecture 2

Title: Advancing Dental Public Health in China: Bridging Gaps Through AI, Genetic Insights, and Innovative Strategies

Speaker: Prof. Shuguo Zheng

Affiliation: Peking University School of Stomatology



Abstract

Addressing the challenges of dental public health in China requires innovative approaches and collaborative efforts. Over the past decade, China has harnessed artificial intelligence to conduct large-scale oral epidemiological surveys with unprecedented precision, enabling targeted interventions in high-risk populations. Meanwhile, systematic research into sugar control policies has demonstrated significant reduction in caries prevalence among children. Genetic epidemiology has provided critical insights into the heritability of oral diseases, revolutionizing personalized prevention strategies. Furthermore, breakthroughs in the development of preventive materials, such as fluoride-releasing composites, have enhanced oral health outcomes. These multidisciplinary innovations not only address domestic disparities but also serve as a model for bridging gaps in dental public health across Asia.

Biography

Shuguo Zheng, Professor and Chairman, Department of Preventive Dentistry, Peking University School of Stomatology (PKUSS). He graduated from PKUSS with DMD (1992) and Ph.D. & M.D. (1996). He is the vice-President of the Asian Academy of Preventive Dentistry (AAPD) and the director of the World Health Organization Collaborating Center (WHOCC) for the Research and Training in Preventive Dentistry in China. He is also the Chairman-elect of the Chinese Society of Preventive Dentistry, Chinese Stomatological Association. He is also the chief representative of the Chief Dental Officer of China. His main research areas are: oral biomarker study in oral and systemic diseases, dental public health study in China, molecular biological study for dental developmental abnormality. He received over 23 national research grants and published over 100 papers as the first author or corresponding author in journals such as *Protein & Cell*, *Journal of Dental Research*. As the first complete person, he has won one international and three national science and technology awards.

Day 2 – Symposium 1

Title: Integrating Oral Health into Maternal and Child Health: Global Strategies and Local Innovations

Speaker: Dr. Hyewon Lee, DrPH DMD

Affiliation: Seoul National University



Abstract

Background: Despite WHO's unprecedented momentum to integrate oral health into primary healthcare, oral health remains poorly integrated into maternal and child health (MCH) services globally. In Kenya's Kilifi County, only 10 dentists serve 1.5 million residents, while oral health education is absent from antenatal/postnatal care and well-child visits. Acknowledging intergenerational associations of oral diseases and the importance of creating healthier environment and behavior among mothers and young children, this first Korea International Cooperation Agency (KOICA)-funded oral health project aims to promote maternal and child oral health by training MCH providers in oral health education and assessment.

Methods: This capacity building project has implemented a Maternal and Child Oral Health (MCOH) training model across 27 health facilities in Kilifi County, Kenya (2025-2026), training 50 MCH providers to serve about 1,000 mothers. The project establishes a multi-stakeholder Kilifi Oral Health Committee comprising dental professionals, MCH providers, government representatives, and community members to guide implementation. Using WHO oral health modules and Smile for Life Oral Health, we train nurses from level 2-4 facilities and community oral health officers through task-shifting strategies.

Expected Impact: This project focuses on implementing what is already know (evidence) adapting to the specific contexts for the region. By training MCH providers across diverse facility levels, the project demonstrates scalable integration of oral health into primary healthcare systems. The model advances WHO Global Oral Health Strategy objectives while generating evidence for sustainable, equity-focused oral health delivery in resource-limited settings, potentially informing national policy and regional expansion.

Biography

Hyewon Lee is a board-certified pediatric dentist in the U.S. and Kenya, currently directing the Global Maternal and Child Oral Health Center at Seoul National University. From 2021 to 2024, she has chaired the World Federation of Public Health Associations (WFPHA) Oral Health Workgroup, fostering collaborations among national public health associations to integrate oral health into primary healthcare. Her major achievement included the launch of the Global Maternal and Child Oral Health Initiative with more than 50 endorsements from international and national public health organizations, including ministries of health.

Her expertise bridges clinical practice and public policy. Previously, as a public health officer at the U.S. Department of Health, she worked with public health experts in developing national oral health guidelines and oral health indicators, with particular focus on maternal oral health. Recently, she secured a South Korea's Ministry of Affairs grant to strengthen Kenya's primary healthcare workforce capacity in maternal and child oral health promotion. Dr. Hyewon holds a dental degree from Harvard School of Dental Medicine and earned both master's (health communication) and doctoral degrees in public health (health policy and management) from Johns Hopkins School of Public Health.

Day 2 – Symposium 1

Title: Engaging Children, Adolescents and Adults in the Continuum of Oral Health Promotion

Speaker: Assoc. Prof. Wong Mun Loke

Affiliation: National University of Singapore



Abstract

Globally, oral diseases continue to be a public health concern for populations. Dental caries and periodontal disease remain the two most common oral diseases which affect populations across the lifespan. These two diseases can be prevented with the adoption of tooth-friendly lifestyles, practices and habits. A life course approach to health promotion and disease prevention is increasingly being valued as an effective strategy to help individuals and populations achieve better oral health outcomes. The young lend themselves as a good starting point to initiate oral health promotion efforts as well as inculcate lifelong habits to prevent oral diseases. Such efforts, anchored upon behavioural change models targeting children, adolescents and young adults can empower the young to promote and sustain good oral health through life.

Biography

Associate Professor Wong Mun Loke has been involved in dental education for over two decades. In his present role as Vice Dean (Education), he is actively engaged in the design, planning and review of the Bachelor of Dental Surgery curriculum. With his specialist training in Dental Public Health, Mun Loke anchors the teaching of the undergraduate Dental Public Health and Behavioural Science curricula in the Faculty of Dentistry. Mun Loke has an interest in exploring how preventive dentistry when coupled with behavioural science concepts can be applied in the practice of clinical dentistry to facilitate the promotion of oral health among individuals and in the population. Prior to joining academia, Mun Loke worked in the Health Promotion Board in Singapore where he had extensive experience designing, planning and implementing general health and oral health promotion programmes across the lifespan.

Another area of interest which Mun Loke anchors his work in is inter-professional collaborative healthcare to help populations achieve good health. This has fuelled his interest and work in advancing inter-professional education in healthcare training. In line with this, he played an active role in planning the communication courses of the NUS Common Curriculum for Health Professional Education which is extended to all Medicine, Nursing, Pharmacy and Dentistry students.

With his keen interest in education, he is involved in various aspects of higher education. Presently, he is the Vice Chairperson of the Executive Council at the NUS Teaching Academy which aims to inspire and encourage excellence in teaching through professional development and regular engagements with fellow educator peers to exchange ideas and best practices in education. Regionally, Mun Loke is a Council Member of the South East Asia Dental Education Association (SEAADE).

More recently, Mun Loke has been looking at how the formal and informal curricula can complement one another and contribute towards enhanced holistic educational experiences for students. In this role, Mun Loke works closely with colleagues from disciplines beyond the healthcare programmes.

Title: Oral Health for Healthy Ageing in the Western Pacific Region**Speaker: Dr. Yuriko Harada****Affiliation:** WHO Regional Office for the Western Pacific**Abstract**

As populations in the Western Pacific Region rapidly age, promoting oral health becomes increasingly critical to achieving healthy ageing and maintaining quality of life. Oral diseases affect nearly 42% of the Region's population, or approximately 820 million people. These largely preventable conditions contribute to pain, functional limitations, and reduced mental and social well-being, particularly among older adults, where one in five suffers from complete tooth loss. Addressing oral health from early life through older age is essential towards healthy ageing.

Despite growing global and regional momentum, including the adoption of the Global Oral Health Action Plan 2023–2030, progress in the Region remains limited. Barriers such as lack of access to services, workforce shortages, and the lack of integration into Primary Health Care and Universal Health Coverage persist. The WHO Regional Office for the Western Pacific will discuss regional priorities at the upcoming Regional Committee Meeting, including five acceleration projects to support Member States, which includes oral health promotion throughout the life course.

Recognizing that oral health in older age reflects cumulative exposures across the life course, WHO adopts a settings-based approach that pairs community-based lifelong promotion and prevention with age-responsive care. Oral health is linked to the WHO Integrated Care for Older People (ICOPE) framework to support early detection and care coordination, while access to essential oral health services is promoted within Primary Health Care and long-term care settings. This adaptable package enables countries to improve function, nutrition, and well-being for older adults, while reinforcing upstream intervention efforts.

Biography

Yuriko Harada is a consultant on oral health at the WHO Regional Office for the Western Pacific, supporting 38 countries and areas. Before taking on her current role, she served as a Technical Officer in the Oral Health Programme at WHO Headquarters, where she contributed to the development and implementation of global oral health policies. Prior to joining WHO, she worked as an Assistant Professor at Tokyo Women's Medical University and with the United Nations Relief and Works Agency for Palestine Refugees. She is a dentist with a Doctor of Dental Surgery degree from Kyushu University, Japan, and holds a Master of Public Health from the London School of Hygiene & Tropical Medicine, United Kingdom.

Day 2 – Symposium 2

Title: Transforming Dental Public Health through the use of AI

Speaker: Prof. Colman McGrath

Affiliation: The University of Hong Kong



Abstract

Artificial Intelligence (AI) is transforming dental public health through: disease detection, surveillance and monitoring so as to enable timely responses; diagnostic and imaging AI algorithms that can aid disease/ disorder diagnoses with high accuracy, speeding up diagnosis and reducing errors; predictive analytics to forecast trends, identify at-risk and high risk groups enabling a targeted approach to prevention; health education, health promotion and behavioural change through AI-powered chatbots and apps to provide health advice, reminders, and support to promote healthier behaviours; personalised healthcare enabling tailored health interventions based on individual data to improve treatment outcomes (including computer aided design, computer aided manufacture); health data management that can organise and analyse large health datasets efficiently, improving data quality and supporting research; and many more. Ultimately, AI has the potential to improve the efficiency, accuracy, and reach of public health initiatives, leading to better oral health outcomes at the population level. However, AI and the challenges it poses by the digital divide, may inadvertently exacerbate existing oral health inequalities. There is an urgent need for the development and rigorous implementation of ethical frameworks and regulatory guidelines ensuring the validity, reliability, transparency, and accountability of these AI innovations and interventions. We need to foster a balanced approach that maximizes the clinical benefits of emerging AI technologies while safeguarding patient autonomy and promoting equitable oral healthcare delivery.

Biography

Colman McGrath is Clinical Professor & Chief, Division Coordinator of Applied Oral Sciences & Community Dental Care at the Faculty of Dentistry, The University of Hong Kong. His clinical and research interests are in Special Care Dentistry, and particularly in Aged Care. He was published over 300 research papers in international peer review journals and has a h-index >80. He was recently ranked among the Top 2% of Scientist globally by the Stanford University Rankings. He is past President of the Behavioural, Epidemiology and Health Service Research Group of the International Association of Dental Research, serves on the Scientific Committee of the International Association of Disability and Oral Health (iADH), and is the currently Vice President of The Dental Anaesthesiology & Special Care Dentistry (DASCR) of the International Association of Dental Research. He was awarded the Distinguished Service Award of the International Association of Dental Research in 2024.

Day 2 – Symposium 2

Title: Chatbot-Driven Oral Health Promotion

Speaker: Asst. Prof. Dr. Jaranya Hunsrisakhun

Affiliation: Prince of Songkla University



Abstract

Early childhood caries (ECC) remains a critical global health concern, particularly in low-resource settings. Traditional prevention efforts often rely on intensive, face-to-face strategies that limit scalability and accessibility. This session presents an innovative, AI-driven solution: the *21-Day FunDee Plus* chatbot, developed by the Faculty of Dentistry, Prince of Songkla University, Thailand. This digital intervention offers a cost-effective, scalable approach to support oral health behavior change among caregivers of young children.

The chatbot delivers 24/7 personalized messaging via Facebook Messenger, guiding users daily over a 21-day journey. It addresses key behaviors—such as dietary sugar reduction, feeding habits, and toothbrushing—without requiring in-person instruction. Grounded in Protection Motivation Theory (PMT) and AI-supported behavior change frameworks, it emphasizes not just knowledge transfer, but habit formation and sustained parental engagement. After six months of deployment, 21FunDee Plus demonstrated reductions in plaque and caries risk, improved caregiver practices, and increased oral health knowledge.

This presentation will explore core strategies behind the design, implementation, and behavior-change mechanisms of the chatbot. Additionally, it will introduce adaptable business models that support integration across diverse populations and health systems.

By showcasing the success and scalability of 21 FunDee Plus, this session aims to empower dental professionals, public health leaders, and researchers to adopt and adapt chatbot technology to transform oral health promotion—turning simple digital interactions into impactful, lasting habits.

Biography

Asst. Prof. Dr. Jaranya Hunsrisakhun is an Assistant Professor in the Division of Community Dentistry, Department of Preventive Dentistry, Faculty of Dentistry, Prince of Songkla University, Thailand. She also serves as Director of the Rural Oral Health Center of Southern Thailand. Dr. Jaranya obtained her DDS from Prince of Songkla University, a PhD in Dental Public Health from the University of Copenhagen, Denmark, and a Thai Board Diploma in Dental Public Health.

Her research spans early childhood caries prevention, oral health literacy, and innovative applications of digital technology in oral health promotion, including chatbot-based interventions for young children, caregivers, and the elderly. She has led multiple national and international research projects and published widely in journals such as *JMIR Pediatrics and Parenting*, *International Dental Journal*, and *Journal of International Oral Health*. Dr. Jaranya has held leadership roles including President of the Dental Public Health Association of Thailand and Vice Dean for Communication at PSU. She is recognized with multiple awards for her excellence in teaching, research, and community service.

Day 2 – Symposium 2

Title: From Traditional Dentistry to Digital and AI: Vietnam's Experience in Dental Public Health

Speaker: Dr. Hoang Trung Hung

Affiliation: The University of Medicine and Pharmacy at Ho Chi Minh City



Abstract

Vietnam has experienced a remarkable transition from conventional oral health survey methods toward digital and artificial intelligence (AI)-driven innovations in dental public health. Traditionally, oral health surveillance relied on manual paper-based recording, limiting efficiency and scalability. To address this, our team developed the Vietnam Oral Survey Electronics Recorder (VOSER), a digital platform designed to record caries data according to WHO 2013 criteria. VOSER demonstrated excellent reliability and significantly reduced recording time compared to paper methods, proving its value in nationwide surveys and school-based oral health programs.

Building on this digital foundation, we further advanced into AI-based applications. The open-source SegmentAnyTooth framework was developed to enable automated tooth enumeration and segmentation from intraoral photographs across five standard views, achieving superior accuracy compared to conventional deep learning models. Complementing this, the DMFT-AI classifier was validated on over 27,000 teeth, showing excellent agreement with expert assessments and strong potential as a scalable screening tool for caries burden monitoring. Additionally, AI-driven approaches are being extended to orthodontic treatment needs assessment, broadening the scope of preventive and community-oriented applications.

Vietnam's case illustrates how combining digital data collection tools and AI-based analytics can improve surveillance, enable early disease detection, and enhance equity in access to preventive dental care, particularly in underserved urban communities. These innovations highlight a feasible model for other low- and middle-income countries seeking to bridge gaps in dental public health through digital transformation and AI integration.

Biography

Assoc. Prof. Hoang Trong Hung, DDS, MSc, PhD, FICD, is Vice-Dean and Head of the Department of Dental Public Health at the Faculty of Dentistry, University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam. He currently serves as Regent of Vietnam ICD Region 31, Vice-President of the Vietnam Odonto-Stomatological Association (VOSA), Vice-President of the Ho Chi Minh City Odonto-Stomatological Association (HOSA), and President of the IADR Southeast Asia Division. He obtained his DDS in 1995, MSc in 2003, and PhD in 2017. His main research interests include oral disease epidemiology, preventive dentistry, behavioral sciences in oral health, and dental education. More recently, his work has expanded into digital and AI innovations in public health dentistry, including the development of VOSER, SegmentAnyTooth, and AI-driven models for caries detection and orthodontic assessment. He has been an invited speaker at numerous national and international conferences and has received several international awards for his scientific contributions.

Day 3 – Symposium 3

Title: Setting the Scene: Promoting and Evaluating Oral Health Literacy

Speaker: Assoc. Prof. Wong Mun Loke

Affiliation: National University of Singapore



Abstract

The importance of oral health in populations and individuals cannot be underestimated. Oral health plays a pivotal role in ensuring overall wellbeing and is an essential part of holistic health. Globally, strategic plans have been developed to help populations reduce the prevalence of oral diseases and also mitigate the effects of such diseases. Oral health literacy is a key enabler in promoting oral health. It helps to build the capacities of populations and empower individuals to take proactive steps to maintain good oral health and experience better overall health outcomes. This session will provide a platform for participants to share their experiences in enhancing oral health literacy, identify key principles and considerations in the design and implementation of plans to enhance oral health literacy as well as explore effective ways to evaluate such efforts and facilitate the sharing of best practices.

Biography

Associate Professor Wong Mun Loke has been involved in dental education for over two decades. In his present role as Vice Dean (Education), he is actively engaged in the design, planning and review of the Bachelor of Dental Surgery curriculum. With his specialist training in Dental Public Health, Mun Loke anchors the teaching of the undergraduate Dental Public Health and Behavioural Science curricula in the Faculty of Dentistry. Mun Loke has an interest in exploring how preventive dentistry when coupled with behavioural science concepts can be applied in the practice of clinical dentistry to facilitate the promotion of oral health among individuals and in the population. Prior to joining academia, Mun Loke worked in the Health Promotion Board in Singapore where he had extensive experience designing, planning and implementing general health and oral health promotion programmes across the lifespan.

Another area of interest which Mun Loke anchors his work in is inter-professional collaborative healthcare to help populations achieve good health. This has fuelled his interest and work in advancing inter-professional education in healthcare training. In line with this, he played an active role in planning the communication courses of the NUS Common Curriculum for Health Professional Education which is extended to all Medicine, Nursing, Pharmacy and Dentistry students.

With his keen interest in education, he is involved in various aspects of higher education. Presently, he is the Vice Chairperson of the Executive Council at the NUS Teaching Academy which aims to inspire and encourage excellence in teaching through professional development and regular engagements with fellow educator peers to exchange ideas and best practices in education. Regionally, Mun Loke is a Council Member of the South East Asia Dental Education Association (SEAADE).

More recently, Mun Loke has been looking at how the formal and informal curricula can complement one another and contribute towards enhanced holistic educational experiences for students. In this role, Mun Loke works closely with colleagues from disciplines beyond the healthcare programmes

Title: Aligning with WHO's Global Oral Health Action Plan: The Hong Kong Experience

Speaker: Dr. Kitty Hse

Affiliation: The University of Hong Kong



Abstract

The World Health Organization's Global Oral Health Action Plan (2023–2030) calls for strengthened oral health promotion, integration into primary care, and a life-course approach to prevention. A central pillar of this framework is the improvement of oral health literacy (OHL) to empower individuals and communities in making informed decisions about their oral health. In Hong Kong, a city with unique demographic challenges and a rapidly aging population, oral health initiatives have been strategically designed to align with this global vision.

This presentation will share Hong Kong's experience in advancing OHL through multi-level and multi-sectoral actions. At the policy level, Hong Kong has integrated oral health promotion into primary care reform, ensuring that risk assessment with personalised health advice, disease prevention, early diagnosis and management are the keys for betterment of oral health. At the community level, the Government has formulated an Oral Health Action Plan towards 2030, based on the the strategies of (i) providing community-wide preventive primary oral health care; and (ii) delivery of essential dental services targeting underprivileged groups.

Lessons learned emphasize the importance of cross-disciplinary collaboration, digital health innovations, and sustainable financing models to scale up OHL efforts in a city-state context.

Biography

Dr HSE graduated with BDS from the Faculty of Dentistry, The University of Hong Kong (HKU) in 1990 and joined the Department of Health in the same year. She developed special interest in Paediatric Dentistry when serving in the School Dental Care Service. From 1994 to 1996, she furthered her postgraduate training in Paediatric Dentistry at the Faculty of Dentistry, HKU and became a Specialist in Paediatric Dentistry in the year 2000.

After the SARS impact in 2003, Dr HSE started to take up administrative roles in Dental Service Head Office. Subsequently in 2015, she was promoted to Principal Dental Officer in charging of the School Dental Care Service. Further in 2016, she started her next chapter in career as Consultant in Paediatric Dentistry. In May 2023 after the COVID pandemic, she succeeded the role as Consultant in-charge of Dental Services, Department of Health, Hong Kong SAR.

Title: Issues, challenges, and strategies to improve oral health literacy among people in Sabah, Malaysia

Speaker: Dr. Thaddius Herman A.M.

Affiliation: Sabah State Health Department



Abstract

Oral health literacy is a critical determinant of oral health outcomes, yet remains a persistent challenge in geographically diverse and socio-culturally complex regions like Sabah, Malaysia. This presentation highlights the key issues and challenges faced in improving oral health literacy among the population in Sabah, particularly in rural and indigenous communities. Barriers include limited access to oral health services, language and cultural diversity, low general health literacy, and a lack of community-tailored educational materials. Despite the presence of national programs, their impact has been uneven due to infrastructural gaps and limitations in aligning program designs with the specific social, cultural, and geographic contexts of communities in Sabah.

This presentation will also explore strategic responses adopted by the Sabah State Health Department to address these gaps. These include the deployment of community-based oral health educators, integration of oral health messages within maternal and child health services, and engagement with local leaders and volunteers to promote culturally relevant communication. School dental programs have been adapted with visual aids and local dialects, while mobile dental clinics and outreach initiatives help bridge access gaps.

This session aims to share insights from Sabah's experience in navigating systemic constraints to promote oral health literacy, with implications for similarly underserved regions across Asia.

Biography

Dr. Thaddius Herman Maling, BDS, DDPH RCS (Eng), MSc, DrDPH is the Deputy Director of Health at the Sabah State Health Department, Malaysia. He graduated with a BDS from the University of Malaya in 2002, later completing a Master of Science in Dental Public Health at University College London and a Diploma in Dental Public Health from the Royal College of Surgeons, England. In 2016, he earned his Doctorate in Dental Public Health from the University of Malaya.

With over two decades of service in the Ministry of Health Malaysia, Dr. Thaddius has contributed extensively to oral health promotion, oral cancer prevention, and safety in dental practice. He has chaired national guidelines on oral cancer screening and dental laboratory safety, and actively participates in technical working groups for national oral health initiatives.

He has also served in leadership roles with the Malaysian Dental Association and is currently President-Elect of the Malaysian Association of Dental Public Health Specialists

Day 3 – Symposium 4

Title: Efficacy and Patient Acceptance of Silver diamine fluoride for caries management

Speaker: Dr. Kitty Jieyi Chen

Affiliation: The University of Hong Kong



Abstract

Silver diamine fluoride (SDF) has emerged as a minimally invasive, evidence-based treatment for dental caries, particularly among young children and underserved populations. This workshop will provide a comprehensive overview of SDF's clinical application, including indications, contraindications, proper technique, and follow-up care. Drawing from research and real-world implementation, the session will showcase outcomes from large-scale community programs and recent clinical trials that demonstrate SDF's safety, efficacy, and patient acceptability in caries management. Participants will gain practical insights into integrating SDF into routine dental care, communicating effectively with patients and caregivers, and addressing common concerns such as tooth discoloration. The workshop aims to equip dental professionals with the skills and confidence to implement SDF successfully across diverse practice settings.

Biography

Dr. Chen is an honorary Assistant Professor at the Faculty of Dentistry, The University of Hong Kong. She is a Fellow of the International College of Dentists (FICD) and currently chairs its Humanitarian Committee. Her research focuses on paediatric and community dentistry, and she has authored more than 40 articles in international, peer-reviewed journals. Dr. Chen serves as a reviewer for six leading journals and for the Cariology Group of the International Association for Dental Research. She is also a Senior Editor of *BMC Oral Health* and an Associate Editor of *Frontiers in Oral Health | Preventive Dentistry*.

Day 3 – Symposium 4

Title: Mechanism, and Evolving Role of Silver diamine fluoride in Minimally Invasive Dentistry

Speaker: Prof. May Lei Mei



Abstract

Silver diamine fluoride (SDF) is a 38% solution containing approximately 255,000 ppm silver and 44,800 ppm fluoride ions, stabilized with ammonia. It is used in diverse dental applications, including management of early childhood caries, arrest of root caries, prevention of fissure and secondary caries, desensitization of hypomineralized and hypersensitive teeth, remineralization of demineralized enamel, prevention of dental erosion, and treatment of infected root canals. Silver acts as an antimicrobial agent, inhibiting cariogenic biofilm, while fluoride promotes remineralization and prevents demineralization of tooth structure. Ammonia provides an alkaline environment that inhibits collagen degradation in carious dentin. With its painless application and proven efficacy, SDF is a cornerstone of minimally invasive dentistry.

Biography

Dr Mei is the Professor in Cariology and the Deputy Convenor (Early Learning) of BDS programme, University of Otago, New Zealand. She is the Associate Editor of the *Archives of Oral Biology* and the *Frontiers in Oral Health*. She also sits on the Editorial Boards of the *Journal of Dentistry* and the *Dentistry Journal*. Dr Mei's research focuses on cariology, in particular on the effect of SDF on mineralized tissue, collagen and biofilms, and on the development of novel bioactive materials for caries management. Dr Mei was the President of the International Association for Dental Research (IADR) Cariology Research Group (2022-2023). She received a number of prestigious awards, including the IADR (Australia & New Zealand Division) Oral Biology Award, IADR Centennial Emerging Leaders Award, and IADR Basil G. Bibby Young Investigator Award.

Day 3 – Symposium 4

Title: Integrating Silver Diamine Fluoride into School-Based Oral Health Programs

Speaker: Prof Chun Hung Chu

Affiliation: The University of Hong Kong



Abstract

Early childhood caries (ECC) remains the most common chronic childhood disease. In 2019, Hong Kong launched a school-based outreach program to address the high prevalence of dental caries among preschool children. The initiative provides dental screening and SDF treatment for ECC management, alongside oral health education for parents and training for kindergarten teachers to deliver regular oral health lessons. The program's objectives are to improve the oral and general health of preschool children, foster positive oral health behaviors, safeguard psychological well-being, and reduce familial burdens. This presentation will explore the program's development, implementation, and outcomes, emphasizing SDF's practical benefits in public health settings.

Biography

Dr Chu is the Professor in Family Dentistry, The University of Hong Kong, China. He serves as Chair of the FDI Public Health Committee. He is a fellow of the Royal Australasian College of Dental Surgeons, a dental fellow of the Royal College of Surgeons of Edinburgh and a diplomate of the American Board of General Dentistry. Dr Chu is Section Chief Editor (Preventive Dentistry) of the *Dentistry Journal* and *Frontiers in Oral Health*. He also serves on the editorial boards of the *Journal of Dental Research* and the *International Dental Journal*. An educator at heart, he supervises PhD students and postdoctoral fellows, some of whom have ascended to full or associate professorships, with several listed among the Stanford/Elsevier Top 2% Scientists.

Day 3 – Symposium 5

Title: Primary Oral Health Care in Rural Thailand: A Strategy for Access and Equity

Speaker: Prof. Waranuch Pitiphat

Affiliation: Khon Kaen University



Abstract

Disparities in oral health between urban and rural populations remain a significant public health challenge across Asia. This presentation uses rural Thailand as a case study to demonstrate a comprehensive national approach to this issue. Grounded in its Universal Health Coverage (UHC) scheme, Thailand has established a Primary Oral Health Care (POHC) system featuring a life-course benefits package covering prevention, promotion, treatment, and rehabilitation. This model is designed to overcome deep-seated challenges, including geographic isolation and socioeconomic barriers, which contribute to a persistent urban-rural health gap. The presentation will highlight key components of the Thai system, such as the integration of oral health into primary care facilities, the crucial role of Village Health Volunteers and local government partners in health promotion, and the implementation of extensive school-based programs. This case study offers transferable insights for clinicians, academics, and policymakers by providing a practical look at building sustainable, community-based systems to improve oral health access and bridge equity gaps for vulnerable populations.

Biography

Dr. Waranuch Pitiphat is an epidemiologist and Dental Public Health Specialist at Khon Kaen University, Thailand, where she previously served as Dean. She earned her DDS from Chulalongkorn University, a Master's in Primary Health Care Management from Mahidol University, and an MSc and ScD in Epidemiology from Harvard University.

Dr. Pitiphat is a past president of both the Asian Academy of Preventive Dentistry (AAPD) and the Thai Society of Public Health Dentistry. She currently serves as President of the South East Asia Association for Dental Education (SEAADE) and is a member of the Board of Directors at the DeRouen Center for Global Oral Health, University of Washington, USA.

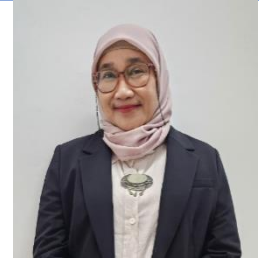
With over 100 peer-reviewed publications, Dr. Pitiphat has made significant contributions to the field and serves on editorial boards of leading journals, including the Journal of Dental Research, JDR Clinical & Translational Research, and Oral Diseases. She also directs a U.S. NIH-funded program supporting oral health research training in Southeast Asia.

Day 3 – Symposium 5

Title: Epidemiology, Etiology, Risk Factors, Impact, and Prevention of Early Childhood Caries (ECC)

Speaker: Prof. Febriana Setiawati

Affiliation: Universitas Indonesia



Abstract

Early Childhood Caries (ECC) is one of the most common dental health problems among young children, particularly in developing countries such as Indonesia. The epidemiology of ECC shows a high prevalence, with data from the 2018 National Health Research (Riskesdas) indicating that over 90% of five-year-old children in Indonesia suffer from dental caries and Indonesia Health Survey (SKI) 2023 indicating ECC prevalence of 3-4 years old children 78,3%. The etiology of ECC is multifactorial, involving the interaction between microorganisms such as *Streptococcus mutans*, high sugar consumption, prolonged breastfeeding or bottle feeding especially during sleep, and poor oral hygiene. Risk factors include low socioeconomic status, lack of parental education about child dental health, limited access to dental care services, and minimal preventive roles from healthcare providers.

The impact of ECC extends beyond dental problems, affecting the overall quality of life of children, including disturbances in eating, sleeping, growth, and even cognitive development. ECC also increases the risk of systemic infections and may require complex dental treatment later in life. Preventive strategies for ECC in Indonesia should include promotive and preventive approaches through early oral health education, integration of child dental health programs in community health posts (Posyandu) and early childhood education centers (PAUD), training for healthcare workers, and raising public awareness of the importance of child dental care. Family- and community-based interventions are essential to significantly reduce the burden of ECC at the national level. Early prevention is the key to addressing the ECC epidemic in Indonesia.

Biography

Prof. Dr. drg. Febriana Setiawati, M.Kes, FISDPH, FISPD is a Professor of Dental Public Health at the Faculty of Dentistry, Universitas Indonesia. She earned her DDS and PhD in Dentistry from Universitas Indonesia and an MSc in Epidemiology from the Faculty of Public Health, Universitas Indonesia. Prof. Febriana has dedicated her academic career to advancing knowledge in epidemiology, oral health promotion, and preventive dentistry, with a strong focus on early childhood caries and maternal-child oral health.

She has led and collaborated on numerous nationally funded research projects and published widely in indexed international journals, covering topics from teledentistry and caries prevention to oral health literacy and special care dentistry. Her contributions have been recognized through multiple awards, including national honors for intellectual property and recognition as a Fellow of both the Indonesian Society of Dental Public Health and the Indonesian Society of Preventive Dentistry. Prof. Febriana continues to serve as educator, researcher, and mentor, shaping the next generation of dental professionals in Indonesia.

Day 3 – Symposium 5

Title: Caring for the Marginalized Population Through Community Oral Health Programs: The Philippine Experience

Speaker: Prof. Michelle Sunico Segarra

Affiliation: University of the Philippines Manila



Abstract

According to the 2018 National Survey on Oral Health, the prevalence of dental caries among vulnerable groups, including children and the elderly, remains considerably high. Among 5-year-old children, caries prevalence was reported at 85.3%, with a mean DMFT (Decayed, Missing, Filled Teeth) of only 0.06. In 12-year-old children, caries prevalence decreased to 68.2%, although the mean DMFT increased to 2.54, indicating a higher number of affected permanent teeth. In contrast, among the elderly population aged 65–74 years, caries prevalence was 55.1%, but the mean DMFT was substantially higher at 12.57, reflecting a significant burden of tooth loss and restorations in this age group.

Although these values can still be considered high, they have slightly lessened compared to those in 2011. Oral health programs have been instituted by the government to solve the high prevalence of caries and other oral health diseases. Aside from these government initiatives, the slight improvement in the oral health status among Filipinos could be partly attributed to various community oral health programs which are initiated by the government, dental academic institutions, the national dental organization, private institutions and NGO's. These community programs help address the high prevalence of oral diseases through different interventions which include free dental services, preventive therapies and oral health education. Community oral health programs also significantly augment the dental workforce especially among marginalized population such as children and elderly in underprivileged communities, improving access to necessary dental care. This brief presentation will describe several community oral health strategies and programs in the Philippines, specifically those that target the children and the elderly and how the communities benefited from such initiatives.

Biography

Accomplished career of 30 years in university-level teaching; held important administrative positions in the College; chaired significant local, national and international scientific conventions; author of several research and clinical articles in peer-reviewed local and international scientific journals and formerly editor-in-chief of the national scientific journal in dentistry; author of interactive learning/teaching aids; experienced resource speaker in local, national and regional scientific meetings. She also serves as Key Opinion Leader to several dental materials companies.

Dr. Segarra was a Research Scholar at the Department of Operative Dentistry, Nippon Dental University, Niigata Japan from 1998 – 2000. In May 2004 and July 2006, she was invited as a Visiting Researcher at the Graduate School, Tokyo Medical and Dental University where the focus of her research was adhesive resins, restorative materials dental burs and diamond points. She finished her PhD in Medical and Dental Sciences major in Cariology and Operative Dentistry at the Tokyo Medical and Dental University under Professor Junji Tagami. Her research centers on the use of optical coherence tomography and diagnosis and analysis of enamel cracks. Other research interests include effects of calcium phosphate technologies and fluoride on remineralization and demineralization of teeth, preventive dentistry, and teeth whitening. Dr. Segarra also holds a Masters in Occupational Health from the UP College of Public Health and is involved in a number of occupational and environmental health advocacies. She has been president and currently vice-president of the international non-governmental organization Health Care Without Harm Asia. Dr. Segarra has been in private practice since 1992 in General Dentistry with focus on adhesive restorations and treatment of child patients. She has lectured on adhesive dentistry, esthetic dentistry, occupational health, direct composite restorations, cariology and preventive dentistry.

Day 3 – Symposium 5

Title: Embedding Oral Health into National Primary Healthcare: Malaysia's Approach to Vulnerable Groups

Speaker: Dr. Salleh Zakaria

Affiliation: Ministry of Health, Malaysia



Abstract

Oral health is a critical component of overall health and well-being, yet it remains underprioritized in many healthcare systems. Malaysia has adopted a strategic and inclusive approach to integrate oral health into its national primary healthcare system, particularly targeting vulnerable groups such as children, the elderly, people with disabilities, and low-income populations. This initiative emphasizes equity, accessibility, and sustainability in the healthcare system.

By embedding oral health services within existing primary care settings, Malaysia aims to reduce disparities, increase early detection and prevention, and improve treatment outcomes. Community-based programs, school dental services, mobile dental clinics, and health promotion activities are tailored to the specific needs of marginalized populations. Intersectoral collaboration, policy integration, and resource development are key enablers of this approach.

Early outcomes indicate improvements in access and awareness, though challenges persist, including resource allocation and behaviour change among high-risk groups. This abstract showcase Malaysia's experience as a possible example for countries aiming to better incorporate oral health into their healthcare systems. The Malaysian approach underlines the importance of embedding oral health in a broader health equity agenda, reinforcing the notion that no population group should be left behind.

Biography

Dr. Salleh Zakaria currently serves as the State Deputy Director of Health (Dental) based in Shah Alam, Selangor MALAYSIA. He obtained his dental degree from the University of Malaya, Kuala Lumpur in 1999 and later completed his Master of Public Health (Oral Health) at the same university in 2008. Presently, he holds the position of Immediate Past President at the Malaysian Association of Dental Public Health Specialists and Head of Dental Public Health Specialist, MoH Malaysia. Additionally, he has been a clinical examiner for numerous national oral health surveys conducted in the country. In 2015, he served as the Benchmark Examiner for Dental Caries in the National Oral Health Survey of Preschool Children, and later in 2017, he acted as the Gold Standard Examiner for Dental Caries in the NHMS 2017: School-based Oral Health Survey. Dr. Salleh was among the pioneers in the development of the Modified MOH ICDAS and BEGIN Program, which is currently being implemented in MOH dental clinics nationwide. Moreover, he is an active member of several working groups responsible for the formulation of policy documents and guidelines related to oral health programs in Malaysia.

Keynote Lecture 3

Title: Innovative Preventive Dentistry: Integrating Advanced Technologies into Traditional Practices

Speaker: Prof. Lee Byoung-Jin

Affiliation: 3Beans Institute for Oral Health Research



Abstract

Since the 1900s, many preventive techniques have been developed and applied to prevent oral diseases, which has been greatly improved and prevented oral diseases in humans. These techniques can be applied individually in the dental treatment process, but in the modern concept of patient-centered precision dentistry, it is reported that preventive techniques are more effective when applied in an integrated program.

In this, I would like to introduce a comprehensive program that combines various preventive techniques that can be applied in dental clinics and various cutting-edge preventive examinations, diagnosis, and treatment techniques that are currently available. This includes the latest equipment and materials for early examination and diagnosis of oral diseases, microbiome control, and preventive techniques. I also would like to present the clinical cases applied preventive programs in Korea.

Biography

Prof. Byoungjin Lee (Jake) is a leading figure in preventive dentistry and oral health promotion in South Korea. He is currently Director of the 3Beans Institute for Oral Health Research in Sejong, Director of the Department of Preventive Dentistry at GOODWILL Dental Hospital in Busan, and Director of the Science and Research Team at Denomics Co. Ltd. He also serves as Co-Chairperson of Action for Prevention Dental Diseases (NPO) and Clinical Instructor at the School of Dentistry, Seoul National University.

Previously, Prof. Lee was Professor of Preventive and Public Health Dentistry at Chosun University (2007–2016) and has been a Board Member of the Korean Academy of Preventive Dentistry and Oral Health since 2012. His academic journey began at Seoul National University, where he earned his dental degree and postgraduate training in preventive and public health dentistry.

Prof. Lee's career reflects a strong dedication to integrating research, education, and innovation to advance preventive oral health strategies at both national and global levels

Poster Presentation Abstracts

Reducing Dental Anxiety: Insights From Malaysian Young Adults, Dentists and Mental Health Professionals On Enhancing Oral Healthcare Delivery

Azizi Ab Malek¹, Nawwal Alwani Mohd Radzi¹, Muhd Firdaus Che Musa²

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

²Department of Pediatric Dentistry and Dental Public Health, Kulliyah of Dentistry, International Islamic University Malaysia, Pahang, Malaysia

Background: Dental anxiety constitutes a significant barrier to the utilisation of oral healthcare among young adults, adversely impacting both long-term oral and psychosocial health. Despite the availability of numerous interventions, there exists a scarcity of qualitative studies that explore multidisciplinary perspectives to inform patient-centred care across diverse healthcare systems. **Objectives:** This study aims to investigate the optimal delivery of oral healthcare services to mitigate dental anxiety among young Malaysian adults, drawing upon insights from young adults, dentists, psychologists, and psychiatrists. **Methods:** A qualitative methodology was utilised, incorporating focus group discussions (FGD) and in-depth interviews (IDI) with a participant pool comprising 18 dentists, four mental health professionals (psychologists and psychiatrists), and 16 young adults exhibiting elevated Modified Dental Anxiety Scale (MDAS) scores. The data were analyzed through the application of Braun and Clarke's thematic analysis framework, aided by NVivo software. Triangulation was employed to synthesise insights garnered from all participant groups. **Results:** Eight key themes emerged: (1) Visible and Felt Cues of Anxiety, (2) Environmental Triggers, (3) Trust and Safety, (4) Professional Aesthetic, (5) Communication and Relationship, (6) Anxiety Management Approaches, (7) Duration and Familiarity, and (8) Content Design for Anxiety Reduction. Cross-group triangulation confirmed overlapping and distinct patterns, supporting the need for integrated care. **Conclusion:** Reducing dental anxiety requires globally informed yet locally adapted approaches to oral healthcare delivery. Emphasis on early screening, empathetic communication, sensory-sensitive environments, and interprofessional collaboration is essential. These findings contribute to international best practices and provide practical guidance for enhancing services and developing policies, particularly within the Malaysian context.

Keywords: Dental anxiety, young adult, oral health, delivery of health care, malaysia

Effect Of Silver Diamine Fluoride Application on the Bonding Strength of Carious Dentine to Restorations Under Reduced Saliva Conditions

Sonia Hua¹, Yan Kang Lim¹, May Lei Mei¹, Manikandan Ekambaram², Kai Chun Li¹

¹Department of Oral Rehabilitation, Faculty of Dentistry, University of Otago, Dunedin, New Zealand

²Department of Oral Sciences, Faculty of Dentistry, University of Otago, Dunedin, New Zealand

Background: Silver diamine fluoride (SDF) is effective in arresting dental caries but causes black discolouration of treated tooth structure. This aesthetic drawback can be mitigated by placing tooth-coloured restorative materials over SDF-treated lesions. However, the impact of SDF on the bonding performance of these materials, particularly under conditions of reduced salivary flow, remains unclear. **Objectives:** To evaluate the effect of SDF application on the microshear bond strength (μ SBS) of carious dentine under reduced saliva conditions, using bioactive filling material Cention Forte (CF) and resin-modified glass ionomer cement (RMGIC). **Methods:** A total of 120 bovine dentine blocks were randomly assigned to six treatment groups: Group 1: Sound dentine + CF, Group 2: Sound dentine + RMGIC, Group 3: Artificial carious dentine + CF, Group 4: Artificial carious dentine + RMGIC, Group 5: SDF-treated carious dentine + CF, Group 6: SDF-treated carious dentine + RMGIC. Artificial carious dentine specimens were prepared by immersion in a 50 mM acetate buffer solution (pH 4.5) at 37 °C for 7 days. All specimens then underwent a 14-day pH cycling protocol prior to micro shear bond strength (μ SBS) testing. Failure modes were subsequently analysed using scanning electron microscopy. **Results:** Mean μ SBS values (MPa $\pm$ SD) for groups 1-6 were 15.07 $\pm$ 5.65, 8.56 $\pm$ 9.15, 11.61 $\pm$ 6.35, 4.14 $\pm$ 3.22, 8.72 $\pm$ 7.01 and 3.03 $\pm$ 1.74 respectively. Significant differences were observed between the mean μ SBS of CF and RMGIC on sound (group 1 and 2, $p < 0.05$), carious (group 3 and 4, $p < 0.01$) and SDF-treated carious dentine (group 5 and 6, $p < 0.05$). Other comparisons were statistically insignificant. **Conclusion:** Cention Forte demonstrated higher μ SBS than RMGIC across all conditions. SDF application did not significantly affect the μ SBS of either material when bonding to carious dentine.

Keywords: Cention Forte, resin-modified glass ionomer cement, silver diamine fluoride, microshear bonding strength, dentine

Bridging The Fear Gap: Evaluating the Effectiveness of the HI Bogi Artificial Intelligence Application in Reducing Dental Anxiety Among Children

Rina Putri Noer Fadilah¹, Alvania Callysta Berliandinanto², Asih Rahaju³

¹Department of Dental Public Health, Faculty of Dentistry, Universitas Jenderal Achmad Yani, Indonesia.

²Graduate program, Faculty of Dentistry, Universitas Jenderal Achmad Yani, Indonesia

³Conservative Dentistry, Faculty of Dentistry, Universitas Jenderal Achmad Yani, Indonesia

Background: Dental anxiety is a common psychological barrier that can significantly affect children's willingness to undergo dental treatment, often leading to delayed care and worsening oral health outcomes. Traditional dental examination methods may unintentionally increase anxiety, particularly in children. To address this issue, the HI Bogi Artificial Intelligence application was developed as a child-friendly digital tool to reduce fear and improve comfort during dental visits. By integrating technology into dental examinations, the app aims to bridge the gap between clinical procedures and childcare. **Objectives:** To evaluate the effectiveness of HI Bogi application in reducing anxiety levels during dental caries examinations, compared to conventional methods, among elementary school students in Cimahi City. **Methods:** This analytical observational study employed a cross-sectional design and involved 97 students from six public elementary schools in Cimahi City. Participants were randomly divided into two groups: one undergoing a conventional dental caries examination and the other undergoing an examination integrated with HI Bogi application. Anxiety levels were objectively measured using the Galvanic Skin Response (GSR) technology. Data analysis was performed using Wilcoxon signed-rank test. **Results:** Galvanic Skin Response measurements indicated that students in the HI Bogi group exhibited lower anxiety levels than those in the conventional group, both before and after the dental caries examination. Statistical analysis using the Wilcoxon test revealed significant differences in anxiety levels between the two groups before ($p = 0.027$) and after the examination ($p = 0.032$). **Conclusion:** The integration of the HI Bogi Artificial Intelligence application in dental caries examinations significantly reduced dental anxiety among elementary school students in Cimahi City compared to conventional examination methods.

Keywords: Dental anxiety, HI bogi application, children, artificial intelligence, anxiety reduction

Enhancing Manpower Capacity and System Support for Domiciliary Oral Care in Malaysia's Ageing Population

Haslina Rani¹, Muhammad Syafiq Asyraf Rosli¹, In Meei Tew², Aznida Firzah Abdul Aziz³, Nur Saadah Mohamad Aun⁴, and Tuti Ningsih Mohd Dom¹

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

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

³Department of Family Medicine, Faculty of Medicine, Universiti Kebangsaan Malaysia, Malaysia

⁴Centre for Research in Psychology and Human Well-Being, Universiti Kebangsaan Malaysia, Malaysia

Background: Malaysia's ageing population faces growing challenges in accessing oral healthcare, especially among frail, homebound, or institutionalized older adults. Domiciliary oral care (DOMS), which delivers services beyond conventional settings, offers a practical solution to address this gap. However, its implementation remains limited due to barriers in workforce preparedness, policy clarity, and service coordination. **Objectives:** This study aimed to develop stakeholder-informed strategies to enhance the capacity and system-level support needed for effective nationwide implementation of domiciliary oral care for Malaysia's ageing population. **Methods:** A mixed-methods approach was adopted. A nationwide cross-sectional survey involving 354 GDPs assessed their perceptions, confidence, training, and perceived barriers related to DOMS. These quantitative findings were used to guide a participatory qualitative phase involving 12 stakeholders from clinical, academic, and policy sectors. Through structured roundtable discussions and a co-creation session, stakeholders proposed and evaluated strategies to strengthen DOMS, assessing their feasibility and potential impact. **Results:** While 80.2% of GDPs expressed willingness to provide DOMS with appropriate support, 56.8% reported inadequate undergraduate training, and 62.4% lacked post-graduate exposure. Confidence in providing DOMS was significantly associated with prior training. Key barriers identified included patient and caregiver limitations, unsuitable working conditions, and unclear regulatory frameworks particularly for non-Ministry of Health practitioners. Stakeholders recommended strategies that included expanding continuing education, clarifying legal pathways, fostering public-private partnership and interdisciplinary collaboration. All strategies were rated as having moderate to high feasibility and potential impact. **Conclusion:** This study highlights the gap between dental workforce readiness and systemic support for DOMS in Malaysia. A coordinated approach that aligns workforce development with policy reform and stakeholder collaboration is essential to meet the oral healthcare needs of the ageing population.

Keywords: domiciliary oral care, ageing population, dental workforce, mixed-methods, stakeholder engagement

Remineralising Enamel Caries with Copper Tetraamine Fluoride: A Laboratory Study

Veena Wenqing Xu¹, Chun-Hung Chu¹

¹Faculty of Dentistry, The University of Hong Kong, Hong Kong

Background: Dental caries is a highly prevalent oral disease. While silver diamine fluoride (SDF) is effective in arresting caries, it can cause enamel and dentine discolouration. Our previous research introduced copper tetraamine fluoride (CTF), which prevents *Streptococcus mutans* biofilm formation without causing discolouration. **Objective:** To investigate the antibacterial, remineralising, and discolouring effects of CTF on artificial enamel caries. **Method:** Human enamel blocks with artificial caries were treated with CTF, SDF (positive control) and water (negative control) before being challenged with *Streptococcus mutans*. The morphology, viability, and growth kinetics of biofilm were evaluated using scanning electron microscopy (SEM), confocal laser scanning microscopy (CLSM), and colony-forming unit (CFU) counting. The lesion depths, micro-hardness, and crystal characteristics were assessed using micro-computed tomography, Knoop Hardness Tester, and X-ray diffraction (XRD), respectively. The discolouring property was assessed by spectrophotometry. **Results:** SEM showed that bacteria completely covered the enamel surface treated with water, but not the enamel surface treated with CTF and SDF. CLSM showed dead-to-live ratio of biofilm treated with CTF, SDF and water were 0.8 ± 0.1 , 0.9 ± 0.2 and 0.5 ± 0.1 ($p < 0.001$, CTF, SDF > Water). Log₁₀ CFU values of biofilm treated with CTF, SDF and water were 7.7 ± 0.2 , 7.7 ± 0.1 and 8.1 ± 0.1 ($p < 0.001$, CTF, SDF < Water). Lesion-depths (μm) of the CTF, SDF and water groups were 93 ± 6 , 92 ± 7 and 152 ± 29 ($p < 0.001$, CTF, SDF < Water). Knoop hardness of the CTF, SDF and water groups were 70 ± 23 , 68 ± 16 and 21 ± 10 ($p < 0.05$, CTF, SDF > Water). XRD revealed well-crystallised hydroxyapatite in CTF and SDF group, but not water group. Spectrophotometry showed ΔE values of the CTF, SDF and water groups were 5 ± 3 , 54 ± 6 and 6 ± 2 ($p < 0.001$, CTF, water < SDF). **Conclusion:** CTF inhibited *Streptococcus mutans* biofilm and remineralised artificial enamel caries without discolouration.

Keywords: caries, antibacterial, enamel, fluoride, remineralization

Are Children's Oral Health Status and Oral Microbiome Profiles Associated with Their Parents'?

Zhou Ni¹, Zeng Xinyi², Wong Hai Ming¹

¹Faculty of Dentistry, The University of Hong Kong, Hong Kong SAR, China,

²Anning Maternal and Child Health Hospital, Yunnan, China

Background: Family members, particularly parents and children, often share similar dietary and oral hygiene habits, which might contribute to the development of dental caries. Previous studies have indicated that cariogenic bacteria, particularly *Streptococcus mutans* can be transmitted from mothers to infants. However, limited studies have compared the oral health status and oral microbiome profiles between children and parents. **Objectives:** To investigate the associations between oral health status and oral microbiome profiles in children and their parents. **Methods:** The oral health status of 127 children and their parents was assessed by calibrated pediatric dentists. Caries status was evaluated using World Health Organization (WHO) criteria, and oral hygiene status was assessed using the simplified debris index (DI-S). Additionally, the supragingival dental plaque samples were collected and analyzed using 16S rRNA high-throughput sequencing technique. **Results:** Parents whose children suffering from caries exhibited higher DI-S scores than parents of caries-free children (1.22 ± 0.58 vs 0.96 ± 0.50 , $p = 0.004$). Children whose parents had dental caries demonstrated higher dmft scores than their peers whose parents had no caries (3.06 ± 3.65 vs 1.67 ± 3.07 , $p = 0.029$). Significant differences observed in microbial diversities between parents of caries-free children and parents of children with caries ($p < 0.001$). Parents of children with caries showed higher relative abundance of *Streptococcus mutans* than parents of caries-free children ($p < 0.001$). **Conclusion:** Children's oral health status and oral microbiome might be associated with their parents'. Family-based oral health promotion activities should be recommended.

Key words: oral microbiome, dental caries, family-based, parents

Effectiveness and Acceptability of Smoking Cessation Interventions Among the Orang Asli in Malaysia: A Quasi-Experimental Pilot Study

Nurliyana Roslan^{1,2}, Norashikin Yusof¹, Azri Azliah Mohd Yani¹, Nurul Fahizha Fahimi^{1,2}, Izzati Mohd Khairunjauhari^{1,2}

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

²Training Management Division, Ministry of Health Malaysia, Putrajaya, Malaysia.

Background: Tobacco use remains a leading preventable cause of death globally, with Indigenous populations experiencing disproportionately high smoking rates. Despite national efforts to curb smoking rates, cessation strategies for this underserved group in Malaysia are rather scarce. **Objective:** To explore the effects and acceptability of smoking cessation interventions among the Orang Asli (Indigenous community in West Malaysia). **Methods:** This study comprised a quasi-experimental pilot study among Orang Asli smokers aged ≥ 15 in Selangor, Malaysia, comparing the effectiveness and acceptability of two smoking cessation interventions: the 5As and Very Brief Advice or 3As. Participants were followed up at 1 and 3 months. Smoking outcomes included self-reported tobacco use, expired carbon monoxide levels, and the Fagerstrom Test for Nicotine Dependence (FTND). Acceptability was assessed through eligibility, recruitment and retention rates, and structured interviews. **Results:** The study involved 64 Orang Asli with 88.9% response rate. No significant differences were found in the median of smoking outcome measures across both 5As and 3As groups, indicating that both approaches demonstrated equal effectiveness in promoting smoking cessation. Moreover, the eligibility rate was 66.0%, the recruitment rate was 100%, and the retention rate for the three-month follow-up was 71.9%. 20 participants who completed the follow-ups were interviewed, and thematic analysis identified four major themes: i) General acceptability, ii) Reasons to quit smoking, iii) Reasons to continue smoking/vaping, and iv) Changes after counselling. **Conclusion:** This study showed that both the 5As and 3As smoking cessation interventions were well accepted and showed comparable effectiveness. These findings highlighted the need for culturally safe tobacco control policies and tailored cessation support programmes to address the unique needs of the Orang Asli community.

Keywords: Indigenous, smoking, cessation, acceptability, Orang Asli

Exploring Pulpal Regeneration with Liposome Hydrogel Scaffold: An In-Vitro Study

Shivaranjhany Sivakumar¹, Nurul Shaqinah Nasruddin¹, Farinawati Yazid¹, Rohaya Megat Abdul Wahab² and Fazren Azmi³

^{1,2}Department of Paediatric Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, 50300, Kuala Lumpur, Malaysia.

¹Department of Craniofacial Diagnostic and Biosciences, Faculty of Dentistry, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, 50300, Kuala Lumpur, Malaysia.

³Faculty of Pharmacy, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, 50300, Kuala Lumpur, Malaysia.

Background: The current intervention for irreversible pulpitis and pulpal necrosis is root canal therapy, which compromises the structural integrity of the tooth. An ideal alternative would be regeneration of pulp-like tissue to restore vascular supply, neural innervation, and dentinogenesis, thereby recapitulating native pulp function. This study evaluates the odontogenic and angiogenic potential of stem cells from Human Exfoliated Deciduous teeth (SHEDs) encapsulated within a liposome-integrated hydrogel scaffold in an in vitro model. **Objectives:** To determine the pulpal regeneration potential of liposomal hydrogel scaffold seeded with stem cells from Human Exfoliated Deciduous teeth and VEGF. **Methods:** The study involved isolating dental pulp from 32 tooth samples via enzymatic digestion, followed by the characterization of stem cells from human exfoliated deciduous teeth (SHEDs) using light microscopy and RT-PCR. Liposomal hydrogel scaffolds were then prepared and analyzed for morphology and composition using FESEM and EDX. SHEDs were seeded into the scaffolds, and in vitro viability was evaluated via angiogenesis assays. Statistical analysis included descriptive analysis, independent t-tests, and repeated measures ANOVA. **Results:** SHEDs reached confluence by Day 14. Morphology was confirmed microscopically and stemness validated by RT-PCR (RNA purity A260/A280 ≥ 1.80 , A260/A230 ≥ 2.00). The liposomal hydrogel scaffold exhibited 127–480 μm pore size and 92% porosity by FESEM, supporting vascularization and SHED viability. Angiogenesis assay revealed increased vessel formation by Day 5. **Conclusion:** In-vitro data supports neo-vascularization and SHEDs survival in the liposome hydrogel scaffold.

Keywords: SHEDS, pulp regeneration, in-vitro, liposome hydrogel scaffold, VEGF

Caries-Free Status of Orang Asli Children in West Malaysia

Fahimi NF^{1,2}, Yusof NR¹, Md Sabri BA¹, Roslan N^{1,2}, Khairunjauhari I^{1,2}

¹Centre of Population Oral Health & Clinical Prevention Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh, 47000 Selangor

²Oral Health Programme, Ministry of Health Malaysia.

Introduction: Dental caries has been recognised as the most common dental illness that significantly affects everyday activities in Asia. It is high among children. Orang Asli children were also affected by caries disorder. Despite this, limited research was conducted on them. **Objective:** This research examines the association between OA children's caries-free status and family cohesion in West Malaysia. **Methods:** Data collection was performed after ethics approval. A total of 171 dyads of a parent and a child between the aged of 5 and 12 from an Orang Asli village in Perak, Selangor, Pahang and Johor were randomly chosen as participants. After giving consent, oral examinations were conducted, and caries were charted according to the DMFT/dft index. The Family Adaptability and Cohesion Evaluation Scale-III (FACES-III) were used to collect data on family cohesion. Structural Equation Modelling (SEM) was conducted to model the effects of family cohesion on the caries-free status of OA children. **Results:** 43.9% of the children's participants are male, while 56.1% are female. Caries prevalence among 5 to 12-year-old OA children is 76.0% with a mean DMFT of 0.81 (± 1.288). Contradictly, 23% were caries-free. SEM shows that family cohesion values significantly positively affect the OA children's caries-free status ($\beta = 0.081$, $P < 0.019$). **Conclusions:** Family cohesion affects OA children's caries-free status.

Keywords: Orang Asli, children, caries-free status, indigenous population, oral health

Immersive Oral Health Promotion Using Meta-Ohe: A Quasi-Experimental Study on The Effectiveness of a Metaverse-Based Education Platform Among Adolescents

Amirul Faiz Luai^{1,2}, Eddy Hasrul Hassan³, Budi Aslinie Md Sabri¹, Nawwal Alwani Mohd Radzi¹

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

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

³Centre of Preclinical Science Studies, Faculty of Dentistry, Universiti Teknologi MARA, Malaysia

Background: The metaverse platform, like Meta-OHE offers avatar-mediated simulations, an immersive experience that enhances user engagement through realistic, three-dimensional interactions. Its potential to transform oral health education lies in its ability to create personalized, experiential learning environments, and immersiveness that could improve knowledge retention, motivation, and behavioural change among adolescents. **Objective:** To compare the effectiveness between three oral health education (OHE) modalities—Conventional face-to-face OHE, mHealth via WhatsApp, and the immersive Meta-OHE metaverse platform—in improving oral health knowledge and attitudes among 16-year-old secondary school students at a semi-government secondary school in Malaysia. **Method:** A validated questionnaire was used to identify the participants' sociodemographic background, oral health knowledge, and oral health attitudes before and immediately after intervention. A quasi-experimental three-arm parallel group study was conducted among 220 randomly selected students. Group A received conventional OHE lectures, Group B received WhatsApp-based materials, and Group C engaged with the Meta-OHE platform. Quade's ANCOVA was employed to evaluate differences between-group in post-test scores, controlling pre-test values due to non-normality of data. **Results:** A total of 220 students (72.6% female, 27.4% male) completed the study. Between-group analysis revealed a statistically significant difference in post-test oral health knowledge scores across groups ($F = 3.304$, $p = 0.039$). Meta-OHE participants demonstrated significantly higher knowledge scores than those in the mHealth group ($p = 0.032$), while no significant differences were observed between Meta-OHE and Conventional or between Conventional and mHealth. For oral health attitude, a significant difference was also observed ($F = 7.712$, $p < 0.001$), with both Meta-OHE ($p = 0.004$) and mHealth ($p = 0.015$) outperforming the Conventional method. However, no significant difference was found between Meta-OHE and mHealth ($p = 1.000$), suggesting comparable effectiveness in attitude improvement. **Conclusions:** Between-group findings indicate that while all three interventions improved knowledge and attitudes, immersive metaverse-based and mHealth approaches were significantly more effective than Conventional methods in enhancing oral health attitudes. Meta-OHE also led to greater gains in knowledge compared to mHealth, highlighting its potential as a scalable digital tool for adolescent oral health education.

Keywords: Metaverse, meta-ohe, virtual reality, immersive reality, oral health education

Determinants of Malaysian Preschool Children's Behaviour During Tooth Brushing Using Structural Equation Modeling

Yu Jie Chin¹, Shani Ann Mani¹, Jennifer Geraldine Doss², Sabri Musa¹, Mahmoud Danace³

¹Department of Paediatric Dentistry and Orthodontics, Faculty of Dentistry, Universiti Malaya, 50603 Kuala Lumpur, Malaysia

²Department of Community Oral Health and Clinical Prevention, Faculty of Dentistry, Universiti Malaya, 50603 Kuala Lumpur, Malaysia

³Department of Social and Preventive Medicine, Faculty of Medicine, Universiti Malaya, 50603 Kuala Lumpur, Malaysia

Background: In Malaysia, the prevalence of dental caries among preschool children remains high at 71.3%, with 59.5% exhibiting poor oral hygiene. Preschool children display diverse brushing behaviours and parental responses to these behaviours vary depending on their knowledge, awareness and attitude. The Malay version of the Parenting and Child Tooth brushing Assessment (M-PACTA) is a reliable and validated questionnaire to assess child's toothbrushing behaviour, parental strategies, attitude and knowledge among Malaysian preschoolers. **Objectives:** To evaluate the factors influencing tooth brushing behaviour among preschool children in 2 states in Malaysia (Selangor and Kelantan) using Structural Equation Modeling (SEM). The secondary objective was to identify areas requiring targeted intervention to improve child's tooth brushing behaviour. **Methods:** A multistage sampling method was used to select preschool children from 40 government preschools. The M-PACTA was distributed to their parents via school teachers. SEM was applied to identify factors associated with the four scales of M-PACTA using SmartPLS 4.0 software. Importance-performance map analysis (IPMA) was conducted to determine the scales with high performance and importance. **Results:** A total of 941 parents completed the M-PACTA. Significant associations were observed between social support ($p=0.010$), home-based tooth brushing habits (HTB) ($p<0.001$), and child's tooth brushing behaviour. Parental strategies ($p<0.001$) and parental attitude ($p<0.001$) were positively associated with the child's tooth brushing behaviour. HTB appeared as the most critical factor in improving child's tooth brushing behaviour, followed by parental strategies and attitudes. **Conclusions:** Home-based tooth brushing habits, social support, parental strategies, and attitude were significantly associated with children's tooth brushing behaviour. By reinforcing good home-based tooth brushing habits, strengthening parental belief and applying both uncommon positive and negative parental strategies is essential for improving tooth brushing practices among preschool children.

Keywords: M-PACTA, tooth brushing, child's behaviour, determinants, structural equation modeling

Zinc-Substituted Bovine-Derived Hydroxyapatite: A Sustainable Antibacterial Agent for Preventive Dentistry

Eisha Imran¹, Maree Gould², Erwin Lamping², Nick Heng², Paul R Cooper², May Lei Mei¹, Jithendra Ratnayake², Kai Chun Li¹

¹Department of Oral Rehabilitation, Faculty of Dentistry, University of Otago, Dunedin, 9054, New Zealand

²Department of Oral Sciences, Faculty of Dentistry, University of Otago, Dunedin, 9054, New Zealand

Background: The use of biowaste in dentistry is gaining interest as demand grows for sustainable biomaterials in caries management. Hydroxyapatite (HA), a mineral naturally found in teeth and bones, can be sustainably sourced from bovine bone and is compositionally similar to human enamel. To enhance its antibacterial potential, zinc can be substituted into the HA lattice structure to inhibit growth of common cariogenic bacteria. **Objectives:** To synthesize zinc-substituted bovine-derived HA and evaluate its antibacterial efficacy and biocompatibility for potential use in preventive dental applications. **Methods:** HA was extracted from New-Zealand sourced bovine cancellous bone and substituted with various zinc concentrations (2%, 4%, 6% and 20%) using the sol-gel method. Material composition and structure were analysed using SEM, EDX, ICP-MS and XRD. Antimicrobial activity was evaluated against cariogenic species (*Streptococcus mutans*, *Streptococcus sobrinus*, *Lactobacillus rhamnosus*) and beneficial oral species (*Streptococcus sanguinis*, *Streptococcus salivarius*), to assess any potential collateral effects on the commensal microbiota. Biocompatibility was evaluated using osteoblast cell lines with MTT assay and live/dead staining with Calcein-AM and Propidium Iodide. **Results:** FTIR and XRD analyses confirmed HA presence in all groups. In the 20% Zn-HA group, β -tricalcium phosphate was also detected. EDX and ICP-MS confirmed that the combined (Ca + Zn)/P molar ratio remained consistent at 1.67 across all samples. The 20% Zn-HA sample exhibited significant antibacterial activity against cariogenic bacteria and *Streptococcus sanguinis*, while *Streptococcus salivarius* showed antibacterial resistance. Lower Zn substitution levels (2–6%) showed no antibacterial effect. Cytotoxicity assays confirmed the 20% Zn-HA was non-toxic to osteoblasts. **Conclusion:** Bovine-derived HA with 20% zinc substitution demonstrated strong antibacterial activity without compromising cell viability. Given that HA is also a rich source of calcium and phosphate ions, which support enamel/dentine remineralisation, there is strong potential for incorporation into preventive dental products such as toothpastes and varnishes.

Keywords: Bovine, zinc, substitution, antibacterial, biocompatibility, sustainability, hydroxyapatite

Synthetic Antimicrobial Polymers in Dentistry

Claire Minchun Huang¹, Christie Y K Lung¹, Chu Chun Hung¹

¹Faculty of Dentistry, The University of Hong Kong, Hong Kong, China.

Background: Researchers develop synthetic antimicrobial polymers with tunable properties, biocompatibility, durability, and stability as a novel and long-lasting strategy for managing biofilm-mediated oral infections. **Objectives:** This review summarizes the types, mechanisms, and dental applications of synthetic antimicrobial polymers, highlighting their potential in preventive and therapeutic care. **Methods:** PubMed, Web of Science and Scopus were searched for relevant literature on the development and application of antimicrobial polymers in dentistry. Relevant original studies were selected for review. **Results:** The search identified 1414 publications and included 91 publications. A total of 27 antimicrobial polymers were synthesized. They can functionally be categorized as cationic or zwitterionic. Cationic polymers, such as polymeric quaternary ammonium compounds or polybiguanide, directly kill pathogens by disrupting negatively charged bacterial membranes through electrostatic interaction. Zwitterionic polymers, like poly (methacryloyloxyethyl phosphorylcholine), and poly (Carboxybetaine methacrylate) are able to form a hydration layer to resist biofilm formation through repelling microbial adhesion and protein deposition. Synthetic cationic and zwitterionic polymers show significant promise against biofilm-related oral diseases. Cationic polymers, when incorporated into resin-based restoratives, deliver durable, contact-active antimicrobial effects. Zwitterionic polymers, used to modify dental surfaces like dentures and sealants, inhibiting biofilm formation. **Conclusion:** In conclusion, researchers synthesized cationic polymers and zwitterionic polymers which kill pathogens and resist biofilm formation. These synthetic antimicrobial polymers can be incorporated into restorative materials to increase the success of clinical treatment.

Keywords: Antimicrobial polymers, dentistry, infection control, biofilm, dental applications

Toothless Governance: How Sin Industry Lobbying and Fiscal Decentralization Derail Dental Public Health in Indonesia

Irsyad Dhahri¹, Rasmidar Samad², Fuad Husain Akbar²

¹Business Law Dept, Makassar State University

²Dentistry Faculty, Hasanuddin University, Indonesia

Background: Despite a diabetes prevalence of 10.6% and 90% untreated dental caries, Indonesia remains Asia's only non-FCTC signatory, reflecting systemic neglect of public health in favor of sin industry interests. Using Mialon's Corporate Political Activity (CPA) framework and Kingdon's Multiple Streams model, **Objectives:** this study analyzes how tobacco, sugar, and alcohol industries exploit decentralization to block policies like sugar taxes and advertising bans in Indonesia. **Methods:** Through a mixed-methods approach, including analysis of Ministry of Finance excise data, BPJS health expenditure reports, and case studies from Thailand and Mexico, **Results:** The article shows that fiscal dependence on sin industries (contributing 20% of national excise revenue) perpetuates policy stagnation. Decentralization amplifies this by enabling local governments to prioritize industry lobbying over health mandates. It is recommended to have earmarking 20% of sin taxes for dental health programs and legislating lobbying transparency under Indonesia's Public Information Disclosure Act. **Conclusion:** This research contributes to global health governance by illustrating how middle-income countries' fiscal structures enable regulatory capture.

Keywords: Dental public health, legal political economy, universal health coverage, sugar-tobacco-alcohol industries.

The Relationship Between Various Factors with the Knowledge and Perceptions Regarding Evidence-Based Dentistry: A Study Among Dental Students in Indonesia

Herry Novrinda^{1*}, Daiyane Safirasari², Risqa Rina Darwita¹, Febriana Setiawati¹, Armasastra Bahar¹, Han Dong-Hun^{3,4}

¹Department of Dental Public Health and Preventive Dentistry, Faculty of Dentistry, University of Indonesia, Jakarta, Indonesia

²Faculty of Dentistry, University of Indonesia, Jakarta, Indonesia

³Department of Preventive and Social Dentistry, Seoul National University, Seoul, Korea

⁴Dental Research Institute, Seoul National University, Seoul, Korea

Background: As a dentist in providing health services to patients, they should use evidence-based dentistry (EBD) treatment. Teaching EBD to dental students today is key to increasing the proportion of evidence-based care in the future. **Objectives:** To determine the relationship between various factors associated with the knowledge and perceptions regarding EBD among dental students in Indonesia. **Methods:** This is a cross-sectional study with convenient sampling among 416 dental students. The questionnaire was distributed online through Google form. The questionnaire consisted of 22 questions with 5 questions on the knowledge section, 7 questions regarding access to knowledge sources and 10 questions regarding perception. The data has been analyzed univariate and bivariate using SPSS ver.30. **Results:** The bivariate test results show that there is a relationship between age, entry class and education program with knowledge about EBD (p-value <0.05). There is a relationship between education program and year of entry (batch) with access to EBD knowledge sources (p-value <0.05). However, there was no association between age, gender, education program, and year of entry (batch) with perception of EBD. **Conclusion:** There were several related factors to the knowledge and the perceptions regarding EBD among students in Indonesia.

Keywords: knowledge, perception, evidence-based dentistry, indonesia, dental students

A Global Review of Dental Advertising Practices

Anis Nadhia Roslan¹, Nor Azlida Mohd Nor¹, Yasmin Kamarudin²

¹Department of Community Oral Health and Clinical Prevention, University Malaya, Kuala Lumpur, Malaysia

²Department of Paediatric Dentistry and Orthodontic, University Malaya, Kuala Lumpur, Malaysia

Background: The rise of social media and online platforms has changed how dental services are advertised, with digital marketing now used to connect with audiences and promote services. Many countries are adapting and updating their guidelines to keep up with advertising trends. **Objectives:** This study aims to identify the key principles and summarise advertising strategies outlined in dental advertising guidelines, regulations, or policies across different countries. **Methods:** This was a comprehensive document review conducted using the READ approach. A search on databases (PubMed, Medline, Scopus, Web of Science), targeted websites (relevant websites of government organizations, dental associations, or regulatory bodies), and grey literature was conducted to identify relevant documents covering five global regions: America, Europe, Asia, Africa, and Oceania. **Results:** This review included 67 documents from 43 countries. Eight key advertising principles were identified: legal compliance, accuracy and truthfulness, balanced and transparent information, professionalism and integrity, appropriate language, respectful communication, patient safety, and cultural sensitivity. Most principles were consistently emphasized across jurisdictions. However, cultural sensitivity, particularly regarding religious and sociocultural values, was more prominent in countries with strong cultural or religious influences such as the UAE (Dubai), Syria, Ghana, Armenia, and China. In contrast, countries like the United States addressed religious and racial content primarily through legal safeguards against discrimination, rather than as core ethical principles. Eight common advertising strategies were also identified: use of testimonials, product endorsement, non-professional endorsers, patient images, comparative advertising, third party promotion, discounts and promotional incentives and the display of professional qualifications. These advertising strategies were either permitted, permitted with strict conditions or prohibited depending on jurisdiction. **Conclusion:** This review highlights similarities and variations in how dental advertising is regulated. The findings contribute to a broader understanding of international regulatory perspectives and may serve as a foundation for future efforts to update existing guidelines.

Keywords: Dental advertising, key advertising principles, advertising strategies.

Factors Associated with Parental Acceptance of Silver Diamine Fluoride for Management of Early Childhood Caries in Malaysia

Simran Kaur Olikh¹, Nabihah Dzaruddin¹, Tengku Nurfarhana Nadirah¹, Nor Azlida Mohd Nor²

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

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

Introduction: Silver diamine fluoride (SDF) treatment has emerged as a promising option for arresting dental caries in young children. However, the black staining effects has hindered parental acceptance for the treatment. This study aimed to investigate Malaysian parents' acceptance of SDF treatment for management of early childhood caries (ECC) and their associated factors. **Methods:** This cross-sectional study was conducted from May 2023 to January 2024 across eight hospitals with Paediatric Dentistry services in Malaysia. The study included an educational video on SDF to parents, followed by a self-administered questionnaire to assess their perceptions. The data was analysed using descriptive statistics and association measures. **Results:** A total of 609 parents and children who were diagnosed with ECC were involved in this study. The results revealed a higher acceptance of SDF on posterior teeth (85.22%) among Malaysian parents as compared to 69.62% on anterior teeth. The acceptance of SDF for posterior teeth is influenced by children's dental anxiety, the behaviour management technique (BMT) planned, children's reported past dental experience, their behaviour during dental treatment, and dental visit frequency. For acceptance on anterior teeth, parental ethnicity, child's dental anxiety, BMT planned, past dental experience, and behaviour during dental treatment also played significant roles. **Conclusion:** Overall parents were likely to accept SDF treatment despite the dark stains on their children's teeth. The significant associated factors for parental acceptance of SDF were children's dental anxiety, behaviour during dental treatment, and history of BMT required.

Keywords: Parental acceptance, silver diamine fluoride, early childhood caries.

Association Between Multiple Psychological Symptoms and Severe Periodontitis Among Myanmar Adults

Kaung Myat Thwin¹, Wa Than Lin², Sachiko Takehara¹, Hiroshi Ogawa¹

¹Division of Preventive Dentistry, Faculty of Dentistry & Graduate School of Medical and Dental Sciences, Niigata University, Japan

²Committee for Oral Health Education, Myanmar Dental Association, Myanmar

Background: Most existing studies have examined the individual associations of psychological symptoms with periodontal health, but few have explored their combined presence. A significant gap remains in understanding how the co-occurrence of depression, anxiety, and stress relates to periodontal status, especially in low-resource settings like Myanmar. **Objectives:** To identify the associations of any emotional state of depression, anxiety, or stress symptoms, and co-occurrence, with periodontal status in Myanmar adults. **Methods:** This cross-sectional study included 316 participants from a health center in Yangon city in 2023-2024. Psychological symptoms were assessed using the validated Myanmar version of Depression, Anxiety, and Stress Scale-21, and participants were further categorized into four groups: "non-DAS" (no symptoms), "any one positive-DAS" (one symptom), "any two positive-DAS" (two symptoms), and "all positive-DAS" (all symptoms). Periodontitis was classified per parameters based on CDC/AAP criteria and dichotomized into "severe" or "not severe." Logistic regression analyses were performed to evaluate associations between psychological symptoms and severe periodontitis. **Results:** Among 316 participants, 22.8% reported depressive symptoms, 33.5% had anxiety symptoms, and 13.3% had stress symptoms. The distribution of psychological symptoms categories was 59.5% for "non-DAS", 19.0% for "any one positive-DAS", 13.9% for "any two positive-DAS", and 7.6% for "all positive-DAS". Overall, 45.9% of participants had severe periodontitis. Logistic regression analyses revealed that depressive, anxiety, and stress symptoms were independently associated with severe periodontitis, even after adjusting for potential confounders. The presence of two or more psychological symptoms was associated with an increased likelihood of severe periodontitis across all models. **Conclusion:** Psychological symptoms showed adverse associations with periodontal health and multiple concurrent conditions may be related to increased periodontitis severity in Myanmar adults. These findings indicate the importance of considering psychological well-being into periodontal health assessments.

Keywords: Depression, anxiety, stress, periodontitis, myanmar.

Assessing The Feasibility, Acceptability, And Readiness of Carers for Teledentistry in Oral Healthcare for People with Disabilities: A Preliminary Study

Nur Nuha Mohd Nazeri¹, Norashikin Yusof¹, Noor Nazahiah Bakri¹

¹Centre of Population Oral Health and Clinical Prevention Studies, Universiti Teknologi MARA, Malaysia

Background: People with disabilities (PWDs) often face barriers to accessing dental care due to physical, financial, and logistical constraints. Carers, who are responsible for managing the oral health of PWDs frequently experience low confidence and limited knowledge, and face challenges in ensuring oral health compliance. Teledentistry offers a promising alternative by providing remote dental care and education. However, its success depends on the feasibility, acceptability, and readiness of carers to adopt this technology. **Objectives:** To explore the feasibility, acceptability, and readiness of carers to adopt teledentistry to support oral healthcare for PWDs. **Methods:** This qualitative study employed semi-structured, in-depth interviews (IDIs) with carers from two long-term care facilities (LTCFs) in Selangor. Participants were selected through purposive sampling and included full-time carers with at least six months of experience, who were directly involved in oral care and proficient in either Malay or English. Carers with disabilities or part-time roles were excluded. Interviews were conducted, and data were thematically analysed after each session to identify emerging themes and subthemes related to the feasibility, acceptability, and readiness of teledentistry usage for carers of PWDs. **Results:** This preliminary report is based on four IDIs. Participants were predominantly female, with a median age of 50 years and median working experience of 4 years in LTCFs. They expressed interest and willingness to use teledentistry, citing its potential to improve convenience, reduce travel time, and lower costs. Key enablers included stable internet access, digital literacy, and formal training. Carers emphasised the need for accessible dental information, responsive professional support, and integration into a user-friendly application. **Conclusion:** Teledentistry appears acceptable for carers managing oral healthcare for PWDs. Its successful implementation requires improved digital skills and the development of supportive, user-centred platforms offering local expertise and timely assistance.

Keywords: Teledentistry, oral healthcare, people with disabilities, carers, virtual dental care

Effectiveness of School-Based Fluoride Mouth Rinse Programme in Keningau on Dental Caries Experience Among Standard 1 Students In 2023: A Comparative Observational Study

Muhamad Khizreen bin Mohd Rothman¹, Nur Shaheerah binti Rasamin¹, Siti Aisah binti Lugiman¹, Salliesiah binti Lainus¹, Jamiliah binti Paun¹, Clyrona William Jerome Yapas¹, Siti Nurul Afiqah binti Mahian Nordin², Erlyna binti Endot³, Ani Atiqah binti Muslim³, Muhammad Faiz bin Mohd Hanim⁴, Nurul Izzati binti Mohamad Ali⁵

¹ Keningau Dental Clinic, Ministry of Health, Malaysia

² Tambunan Dental Clinic, Ministry of Health, Malaysia

³ Keningau District Dental Health Office, Ministry of Health, Malaysia

⁴ Oral Health Division Sabah, Ministry of Health, Malaysia

⁵ Oral Health Programme, Ministry of Health, Malaysia

Background: Sabah recorded as one of the highest dental caries prevalences in Malaysia among schoolchildren. Furthermore, water fluoridation in Sabah were not widely applied, the school-based fluoride mouth rinse (sFMR) programme is the primary alternative fluoride source for schoolchildren especially in rural areas like Keningau. However, its effectiveness under inconsistent real-world implementation remains unclear. **Objectives:** This study aimed to assess Standard 1 students' caries status before and after sFMR implementation, compare caries experience between sFMR and non-sFMR groups, estimate the caries prevention fraction, and investigate the influence of sFMR frequency, oral hygiene status, and gender on DMFT increment. **Methods:** A retrospective study was conducted involving Standard 1 students in selected schools across Keningau. Data on sociodemographic, oral hygiene status, sFMR frequency and DMFT index were collected. All data were analysed using SPSS version 26.0 included Welch's t-test, simple and multiple linear regression. **Results:** This study involved 935 students, 47.6% were male and 52.4% female, predominantly of Dusun, Murut, and Kadazan ethnicities. The sFMR group showed a lower mean DMFT increment (0.127 ± 0.457) compared to the control (non-sFMR) group (0.305 ± 0.722) (Welch's $t = 4.526$, $p < 0.001$; Cohen's $d = 0.294$). The calculated caries prevention fraction was 58.4%. Simple linear regression revealed a significant inverse association between sFMR frequency and DMFT increment ($B = -0.010$, $p < 0.001$). However, this association was not significant in multivariable analysis after adjusting for gender and oral hygiene. Female and poor oral hygiene were significantly associated with greater DMFT increment ($p < 0.05$). **Conclusion:** The sFMR programme moderately reduces caries among schoolchildren in non-fluoridated areas. However, its effectiveness appears to be influenced by gender and oral hygiene. Reinforcement through oral health education and consistent FMR delivery is essential to optimise outcomes.

Keywords: fluoride mouth rinse, dental caries, school-based programme, DMFT, oral hygiene

Preliminary Findings on Patient Acceptability of The Community Service in School Dental Clinic Programme in Selangor, Malaysia: A Qualitative Study

Mohd Sanif, Nur Syafrina^{1,2}, Mohd Radzi, Nawwal Alwani¹, Bakri, Noor Nazahiah¹

¹Centre of Population Oral Health & Clinical Prevention Studies, Faculty of Dentistry, Universiti Teknologi MARA, Malaysia

²Oral Health Division, Ministry of Health, Malaysia

Background: Access to oral healthcare in Malaysia remains limited, especially in underserved communities. The Community Service in School Dental Clinic Programme (Program Pemasarakatan Klinik Pergigian Sekolah, PPKPS) is a service innovation that expands the scope of school dental clinics beyond students, to include teachers, staff, and their families, aiming to bridge access gaps. While the programme has potential to enhance accessibility, its acceptability from the patient perspective remains underexplored - an essential factor for effective implementation and long-term sustainability. **Objectives:** To assess the acceptability and experiences of patients regarding the PPKPS programme in Selangor, and to explore their suggestions for programme improvement. **Methods:** Data were collected through in-depth interviews (IDI) and transcribed verbatim. Analysis followed a two-step approach. First, a deductive content analysis was conducted using the Theoretical Framework of Acceptability (TFA) domains as predefined categories. Next, inductive coding was applied to identify emerging subthemes within and beyond the TFA structure. This allowed deeper insight into participants' experiences. **Results:** This preliminary study involved nine participants of the PPKPS programme in Selangor, mostly females aged 30–49 with tertiary education. All were repeat users, reflecting sustained engagement. The programme notably improved dental attendance, shifting participants from irregular to regular yearly visits. Participants expressed positive affective attitudes, reporting feelings of happiness, gratitude, and comfort. The service was well understood (intervention coherence), perceived as beneficial (perceived effectiveness), and helped improve confidence in managing oral health care (self-efficacy). Participation was described as convenient (low burden), with minimal disruption to daily routines (low opportunity cost), and aligned with participants' personal values (ethicality), showed strong alignment with personal values, as participants viewed the programme as beneficial and appropriate. The general acceptability domain further highlighted the programme's perceived value. **Conclusion:** Overall, the findings indicate that the PPKPS is highly acceptable among users, with strong emotional, practical, and behavioural support for its continuation and future expansion.

Keywords: Acceptability, community, patients, school dental clinic, theoretical framework of acceptability

Control of Smoking Products for Public Health Act 2024 (Act 852): A Content Analysis of Malaysia Online News

Nurul Syariza Kamal¹, Azri Aliah Mohd Yani¹, Budi Aslinie Md Sabri¹, Eddy Hasrul Hassan¹

¹Centre of Population Oral Health & Clinical Prevention, Faculty of Dentistry Universiti Teknologi MARA (UiTM), Malaysia

Background: In Malaysia, the Control of Smoking Products for Public Health Act 2024 (Act 852) commenced enforcement, along with its regulations and orders, on 1st October 2024. This encompasses provisions on the sale of smoking products and regulations governing the advertising, marketing, and sponsorship of all tobacco products, as well as the prohibition of tobacco sales. Understanding how online news portals respond to the Act will reveal alignment or disconnects between policy intent and public discourse. **Objectives:** To determine the response of the Malaysia-based online news portals regarding the Act 852. **Methods:** The online news articles regarding Act 852 were gathered from the top ten Malaysia-based online news portals, published in Malay or English, from January 2024 to May 2025, using NCapture and NVivo software. Articles were classified as “pro” (supportive of Act 852), “anti” (opposed), or “neutral”. Two researchers independently coded the articles and compared their results to achieve consensus among researchers. The descriptive analysis was carried out using Microsoft Excel. **Results:** Out of 700 news articles identified, 607 were included in the analysis. The number of news articles published increased steadily from January 2024, peaking sharply in October 2024, coinciding with the implementation of the Act. After October 2024, coverage declined significantly. Majority (71.66%) of the news articles showed a positive sentiment towards the implementation of the Act, followed by neutral responses (19.28%), and 9.06% responded negatively. **Conclusion:** The findings indicate a largely supportive response from Malaysian online media regarding Act 852, especially around its enforcement date. The temporary spike in coverage reflects heightened public and media interest during implementation. The predominance of positive reporting suggests online news portals played a supportive role in disseminating public health messaging. These insights underscore the media's potential in shaping public understanding and acceptance of health legislation.

Keywords: Act, smoking, content analysis, news

Application of Chiral-Coated Probiotics in Periodontitis Treatment: Enhanced Antibacterial, Anti-Inflammatory, and Osteogenic Effects

Yifei Chen¹, Yue Zhou¹, He Cai¹, Ran Cheng¹, Tao Hu¹

¹Department of Preventive Dentistry, West China Hospital of Stomatology, Sichuan University, Chengdu, Sichuan, China

Background: Periodontitis is a chronic disease with inflammatory tissue destruction caused by the imbalance of periodontal microbiome. *Lactobacillus reuteri* (LR), as a probiotic which can alleviate periodontitis and prevent drug resistance, limits by single function and poor persistence. Chiral polymers can improve drug efficiency, but has never be combined with periodontal probiotic to treat periodontitis. **Objectives:** To construct left-handed/right-handed/racemic histidine-modified polyethylenimine and Sr²⁺ coatings on LR (LR@L-/D-/DL-His-PEI-Sr), enhancing antibacterial activity, anti-inflammatory effects, and osteogenesis in periodontitis treatment. **Methods:** LR@L-/D-/DL-His-PEI-Sr were characterized after self-assembly. Its antibacterial effect was evaluated using co-culture assays. The issue adhesion capacity was assessed by isolating and counting LR colonies adhering to periodontal ligament of extracted teeth. Osteogenic differentiation was assessed by alkaline phosphatase (ALP) activity, safranin red staining, and qPCR. ROS scavenging was analyzed using DCFH-DA fluorescence and flow cytometry. Macrophage polarization was examined via immunofluorescence staining and flow cytometry. Periodontitis rats were used to evaluate material biocompatibility and osteogenic potential in vivo. **Results:** Stable chiral coatings were successfully formed on the surface of LR without compromising its activity. LR@L-His-PEI-Sr exhibited significant inhibitory effects on both *Porphyromonas gingivalis* and *Fusobacterium nucleatum*, and could enhance the adhesion of LR onto periodontal tissue. Additionally, LR@L-His-PEI-Sr had strongest ROS scavenging capacity, could promote the polarization of macrophages toward M2 phenotype, and increased ALP activity, mineral deposition, and expression of osteogenic genes. In periodontitis rats, all groups showed no obvious toxicity, among which LR@L-His-PEI-Sr had significantly increased new bone formation and more intact trabecular structure. **Conclusion:** LR@L-His-PEI-Sr achieves multi-target synergy through chiral selectivity, overcoming the limitations of traditional probiotics and enhancing antibacterial, anti-inflammatory and osteogenic effects. As the first innovation to apply chiral-coated probiotics in medical practice, it may provide a new strategy with higher efficacy in the treatment of periodontal diseases.

Keywords: Periodontitis, chiral regulation, lactobacillus reuteri, macrophage polarization, osteogenesis

Evolution of Silver Diamine Fluoride Research in Dentistry: A Bibliometric Analysis

Wong Fui Jak^{1,3}, Nor Azlida Mohd Nor¹, Tengku Nurfarhana Nadirah Tengku Hamzah², Thaddius Herman Maling³

¹Department of Community Oral Health and Clinical Prevention, Faculty of Dentistry, Universiti Malaya, Malaysia

²Department of Paediatric and Orthodontics, Faculty of Dentistry, Universiti Malaya, Malaysia

³Oral Health Division, Sabah State Health Department, Ministry of Health, Malaysia

Background: Silver Diamine Fluoride (SDF) has emerged as an innovative and cost-effective preventive agent for managing Early Childhood Caries (ECC), attracting growing research interest. Previous bibliometric studies, limited to publications up to 2021, focused on trends and keywords but lacked detailed insights into thematic evolution. A comprehensive mapping is needed to inform current patient-centred and public health research directions. **Objective:** To perform an updated bibliometric analysis of global SDF research, focusing on publication trends, leading contributing countries, and thematic evolution to bridge existing knowledge gaps in preventive dentistry. **Methods:** A search was conducted using the Scopus database to retrieve publications from inception to 20 April 2025. After data cleaning and harmonisation, descriptive analyses were performed to assess publication output, citation metrics, and country contributions. Author keyword co-occurrence analysis was used to identify core themes, track evolution, and map positioning. Data analysis and visualisation were performed using biblioMagika®, VOSviewer, and Biblioshiny. **Results:** A total of 727 SDF-related documents were screened, and 659 were included in the analysis. Cumulative publication output grew from 337 in 2021 to 624 in 2024. The United States contributed the highest number of publications, while Hong Kong had the highest average citations per publication. Seven thematic clusters were identified: Interaction with Dental Structures and Materials, Paediatric Caries Management, Remineralisation and Cariostatic Action, Antimicrobial and Biofilm Disruption, Aesthetics and Acceptance, Public Health and Clinical Prevention, and Education and Awareness. Thematic progression showed early focus on antimicrobial and material-related studies (pre-2020), followed by emphasis on cariostatic mechanisms, paediatric care, and public health (2020–2021). From 2022 onward, research increasingly addressed aesthetics, parental acceptance, and education-related themes. **Conclusions:** SDF research has expanded rapidly with evolving themes. Future research should prioritise translating these evidence-based innovations into practical strategies, particularly for ECC control in community-based settings.

Keywords: Silver diamine fluoride, bibliometric analysis, conceptual structure, thematic evolution

Artificial Intelligence Integration in Dental Education: Awareness, Attitudes And Practices of Malaysian Dental Students

Muhammad Nazmi bin Abdul Majid¹, Noor Syahidah binti Hisamuddin¹, Zamros Yuzadi Mohd Yusof¹

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

Background: Artificial intelligence (AI) has emerged as a transformative tool in dentistry, offering opportunities to enhance education, diagnostics, and clinical practice. However, the awareness, attitudes, and practices of dental students toward AI remain underexplored, particularly within the Malaysian context. **Objectives:** This study aimed to assess Malaysian dental students' awareness, attitudes, and practices regarding AI use in dental education and examine the association of these variables with school type. **Methods:** A cross-sectional online survey was conducted among 1,104 dental students from 13 Malaysian dental schools (83% government, 17% private). The questionnaire comprised validated items addressing sociodemographic characteristics, awareness, attitudes, and practices related to AI use in dentistry. Data were analyzed using descriptive statistics and chi-square tests. **Results:** Awareness of AI tools was high in both groups (97.3%). However, government school students demonstrated significantly greater exposure to AI information sources, including lectures (88.2% vs. 11.8%) and internet/social media platforms (84.1% vs. 15.9%) ($p < 0.001$). They also reported more frequent AI use for academic tasks, such as presentations (85.6% vs. 14.4%) and group discussions (86.3% vs. 13.7%), whereas private school students showed slightly higher proportions of limited or no AI usage. Attendance at AI workshops was notably higher in private institutions (24.8%) compared to government schools (13.5%) ($p < 0.001$). Attitudinal differences were also evident which government students were more likely to believe that AI supports academic activities without raising ethical concerns (85.8% vs. 14.2%, $p = 0.031$) and to recommend AI to peers (85.5% vs. 14.5%, $p = 0.022$). **Conclusion:** Malaysian dental students generally exhibit high awareness and positive attitudes toward AI. Nonetheless, significant differences exist between government and private institutions regarding exposure, training, and attitudes. These findings underscore the need for standardized AI education across dental schools to ensure equitable preparedness for AI-driven advancements in dentistry.

Keywords: Artificial intelligence, dental education, government vs private institutions, awareness, attitudes, practices, malaysia

Accuracy of Clinical Photography For Detecting Dental Caries: A Systematic Review and Meta-Analysis

Jason Chi-Kit Ku¹, Ollie Yiru Yu¹

¹Faculty of Dentistry, University of Hong Kong, Hong Kong

Background: Early caries detection is the premise of proper caries management. Clinical photography is increasingly integrated into routine clinical practice; however, its effectiveness in facilitating caries detection has yet to be clearly established. **Objectives:** To evaluate the accuracy of visual caries detection using clinical photographs in comparison with visual clinical intraoral examination for the detection of dental caries. **Methods:** This review followed PRISMA-DTA guidelines and was registered in PROSPERO (CRD42024598814). A systematic search for clinical studies was conducted on January 1st, 2025, on PubMed, Web of Science, Scopus and EMBASE databases. Risk of bias was assessed using QUADAS-2 tool. Accuracy parameters of sensitivity, specificity and diagnostic odds ratio (DOR), area under summary receiver operating characteristic curve (AUC) and partial AUC (pAUC) were generated. **Results:** Eighteen studies including 1300 participants were included in this review. Risks of bias and applicability concerns were frequently encountered in one or more domains. The pooled sensitivity (95 % Confidence Interval, CI), specificity (95 %CI), DOR (95 %CI) and AUC (pAUC) of the visual assessment of clinical photographs were 0.74(0.70–0.77), 0.95(0.88–0.98), 52.94(22.13–126.66), and 0.813(0.753) for enamel caries; 0.81(0.75–0.86), 0.98(0.94–0.99), 142.01(67.50–298.77), and 0.935(0.857) for dentine caries; 0.81(0.70–0.89), 0.99(0.96–1.00), 245.04(83.75–716.96), and 0.957(0.902) for any caries depth. Subgroup analysis suggested that caries depth (enamel caries v.s. dentine caries v.s. any caries depth; $p=0.072$), dentition (primary v.s. permanent; $p=0.584$ (dentine caries data), $p=0.923$ (any caries data)), technology (smartphone camera v.s. intra-oral camera; $p=0.993$), and photographer (dental professional v.s. layperson; $p=0.466$) did not modify the diagnostic performance. **Conclusion:** Visual assessment of clinical photographs for caries detection demonstrated clinically acceptable accuracy when compared with visual clinical intraoral examination. High specificity values across diagnostic thresholds suggest a high level of accuracy in correctly identifying sound tooth structure.

Keywords: Caries detection, clinical photography, diagnostic accuracy

Effectiveness of School Nurses in Promoting Oral Health Among School Children's in Nepal

Dilip Prajapati¹, Swagat Kumar Mahanta², Ramesh Yadav³, Darpa Pradhan⁴, Shaili Pradhan⁵

^{1,2,3}Department of Public Health Dentistry, Kathmandu University School of Medical Sciences, Dhulikhel Hospital, Nepal

⁴Orthodontist, Darpan Dental Home, Nepal

⁵ Department of Periodontology and Implantology, Kathmandu Medical College, Nepal

Background: Gingival diseases and Dental Caries is the global burden especially in low and middle income countries. The Nepal government has established a policy framework, including the "National School Health and Nutrition Strategy" (2006) and "One School One Nurse" program. **Objectives:** The study aimed to evaluate the effectiveness of school nurses led in promoting oral health among school children in Nepal. **Methods:** A prospective cohort study was conducted among 324 students (aged 7-15) from three different government schools with school nurses in Kavre district of Nepal. An Intervention group received weekly reinforced oral health education from a trained school nurse. A semi intervention group received a single education session, while a control group doesn't receive any training or intervention. Expert dentist collected baseline and three months follow-up data on DMFT, Plaque index and gingival index. **Results:** Baseline data recorded high dental caries prevalence in both primary (48.9%) and permanent dentition (46.8%), Students (52.9%) brush their teeth occasionally and 46.2 % of them use non fluoridated tooth paste. There was significant reduction in the plaque score (2.06 ± 0.63 to 1.50 ± 0.54) in intervention group in compared to Semi-intervention and Control Group (2.06 ± 0.68 to 2.02 ± 0.69 and 2.18 ± 0.64 to 2.06 ± 0.98). There was improved gingival bleeding in Intervention Group (3.4 ± 2.47 to 1.32 ± 1.20) whereas minimal improvement was observed in the Semi-intervention group, whereas slight decrease in semi intervention group (4.94 ± 2.75 to 4.59 ± 2.662) and worsened in the Control group (3.97 ± 3.14 to 4.96 ± 3.18). **Conclusion:** School nurses plays significant role in improving gingival health of school children and effective in promoting oral health among the school children's especially in the low and middle income country where there is no provision of school dental nurses.

Key words: Dental caries, gingival disease, plaque, school nurse, school oral health

Oral Health Issues and Barriers Among Methadone Replacement Therapy Patients: A Scoping Review

Nur Athirah Abdul Aziz¹, Ainol Haniza Kherul Anuwar^{1,2}

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

² Oral Cancer Research and Coordinating Centre, Universiti Malaya, Kuala Lumpur, Malaysia

Background: Since 2005, Methadone Replacement Therapy (MRT) has been central to Malaysia's strategy for managing opioid dependence. While effective in reducing drug-related harm, the oral health needs of MRT patients remain overlooked. They face high burden of dental disease, including caries, periodontal disease, xerostomia, and mucosal lesions, compounded by methadone syrup's sugar content, reduced salivary flow, and socioeconomic barriers. The absence of integrated dental services indicates a systemic gap in holistic addiction care. **Objectives:** To synthesise existing evidence on oral health conditions and barriers to dental care among MRT patients. **Methods:** A scoping review was conducted following PRISMA-ScR guidelines. Systematic searches across PubMed, OVID Medline, Scopus, and Web of Science identified English-language studies on oral health in MRT patients. Eligible studies were screened, data on disease prevalence and care barriers were charted and synthesised using thematic analysis. **Results:** A total of 38 studies were included. Dental caries prevalence ranged from 11.4% to 99.6% with mean DMFT scores between 9 and 23.6, significantly higher than non-MRT populations. Periodontal disease was prevalent, with bleeding on probing reported in up to 99.6% and calculus formation in 96.6% of patients. Xerostomia affected up to 67.4% of patients, though its prevalence decreased with longer treatment duration. Temporomandibular dysfunction presented as joint clicking (74.5%) and tenderness (69.1%). Patients also experienced significant tooth loss (11 - 15 missing teeth) and parafunctional habits such as bruxism (25.4% - 59.7%). Identified barriers to care spanned individual, social, environmental, and system levels. **Conclusion:** Oral health disparities among MRT patients highlight gaps in integrated addiction care. Coordinated MRT-dental services, stigma reduction training, and preventive strategies like sugar-free methadone are essential. Policy reforms must prioritise oral health to improve treatment outcomes and quality of life.

Keywords: Methadone replacement therapy, oral health conditions, integrated healthcare, substance use disorders, dental care

Geospatial Accessibility and Oral Cancer Stage at Diagnosis: A Five-Year Study in Sarawak

Bibiana Yong Hui-Ying^{1,2}, Jamaludin Marhazlinda¹

¹Department of Community Oral Health and Clinical Prevention, Faculty of Dentistry, Universiti Malaya, Malaysia

²Oral Health Division, Sarawak State Health Department, Ministry of Health, Malaysia

Background: Sarawak faces a significant public health challenge due to the high burden of oral cancer. From 2017 to 2022, the National Oral Health Report consistently ranked Sarawak among the states with the highest rates of late-stage oral cancer detection. This highlights the critical need for research into the spatial distribution of oral cancer cases, staging at the time of detection, and geospatial accessibility to healthcare services. **Objective:** This study assessed the relationship between geospatial accessibility to public referral hospitals and the stage of oral cancer at detection among positively screened adult patients in Sarawak from 2019 to 2023. **Methods:** Residential postcodes data and the locations of hospitals providing Oral and Maxillofacial Surgery (OMFS) services were obtained from the Register for Referral Cases maintained by the Sarawak State Health Department. Using QGIS Version 3.30, geocoding and spatial analyses, including buffer analysis, were performed to examine the relationship between TNM stage at detection and geospatial accessibility. Accessibility was assessed based on travel distances (5 km, 10 km, 20 km) and travel times (30, 60, 90 minutes) to five referral hospitals: Hospital Umum Sarawak, Hospital Sibul, Hospital Sarikei, Hospital Miri, and Hospital Bintulu. **Results:** A total of 225 patients screened positive for oral cancer and were referred to OMFS departments from 2019 to 2023. A high number of Stage IV diagnoses were reported, particularly in 2020 and 2022. In Kuching, many Stage IV cases were located within 10 km of Hospital Umum Sarawak, while in the Central Zone, several were found beyond 20 km from Hospital Sarikei and Sibul. Late-stage detections also occurred among patients residing within short travel times to referral hospitals. **Conclusion:** Geographic accessibility alone does not explain late-stage detection. Integrated strategies are crucial for enhancing early screening, public awareness, and healthcare responsiveness in population-based strategies for the early detection and prevention of oral cancer.

Keywords: Oral cancer, geospatial accessibility, cancer staging

Exploring Oral Health Care in Nursing Homes: Preliminary Insights into Challenges and Coping Strategies Among Elderly in Nursing Homes

Aisyah Mohd Abu Bakar¹, Noor Nazahiah Bakri¹, Norashikin Yusof¹

¹Centre of Population Oral Health and Clinical Preventive Studies, Faculty of Dentistry, Universiti Teknologi MARA, Malaysia

Background: The increasing ageing population in Malaysia has led to a growing demand for institutional elder care. However, oral health care in nursing homes remains inadequate, despite national policies. Elderly residents often face oral health challenges that are under-addressed, affecting their quality of life and overall health. **Objectives:** This study explores the challenges faced by elderly residents in meeting their oral health care needs and accessing services in nursing homes and identifies the coping strategies used. **Methods:** A qualitative approach using in-depth interviews (IDIs) was conducted with five elderly residents from nursing homes in Selangor. Four participants were from two private institutions, and one from a government facility. Participants were selected through purposive sampling based on the following inclusion criteria: aged 60 and above, residing in a nursing home for at least three months, and able to communicate in Malay or English at a basic level. Data were collected using semi-structured interview guides, transcribed verbatim, translated, and thematically analysed using NVivo software. **Results:** Participants, mostly male and aged 63 to 90 years, with stays ranging from 8 months to 5 years, reported barriers such as limited dental service access, long waiting times, fear of treatment, and untreated conditions. Systemic illnesses and lack of suitable hygiene tools further hindered care. Coping strategies included saltwater rinses, eating on one side, modifying food, and accepting tooth loss. Differences in family involvement, such as buying oral care supplies and arranging check-ups, and institutional support, including caregiver help during showers and bathroom chair provision, influenced how residents managed their oral health. **Conclusion:** Preliminary findings highlight complex barriers to oral health care in nursing homes. Addressing these requires multi-level interventions, including better dental service access, caregiver training for dependent residents, and personalized oral health support systems.

Keywords: Elderly, nursing homes, oral health, challenges, coping strategies

Functional Tooth Units and Dietary Inflammatory Index Among Older Adults: A Cross-Sectional Study

Rieski Prihastuti^{1,2}, Daisuke Hinode³, Makoto Fukui³, Yoshizo Matsuka¹

¹ Department of Stomatognathic Function and Occlusal Reconstruction, Graduate School of Biomedical Sciences, Tokushima University, Japan

² Department of Preventive and Community Dentistry, Faculty of Dentistry, Universitas Gadjah Mada, Indonesia

³ Department of Hygiene and Oral Health Science, Graduate School of Biomedical Sciences, Tokushima University, Japan

Background: Tooth loss and reduced functional tooth units (FTUs) have been associated with impaired dietary quality. However, the relationship between FTUs subtypes and the dietary inflammatory index (DII), which quantifies individual potential for dietary inflammation, remains unclear, as prior studies mainly focused on the total FTUs. **Objectives:** This study evaluated the association between FTUs subtypes, natural (n-FTU), natural/fixed prosthetic (nif-FTU), total FTU, and DII scores in older adults aged ≥ 50 years. **Methods:** This study included dental examination and dietary data from four National Health and Nutrition Examination Surveys (NHANES) cycles, from 2011–2012 to 2017–2018. Survey-weighted linear regression was used to examine the relationship between FTUs and DII after controlling for demographic characteristics, lifestyle, and cardiometabolic factors. Additionally, complete-case and multiple imputation analyses were applied to produce reliable results. **Results:** A total of 5,629 participants were included, 3,032 males and 2,597 females. The result demonstrated consistent negative associations between all FTUs subtypes and DII scores, even after controlling for potential confounders, indicating that higher scores of FTUs are associated with more anti-inflammatory diets. In contrast to total FTU ($\beta = -0.033$, 95% CI -0.053 to -0.013, $p < 0.001$), n-FTU and nif-FTU demonstrated stronger associations ($\beta = -0.061$, 95% CI -0.081 to -0.040, $p < 0.001$). In addition, multiple imputation analysis showed similar results to complete-case analysis, indicating the robustness of these findings. **Conclusion:** This study demonstrates that all FTU subtypes are substantially associated with lower DII scores. Particularly, n-FTU and nif-FTU showed greater association than total-FTU, suggesting that maintaining natural teeth or replacing them with fixed prostheses may play an important role in promoting anti-inflammatory dietary patterns.

Keywords: Functional teeth unit, dietary inflammatory index, oral health, nutrition

Oral Frailty, Reduced Quality of Life, and The Need for Domiciliary Dental Services for Older Adults in Malaysia

Tuti Ningsch Mohd-Dom¹, Tew In Meei², Haslina Rani¹

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

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

Background: Oral frailty—a decline in oral function—is a critical marker of deteriorating health and reduced quality of life in older adults. In nursing homes, where residents are often functionally dependent, preventive oral care is challenging. Despite clear links to malnutrition, social isolation, and functional decline, oral frailty is still poorly addressed in aged care policies. Caregivers, who play a key role in daily oral hygiene, face systemic and practical barriers that limit effective prevention. **Objectives:** To assess the relationship between oral frailty and oral health-related quality of life, and to integrate caregivers' perspectives to inform improvements in dental service access for long-term care residents. **Methods:** A mixed-method approach was employed. A cross-sectional study of 115 nursing home residents (mean age 72.9 ± 6.8 years; 58.3% male) assessed oral frailty using the Oral Frailty Five-Item Checklist (OF-5) and OHRQoL using the Geriatric Oral Health Assessment Index (GOHAI). In parallel, three focus group discussions with 16 caregivers were conducted to explore challenges in daily oral care provision. Data were analyzed using descriptive statistics, inferential tests, and thematic analysis. **Results:** Oral frailty was prevalent in 94.8% of residents. Xerostomia and difficulty chewing were significantly associated with lower GOHAI scores ($p = 0.005$; $p < 0.001$). Caregivers reported barriers including resident resistance, lack of training, limited staffing, and poor access to professional dental services. These findings reflect a convergence of clinical needs and system-level shortcomings. **Conclusion:** Oral frailty significantly compromises QoL in nursing home residents, compounded by service delivery gaps. Addressing these issues requires policy reforms that expand domiciliary dental care, mandate caregiver training, and integrate oral health into aged care protocols.

Keywords: Oral frailty, older adults, nursing home, domiciliary care, caregiver

Multi-Model Machine Learning for Caries Risk Assessment In Adults

Mohd Hidir Atni^{1*}, Budi Aslinie Md Sabri¹, Nik Mazuan Nik Mohd Rosdy², Mohd Azrul Amir Muhamad Tajudin³, Noor Asilati Ab Raob¹

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

²Centre of Oral & Maxillofacial Diagnostics & Medicine Studies, Faculty of Dentistry, Universiti Teknologi MARA.

³Jabatan Infostruktur, Pejabat Pembangunan Infrastruktur dan Infostruktur, Universiti Teknologi MARA Shah Alam

Background: Dental caries is a multifactorial chronic disease that can be effectively managed with timely intervention. Accurate and consistent caries risk prediction is crucial for improving dental health outcomes, reducing treatment costs, and mitigating long-term complications. With advancements in artificial intelligence (AI), machine learning offers significant potential for enhancing caries risk assessment in adults, supporting evidence-based decision-making. **Objective:** This study aims to develop computational models using machine learning classification techniques for caries risk prediction in adults. **Methods:** Twelve key predictors were identified through a systematic review of evidence-based causative factors, focusing on studies with longitudinal designs to ensure temporality. A balanced dataset of 3,000 samples, equally distributed among low, moderate, and high-risk categories was constructed using data from the Universiti Teknologi MARA (UiTM) patient database and supplemented by phone calls to ensure data completeness. Seven machine learning algorithms, Decision Tree, XGBoost, k-Nearest Neighbours, Logistic Regression, Multi-Layer Perceptron, Random Forest, and Support Vector Machines were evaluated using K-fold cross-validation. Ensemble learning with stacking was applied to combine classifiers and improve performance. **Results:** The stacking ensemble model KNN+LR achieved the highest accuracy (95.17%), sensitivity (95.17%), and specificity (97.58%). The three-model ensemble KNN+LR+MLP also performed well with 93.63% accuracy and 96.82% specificity. Among individual classifiers, Random Forest showed strong accuracy (91.00%) and sensitivity (93.57%), while Extreme Gradient Boosting had slightly lower accuracy (90.77%) and sensitivity (90.60%). Overall, ensemble models outperformed single classifiers in predictive performance. **Conclusions:** This study highlights the effectiveness of multi-model machine learning approaches in caries risk assessment for adults, demonstrating their potential to deliver consistent and reliable predictions. These findings pave the way for integrating advanced algorithms into clinical workflows to enhance prevention strategies and optimize patient care.

Keywords: Adult dental screening; caries risk assessment; machine learning

The Preventive Effects of Silver Diamine Fluoride Against Enamel Erosion: An In Situ Study

Dhananthat Chawhuaveang^{1,2}, Chun Hung Chu², Ollie Yiru Yu²

¹ Department of pediatric dentistry, Faculty of Dentistry, Thammasat University, Pathumthani, Thailand

² Cariology, Restorative Dental Sciences, Faculty of Dentistry, The University of Hong Kong, Hong Kong SAR, China

Background: The efficacy of silver diamine fluoride (SDF) in preventing dental erosion and its impact on tooth discoloration have not been evaluated in clinical settings. **Objective:** To evaluate the preventive effect of SDF against dental erosion on enamel and assess the associated color change in enamel. **Materials and Methods:** A randomized, crossover in situ study was conducted involving 15 healthy volunteers aged 25–35 years. Each participant wore a palatal appliance holding four enamel specimens for three 14-day treatment phases. Each phase was separated by 7-day washout periods. The treatment phases included: (1) weekly application of 38% SDF solution (Group SDF), (2) daily application of 800 ppm Sn²⁺ of stannous chloride/500 ppm F⁻ of amine fluoride/sodium fluoride mouthrinse (Group SNF), and (3) daily application of deionized water (Group DW). After intervention, appliances were worn for one hour before extraoral erosive challenges for five times daily. Enamel blocks were analyzed for crystal characteristics (X-ray diffraction), surface morphology (scanning electron microscopy), surface loss (profilometry), microhardness loss (hardness tester), and color change (digital spectrophotometry). Data were analyzed using One-way ANOVA and Tukey's post hoc test. **Results:** XRD revealed the presence of fluorapatite, silver chloride, silver phosphate, and silver fluoride in Group SDF; fluorapatite and tin hydroxychloride in Group SNF; and hydroxyapatite and calcium pyrophosphate in Group DW. SEM images showed less demineralization in Groups SDF compared to DW. Enamel surface loss (µm) of Group SDF, Group SNF, and Group DW were 2.7±0.6, 3.2±0.7, and 5.4±0.8, respectively (SDF<SNF<DW; p<0.001). Hardness loss were 21.7±1.0 for SDF, 30.0±1.1 for SNF and 42.4±1.0 for DW (SDF<SNF<DW; p<0.001). Color change (ΔE) were 5.5±3.5 for SDF, 2.7±3.0 for SNF and 1.6±2.8 for DW (SDF≥SNF≥DW; p<0.05). **Conclusion:** Weekly application of SDF was more effective than daily application of SnCl₂/AmF/NaF in reducing enamel erosion but caused perceptible black staining on enamel.

Keywords: tooth erosion, silver diamine fluoride, in situ, enamel

Media Narratives and Public Sentiment on Malaysia's Generation End Game: A Netnographic Analysis

Abdul Raob NA^{1,2}, Nik Mohamed MH², Mohd Radzi NA¹, Md Sabri BA¹

¹Centre of Population Oral Health and Clinical Prevention Studies, Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Sg Buloh Campus, Selangor, Malaysia.

²Training Management Division, Ministry of Health, Putrajaya, Malaysia.

³Department of Pharmacy Practice, Kulliyah of Pharmacy, International Islamic University Malaysia, Kuantan, Pahang, Malaysia.

Background: The Generation End Game (GEG) policy in Malaysia seeks to establish a smoke-free generation by banning tobacco sales to individuals born from 2007 onwards. As a contentious public health measure, it has attracted significant attention and debate across digital platforms. **Objectives:** This qualitative cross-sectional study using the netnography technique analyse the perceptions among Malaysians through news articles' response and population commentaries regarding the GEG policy. **Methods:** Online news articles published on popular online news portals and online commentaries from January 2022 to January 2024 after the initial announcement of the GEG policy until removal of the policy from the bill were downloaded using NCapture and imported into NVivo for thematic content analysis. **Results:** A total of 441 news articles and 7450 commentaries were analysed. Articles were categorised according to three timeframes; initial announcement, official announcement and after the removal of the GEG from the Bill. A positive slant prevailed across all timeframes with 52.2%, 42.1%, 37.8% respectively, while negative slants observed with 32.6%, 30.3%, 21.6% respectively. Supportive arguments emphasised anticipated public health benefits, whereas opposition centred on concern of the enforcement challenges. Similarly, the analysis revealed that support for the policy accounted for 43.0%, 70.4%, and 67.9% of commentaries across the respective timeframes, while opposition was noted with 57.0%, 29.6%, and 32.1% respectively. **Conclusion:** The online news articles were mainly written with a positive slant towards implementing the GEG policy in Malaysia. Correspondingly, many online readers opposed to the policy at the initial announcement and support increased following the official announcement and during removal the GEG policy from the bill. The results suggest that the media played a role in supporting the health policy and this highlights important considerations for policymakers and public health advocates seeking to implement similar initiatives in the future.

Keywords: tobacco control, tobacco endgame, tobacco policy, generation end game

From Health to Decay: Microbial Changes in Root Caries Development – A Scoping Review

Ronnie Ruonan Zhang¹, Josie Shizhen Zhang¹, Walter Yu-Hang Lam¹, Chun-Hung Chu¹, Ollie Yiru Yu¹

¹ Faculty of Dentistry, The University of Hong Kong, Hong Kong, S.A.R., China

Background: Understanding the specific bacteria involved in root caries could help clinicians develop more effective treatment strategies. **Objectives:** This review systematically examines the microbial community shifts on carious root surfaces relative to sound root surfaces. **Methods:** Included in the review was a comprehensive search of English-language publications focusing on clinical studies that assess oral microbiomes in patients with root caries through high-throughput sequencing methods, published up to April 1, 2025. The search covered databases including Medline, Cochrane Central Register of Controlled Trials, Web of Science, Embase, and Scopus, with additional efforts to identify gray literature in ClinicalTrials.gov and Google Scholar. **Results:** According to the inclusion criteria, a total of 1,133 publications were initially screened, and 465 duplicates were removed. From the remaining studies, eight studies focusing on the oral microbiome of saliva, decayed roots, or dental plaque in patients with root caries were included. These studies examined microbial community characteristics, including intra-community species diversity (alpha-diversity, 4 studies), inter-community compositional differences (beta-diversity, 4 studies), predominant microbial genera or species (8 studies), and functional pathways (1 study). Three studies found no significant difference in alpha-diversity between root caries and sound root surfaces, while one study observed a significant reduction in alpha-diversity in root caries. Regarding beta-diversity, three studies reported notable differences between diseased and healthy sites, whereas one study found no significant variation. The dominant microbial taxa associated with root caries varied across studies; however, *Lactobacillus* spp., *Prevotella denticola*, *Propionibacterium acidifaciens*, *Streptococcus mutans*, and *Veillonella parvula/dispar* were frequently identified. Furthermore, bacteria linked to root caries appeared to influence predicted functional pathways, promoting organic acid production and accelerating collagen breakdown. **Conclusion:** The bacteria associated with root caries exhibit different microbial communities, predominant species, and functional changes compared to those on sound root surfaces.

Keywords: Root caries, oral microbiome, high-throughput sequencing technologies

Development and Validation of a Knowledge, Attitude, And Practice (Kap) Questionnaire on Geriatric Dentistry for Dental Practitioners in Malaysia

Senin, Nur Amalina Hani^{1,2}, Anwar, Diyana Shereen¹, Mohd Radzi, Nawwal Alwani¹

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

²Oral Health Division, Ministry of Health, Malaysia

Background: As Malaysia's population ages rapidly, it is imperative to adequately prepare dental practitioners for geriatric dental care. Presently, there is no validated assessment instrument to evaluate Malaysian dental practitioners' knowledge, attitudes, and practices (KAP) concerning geriatric dentistry. **Objectives:** To develop and validate a comprehensive KAP questionnaire, ensuring sound content validity, face validity, and internal consistency, for assessing Malaysian dental practitioners' preparedness in geriatric dentistry. **Methods:** The initial 47-item questionnaire was developed through literature review and expert input. Content validity was assessed by six expert raters (three from the Ministry of Health Malaysia and three academicians), who rated the relevance of each item on a four-point scale. The Content Validity Index (CVI), including the item-level (I-CVI), scale-level (S-CVI/Average), and a chance-corrected agreement coefficient, was calculated. Face validity was evaluated by 34 dental practitioners for clarity and comprehension using a four-point Likert scale (1=not clear, 4=very clear). Internal consistency was determined by Cronbach's alpha for each domain. **Results:** Content validation showed an I-CVI ranging from 0.33 to 1.00, a strong S-CVI/Average of 0.92, and a chance-corrected agreement coefficient of 0.872, indicating excellent expert agreement beyond chance. Face validation indicated high clarity, with an overall mean clarity score of 3.58 out of 4. Cronbach's alpha demonstrated excellent internal consistency: Knowledge ($\alpha=0.88$), Attitude ($\alpha=0.94$), and Practice ($\alpha=0.85$). After validation, the final questionnaire consisted of 22 Knowledge items, 11 Attitude items, and 7 Practice items. **Conclusion:** The developed KAP questionnaire exhibits robust content validity, face validity, and excellent internal consistency, rendering it an effective instrument for evaluating the preparedness of dental practitioners in geriatric dentistry. It can assist in identifying training requirements, guiding continuous professional development (CPD) initiatives, and informing targeted educational strategies and policy planning to improve geriatric oral healthcare in Malaysia.

Keywords: Geriatric dentistry, questionnaire validation, content validity, face validity, dental practitioners

Molecular Mechanism by Which Streptococcus Mutans Modulates Symbiotic-Biofilm Cariogenicity Via GcrR

Wenjiao Zhang^{1,2}, Jun Liang^{1,2}, Bin Zhang¹, Ruizhe Huang^{1,2}

¹Key Laboratory of Shaanxi Province for Craniofacial Precision Medicine Research, College of Stomatology, Xi'an Jiaotong University, Xi'an, Shaanxi, China

²Clinical Research Center of Shaanxi Province for Dental and Maxillofacial Diseases, Center of Oral Public Health, College of Stomatology, Xi'an Jiaotong University, Xi'an, Shaanxi, China

Background: Symbiotic biofilms formed by *Streptococcus mutans* and *Candida albicans* are a major driver of early childhood caries (ECC). While arginine suppresses *S. mutans* extracellular polysaccharide (EPS) synthesis, it also triggers *C. albicans** hyphal transition, thereby diminishing its cariostatic potential. This study aims to determine whether the *S. mutans* transcription factor GcrR modulates arginine metabolism to rebalance this interaction and reduce biofilm cariogenicity. **Objectives:** Unraveling the molecular mechanism by which *Streptococcus mutans* GcrR modulates arginine metabolism to suppress *Candida albicans* hyphal morphogenesis and the cariogenic potential of symbiotic biofilms, thereby providing a theoretical foundation for micro-ecologically targeted anti-caries strategies. **Methods:** *Streptococcus mutans* GcrR knockout and over-expression strains were constructed and co-cultured with *Candida albicans* to establish a dual-species biofilm model. LC-MS-based metabolomics, RT-qPCR, EMSA, Western blot, and Co-IP were employed to dissect how GcrR modulates arginine-metabolic genes and the fungal Ras/cAMP/PKA pathway (Ras1, Tpk1/2, Efg1) as well as hypha-associated genes (HWP1, ALS3). The impact of GcrR on biofilm cariogenicity was further validated by SEM and CLSM. **Results:** Phenotypic assays revealed that in the *Streptococcus mutans* GcrR-overexpressing group, *Candida albicans* underwent hyphal transition only when the arginine concentration reached 5 mM, whereas in the wild-type group, hyphal induction was observed at 0.1 mM arginine and biofilm biomass progressively declined with increasing arginine levels. Metabolically, GcrR overexpression markedly reduced intrabiofilm arginine concentrations (LC-MS) and repressed the expression of ArgG/ArgH. At the signaling level, GcrR-mediated depletion of arginine abolished activation of the *C. albicans* Ras/cAMP/PKA pathway, as evidenced by decreased Ras1 and Tpk1/2 expression in western blot and RT-qPCR analyses. **Conclusion:** *Streptococcus mutans* GcrR directly represses the key arginine-biosynthetic enzymes ArgG/ArgH, lowering local arginine levels. This blocks *Candida albicans* Ras/cAMP/PKA-mediated hyphal morphogenesis and ultimately attenuates the cariogenicity of the symbiotic biofilm.

Keywords: *Streptococcus mutans*; GcrR; arginine; *Candida albicans*

Dental Health Status and Treatment Needs Of 12-Year-Old Students on Sebatik Island, Tawau 2017- 2024.

Kevin Chee Pheng Neo¹, Muhammad Faiz Mohd Hanim²

¹ Orthodontic Unit, Tawau Dental Clinic, Sabah, Ministry of Health Malaysia, Malaysia.

² Oral Health Section, Sabah State Health Department, Ministry of Health Malaysia, Malaysia.

Background: Dental caries is an oral disease which involves the dentition. Untreated dental caries could affect children's quality of life such such as mastication, communication and esthetics. Sebatik Island is an island that is located near eastern Sabah and North Kalimantan with limited access to healthcare and the absence of dental clinic on the island. The only dental care schoolchildren could obtain was during annual school dental checkups and treatments, which only lasted one week. This poses limited accessibility for oral health care to students. **Objectives:** To determine the dental health status and treatment needs of 12-year-old students on Sebatik Island, Tawau from 2017 to 2024. **Methods:** A retrospective study reviewing existing records of 5 primary schools located on Sebatik Island, Tawau from year 2017 to 2024. Information such as Mean DMFT, Mean Decay, caries prevalence and number of students who were caries-free and had no missing teeth or teeth indicated for extraction were collected. The data was analyzed and tabulated in line graph. **Results:** There was an increase in prevalence of dental caries and treatment need over the period of 8 years, from 66.27% in 2017 to 71.43% in 2024. There was a slight increase in treatment needs, from 0.84 in 2017 to 0.88 in 2024. The percentages of students with no missing teeth and no teeth indicated for extraction declined drastically over the years, from 97.6% in 2017 to 88.31% in 2024. The number of permanent teeth indicated for extraction also quadrupled over the years. **Conclusion:** Despite annual dental treatment carried out in these schools, the prevalence of caries and treatment needs remained high and increasing. Alternative strategies are needed to improve dental health status of these students on Sebatik Island, Tawau.

Keywords: Sebatik Island, Tawau, Dental Health Status, Treatment Needs, 12-year-old students.

Whether The Use of Prolonged Face Masks Impact Halitosis? A Systematic Review with Implications for Preventive Dentistry

Latifah Fitriani Rakhman¹, Marcelline Olivia¹, Anton Rahardjo¹,
Risqa Rina Darwita¹, Atik Ramadhani¹

¹ Department of Preventive and Public Health Dentistry, Universitas Indonesia, Indonesia

Background: The COVID-19 pandemic led to the global adoption of face masks as a primary public health measure. While effective in reducing viral transmission, prolonged face mask usage has been linked to various oral health issues, including halitosis. **Objectives:** This systematic review aimed to evaluate the impact of face mask use on halitosis, particularly self-perceived halitosis, based on studies conducted during the COVID-19 pandemic. **Methods:** Systematic literature search was conducted across PubMed, Scopus, EBSCOhost, and ProQuest for English-language articles published between December 2019 and October 2024. Studies were included if they assessed halitosis in individuals wearing face masks during the pandemic. The review followed PRISMA guidelines and was registered in PROSPERO (CRD42024612320). Data extraction and quality assessment were performed independently by two reviewers using the JBI critical appraisal tool. Due to heterogeneity in study designs and outcomes, narrative synthesis was performed. **Results:** Seven cross-sectional studies met the inclusion criteria, involving diverse populations across Asia, South America, and Europe. Prevalence of self-perceived halitosis ranged from 12% to 50%. Prolonged mask use was consistently associated with increased reports of halitosis. The duration of daily mask use (particularly 4–10 hours) appeared to be a critical factor in halitosis perception. Contributing factors included xerostomia, reduced toothbrushing frequency, increased volatile sulfur compound (VSC) levels, and psychological stress. One study confirmed the presence of VSC-producing bacteria on both the mask surface and in oral samples. The findings also indicated that mask-related oral problems could negatively impact oral health-related quality of life. **Conclusion:** Prolonged use of face masks can influence the development or perception of halitosis by altering the oral microenvironment and affecting oral hygiene habits. These findings underscore the importance of public health strategies that combine oral hygiene education with mask hygiene to mitigate potential adverse effects.

Keywords: Face mask, halitosis, oral health, preventive dentistry

Preventive Dentistry in Action: Caregiver Experiences Managing Oral Hypofunction Among Institutionalized Older Adults in Selangor

Muhammad Firdaus Mokhtar¹, Azri Aliah Mohd Yani¹, Budi Aslinie Md Sabri¹, Md Riasat Hasan¹

¹Faculty of Dentistry, University Teknologi MARA (UiTM), Malaysia

²Oral Health Division, Ministry of Health, Malaysia

³Health Sciences University of Hokkaido, Japan

Background: Malaysia's rapidly aging population—projected to reach 14.5% aged 65 and above by 2040—poses increasing healthcare challenges, particularly for institutionalized older adults who are more susceptible to chronic illnesses and deteriorating oral health. Oral hypofunction (OHF), which involves a decline in oral functions such as chewing and swallowing, contributes significantly to frailty and reduced quality of life. However, caregiver perspectives on managing OHF in Malaysian aged care settings remain underexplored. **Objective:** To explore caregivers' experiences in managing oral health for older adults with oral hypofunction in institutional care settings. **Methods:** A qualitative study was conducted using two focus group discussions (FGDs) involving eight purposively sampled caregivers from eight aged care institutions in Selangor. The FGDs were guided by semi-structured questionnaires validated by experts in public health, oral medicine and oral pathology, and special care dentistry. Trained researchers facilitated the sessions, focusing on caregiver roles, challenges in managing OHF, and available training and resources. All discussions were audio-recorded, transcribed verbatim, and analyzed thematically using NVivo software. Two researchers independently coded the data and resolved discrepancies through discussion. **Results:** Six key themes emerged: (1) routine oral hygiene care and delegation, (2) ensuring comfort through communication and adaptation, (3) non-compliance and behavioral resistance, (4) impact of resistance on quality of care, (5) value of professional training, and (6) need for continuous training and workforce support. Caregivers emphasized the importance of gentle techniques, communication, and adapting care routines to resident needs. Behavioral issues, such as aggression and refusal due to dementia, were commonly cited barriers. Staff valued external training but highlighted limitations due to workforce shortages. **Conclusion:** Caregivers are vital to maintaining oral health among institutionalized elderly individuals but face significant challenges. These findings underscore the need for targeted training, policy support, and staffing improvements to effectively address OHF and improve elder care outcomes in Malaysia.

Keywords: Oral hypofunction, caregiver experience, institutionalized elderly, focus group discussion, qualitative research

Social Return on Investment of School-Based Oral Health Promotion and Prevention Program in Primary Schools, Bangkok

Supassara Chanpakorn¹, Pagaporn Pantuwadee Pisanmturakit¹, Patita Bhuridej¹, Palinee Detsomboonrat¹, Issarapong Kaewkamnerdpong¹, Tewarit Somkotra¹, Nipaporn Urwannachotima¹

¹ Department of Community Dentistry, Faculty of Dentistry, Chulalongkorn University, Thailand

Background: Dental caries has remained highly prevalent among school children in Thailand despite decades of prevention efforts. School-based oral health promotion programs are recommended globally; however, their impact in Thailand has shown mixed results, highlighting the need for a more proper evaluation method. Social return on investment (SROI) is an investment appraisal method. With its comprehensive stakeholder engagement and inclusion of social, economic and environmental values, this tool is regarded as a suitable framework for public health interventions. **Objectives:** This study evaluated the SROI of a school-based oral health promotion and prevention program delivered by dental students in Bangkok. **Methods:** The research team evaluated the school-based oral health promotion and prevention program delivered by dental students during the 2023 academic year across three primary schools in Bangkok, involving 266 students, using SROI methods. Stakeholders were identified and involved to develop an impact map. The stakeholder data were collected via focus group discussion and face-to-face interview with school principals, phone interviews with guardians, questionnaires for dental students, and oral examination of school students. The data concerning cost were mainly obtained from literatures and official documents. SROI ratio was calculated by net present value of impact divided by net present value of investment. Sensitivity analysis was performed. **Results:** The current investment value was 273,139.57 baht (8,479.04 USD), while the social return was 300,653.12 baht (9,333.14 USD). For every 1 USD invested, 1.10 USD of social value were created. Sensitivity analysis revealed SROI ratio ranged from 0.44 to 2.16. **Conclusion:** The overall benefits of the program outweighed its costs, indicating that it is cost-effective from a social impact perspective. However, given the range of possible outcomes, the result should be interpreted with some caution.

Keywords: Social return on investment, school-based oral health promotion, dental sealant, evaluation

Effectiveness of Fluoride Varnish Delivery in Clinical Versus School-Based Settings: A Retrospective Analysis of Secondary Data

Mohd Zuheem bin Hamzah¹, Nur Maheeda Wirdany binti Mahmud¹, Normadiah binti Samsudi¹, Lyediana binti Sabadali¹

¹Penampang Dental Clinic, Ministry of Health, Malaysia

Background: Fluoride varnish (FV) has been used since the 1960s as a preventive measure against dental caries by promoting enamel remineralization. Recommended by global health authorities like the WHO and ADA, biannual FV applications can reduce caries incidence by up to 43%. In Malaysia, FV is delivered through the Ministry of Health's preschool oral health programs. Internationally, FV is administered through school, clinic or medical-based programs, each showing varying levels of success and coverage. School-based models typically offer wider outreach, especially to underserved populations, while clinic-based models provide more individualized dental care. **Objectives:** To assess and compare the mean dfx scores of toddlers who received fluoride varnish in clinics versus preschools in the Penampang and Putatan districts. It also sought to compare the proportion of toddlers receiving FV applications across both settings and to describe overall FV application trends from 2023 to 2024. **Methods:** A retrospective cross-sectional study was conducted using secondary data from the Annual Dental Report of the Oral Health Division. Dental records of children aged 3 years and below who received FV in two government clinics and nine preschools were analyzed. Statistical methods included descriptive statistics, Chi-Square or Fisher's Exact tests, and graphical analysis through bar charts and percentage distributions. **Results:** Toddlers receiving FV in clinics had a lower mean dfx scores (0.164) compared to those in preschools (0.667). Chi-square test showed that there was no significant association between the FV application setting and number of FV received, $X^2(1, N = 667) = 2.112, p = .146144$. The FV application trend is declining for both clinic and schools (Clinics = ↓ 67.38%, Preschools = ↓ 74.26%). **Conclusion:** In conclusion, while clinic-based FV delivery appears associated with lower caries experience, the number of applications and coverage trends were similar across both settings, with overall declining application rates observed.

Keywords: Fluoride, varnish, toddler, school, clinic

Oral Health-Related Quality of Life Among International Migrant Populations: A Systematic Review

Win Myat Phyto¹, Duangporn Duangthip², Palinee Detsomboonrat³

¹International Graduate Program in Dental Public Health, Department of Community Dentistry, Faculty of Dentistry, Chulalongkorn University, Thailand

²Division of Dental Public Health, College of Dentistry, The Ohio State University, United States

³Department of Community Dentistry, Faculty of Dentistry, Chulalongkorn University, Thailand

Background: According to the World Migration Report 2024, the global number of international migrants has reached 281 million, presenting growing public health challenges. Migrants often face barriers such as language, culture, low socioeconomic status, and limited access to dental care, increasing their risk of oral diseases. These challenges can negatively affect oral health and, consequently, oral health-related quality of life (OHRQoL). Given the rising migration trends, understanding OHRQoL among migrant populations is essential for addressing health disparities and informing effective oral health policies and interventions. **Objective:** To review and synthesize available information on OHRQoL among international migrant populations. **Methods:** A systematic search was conducted across four databases: PubMed, Scopus, EBSCO, and Web of Science, without language restrictions, up to 3 July 2025. After removing duplicates, two researchers independently performed study selection and data extraction, with any discrepancies resolved through discussion with a third researcher. The inclusion criteria encompassed observational or experimental studies that evaluated OHRQoL among migrant populations using at least one validated OHRQoL instrument. **Results:** After screening titles and abstracts, 24 studies were eligible for full-text review. Among these, 5 studies met the inclusion criteria and were included in this review. These studies, published between 2007 and 2024, were conducted in the United States, Germany, Spain, and Malaysia, with participants aged 7 to ≥55 years. Participants originated from various regions, including Latin America, the Middle East, Africa, Asia, the Pacific, and Europe. The majority of studies assessed OHRQoL using the Spanish version of the Oral Health Impact Profile-14 (OHIP-14). Psychosocial discomfort and physical pain domains were the most severely impacted among migrant populations across the included studies. **Conclusion:** This review highlights that migrants experience substantial impairments in OHRQoL and addresses a critical gap in global health equity by focusing on OHRQoL and underscoring the urgent need to tackle oral health disparities within this vulnerable population.

Keywords: Oral health-related quality of life, migrant, systematic review

What Patients Say About Dental Services in Malaysia?

Nurfazlina Rosman¹, Nor Azlida Mohd Nor¹, Natrah Ahmad Fuad²

¹Department of Community Oral Health and Clinical Prevention, University of Malaya, Kuala Lumpur, Malaysia

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

Background: Patient satisfaction is a key indicator of healthcare quality, often influenced by provider's expertise and soft skills. Platforms such as Google Reviews provide an open space where patients share their experiences. However, such data remain underutilised in dental research. **Objective:** This study aimed to explore positive and negative comments from Google Reviews of dental clinics across Peninsular Malaysia. **Methods:** Google Reviews with 1–2-star and 5-star ratings posted within the past two years were analysed from 79 government dental clinics (GDC), 117 private dental clinics (PDC) and 9 school dental clinics (SDC). Clinics were selected using purposive sampling to ensure diverse representation across Peninsular Malaysia. Reviews were extracted, coded, and analysed thematically using ATLAS.ti software. Sub-themes from 1–2-star and 5-star reviews were summarised and ranked by frequency. **Results:** A total of 1848 reviews were analysed, comprising 1363 five-star and 485 one- to two-star reviews. The average star rating was 3.9 for GDC, 4.3 for PDC, and 4.1 for DSC. Eight main themes were identified: clinician attributes, treatment-related factors, cost, clinical staff, service-related factors, environmental factors, general recommendations and others. Among the five-star reviews, the most frequently cited positive experiences were related to the friendliness, politeness, and communication skills of staff and clinicians. In contrast, the most common concerns in the one- to two-star reviews were long waiting times and rude staff. Additional issues included excessive charges, ineffective treatment and perceived incompetent of the clinician. **Conclusion:** Most feedback focused on the soft skills of dental professionals and supporting staff. Attributes such as friendliness, politeness, empathy, and clarity in communication consistently emerged as key drivers of patient satisfaction across government, private, and dental school settings. Continuous training in communication and interpersonal skills may further enhance service delivery and improve patient satisfaction in dental clinics throughout Malaysia.

Keywords: Dental clinic, google review, patient satisfaction, soft skill, thematic analysis

Artificial Intelligence Integration in Dental Education: Awareness, Attitudes and Practices of Malaysian Dental Students

Muhammad Nazmi bin Abdul Majid¹, Noor Syahidah binti Hisamuddin¹, Zamros Yuzadi Mohd Yusof¹

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

Background: Artificial intelligence (AI) has emerged as a transformative tool in dentistry, offering opportunities to enhance education, diagnostics, and clinical practice. However, the awareness, attitudes, and practices of dental students toward AI remain underexplored, particularly within the Malaysian context. **Objectives:** This study aimed to assess Malaysian dental students' awareness, attitudes, and practices regarding AI use in dental education and examine the association of these variables with school type. **Methods:** A cross-sectional online survey was conducted among 1,104 dental students from 13 Malaysian dental schools (83% government, 17% private). The questionnaire comprised validated items addressing sociodemographic characteristics, awareness, attitudes, and practices related to AI use in dentistry. Data were analyzed using descriptive statistics and chi-square tests. **Results:** Awareness of AI tools was high in both groups (97.3%). However, government school students demonstrated significantly greater exposure to AI information sources, including lectures (88.2% vs. 11.8%) and internet/social media platforms (84.1% vs. 15.9%) ($p < 0.001$). They also reported more frequent AI use for academic tasks, such as presentations (85.6% vs. 14.4%) and group discussions (86.3% vs. 13.7%), whereas private school students showed slightly higher proportions of limited or no AI usage. Attendance at AI workshops was notably higher in private institutions (24.8%) compared to government schools (13.5%) ($p < 0.001$). Attitudinal differences were also evident which government students were more likely to believe that AI supports academic activities without raising ethical concerns (85.8% vs. 14.2%, $p = 0.031$) and to recommend AI to peers (85.5% vs. 14.5%, $p = 0.022$). **Conclusion:** Malaysian dental students generally exhibit high awareness and positive attitudes toward AI. Nonetheless, significant differences exist between government and private institutions regarding exposure, training, and attitudes. These findings underscore the need for standardized AI education across dental schools to ensure equitable preparedness for AI-driven advancements in dentistry.

Keywords: Artificial intelligence, dental education, government vs private institutions, awareness, attitudes, practices, malaysia

Chlorine Dioxide Mouthwash Effects on Gingivitis and the Supragingival Plaque Microorganisms

Jiellin Yang¹, Xiaozhong Wang², Anqi Zhang¹, Wenjiao Zhang¹, Ruizhe Huang^{1*}

¹ College of Stomatology, Xi'an Jiaotong University, China

² Department of Stomatology, Xianyang Central Hospital, China

Background: Gingivitis, the most prevalent form of periodontal disease, is typically managed with a combination of mechanical debridement and antimicrobial agents. Chlorhexidine gluconate (CHX) 0.2% is considered the gold standard anti-plaque rinse, demonstrated to reduce gingival inflammation by 30-50% in clinical trials. However, prolonged use is associated with tooth staining, mucosal discoloration, and microbiota disruption. This randomized controlled trial investigated Chlorine Dioxide Mouthwash as a potential alternative to address these limitations. **Objectives:** To evaluate the chlorine dioxide mouthwash effect in alleviating gingivitis and its impact on supragingival plaque microbiota. **Methods:** A randomized controlled trial was conducted involving 90 patients with gingivitis, who were assigned to either an experimental group (n = 44) or a positive control group (n = 46). Key clinical indicators—including the Gingival Index (GI), Plaque Index (PLI), and Sulcus Bleeding Index (SBI)—were recorded and compared at baseline as well as on Day 1, Day 3, and Day 7. Additionally, supragingival plaque samples were analyzed via 16S rDNA sequencing to evaluate temporal changes in the bacterial composition. **Results:** 1. Clinical Outcomes Both groups exhibited significant time-dependent reductions in GI and PLI starting at 24 hours post-intervention ($P < 0.05$ for both), whereas improvements in SBI reached statistical significance by 72 hours. Intergroup comparisons revealed no significant differences in any clinical parameter throughout the 7-day observation period ($P > 0.05$). 2. Microbial Effects: In the experimental group, Alpha diversity (Shannon and Chao1 indices) and Beta diversity metrics decreased during Days 0–3 but rebounded by Day 7. The control group exhibited slower recovery. Chlorine dioxide demonstrated stronger bactericidal effects on *Neisseria* and *Kingella* compared to chlorhexidine, with increasing differences over time. **Conclusion:** 1. Chlorine dioxide mouthwash effectively reduced GI, PLI, and SBI scores, with greater reductions observed in the early phase (Days 1–3). 2. It significantly reduced bacterial abundance in supragingival plaque, particularly *Neisseria* and *Kingella*, with limited impact on microbial community structure and recovery dynamics by Day 7.

Keywords: Chlorine dioxide, mouthwashes, randomized controlled trial, dental plaque

Interaction Between *Enterococcus Faecalis* and *Fusobacterium Nucleatum* Regulated Macrophage Transcriptional Profiling and Reprogrammed Cellular Immune and Metabolic Response

Jingheng Liang^{1,2}, Wenling Huang^{1,2}, Poukei Chan^{1,2}, and Lihong Guo^{1,2}

¹ Hospital of Stomatology, Sun Yat-sen University, China;

² Guangdong Provincial Key Laboratory of Stomatology, Sun Yat-sen University, China

Background: Apical periodontitis is a risk factor of systemic diseases such as cardio-vascular diseases, diabetes, and adverse pregnancy outcomes. Refractory apical periodontitis (RAP), a persistent infection after root canal treatment, still has no effective treatment. *Enterococcus faecalis* (*E. faecalis*) and *Fusobacterium nucleatum* (*F. nucleatum*) are frequently detected in the lesion. **Objectives:** We previously found that coaggregation altered gene expression of *E. faecalis* and *F. nucleatum* and promoted immune evasion by suppressing pro-inflammatory cytokine secretion of macrophages (Mφs) while sustaining low-grade inflammation. In this study, we further investigated the synergistic effect of coaggregated *E. faecalis* and *F. nucleatum* on modulating Mφ immune and metabolic responses. **Methods:** We used transmission electron microscopy to observe the ultrastructure of Mφ, as well as the connection between two species of bacteria within Mφ. Then, we applied flow cytometry to detect the effect coaggregated *E. faecalis* and *F. nucleatum* on Mφ polarization. Next, we detected the production of oxygen species (ROS) in infected Mφ by fluorescent probe DCFH-DA. Furthermore, we used RNA-seq to detect the effect of coaggregated *E. faecalis* and *F. nucleatum* on Mφ transcriptome, and validated the transcriptome results through Oil Red O staining and qRT-PCR. **Results:** We found that coaggregated *E. faecalis* and *F. nucleatum* caused nuclear shrinkage and increased mitochondria in Mφ while inducing M1 polarization, ROS production, and lipid accumulation. The key driver genes causing the difference between single species-infected and coaggregated bacteria-infected Mφ mainly included IFN-stimulated genes and genes related to the chemokine signaling pathway. **Conclusion:** These findings indicate that the synergism of *E. faecalis* and *F. nucleatum* can regulate the immune and metabolic response of Mφ, offering novel insights into therapeutic targets for refractory apical periodontitis.

Keywords: *E. faecalis*, *F. nucleatum*, bacterial interaction, macrophage, refractory apical periodontitis

Effectiveness of Artificial Intelligence Jingle Music Video on Knowledge and Interest in Going to Dentist at Melong Asih Community Health Center

Marlin Himawati¹, Muhamad Rafi Naufal², Azmi Nur Azizah², Amalia R.²

¹ Dental Public Health Department, Faculty of Dentistry, University of Jenderal Achmad Yani, Indonesia

² Faculty of Dentistry, University of Jenderal Achmad Yani, Indonesia

Background: People in general, tend to seek dental health services when they have complaints that interfere with their daily activities. Most cases were brought to health facilities are only in advanced conditions, so that requiring more complex treatment and higher costs. The low rate of visits to dental health services reflects the public awareness of the importance in maintaining dental and oral health. **Objectives:** The purpose of this study was to measure the effectiveness of artificial intelligence (AI)-based jingle music videos in increasing public knowledge and interest in oral health at the Melong Asih Health Centre. **Methods:** This design study was cross-sectional. Counselling was conducted using AI-based jingle music video media which is expected to convey health messages in an interesting and effective way. This study involved 25 respondents who were given questionnaires before and after counselling. **Results:** The results showed a significant increase in the level of knowledge and interest of respondents to visit the dentist. Before counselling, most respondents had moderate knowledge, while after counselling, most respondents were in the high knowledge category. Interest in visiting the dentist also increased, with 72% of respondents showing high interest after counselling. **Conclusion:** This AI-based educational media was proven to be effective in encouraging changes in public health behaviour, especially in increasing visits to the dentist for early detection and treatment of oral problems.

Keywords: Artificial intelligence, knowledge, interest in treatment, music video jingles

Productivity Loss Among Patients and Caregivers with Special Healthcare Needs at a Malaysian Dental Teaching Centre

Mohamad Noor Sairi¹, Nor Azlida Mohd Nor¹, Ainol Haniza Kherul Anuwar¹, Maryani Mohamed Rohani², Aisyah Ahmad Faisal²

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

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

Background: Persons with special healthcare needs (SHCN) and their caregivers often require multiple and prolonged dental visits due to complex medical conditions and disabilities. This commitment frequently translates into productivity losses. However, data on such indirect costs within the Malaysian context remain limited. **Objectives:** To estimate the productivity loss among persons with SHCN and their caregivers attending Special Care Dentistry (SCD) clinic at the Faculty of Dentistry, Universiti Malaya (FODUM). **Methods:** A cross-sectional study was conducted using the validated Work Productivity and Activity Impairment for General Health (WPAI:GH) questionnaire to assess productivity loss from absenteeism, presenteeism, and impairment in daily activities related to dental care among patients and caregivers. Weekly productivity loss per individual was quantified and converted into monetary values. Total annual indirect costs were estimated by multiplying weekly estimates by the average number of annual visits and patients treated. One-way sensitivity analysis explored variability in estimates. **Results:** Absenteeism accounted for 9% of working hours (~3.8 hours/week), while presenteeism contributed an additional 6% loss (~2.5 hours/week), totalling 6.3 hours of weekly productivity loss per individual. In 2021, the weekly productivity loss was estimated at RM 311.09 (USD 66.76), increasing to RM 333.83 (USD 71.64) in 2022 and 2023. Correspondingly, annual indirect costs increased from RM 187,901.38 (USD 40,322.18) in 2021 to RM 251,040.16 (USD 53,871.28) in 2023. Sensitivity analysis showed annual productivity loss per individual ranged from RM 0 to RM 3,971.04 (USD 852.15). **Conclusions:** Significant productivity losses were incurred by both patients with SHCN and their caregivers attending the SCD clinic. These findings highlight the need for targeted support and policy measures to ease the time and income burden on families accessing specialised dental care.

Keywords: Special healthcare needs, financial burden, productivity loss, special care dentistry, cost analysis

Efficacy of the Dual-Action Peptide GA-C16G2 for Remineralising Root Caries

Yipeng Fu^{1,2}, Ya Zhang¹, Kai Chun Li¹, Manikandan Ekambaram¹, Paul R. Cooper¹, May Lei Mei¹

¹ Faculty of Dentistry, Sir John Walsh Research Institute, University of Otago, Dunedin, New Zealand

² The Fifth Outpatient Department, Nanjing Stomatological Hospital, Affiliated Hospital of Medical School, Institute of Stomatology, Nanjing University, Nanjing, China

Background: With the global population ageing, root caries is becoming an increasingly prevalent clinical challenge. In our previous work, we developed GA-C16G2, a conjugate peptide combining the antimicrobial peptide C16G2 with gallic acid (GA) and demonstrated its antimicrobial efficacy. **Objectives:** This study aims to evaluate the mineralising effects of the dual-action peptide GA-C16G2 on root caries. **Methods:** Root dentine specimens were demineralised to simulate carious lesions and treated with GA-C16G2, C16G2, GA, or distilled water (DW, negative control). The specimens underwent 7-day pH cycling regimen and were treated with their respective agents twice daily. The specimens from each group were evaluated using microcomputed tomography, nanoindentation testing, scanning electron microscopy (SEM), and energy dispersive spectroscopy to assess mineral density, hardness, elastic modulus, dentine morphology, and chemical characterisation. Each dentine specimen was analysed across three distinct zones: sound dentine, demineralised dentine, and treated dentine. **Results:** GA-C16G2 and GA treatments significantly restored mineral density in treated dentine (1.70 ± 0.045 g/cm³ and 1.69 ± 0.025 g/cm³, respectively, $p < 0.01$), with mineral gains of 18.4% and 16.5%, compared to minimal gains in C16G2 (2.9%) and DW controls (4.8%). Nanoindentation analysis showed that hardness and elastic modulus were significantly improved in treated dentine following GA-C16G2 (hardness: 0.33 ± 0.08 GPa, elastic modulus: 8.34 ± 2.12 GPa) and GA treatments (hardness: 0.32 ± 0.06 GPa, elastic modulus: 7.59 ± 1.59 GPa), whereas C16G2 (hardness: 0.17 ± 0.07 GPa, elastic modulus: 2.75 ± 1.30 GPa) and DW (hardness: 0.19 ± 0.07 GPa, elastic modulus: 3.49 ± 1.15 GPa) groups demonstrated significantly lesser ($p < 0.05$) mechanical recovery. No significant differences in the calcium-to-phosphate ratio were observed among the groups. SEM images revealed greater structural destruction of dentinal tubules in the C16G2 and DW groups compared to the GA-C16G2 and GA-treated groups. **Conclusion:** GA-C16G2 has been shown to enhance mineral recovery and mechanical reinforcement in demineralised root dentine, indicating its potential for managing root caries.

Keywords: root caries, remineralisation, peptide, dentine

A Novel Multifunctional Material Promotes Enamel Remineralization, Collagen Mineralization and DPSCs Differentiation

Nan Luo¹, Xi Chen¹

¹ Department of Preventive Dentistry, Shanghai Ninth People's Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, China

Background: Effective repair of enamel defects and dentin caries remains a challenge. Ideal biomaterials should not only directly induce mineralization on inorganic surfaces but also facilitate mineralization within organic matrices and stimulate odontogenic cell activity for comprehensive tooth tissue regeneration. **Objectives:** To develop a stable calcium and phosphorus ion solution and investigate the efficacy of this novel material for promoting enamel remineralization, collagen matrix mineralization, and odontogenic differentiation and mineralization of dental pulp stem cells (DPSCs). **Methods:** Demineralized enamel slices were treated with stable calcium and phosphorus ion solution and analyzed by Scanning Electron Microscopy (SEM) for surface morphology and mineral deposition. Type I collagen (Rat Tail) sponges were incubated with calcium and phosphorus ion solution and mineralization was assessed by SEM/EDS. DPSCs were cultured with material extracts. Odontogenic differentiation markers (WB for DMP-1), and mineralized nodule formation (ALP/Alizarin Red S staining) of DPSCs were evaluated. **Results:** SEM revealed that calcium and phosphorus ion solution induced dense, hydroxyapatite-like mineral deposition on demineralized enamel, effectively restoring surface structure and significantly promoted collagen mineralization. Furthermore, compared to the control group, the material significantly enhanced ALP activity, promoted mineralized nodule formation, and upregulated the expression of key odontogenic proteins (DMP-1) in DPSCs. **Conclusion:** Stable calcium and phosphorus ion solution is demonstrated a unique multifunctionality. It directly induces biomimetic mineralization on enamel surfaces and within collagen matrices, while concurrently stimulating the odontogenic differentiation and intrinsic mineralization capacity of DPSCs. This combination of direct induction and bioactive stimulation makes this material a highly promising candidate for promoting comprehensive tooth tissue repair and regeneration.

Keywords: Enamel remineralization, collagen mineralization, dental pulp stem cells, odontogenic differentiation, bioactive material

The Application of Graphene Materials for Dental Use

Iris Xiaoxue Yin¹, Chun Hung Chu¹

¹ Faculty of Dentistry, The University of Hong Kong, Hong Kong

Background: Graphene, a two-dimensional nanomaterial composed of carbon atoms, exhibits unique physicochemical, mechanical, and morphological properties that make it highly suitable for biomedical applications. **Objectives:** This narrative review provides an overview of the applications of graphene-based materials in dentistry, focusing on their antimicrobial properties, mineralisation effects, and regenerative potential. **Methods:** A comprehensive review of existing literature was conducted, examining studies on graphene's role in preventive and regenerative dentistry, including its effects on cariogenic and periodontal bacteria, mineralisation of dental tissues, and applications in hard and soft tissue regeneration. **Results:** Some graphene materials contain various reactive oxygenic groups, which can strengthen the interaction of components at the interface. They are used in many biotechnologies because of their large surface area, simplicity of chemical functionalisation, favourable biocompatibility, and biostability. Graphene materials can be activated and functionalised with metal and metal nanoparticles, polymers, and other small molecules to exhibit multi-differentiation activities, antimicrobial activities, and biocompatibility. They underwent investigations in the fields of preventative dentistry and regenerative dentistry. They can hinder the growth of cariogenic bacteria and periodontal bacteria. Graphene families can enhance the process of mineralisation on both enamel and dentine. They have been extensively researched in the field of regenerative dentistry research, namely in the areas of dental hard and soft tissue regeneration, as well as periodontal tissue and bone regeneration. **Conclusion:** Graphene-based nanomaterials hold promise for advancing dental therapies, particularly in prevention, mineralisation, and tissue regeneration. Further research is needed to optimise their clinical applications and long-term safety.

Keywords: Graphene, dentistry, tissue regeneration, antimicrobial activity

Evaluating the Effectiveness of Parental Diet Counselling in Management of Early Childhood Caries Among Children in Bhopal, India- A Pilot Study

Pankaj Goel¹, Bharti Peshwani¹, Sana Anwar², Anindo Majumdar², Taiba Shaikh³

¹ Department of Dentistry, AIIMS Bhopal, India

² Department of Community and Family Medicine, AIIMS Bhopal, India

³ Department of Dentistry, AIIMS Bhopal, India

Background: Dietary counselling plays a crucial role in preventive healthcare, yet it is often overlooked in oral health due to lack of training, resources, and time constraints. Integrating dietary counselling into clinical practice can help patients understand the link between nutrition and oral health, promoting healthier dietary habits. **Objectives:** This study aimed to evaluate the effectiveness of parental diet counselling in managing Early Childhood Caries (ECC) among children. **Methods:** The study was conducted at a tertiary care hospital in Bhopal with 39 children (up to 6 years) having ECC. Diet assessment was performed using the "Starting The Conversation" (STC) questionnaire and a 24-hour diet diary to record solid and liquid sugar exposure. After one year, follow-up assessments were conducted, including STC scores, sugar exposure, and new carious lesions. **Results:** There was significant improvements post-counselling: the mean STC score decreased from 7.82 ± 1.32 to 5.77 ± 1.27 , solid sugar exposure dropped from 15.38 ± 6.43 to 7.95 ± 3.93 times/day, and liquid sugar exposure decreased from 8.59 ± 3.23 to 5.26 ± 1.12 times/day. Decayed teeth reduced from 5.36 ± 2.07 to 1.08 ± 0.87 . Paired t-tests revealed significant differences ($p < 0.0001$) for all variables. Birth order influenced liquid sugar exposure, but no significant associations were found with parental education, age, gender, or family type. **Conclusion:** Dietary counseling significantly reduced sugar exposure, improved dietary habits, and lowered the incidence of new carious lesions, emphasizing its role in managing ECC and improving children's overall well-being.

Keywords: Diet counselling, diet diary, dental caries, dmft index, dietary habits, caries prevention.

Association Between Medical Aid Recipient Status and Self-Rated Health Among Residents of Jjokbangchon in Seoul: The Mediating Role of Social Support

You-Bin Yim¹, Dong-Hun Han^{1,2}

¹ Department of Preventive and Social Dentistry, School of Dentistry, Seoul National University, Seoul, Korea

² Dental Research Institute, Seoul National University, Seoul, Korea

Background: Jjokbangchon communities in Seoul are urban poor areas characterized by inadequate housing and limited access to healthcare. Residents of these areas often experience chronic poverty, social isolation, and unmet healthcare needs, contributing to poor health outcomes. In this context, understanding the impact of medical aid recipient status on self-rated health is essential. Given the known influence of social support on individual health in Korean society, this study further examines whether social support mediates this relationship. **Objectives:** This study aimed to analyze the association between medical aid recipient status and self-rated health among residents of Seoul's jjokbangchon and to examine the mediating effect of social support. **Methods:** A cross-sectional survey was conducted among 1,549 residents living in jjokbangchon communities in Seoul. Medical aid recipient status, self-rated health, and levels of social support were assessed using structured questionnaires. Multiple regression analysis was used to assess direct relationships, and structural equation modeling (SEM) was employed to examine mediation effects. **Results:** Medical aid recipient status had a significant total effect on self-rated health ($\beta = 0.2987$, $p < .001$). The direct effect remained significant after controlling for social support ($\beta = 0.2838$, $p < .001$). The indirect effect through social support was also statistically significant ($\beta = 0.0149$), indicating a partial mediating role. **Conclusion:** Medical aid recipient status is significantly associated with self-rated health among the urban poor. Social support partially mediates this relationship, suggesting that while access to public healthcare improves perceived health, psychosocial factors like social support also play a critical role. Policies should address both medical and social determinants to promote health equity among vulnerable populations.

Keywords: Medical aid recipient, health services accessibility, self-rated health, social support, urban poor

Association Between Depression and Tooth Loss Among Community-Dwelling Older Adults in China

Dongxin Da^{1,2}, Suyu Ge^{1,2}, Hao Zhang^{1,2}, Xiaoli Zeng^{1,2}, Huning Wang^{1,2}, Yiwei Jiang^{1,2}, Jin Yu^{1,2}, Ying Zhang^{1,2}

¹ Department of Preventive Dentistry, Shanghai Stomatological Hospital & School of Stomatology, Fudan University, Shanghai, China

² Shanghai Key Laboratory of Craniomaxillofacial Development and Diseases, Fudan University, Shanghai, China

Background: The association between missing teeth and depression remains unclear, and few studies focus on it. **Objectives:** We aim to investigate the prevalence of depression and the number of missing teeth among community-dwelling older adults in Shanghai, and to explore the association between the number of missing teeth and depression. **Methods:** From April to December 2020, participants were recruited from the Shanghai Aging Study. After obtaining informed consent, they were evaluated for depression using the Center for Epidemiologic Studies Depression Scale (CES-D), and oral examinations and questionnaires were conducted. Logistic regression models were used to analyze the correlation between depression and the number of missing teeth. **Results:** Among 502 subjects aged 60 and above, 33 (6.57%) were likely to have depressive symptoms, and 38 (7.57%) were confirmed to have depressive symptoms. Body mass index (BMI), years of education, and the number of missing teeth were significantly correlated with depressive symptoms ($P < 0.05$). After adjusting for age, gender, years of education, BMI, and smoking history, an increase in BMI was significantly associated with a decrease in depressive symptoms ($OR = 0.919$, $P < 0.05$), and a decrease in the number of missing teeth was significantly associated with a decrease in depressive symptoms ($OR = 0.444$, $P < 0.05$). **Conclusion:** The prevalence of missing teeth and depression among Shanghai older adults is not optimistic. The association between the number of missing teeth and depression requires attention.

Keywords: Older adults, missing teeth, depression, cross-sectional study

The Application of Nanowire Technology in Dentistry: A Narrative Review

Zhang Y¹, Fu Y¹, Li KC¹, Ekambaram M¹, Cooper PR¹, Li QL², Mei ML¹

¹Sir John Walsh Research Institute, Faculty of Dentistry, University of Otago, Dunedin, New Zealand

²Department of Stomatology, Longgang Otorhinolaryngology Hospital of Shenzhen, Shenzhen, China

Background: Nanowires are extremely thin, wire-like nanostructures with high aspect ratios and tunable surface properties. Their unique physicochemical and structural characteristics have enabled a wide range of applications in dentistry. **Objectives:** This review aims to summarize the current progress on nanowires in dentistry, focusing on synthesis strategies, nanowire classifications, and diverse dental applications. **Methods:** A structured search strategy consisting of “nanowires” and “dentistry” was conducted in PubMed, MEDLINE, and Embase for articles published up to May 2025. Twenty-four studies were included, covering both in vitro and in vivo investigations of nanowire-based dental applications. Key variables extracted include synthesis methods, nanowire types, applications in dentistry, and main findings. **Results:** Metallic and polymeric nanowires were primarily synthesized using hydrothermal methods, with additional techniques such as electropolymerization, microwave-assisted synthesis, and chemical solution deposition. These nanowires have been utilized in five major dental domains: (1) Composites reinforcement, where silver nanowires (AgNWs) enhanced the antibacterial properties of GICs, while polydopamine-coated HA nanowires (HA-PDA-Ag) improved the mechanical and antibacterial properties of the resin; (2) Implant surface modification, where Zn²⁺/Mg²⁺-doped TiO₂ nanowires promoted osteogenesis, angiogenesis, and reduced inflammation; (3) Bone and periodontal regeneration, employing hydroxyapatite nanowires (HANWs) and lithiated porous silicon nanowires (SiNWs) to stimulate hard/soft tissue interface healing; (4) Diagnostics and auxiliary treatment, including SiNWs and zeolitic imidazolate framework coated on AgNWs for detection of oral cancer biomarkers. Polypyrrole nanowires for increasing drug loading capacity; (5) Biomimetic enamel design, where hierarchically aligned HANWs replicated the architecture and mechanical behaviour of natural enamel, achieving high stiffness and toughness. **Conclusion:** Nanowires represent a promising platform for multifunctional dental biomaterials. Their integration offers synergistic improvements in mechanical, biological, and functional performance. Future work should focus on clinical translation, long-term biocompatibility and scalable synthesis to facilitate their adoption in preventive oral healthcare.

Keywords: Nanowires, restorative dentistry, bone regeneration, biomimetic enamel

Effectiveness of Antibiotic Periodontal Treatment on Volatile Sulfur Compounds Levels in Diabetic Patients

Olenka Valenzuela¹, Kumiko Minagawa¹, Aulia Ramadhani¹, Hikaru Okubo¹, Kazuhiro Nagashima¹, Kaname Nohno², Sachiko Takehara¹, Takaho Yamada³, Masaru Kitazawa³, Hirohito Sone³, Hiroshi Ogawa¹

¹ Division of Preventive Dentistry, Department of Oral Health Science, Faculty of Dentistry & Graduate School of Medical and Dental Sciences, Niigata University

² Division of Oral Science for Health Promotion, Department of Oral Health and Welfare, Faculty of Dentistry & Graduate School of Medical and Dental Sciences, Niigata University

³ Faculty of Medicine, Niigata University, Japan.

Background: Halitosis is common among diabetic patients due to multiple factors. Metabolic byproducts contribute to oral malodor, while periodontal disease-closely linked to diabetes-further exacerbates halitosis. There are no studies that have evaluated how antimicrobial periodontal treatment affects halitosis in diabetic patients. **Objectives:** The purpose of this study was to assess the effect of periodontal treatment on halitosis among diabetic patients and to compare the efficacy of treatments with and without antibiotics. **Methods:** Thirty diabetic patients aged ≥35 years receiving treatment at Niigata University Hospital were randomly assigned to two periodontal treatment groups: with and without antimicrobials. The basic periodontal care provided to both groups included scaling, polishing, and oral hygiene instruction during weeks 0, 2, 4, and 6. The antimicrobial group additionally received a 2% minocycline application at sites with probe depth ≥4 mm. Periodontal examinations and volatile sulfur compound (VSC) measurements were carried out in weeks 0, 12, and 24. McNemar’s test analyzed changes in the proportion of participants exceeding clinical VSC thresholds over time. **Results:** Greater CH₃SH reductions were observed in the antimicrobial group, where medians dropped from 0.915 ng/10 mL at baseline to 0.16 and 0.36 ng/10 mL at weeks 12 and 24, showing a trend toward significance at week 12 ($p = 0.070$). Despite this, the medians for the non-antimicrobial group remained unchanged at 0.41, 0.41, and 0.26 ng/10 mL at weeks 0, 12, and 24, respectively. (CH₃)₂S levels showed varied patterns: the antimicrobial group decreased from 0.165 to 0.07 ng/10 mL at week 12 but increased to 0.18 ng/10 mL at week 24, while the non-antimicrobial group showed a steady decline (0.155, 0.105, 0.08 ng/10 mL). Neither group experienced any statistically significant changes over time. **Conclusion:** Among diabetics, periodontal treatment with antimicrobials tends to result in a greater decrease in CH₃SH compared to those without.

Keywords: Halitosis, diabetes mellitus, volatile sulfur compounds, antimicrobial periodontal treatment.

The Impact of Dental Caries and Fluorosis on Oral Health-Related Quality of Life Among Children with Varying Exposure to Fluoridated Water in Malaysia

Nor Azlida Mohd Nor¹, Faizah Abdul Karim², Zamros Yuzadi Mohd Yusof¹

¹ Department of Community Oral Health and Clinical Prevention, Universiti Malaya, Kuala Lumpur, Malaysia.

² Oral Health Division, Perak State Health Department, Ministry of Health, Malaysia.

Background: Dental caries and fluorosis, depending on their presence and severity, can negatively impact a child's oral health-related quality of life (OHRQoL). However, little is known about the impact of these conditions in populations exposed to varying levels of fluoride. **Objective:** To evaluate the impact of dental caries and fluorosis on OHRQoL among Malaysian children living in water-fluoridated (WF) and fluoridation-ceased (WF-ceased) areas. **Methods:** A total of 620 twelve-year-old children from WF (Perak) and WF-ceased (Pahang) areas in Malaysia were examined for dental caries and fluorosis. A validated questionnaire assessed oral hygiene practices and OHRQoL was measured using the Malay version of the Child Oral Impact on Daily Performance (Child-OIDP) questionnaire. Data were analysed using descriptive and multivariate statistical analyses. **Results:** The mean caries experience (D₄₋₆MFT) was higher among children in WF-ceased areas (0.80, 95% CI: 0.72–0.87) than in WF areas (0.33, 95% CI: 0.26–0.40). In contrast, fluorosis prevalence was greater in WF areas (47.5%) than in WF-ceased areas (12.7%). A higher proportion of children in WF-ceased areas experienced moderate (28.8% vs WF: 18.9%) and very severe (10.6% vs WF: 3.0%) impacts on daily activities due to oral problems. Mean OIDP scores were significantly higher among WF-ceased children for eating (mean: 0.83), relaxing (mean: 0.28), emotional stability (mean: 0.46), and doing homework (mean: 0.13) compared to their WF-area counterparts. In the multivariate model, caries prevalence, fluorosis prevalence, night-time toothbrushing, toothpaste type, and frequency of sweet food and drink consumption were significantly associated with total OIDP scores. **Conclusion:** Dental caries and fluorosis were associated with negative impacts on OHRQoL. Children in WF-ceased areas experienced higher prevalence of caries, which contributed to greater disruption in their daily activities and OHRQoL.

Keywords: Dental caries, dental fluorosis, oral health-related quality of life

Association Between Parental Supervision and Caries Risk Among 5–6-Year-Old Children in Kuala Muda District, Malaysia

Ruhaini Sabron¹, Norintan Ab-Murat¹, Elaine Choong¹

¹Department of Community Oral Health and Clinical Prevention, Faculty of Dentistry, ¹Universiti Malaya, Malaysia

Background: Early childhood caries remains highly prevalent in Malaysia, with only 35.1% of 6-year-olds being caries-free. Despite national preventive efforts, poor home oral care, particularly inadequate parental supervision during toothbrushing, continues to raise caries risk. Effective parental supervision plays a crucial role in oral disease prevention. **Objectives:** This study aimed to assess the caries risk levels of selected 5–6-year-old children in Kuala Muda district, the type and quality of parental supervision during tooth brushing, and the association between parental supervision and children's caries risk levels. **Methods:** A cross-sectional study was conducted involving 353 parent–child pairs. Caries risk was assessed using the Ministry of Health Caries Risk Assessment (CRA) tool, while parental supervision was measured using a structured questionnaire. Chi-square tests and multinomial logistic regression were used to analyse the association between supervision and caries risk. **Results:** Among the children, 66.0% had low, 8.8% moderate, and 25.2% high caries risk levels. Active supervision was reported by 53.3% of parents, and passive supervision by 46.7%. However, only 4.5% of parents met the criteria for optimal supervision quality, with 95.5% showing misguided practices. There was a significant association between supervision type and caries risk ($p = 0.034$; Cramer's $V = 0.139$), with passive supervision linked to higher risk. Logistic regression showed that children with passive supervision were about 3 times more likely to have high caries risk ($p = 0.009$; OR = 3.07). Children whose parents did not advise the use of 1000 ppm fluoride toothpaste were also at increased risk of caries ($p = 0.047$; OR = 1.83). **Conclusion:** Most children were at low caries risk, but a notable portion were high risk. While many parents reported active supervision, the quality of supervision was suboptimal. Passive supervision was significantly associated with higher caries risk. Public oral health programs should focus on behaviour-based education to improve parental supervision at home and reinforce it through school-based initiatives.

Keywords: Parental supervision, caries risk, early childhood caries, fluoride toothpaste, oral health behavior

Preventive Management of Early Enamel Lesions in a High-Caries Risk Adolescent: A Case-Based Approach

Syed Yousaf Hussain

Dental Lead at BARSAR Dental Practices and Associate Dentist at Sunningdale Dental Practice, United Kingdom

Background: Dental caries remains one of the most prevalent chronic diseases affecting adolescents globally. Early enamel lesions, if detected promptly, offer a critical window for non-invasive intervention. This case highlights the successful prevention of lesion progression through a personalised, evidence-based regimen. **Objectives:** To demonstrate the clinical efficacy of non-invasive strategies in halting early enamel lesion progression and reducing caries risk in a high-risk adolescent patient. **Methods:** A 13-year-old patient presented with white spot lesions on maxillary incisors and a high DMFT score. A tailored prevention protocol was implemented, including daily 2800 ppm fluoride toothpaste, resin infiltration (ICON®) for aesthetic control, dietary counselling, and quarterly fluoride varnish application. Compliance was reinforced via motivational interviewing techniques and parental involvement. **Results:** At 12-month review, no new lesions had developed, and the white spot lesions showed aesthetic improvement. Salivary pH and plaque scores improved significantly. The patient reported increased oral hygiene adherence and reduced sugar intake. **Conclusion:** Early detection combined with a customised non-invasive preventive approach can effectively manage incipient carious lesions and promote long-term oral health in at-risk adolescents. Parental engagement and patient motivation are key success factors.

Keywords: Preventive dentistry, enamel lesion, adolescent, fluoride therapy, caries risk management

Reducing Incidence of Gingivitis in Adolescents Through Sigimut (Dental Health Information System) Intervention Programme in Highschool Students in Jakarta.

Marta Juslily¹, Emilia Gustika Hadi², Tri Erri Astoeti¹

¹ Department Of Dental Public health and Preventive Dentistry, Universitas Trisakti, Indonesia

² Dental Polyclinic Community Health Centre District Taman Sari, DKI Jakarta, Indonesia

Background: Adolescence is a transitional period from childhood to adulthood, characterised by physiological and hormonal changes. Hormonal changes affect periodontal tissue, increasing the likelihood of gingivitis. Gingivitis is a periodontal disease that is very common in adolescents if oral hygiene is not maintained properly. **Objectives:** The purpose of the study is reducing the incidence of gingivitis in adolescence through dental healthcare promotive intervention programme (SIGIMUT). **Methods:** Experimental research with a longitudinal design involves a population of 446 high school students (grades 10 and 11), and the sample is selected using purposive sampling. Research measuring tools using the Oral Hygiene Index Simplified (OHI-S). **Results:** Screening results among high school students aged 15 to 18 years in Jakarta revealed a high prevalence of gingivitis at 87.44%. Interventions to promote behavioral change in adolescence were implemented using the SIGIMUT (information system of dental healthcare) programme, which utilized social media for years. **Conclusion:** The SIGIMUT programme was proven effective in reducing the incidence of gingivitis from 87.44% (390/446) to 33.63% (150/446), with oral hygiene (OHI-S) scores improving from 3.61 (poor category) to 1.27 (moderate category).

Keywords: Adolescence, dentist, gingivitis, oral healthcare, sigimut programme

Integrating Oral Health Education into Early Childhood Care: A Training Program for Daycare Teachers in Naic, Philippines

Arlene Cecilia A. Alfaro¹, Jannyl Alyanna A. Gonzales¹, Michael Antonio F. Mendoza¹, Rose Anne Q. Rosanes¹, Christel Millicent A. Anatalio², Sheila Mae S. Andres², Lara Dana M. Bool², Aimee Patricia V. Cano², Ma. Carmelita G. Ordoñez², Czareana Mikkaela T. Parra², Mikee Joyce Pasco², Bianca Alexandra R. Pineda², Shaila Janine S. Punzalan², Dynna Rose M. Tabing², Hannah Mae C. Vegafria², Abigail D. Young²

¹ Faculty, Department of Community Dentistry, University of the Philippines Manila College of Dentistry, Philippines

² Undergraduate Students, University of the Philippines Manila College of Dentistry, Philippines

Background: As part of the Cavite-MAGNAMARTE-UP Partnership and in support of the joint initiative between the Municipality of Naic and the University of the Philippines Community Health and Development Program to strengthen the local health system, the UP College of Dentistry and the Municipal Dentist proposed the training of daycare teachers as Oral Health Workers. Recognizing the crucial role of daycare teachers in early childhood care, the intervention aimed to enhance their capacity in oral health education, early detection of common oral conditions, and appropriate referral to dental services. **Objectives:** This capacity-building training aimed to increase the oral health knowledge and skills of Naic daycare teachers to enable them to effectively teach oral health concepts, support early detection, and facilitate timely referral of dental concerns within their communities. **Methods:** An oral health training program was designed and implemented following a Training Needs Analysis with the target group. This analysis identified common oral health issues observed among children and frequently asked questions from caregivers. The training was delivered through four modules: tooth anatomy and care, common oral diseases, prevention and management strategies, and dental trauma and emergency response. Thirty-six daycare teachers participated in the one-day training. A 20-item pretest assessed baseline knowledge, followed by a two-part post-training evaluation: a written post-test and a return demonstration using dental casts and toothbrushes from the Oral Health and Wellness Kit. Participants also answered questions on oral hygiene practices. **Results:** The average pretest score was 15.5 (range: 12–19), with the most missed questions on the number of primary teeth and the timing of first permanent tooth eruption. Post-test scores improved to an average of 17.5 (range: 14–20). All participants completed the return demonstration and answered oral hygiene questions accurately. **Conclusion:** The training effectively improved oral health knowledge and skills, positioning daycare teachers as capable frontline educators and referral agents in community-based oral health promotion.

Keywords: Daycare teachers, oral health workers, capacity-building, oral health education

Influence of pH Microenvironment on Paracrine Function of SCAPs and Its Mediated Angiogenic Effects

¹Haisheng Cao, ¹Chunlei Zhang, ¹Shuguo Zheng, ¹Xiaozhe Wang

¹Department of Preventive Dentistry, Peking University School and Hospital of Stomatology, China

Background: The pH microenvironment within and around root canals of severely infected permanent teeth undergoes complex dynamic changes. Angiogenesis is a critical factor in pulp regeneration, yet whether the pH microenvironment affects the paracrine function of Stem Cells from Apical Papilla (SCAPs) and subsequently regulates angiogenesis remains unexplored. **Objectives:** To investigate how pH variations affect SCAPs' paracrine function and subsequent regulation of human umbilical vein endothelial cells (HUVECs) angiogenesis. **Methods:** SCAPs were cultured under pH 5.4–8.4 conditions, then conditioned media (CM) were collected to treat HUVECs. Cell proliferation, migration, and angiogenic capacity were assessed using CCK-8, wound healing assay, and tube formation assay. Antibody array and Western blot were employed to detect pro-angiogenic factor expression and P38 MAPK signaling pathway activation. **Results:** All pH-CM enhanced HUVECs proliferation and migration versus controls ($P < 0.05$). While the pH 7.4 and pH 8.4 group exhibiting the strongest effect ($P < 0.05$). Total tube length in all experimental groups exceeded the controls, with the pH 5.4 group displaying the lowest values ($P < 0.05$). Moreover, the acidic environment tended to affect the paracrine of SCAPs associated with angiogenesis, evidenced by the significantly reduced secretion of 17 pro-angiogenic factors, particularly ANG, COL18A1, IGFBP-2, PLAU, and VEGF ($P < 0.01$) in pH 5.4 and 6.4 groups. The protein expressions of p-P38/P38 were further explored, which showed markedly suppressed in those two groups as well ($P < 0.05$). **Conclusion:** Acidic microenvironments inhibit SCAPs' secretion of pro-angiogenic factors by suppressing the P38 MAPK signaling pathway, thereby attenuating their promotive effects on HUVEC angiogenesis.

Keywords: Ph environment, paracrine regulation, angiogenesis, scaps, pulp regeneration

Caries Preventive Effects of Silver Diamine Fluoride Pretreated Glass Ionomer Cement Restorations on Sound Root Surface of Adjacent Tooth

¹Kelsey Xingyun Ge, ¹Chun Hung Chu, ¹Ollie Yiru Yu

¹Faculty of Dentistry, The University of Hong Kong, Hong Kong, China

Background: Root caries is the most significant oral health-related negative variable of quality of life for the older adults. **Objectives:** To investigate whether silver diamine fluoride (SDF) pretreatment improves the caries preventive effects of glass ionomer cement restorations (GICR) on the root surface of adjacent sound teeth. **Methods:** Human tooth blocks with GICR pretreated with 38% SDF were designated as intervention. GICR without pretreatment were used as control. A dentin specimen mimicking the root surface of an adjacent tooth was placed beside each GICR. The set of GICR and adjacent dentin specimen underwent cariogenic challenges using a bacterial consortium of *Streptococcus mutans*, *Lactobacillus casei*, and *Candida albicans*. Biofilm growth kinetics, viability and morphology were analyzed via PMA-qPCR, confocal laser scanning microscopy (CLSM) and scanning electron microscopy (SEM). Lesion depth, surface morphology, crystal characteristics and collagen degradation in dentin were evaluated using micro computed tomography (Micro-CT), SEM, X-ray diffraction (XRD) and Fourier transform infrared spectroscopy (FTIR). **Results:** Compared with the control group, the intervention group showed lower microbial cell counts in adjacent dentin specimens, as measured by PMA-qPCR, a higher dead-to-live cell ratio (0.85 ± 0.14 vs. 0.57 ± 0.09 , $p = 0.002$) according to CLSM, a sparsely distributed biofilm observed through SEM. Additionally, in adjacent dentin specimens, the intervention group demonstrated shallower lesion depths ($114 \pm 5 \mu\text{m}$ vs. $256 \pm 10 \mu\text{m}$, $p < 0.001$) measured by micro-CT, less collagen exposure seen in SEM images, preserved hydroxyapatite indicated by sharper hydroxyapatite peaks in XRD analysis, and reduced collagen degradation, as evidenced by lower amide I to hydrogen phosphate ratios (0.11 ± 0.03 vs. 0.19 ± 0.04 , $p = 0.003$) determined by FTIR. **Conclusion:** SDF pretreatment enhances the caries preventive effects of GICR on sound root surface of adjacent tooth by inhibiting biofilm growth and reducing dentin demineralization.

Keywords: Glass ionomer cement, silver diamine fluoride, root caries

Relationship Between Dental Visit Towards Quality of Life in Primary Healthcare Citireup Cimahi Indonesia

Ayu Asri Lestari¹, Almira Belva², Khansa Khairunnisa², Aisyah Widjaja²

¹Department of Dental Public Health, Faculty of Dentistry, Universitas Jenderal Achmad Yani, Cimahi, Indonesia

²Undergraduate Student, Faculty of Dentistry, Universitas Jenderal Achmad Yani, Cimahi, Indonesia

Background: Oral Health Quality of Life (OHRQoL) is a multidimensional understanding that describes a person's quality of life. Perceptions, expectations, experiences, and an individual's capacity for environmental adaptation all impact oral health. The patient's perception of oral disease is important things in assessing treatment needs. **Objectives:** This study aimed to determine the relationship between Oral Health Related Quality of Life (OHRQoL) and the number of visits to the dentist. **Methods:** This design study is a cross-sectional. Instrument were used an OHIP questionnaire and additional questions about healthcare insurance ownership. Data were analyzed using SPSS version 25. Sample were 62 respondents who visited. Data were analyzed correlation test. **Results:** The prevalence of respondents 44-60 years old was 38,7%, most of them as BPJS owners and as unemployed. The highest prevalence of OHRQoL based on dental utilization was low categorized and more than 6 months of dental visit. The result of bivariate analytics and the Pearson chi-square test statistically shows differences between OHRQoL categorized towards dental visit ($p=0,000$). The correlation between OHRQoL and dental visits were statistically significant ($p=0.000$ $r=0.606$). **Conclusion:** Several determinant factors affect a person's desire to enhance their oral health and dental utilization. Based on OHRQoL and ownership of health insurance, the people were used to dental visit more often to preventable out-of-pocket expenses and outgrow their oral health problem.

Keywords: Dental utilization, OHRQoL, oral health

Predictive Model of Pre-, Peri-, and Postnatal Factors Towards Ecc in Stunted Children of Juwiring District, Central Java, Indonesia (A Life Course Approach)

Iwany Amalliah Badruddin¹, Lintang Andarini², Melissa Adiatman¹, Armasastra Bahar¹, Atik Ramadhani¹, Risqa Rina Darwita¹

¹Department of Dental Public Health and Preventive Dentistry, Faculty of Dentistry, Universitas Indonesia

²Faculty of Dentistry, Universitas Indonesia

Background: The Life Course approach emphasizes the importance of early life that begins with the fetal growth. Every event that affects a child's health is believed to be part of a program within the child that determines the development of certain diseases in the future. Oral health researches with this approach are still scarce, especially in Indonesia. A local Community Health Center in Juwiring District, Central Java, has been keeping health records for children of under-3-year-old with stunting history, including their mothers' pregnancy medical record. Therefore, the ECC status was examined to analyze the relationship with retrospective information. **Objectives:** Then the purpose of this study is to assess the influence of pre-, peri-, and postnatal factors towards ECC in Juwiring District, Central Java, Indonesia. **Methods:** Secondary data of pre-, peri-, and postnatal information were obtained from the 264 children's medical records with stunting history, including their mothers' pregnancy and birth records. The oral examination was assisted by local dentists from the health center. Multiple logistic regression analysis was performed to gain a prediction model and to determine the most influencing factors towards dental caries in stunted children of Juwiring District. **Results:** The prevalence of dental caries was 68.5% in 248 subjects in the study. The variables in the final prediction model for factors related to ECC were mother's perceived of her child's dental problems, mother's education level, mother's poor knowledge about dental caries, and stunting status. The most influential factor was the mother's perception of her child's dental problem, with the highest Odds Ratio (OR) of 36.539 (12.904- 103.464). **Conclusions:** This study showed that prenatal factors of mother's education level, and postnatal factors of Mother's perceived dental problem, poor knowledge about dental caries and the child's stunting status were in the ECC prediction model in the stunted children of Juwiring District.

Keywords: Dental caries, EEC, stunting, life course, prediction model, prenatal, perinatal, postnatal.

Observation of Tooth Discoloration of Various Protocols of Silver Diamine Fluoride Against Dental Erosion: An *In Vitro* Study

Ronnakorn Rattanakulwattana¹, Pawarisa Iamngam¹, Manunya Phutrit¹,
Dhananthat Chawhuaveang^{1,2}

¹ Faculty of Dentistry, Thammasat University, Thailand

² Department of Restorative Dental Sciences, Faculty of Dentistry, The University of Hong Kong, Hong Kong SAR

Background: Our recently investigation found that 38% SDF yielded superior results in protecting enamel and dentine from dental erosion than daily application of stannous chloride-containing fluoride (SNF) during a 14-day erosive challenge. However, black staining after SDF application is an adverse effect. Therefore, there is still no consensus on its application protocol for anti-erosion purposes. **Objective:** To investigate tooth discoloration from various SDF application protocols against dental erosion on permanent premolars. **Methods:** Eighty premolars were collected and allocated to 4 groups (n =20 each). The four experimental groups are group 1; SDF single application, group 2; SDF three consecutive weekly application, group 3; deionized water (DW) daily application, and group 4; SNF daily application. The premolars were subjected to 120 seconds of erosive challenge (citric acid at pH 3.2 at 37°C with agitation at 70 rpm) five times per day at 2-hour intervals for 30 days. During each 2-hour interval, teeth were immersed in 2 mL artificial saliva at 37°C with agitation at 70 rpm. After a 30-day erosive cycle, nineteen extracted premolars in each group were investigated by spectrophotometer to determine the color. Another tooth in each group was used to take photographs. The ΔE was analyzed using One-way ANOVA and One-way repeated ANOVA followed by Tukey's HSD. **Results:** The mean total color change (ΔE) ($\pm$ SD) in Groups 1-4 was 6.64 ± 5.00 , 27.18 ± 7.49 , 1.36 ± 2.61 , and 5.73 ± 4.74 , respectively ($\Delta E_{\text{Group 2}} > \Delta E_{\text{Group 1}} = \Delta E_{\text{Group 4}} > \Delta E_{\text{Group 3}}$). The photograph in Group SDF three weekly application showed obvious tooth discoloration. **Conclusion:** It was concluded that the increased frequency of SDF applications statistically affected the color change. However, the anti-erosive effects of different SDF protocols need to be further investigated.

Keywords: Silver diamine fluoride, tooth discoloration, dental erosion

The Discovery, Biological Evaluations, and Modified Applications of Peptide AVHS Derived from Dental Plaque Biofilms

Hai-Xia Lu¹, Yuan-Meng Yang¹, Edward Chin Man Lo²

¹Department of Preventive Dentistry, Shanghai Ninth People's Hospital, Shanghai Jiao Tong University School of Medicine; College of Stomatology, Shanghai Jiao Tong University, Shanghai, China.

²Dental Public Health, Faculty of Dentistry, The University of Hong Kong, Hong Kong, SAR, China.

Background: With the growing prevalence of early childhood caries (ECC), there is an urgent need to develop effective strategies for caries prevention. Investigation of oral metabolomic microenvironments among caries-free children provides valuable insights. **Objectives:** To identify a “dominant metabolite” from plaque biofilms in children with varying levels of dental caries, and to assess the biological attributes of this metabolites. **Methods:** A case-control study, combined with untargeted metabolomics, was conducted among three groups: caries-free (CF), low ECC (LECC), and high ECC (HECC). Then the biological properties of this “dominant metabolite” was evaluated by biocompatibility analysis, bacterial growth and acid production assessment, biofilm targeting and remineralization test, respectively. This “dominant metabolite” was conjugated with a known antibacterial peptide Arg-Trp-Trp-Arg-Trp-Trp (RWWRWW), and the caries preventive effect of this compound was evaluated in vitro and in vivo. **Results:** This study included 102 children aged 36 months. Metabolomic analysis revealed that Ala-Val-His-Ser (AVHS) was the most abundant metabolite in CF group ($P < 0.05$), with moderate predictive performance ($AUC = 0.675$). AVHS has good biocompatibility, it can slow down the growth and acid production rate of *Streptococcus mutans* and effectively target plaque biofilm. The AVHS@RWWRWW conjugate exhibited superior antibiofilm effects in vitro and significantly reduced caries of rat than that of the control group ($P < 0.05$). **Conclusion:** AVHS not only has modest predictive performance for healthy children in clinical research, but also owes multiple biological performances. AVHS@RWWRWW shows better antibiofilm effect and can improve caries prevention, making it a promising candidate for development as a preventive agent.

Keywords: Early childhood caries; plaque biofilms; metabolomics; antimicrobial peptide

Effect of Cobalt-Incorporated Hydroxyapatite on Pre-Osteoclast Viability and Migration, As Well As on Osteoclast Differentiation

Prima Amornvuthivorn¹, Wariya Yoma¹, Phatcha Techamat¹, Somying Patntirapong¹

¹Faculty of Dentistry, Thammasat University, Thailand

Background: Hydroxyapatite (HA) is widely used in bone regeneration due to its biocompatibility and similarity to biological apatite of bone and tooth. However, its slow biodegradation limits nutrient supply, cell viability, and longer bone replacement. Cobalt ions (Co^{2+}) can mimic hypoxic environments by stabilizing hypoxia-inducible factor (HIF), subsequently activating angiogenesis and potentially enhancing osteoclast activity. **Objectives:** To investigate the effects of cobalt-incorporated hydroxyapatite (HACo) on pre-osteoclast viability and migration, as well as osteoclast differentiation. **Methods:** RAW264.7 cells (pre-osteoclasts) were cultured in media incubated with HACo at concentrations of 0, 40, 400, 4000, and 8000 μM . RANKL was added to induce osteoclast differentiation. Cell viability was assessed using the CCK-8 assay at days 1, 3, and 7. Osteoclast differentiation was evaluated through immunofluorescence staining of actin ring formation, while cell migration was analyzed using a scratch wound assay. **Results:** The migration assay revealed that pre-osteoclasts exhibited faster movement toward the denuded areas in the presence of Co. Cell viability assays showed concentration-dependent effects, with optimal effect at low Co levels and cytotoxicity at higher concentrations. Results also demonstrated that specific cobalt concentrations enhanced larger osteoclast formation (HACo40-400 μM). **Conclusion:** These findings suggest that HACo could enhance bone remodeling through targeted effects on cell viability and cell migration, providing potential advantages for bone regeneration applications in dentistry.

Keywords: Cobalt-incorporated hydroxyapatite, osteoclasts, viability, migration, differentiation

Effectiveness of Collaborative Education Program in Improving Knowledge of Dental Health and Stunting in the Area Puskesmas Cigugur Tengah Cimahi

Kertamaya Sundawan¹, Nadya Shinta Pramita¹, Fahira Salma Khairunnisa¹, Raisa Tiara Rahmani¹, Silvyta Zahra Quasima¹, Wahyuni Shofiani¹, Gelady Putra Pratama¹, Asri Nurkhoiriyah²

¹ Fakultas Kedokteran Gigi, Universitas Jenderal Achmad Yani, Cimahi, Jawa Barat, Indonesia

² Poli Gizi, Puskesmas Cigugur Tengah, Kota Cimahi, Jawa Barat, Indonesia

Background: The Global Burden of Disease study reported that 486 million children with malnutrition and stunting suffer from primary tooth decay. Oral health and systemic conditions have a fairly close relationship, these conditions often become reciprocal conditions that affect the overall health of children. Children who experience stunting often show poor dental health conditions. The Indonesian government launched the Healthy Indonesia Program with a Family Approach with a focus on prevention efforts and improving health using a family approach as the smallest unit of society. These findings aim to improve promotive and preventive health services by involving various health workers, including dentists, in monitoring health in the community. **Objectives:** This study involved 33 parents visiting Puskesmas Cigugur Tengah and three families with children diagnosed with stunting. The aim was to assess the increase in parental knowledge related to dental health and stunting after the outreach program and to explore the experiences and challenges faced in the community. **Methods:** This study used a cross-sectional mixed methods design, combining quantitative and qualitative approaches. Quantitative data were collected by questionnaires administered before and after health counseling to measure knowledge gains. Qualitative data were gathered through interviews to understand the contextual challenges faced by participants. **Results:** The questionnaire results showed a significant increase in public knowledge about dental health and stunting, with the proportion of respondents classified as having good knowledge rising from 46.6% before counseling to 90% after ($p < 0.05$). Observational and qualitative analysis showed common dental health problems in stunted toddlers, such as delay eruption and caries. Four main themes emerged: (1) lack of comprehensive education from health workers, most respondents only received information about stunting once and had no direct education about dental health; (2) environmental factors; (3) low socioeconomic status; and (4) parenting patterns. These findings emphasize the importance of cross-sector team collaboration, including the active involvement of dentists. **Conclusion:** Oral health is closely related to systemic health, nutritional status, and child growth. Educational programs are effective in increasing community knowledge about stunting and dental health; however, knowledge alone is not enough to address the complexity of this problem. Factors such as parenting patterns, environmental conditions, socio-economic difficulties, and limited access to information were found in this study. Therefore, to ensure comprehensive child health services and to support effective prevention and treatment, a multidisciplinary approach involving collaboration between various health professionals is essential.

Keywords: Collaboration, Dental Health, Stunting, Education

Comparative Assessment of Four Treatments for Post Orthodontic White Spot Lesions Over A 24-Month Period: A Randomized Controlled Clinical Trial

Yang Zhou¹, Qiqiu Wang¹, Fang Huang¹, Liangyue Pang¹, Qinghui Zhi¹

¹Department of Preventive Dentistry, Hospital of Stomatology, Guanghua School of Stomatology, Sun Yat-sen University, Guangzhou, China

Background: White spot lesions (WSLs) represent the initial indication of the caries process caused by demineralization. WSLs can be treated using a range of techniques, such as topical fluoride treatments, casein phosphopeptide-amorphous calcium phosphate (CPP-ACP), and resin infiltration (RI) therapy. However, there has no widely accepted conclusion. **Objectives:** This study aimed to evaluate and compare the effect of RI, CPP-ACP, fluoride varnish (FV), and fluoride toothpaste on WSLs, over a 24-months period. **Methods:** 79 participants were randomly assigned to treated with RI, CPP-ACP, FV or fluoride toothpaste and were called up every 6 months. The subjects in RI group received fluoride toothpaste treatment every six months beginning with the second visit. Each participant received instructions to use the provided fluoride toothpaste to brush teeth twice daily. The DMFT index and International Caries Detection and Assessment System (ICDAS) scoring were recorded at baseline and each visit. Intra-oral pictures were captured and the changes in WSLs area were assessed by Image J software. **Results:** After 24 months, there's no significant differences in the mean DMFT index between groups. All four treatments were effective in reducing WSLs. After 12 months, The ICDAS mean score and change rate of WSLs in RI group were significantly lower than the other groups ($p < 0.001$). After 24 months, except RI group, the CPP-ACP group began to significantly decrease the WSLs area than fluoride toothpaste group ($p < 0.001$). **Conclusion:** During 24 months period, the combined use of RI, FV, CPP-ACP with fluoride toothpaste and fluoride toothpaste alone were effective in treating WSLs. RI management achieved the best and stable effect in reducing WSLs after 24 months. Besides, after 24 months, CPP-ACP management was better than fluoride toothpaste management alone in reducing WSLs.

Keywords: White spot lesions, casein phosphopeptide-amorphous calcium phosphate, resin infiltration, fluoride varnish, fluoride toothpaste

Strengthening Oral Healthcare for the Orang Asli in Malaysia: Challenges and Opportunities Identified Through Qualitative Evaluation and Targeted Literature Review

Rohaida Alias¹, Muhammad Farid Nurdin¹, Hamizah Masrom¹, Mandeep Singh Minder¹, Menaka Rajandran¹, Siti Balqis Arshad¹, Kamariah Omar¹, Faizah Kamarudin², Nur Syafrina Mohd Sanif³

¹ Oral Health Division, Selangor State Health Department, Malaysia

² Oral Health Programme, Ministry of Health, Malaysia

³ Faculty of Dentistry, Universiti Teknologi MARA, Malaysia

Background: Since 2012, the Oral Healthcare Programme (OHP), Ministry of Health, Malaysia has worked to improve oral health outcomes for the Orang Asli (OA), an Indigenous population facing longstanding inequities in healthcare access. Despite progress, the programme faces persistent implementation challenges. This study explored these challenges and systematically identified evidence-based opportunities to strengthen the OHP. **Objectives:** To explore the challenges faced by programme implementers of the oral healthcare programme for OA in Selangor and to identify evidence-based opportunities for strengthening the programme. **Methods:** Seven focus group discussions (FGDs) were conducted with 39 oral health personnel across seven districts in Selangor. Thematic analysis was used to identify key implementation challenges. In parallel, a systematic targeted literature review of global Indigenous oral health interventions was performed to identify opportunities aligned with these local challenges. **Results:** Five key challenges and corresponding opportunities were identified: (1) Workforce shortages and physical demands: addressed through integrating Indigenous Health Workers and student-led outreach programme. (2) Inadequate transport, equipment, and infrastructure: improved via mobile dental services, school-based delivery, and integration with primary care. (3) Communication gaps due to language and cultural barriers: tackled through bilingual Indigenous Health Workers, culturally adapted materials, and bicultural approaches. (4) Low community trust and engagement: strengthened through community co-design and partnerships with Indigenous organisations and leaders. (5) Limited sustainability of preventive programmes: enhanced by embedding oral health within holistic primary care models and fostering cross-sector collaborations. **Conclusion:** Targeted opportunities exist to strengthen the delivery and sustainability of oral healthcare for OA communities in Selangor. Applying global evidence to local contexts can enhance future programme outcomes.

Keywords: Indigenous oral health, programme evaluation, challenges, opportunities, Malaysia

Comparison of Distance from Piriform Rim to Descending Palatine Artery at High Le Fort I Osteotomy Level Between Class I, II and III Skeletal Pattern in Thai patients by CBCT

Phanisara Nuthadee¹, Naratip Jandat¹, Irin Jotisuta¹, Chirdpan Benjakul²

¹ Undergraduate student, Faculty of Dentistry, Thammasat University, Thailand

² Staff, Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Thammasat University, Thailand

Background: High Le Fort I osteotomy is a surgical technique for correcting midface deformities by placing the osteotomy line higher than in conventional Le Fort I procedures. Bleeding from the descending palatine artery is a major risk. Accurate knowledge of the distance from the piriform rim to this artery is important to prevent complications. This study measures this distance at the high Le Fort I level using CBCT in patients with different skeletal patterns. **Objectives:** To compare the distance from the piriform rim to the descending palatine artery at the high Le Fort I osteotomy level among Thai patients with different skeletal patterns using CBCT. **Methods:** CBCT images of 60 Thai patients with skeletal Class I, II, and III were analyzed. The distance from the piriform rim to the anterior border of the greater palatine canal, along the lateral nasal wall osteotomy line at the high Le Fort I level, was measured bilaterally. Data were stratified by skeletal class, side (right vs. left), and sex. One-way ANOVA was used to compare skeletal patterns; paired t-tests compared both sides, and unpaired t-tests compared sexes. **Results:** The mean distances were 39.74 ± 2.43 mm (Class I), 40.60 ± 1.74 mm (Class II), and 38.80 ± 2.49 mm (Class III). The right and left sides measured 39.71 ± 2.36 mm and 39.72 ± 2.41 mm, respectively. Males had greater distances than females (40.20 ± 2.20 mm vs. 39.26 ± 2.39 mm). A significant difference was observed among skeletal patterns ($p < 0.05$), but not between sides or sexes ($p > 0.05$). **Conclusion:** Skeletal pattern influences the position of the descending palatine artery at the high Le Fort I level. Class II patients have a longer distance, and Class III patients a shorter distance compared to the average, which is important for surgical planning to reduce bleeding risks.

Keywords: High Le Fort I osteotomy, piriform rim, descending palatine artery, skeletal, CBCT

Assessing Ion-Releasing Characteristics and Color Stability of Ion-Releasing Resin Composites (Thamfil): An In Vitro Study

Chontanasawat W¹, Vatthanachairoj P¹, Assawaarsu P¹, Panpisut P¹ and Chotitanmapong T¹

¹Faculty of dentistry, Thammasat University, Thailand

Background: Secondary caries is the most common reason for the failure of resin composite. The development of ion-releasing composite is expected to help prevent secondary caries after composite placement. **Objectives:** This study aimed to evaluate the fluoride release of Thamfil, a resin composite developed by Thammasat University, compared to three commercial resin composites: Cention N, Beautifil, and Filtek (a non-fluoride-releasing control). Additionally, since fluoride-releasing composites may develop porosities affecting color stability, the color stability of Thamfil was assessed alongside the other materials. **Methods:** To evaluate fluoride release, specimens from each resin composite brand were immersed in deionized water. Fluoride concentration was measured at 1, 3, 7, 14, 21, and 28 days by mixing the immersed deionized water with TISAB III (1:10 ratio) and measure using a fluoride-specific electrode. For color stability, disc specimens were prepared (n=5), stored in deionized water and red wine at 37°C, and color measurements were taken with VITA Easyshade V before and after immersion at 24 hours, 2 and 4 weeks. **Results:** Cention N exhibited the highest fluoride release, with a statistically significant difference ($p < 0.001$) compared to all other resin composites. Thamfil and Beautifil showed comparable fluoride release ($p > 0.05$). In the color stability test, Thamfil demonstrated the greatest color change in deionized water ($p < 0.001$), while the other materials remained within an acceptable range. However, in red wine, Thamfil showed significantly lower ΔE_{45} values than Beautifil and Cention N ($p < 0.001$). **Conclusions:** The fluoride release experiment showed no significant difference between Thamfil and the non-fluoride-releasing control ($p > 0.05$). In the color stability test, Thamfil exhibited significantly greater color change than the control in deionized water ($p < 0.001$), but no significant difference when immersed in red wine ($p > 0.05$).

Keywords: Thamfil, color stability, ion releasing, dental materials

Encapsulation of *Boesenbergia rotunda* Extract on Biosynthesized Nanohydroxyapatite from Oyster Shells for Dental Applications

Promwong N¹, Tangsereesuk P¹, Piboonkitsakul P¹ and Wongwitthayakool P²

¹Faculty of Dentistry, Thammasat University, Thailand

Background: Panduratin A, a bioactive compound found in *Boesenbergia rotunda* (fingerroot), has demonstrated antibacterial, anti-inflammatory, antioxidant, and anti-periodontitis properties, making it promising for dental use. However, its clinical application is hindered by low water solubility and poor bioavailability. Nanoparticles, particularly nanohydroxyapatite (nHAP), offer a biocompatible and biodegradable drug delivery system that can enhance Panduratin A's effectiveness. Oyster shells, a sustainable source rich in calcium carbonate, provide an eco-friendly material for synthesizing nHAP. **Objectives:** This study aimed to synthesize nHAP from oyster shells and evaluate how calcination duration affects particle size, as well as assess the potential of encapsulating nHAP with fingerroot extract for dental applications. **Methods:** nHAP was synthesized from oyster shells via a precipitation method and then calcined for 4, 6, 8, and 10 hours. It was then encapsulated with fingerroot extract at concentrations of 1, 1,000, 10,000, and 50,000 ppm. The synthesized materials were characterized for morphology, particle size, crystalline structure, and chemical composition using SEM, particle size analysis, XRD, and FTIR. FTIR and STA were used to confirm encapsulation. **Results:** SEM showed porous structures suitable for drug delivery. The smallest particle size (136 nm) was found in 4-hour calcined samples. Higher extract concentrations slightly reduced particle size, possibly due to phenolic compounds acting as surfactants. XRD confirmed the crystalline nature of HAP. FTIR verified the presence of HAP and successful fingerroot integration. STA showed effective encapsulation at 1,000–50,000 ppm, while 1 ppm had minimal impact. **Conclusion:** This study demonstrates the feasibility of using oyster shell-derived nHAP encapsulate with fingerroot extract, highlighting potential for dental applications like toothpaste or desensitizing gels, pending further antibacterial research.

Keywords: Nanohydroxyapatite, *boesenbergia rotunda*, oyster shell, panduratin a, biosynthesis

Why Does Prolonged Bottle Feeding Still Occur Among Malay Children?

Denisa Khoo¹, Tan Chai Eng³, S. Nagarajan Sockalingam¹, Ahmad Shuhud Irfani Zakaria¹, Elavarasi Kuppusamy¹, You Huay Woon², Alida Mahyuddin¹

¹Department of Paediatric Dentistry, Universiti Kebangsaan Malaysia, Malaysia.

²Pusat GENIUS@Pintar Negara, Universiti Kebangsaan Malaysia, Malaysia.

³Department of Family Medicine, Universiti Kebangsaan Malaysia, Malaysia.

Background: Prolonged bottle feeding beyond the recommended age of 12 months remains prevalent in many Malaysian households, particularly among working mothers, despite public health guidelines advocating timely weaning. This practice is associated with adverse oral health and developmental outcomes. Understanding the underlying reasons for its persistence is essential to inform culturally appropriate and effective intervention strategies. **Objectives:** This study explores factors contributing to prolonged bottle feeding among working Malay mothers in Malaysia. Specifically, it aims to: (1) explore patterns of bottle-feeding practices, (2) determine influencing factors behind prolonged bottle feeding, and (3) investigate the role of social influences in shaping bottle feeding behaviour. **Methods:** A generic qualitative approach was used. Fifteen Malay mothers, each with at least one bottle-fed child aged seven years or younger, were recruited from the UKM Dental Polyclinics and Hospital Pakar Kanak-Kanak UKM. In-depth interviews were conducted using a semi-structured topic guide. All interviews were audio-recorded, transcribed verbatim, and analysed through reflexive thematic analysis using NVivo 14 software. **Results:** Three major themes emerged: (1) personal maternal factors, (2) child-centered factors, and (3) sociocultural norms and external influences. Bottle feeding typically commenced after maternity leave and was sustained by convenience, soothing ability, and perceived nutritional value. Mothers often downplayed the associated risks by adopting compensatory strategies. Discontinuation was delayed due to children's emotional attachment, established routines, and resistance. Cultural norms further normalised prolonged use. Healthcare advice was inconsistently received and selectively applied, depending on alignment with maternal beliefs and daily circumstances. **Conclusion:** Prolonged bottle feeding among Malay children is sustained by a complex interplay of maternal needs, child comfort, and sociocultural influences. Even when aware of potential risks, they justified continued use based on perceived benefits and societal validation. Effective interventions must address knowledge gaps and also reshape cultural perceptions on maternal practices.

Keywords: Bottle-feeding, malay, qualitative study, feeding practices, oral health

Smoking and Saliva: Uncovering Hidden Predictors of Dental Caries

Nurul Asyikin Yahya¹, Mugilarasi Chandra Segaran², Tai Jia Yee²

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

²Ministry of Health, Malaysia

Background: Saliva plays a crucial role in maintaining oral health, serving various functions such as protecting oral tissues, cleansing the mouth, and aiding digestion. Salivary composition, including pH, buffering capacity, and protein components, has been linked to oral diseases, such as dental caries. Tobacco smoking has detrimental effects on salivary glands, altering saliva composition and potentially increasing the risk of dental caries. **Objectives:** This study aimed to investigate the relationships between saliva pH and buffering capacity, as well as the association between smoking status and caries risk. **Methods:** A cross-sectional study was conducted among adult smokers and nonsmokers visiting the Dental Polyclinics at Universiti Kebangsaan Malaysia (UKM). Salivary parameters, including pH and buffering capacity, were assessed using GC Saliva Check Buffer kits. Caries risk assessment was performed using the American Dental Association Caries Risk Assessment form. Sociodemographic characteristics, smoking status, and caries risk were analysed using descriptive statistics and chi-square tests. **Results:** One hundred subjects participated in the study, with 49 smokers and 51 non-smokers. Smokers showed a higher prevalence of high caries risk compared to non-smokers. The buffering capacity of saliva was significantly lower in smokers compared to non-smokers for both resting and stimulated saliva ($p < 0.001$). Resting ($p = 0.035$) and stimulated ($p = 0.049$) saliva pH was significantly more acidic in smokers than in non-smokers. **Conclusion:** The findings demonstrate a significant association between smoking status and alterations in salivary parameters, alongside an increased risk of dental caries. A comprehensive understanding of the effects of smoking on salivary composition and caries susceptibility is essential for informing the development of effective preventive and therapeutic strategies for high-risk populations.

Keywords: Saliva, oral health, oral tissues, salivary parameters, ph, buffering capacity, dental caries, tobacco smoking

Understanding Patient Perspectives: Sentiment Analysis with Vader on Google Maps Reviews of a Dental Teaching Hospital in Surabaya

Ganendra, Anugraha¹; Indra, Mulyawan¹; Achmad Zam Zam Aghasy²

¹ Department of Oral and Maxillofacial Surgery, Faculty of Dental Medicine, Universitas Airlangga, Surabaya, Indonesia; Staff of Oral and Maxillofacial Surgery, Universitas Airlangga Dental Hospital, Surabaya, Indonesia;

² Department of Preventive and Community Dentistry, Faculty of Dentistry, Universitas Gadjah Mada

Background: Google reported that in 2022, 73.7% of Indonesians became internet users, frequently accessing various types of information, including those in the health sector. Google Maps functions as a dynamic data repository that collects, organizes, and continuously updates user-generated content, such as reviews of healthcare services. **Objective:** This study conducts an aspect-based sentiment analysis of Google Maps user reviews, focusing on the Dental and Oral Hospital (RSGM) at the Faculty of Dental Medicine, Airlangga University. **Methods:** Review data were retrieved from the hospital's Google Maps page and analyzed using VADER (Valence Aware Dictionary for Sentiment Reasoning), an open-source sentiment analysis tool. Each review was classified into four sentiment categories: not available, positive, neutral, and negative. Aspect-based analysis was also conducted on service-related dimensions, including service, cost, time, and staff. **Results:** Of all processed reviews, 43.18% were labeled not available, 16.67% positive, 15.15% neutral, and 25.00% negative. Among the service aspects, the highest sentiment score was found in staff (0.6422), followed by time (0.5260), service (0.3796), and cost (0.3736). The sentiment classification model demonstrated strong performance, with a recall of 96.72% and an F1-score of 82.52%, reflecting its effectiveness in capturing user sentiment. **Conclusion:** Overall, patient sentiment toward RSGM was generally positive, especially concerning staff and time efficiency. Service and cost aspects received relatively lower scores. **Implication for Health Information:** Sentiment analysis can serve as a valuable tool for health information systems to monitor feedback, identify service gaps, and enhance patient-centered care through real-time data insights.

Keyword: Sentiment analysis, patient satisfaction, hospital dental service, google maps review, vader

Antibacterial Activity of *Cosmos Caudatus* Extract Against *Streptococcus Mutans*

Ong, Y.Y.¹, Zakaria, A.S.I.¹, Sockalingam, S.N.M.P.¹, Mahyuddin, A.¹, and Shafiei, Z.²

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

² Department of Craniofacial Diagnostic and Biosciences, Faculty of Dentistry, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, Kuala Lumpur, Malaysia.

Background: Dental caries remains a prevalent chronic disease in children, primarily caused by *Streptococcus mutans*, a biofilm-forming oral bacterium with strong adherence capabilities. With growing interest in plant-based therapeutics, *Cosmos caudatus* (Ulam Raja), a local herb known for its antioxidant and antimicrobial properties, has shown potential in oral care applications. **Objectives:** To evaluate the antibacterial, anti-adherence, and antibiofilm effects of *Cosmos caudatus* extract on *Streptococcus mutans*, and to assess ultrastructural changes via transmission electron microscopy (TEM). **Methods:** *Cosmos caudatus* extract was prepared at varying concentrations (6.25-200 mg/ml) and tested against *Streptococcus mutans* (ATCC 25175). Antibacterial activity was assessed using broth microdilution technique. Anti-adherence and antibiofilm assays were performed in 96-well plates using crystal violet staining. TEM analysis was conducted at 100% extract concentration with chlorhexidine gluconate 0.12% served as the positive control. **Results:** No minimum inhibitory concentration (MIC) was observed across the dilution range; however, bacterial growth reduction was noted at 100% concentration, indicating partial bacteriostatic activity. A dose-dependent reduction in bacterial adherence and biofilm formation was observed with increasing concentrations of the extract ($p < 0.001$). Notably, the antibiofilm activity at 100% concentration was statistically comparable to that of 0.12% chlorhexidine ($p = 0.512$), suggesting similar efficacy. TEM revealed membrane disruption, irregular morphology, cytoplasmic disorganization, and increased extracellular debris in treated cells. **Conclusion:** *Cosmos caudatus* extract demonstrated partial antibacterial effects and significant anti-adherence and antibiofilm activity against *Streptococcus mutans*. TEM findings suggest a mechanism involving membrane compromise and cytoplasmic disturbance. These results support its potential as a natural adjunct in caries prevention.

Keywords: *Cosmos caudatus*, *streptococcus mutans*, antibiofilm, anti-adherence, transmission electron microscopy

Vick Impact Membrane Vesicles Derived from Streptococcus Mutans

Yina Cao^{1,2}, Wenyu Wang^{1,2}, Yan Zhou^{1,2}, Wei Zhao^{1,2}, Huancai Lin^{1,2}

¹ Hospital of Stomatology, Guanghua School of Stomatology, Sun Yat-sen University, Guangzhou, China

² Guangdong Provincial Key Laboratory of Stomatology, Sun Yat-sen University, Guangzhou, China

Background: *Streptococcus mutans* (*S. mutans*) is a prominent cariogenic bacterium, and the cariogenicity of its membrane vesicles (MVs) has garnered increasing attention. However, the specific virulence factors derived from MVs remain poorly characterized. **Objectives:** This study aims to demonstrate that *vick* regulates MV production in *S. mutans*, consequently modulating biofilm formation and cariogenicity. **Methods:** Transmission electron microscopy (TEM), bicinchoninic acid (BCA) assay, and flow cytometry were employed to assess the impact of *vick* deficiency on MV morphology and yield. Lipidomics and Lab-4D proteomics were used to analyze differences in MV lipid and protein content between *S. mutans* UA159 and its $\Delta vick$ mutant. Biofilm formation was compared using crystal violet staining, confocal laser scanning microscopy (CLSM), and scanning electron microscopy (SEM). **Results:** Deletion of *vick* significantly reduced both the yield and size of MVs. Furthermore, *vick* deficiency altered the lipid and protein composition of MVs, notably decreasing the enrichment of the virulence factor GtfC. The $\Delta vick$ mutant also exhibited impaired biofilm-forming capacity. **Conclusion:** This study provides evidence that *vick* regulates MV biogenesis and composition in *S. mutans*, thereby influencing the bacterium's ability to form biofilms.

Keywords: *Streptococcus mutans*, membrane vesicle, *vick*, lipidomics, proteomics, biofilm

Impact of Obesity on Salivary Microecology in Early Childhood Caries: A Multi-Omics Analysis

Yiyi Huang¹, Jie Wen¹, Yan Zhou¹, Huancai Lin¹

¹Hospital of Stomatology, Guanghua School of Stomatology, Sun Yat-sen University, China

Background: Both early childhood caries (ECC) and obesity are multifactorial diseases with increasing prevalence among preschool children. Their potential biological interactions, particularly through salivary microecological changes, remain unclear. **Objectives:** To investigate the impact of obesity on the salivary microbiota and metabolome in children with or without ECC using a multi-omics approach. **Methods:** A total of 61 preschool children aged 4–5 years were recruited and stratified into four groups based on caries and obesity status: normal-weight caries-free (n=16), normal-weight with caries (n=17), obese caries-free (n=14), and obese with caries (n=14). Unstimulated saliva samples were collected from all participants. Full-length 16S rRNA gene sequencing was used to characterize salivary microbial composition and diversity. Untargeted liquid chromatography-tandem mass spectrometry (LC-MS/MS) was applied to analyze salivary metabolites. Differential analyses and pathway enrichment were performed, and Spearman correlation was used to explore microbe-metabolite associations. **Results:** No significant difference in microbial diversity was observed between normal-weight and obese groups. Compared to normal-weight caries-free children, the obese caries-free group showed increased abundance of *Abiotrophia defectiva* and *Clostridiales*, along with elevated levels of isoquinoline and N1-methyl-2-pyridone-5-carboxamide. A positive correlation was found between *A. defectiva* and isoquinoline levels. In the obese caries group, no significant microbial differences were found, but levels of metabolites related to glycine, serine, threonine, and glycerophospholipid metabolism were reduced. However, these changes were not directly associated with caries occurrence. **Conclusion:** Obesity induces alterations in salivary microbial composition and metabolic profiles in young children, but such changes do not appear to be directly linked to the development of ECC.

Keywords: early childhood caries, obesity, salivary microbiota, salivary metabolome, preschool children

Synergistic Antibacterial Strategy of AIEgens Photosensitizer CPTQ for Photodynamic Therapy and Ferroptosis-Like Bacterial Death to Prevent Dental Caries

Yixue Li¹, Ting Pan, Kaiqi Peng¹, Yiyi Huang¹, Yan Zhou¹

¹Hospital of Stomatology, Guanghua School of Stomatology, Sun Yat-Sen University, Guangzhou, China.

Background: Antimicrobial photodynamic therapy (aPDT) has emerged as a promising alternative due to its potent works by activating photosensitizers (PSs) with light to generate reactive oxygen species (ROS). However, most traditional PSs suffer from aggregation-caused quenching, resulting in reduced ROS generation and diminished aPDT efficacy. Aggregation-induced emission luminogens (AIEgens) show weak fluorescence in dilute solutions but emit strongly in aggregated states. This makes them promising candidates for enhancing the efficacy of aPDT. This study aimed to develop and evaluate AIEgens-mediated aPDT as a novel approach for caries prevention and treatment. **Objectives:** This study aimed to develop and evaluate aggregation-induced emission luminogens (AIEgens) for their potential in antimicrobial photodynamic therapy (aPDT) against *S. mutans*, with a focus on their photophysical properties, biocompatibility, antibacterial effects, mechanisms, and *in vivo* efficacy. **Methods:** Three AIEgens (TTPQ, CPTI, and CPTQ) were designed and synthesized. Their photophysical properties, ROS generation capabilities, and biocompatibility were assessed *in vitro*. The antibacterial effects on planktonic *S. mutans* and biofilms were evaluated using various techniques, including CLSM, flow cytometry, and CFU counting. The antibacterial mechanism was explored through fluorescence imaging, TEM, and measurements of membrane potential, permeability, ATP production, and ROS levels. An *in vivo* rat caries model was used to assess the anticaries efficacy and biosafety of CPTQ-mediated aPDT. **Results:** CPTQ exhibited superior photophysical properties, ROS generation efficiency, and biocompatibility. It effectively labeled *S. mutans* and demonstrated significant antibacterial effects both in dark conditions and under light irradiation. CPTQ-mediated aPDT inhibited *S. mutans* biofilm formation, reduced cariogenic virulence factors, and altered the microbial community structure of dental plaque biofilms. Mechanistic studies revealed that CPTQ binds to bacterial membranes, inducing endogenous ferroptosis-like pathways in the dark and causing ROS burst, membrane depolarization, and metabolic dysfunction under light. *In vivo*, CPTQ-mediated aPDT significantly reduced *S. mutans* counts, prevented caries progression, and showed excellent biosafety. **Conclusion:** This study highlights the potential of CPTQ as a novel AIEgen for aPDT in caries prevention. Its dual antibacterial mechanisms and efficacy in both *in vitro* and *in vivo* models suggest a promising approach for combating dental caries.

Keywords: *Streptococcus mutans*, bacterial biofilm, aggregation-induced emission

Effectiveness of chomper chums application in improving oral hygiene among elementary school children in bandung

Sampurna Kevin Timothy¹, Ivana Abigayl¹, Anie Apriani¹, Grace Monica¹, Surya Dinata¹

¹ Faculty of Dentistry, Universitas Maranatha, Indonesia

Background: Oral health plays a significant role in the overall well-being of children. Poor dental hygiene may lead to caries, discomfort, and interference with essential daily activities such as eating and learning. Traditional health education methods often fail to capture children's attention effectively. **Objectives:** This study aims to evaluate the effectiveness of the Chomper Chums educational mobile application in improving oral hygiene among elementary school children. **Methods:** A randomized controlled trial was conducted at SDK Yahya Bandung with a total of 175 students from grades 1 to 6. Participants were randomly divided into an intervention group (using the Chomper Chums app) and a control group (receiving conventional dental health education). Oral hygiene was assessed using the Personal Hygiene Performance (PHP) index, with plaque visualized using Triplaque ID gel, both before and after the intervention. **Results:** The intervention group showed a statistically significant decrease in PHP index scores after using the app ($p < 0.001$), while the control group showed minimal improvement. The game-based format and interactive features of the app were found to increase motivation and engagement in toothbrushing behavior among children. **Conclusion:** The Chomper Chums application is an effective and engaging tool for improving oral hygiene in children. It can serve as a valuable supplement to traditional oral health education. Further studies are needed to evaluate long-term effects.

Keywords: oral health, children, Chomper Chums, educational application, PHP index

Living Alone and Oral Health Disparities in Chinese Elderly: A National Cross-Sectional Study

Qingqing Weng^{1,2}, Jiaxin Li¹, Hao Zhang^{1,2}, Xiaoli Zeng^{1,2}, Ying Zhang^{1,2}

¹ Department of Preventive Dentistry, Shanghai Stomatological Hospital & School of Stomatology, Fudan University, Shanghai, China

² Shanghai Key Laboratory of Craniomaxillofacial Development and Diseases, Fudan University, Shanghai, China

Background: With China's rapidly aging population, the oral health of elderly people living alone has become a growing concern due to their limited social support and potential health disparities. **Objectives:** This study aimed to: (1) Compare oral health status between Chinese adults aged 65–74 living alone versus those cohabiting with others; (2) Identify factors influencing oral health disparities. **Methods:** A cross-sectional analysis utilized data from China's 4th National Oral Health Survey, including 4,406 participants (312 living alone; 4,094 cohabiting). Oral examinations assessed caries, periodontal status, and tooth loss; structured questionnaires captured demographics, socioeconomic status, behaviors, and self-perceived oral health. The survey was conducted according to the basic methods proposed by the World Health Organization (WHO). **Results:** Elderly living alone (7.1%) showed worse oral health: higher tooth loss (8.26 ± 8.14 vs. 6.76 ± 7.89 , $p < 0.001$), poorer periodontal status ($p = 0.005$), lower oral health knowledge scores (5.88 ± 2.51 vs. 6.32 ± 2.31 , $p = 0.016$), and worse self-perceived oral health ($p = 0.028$). Regression confirmed living situation, age, gender, education, brushing frequency, and oral health knowledge/attitudes as key predictors of oral health outcomes ($p < 0.05$). **Conclusion:** Oral health is significantly poorer among Chinese seniors living alone, driven by socioeconomic and behavioral factors. Targeted interventions—including enhanced social support, financial aid, and oral health education—are urgently needed for this vulnerable group.

Keywords: Oral health, living alone, elderly, china

Preventing Dentin Collagen Degradation Using Natural Crosslinkers

Anton Schestakow¹, Iris Xiaoxue Yin², Chun Hung Chu¹

¹ Faculty of Dentistry, University of Hong Kong, Hong Kong, China

Background: Effective dentin-collagen-crosslinkers such as glutaraldehyde are toxic, highlighting the need to develop biocompatible alternatives. **Objectives:** The objective of this laboratory study was to investigate the use of three biocompatible natural aldehydes to stabilize collagen in demineralized dentin against enzymatic degradation. **Methods:** Human teeth were sectioned into dentin blocks, demineralized, and cut into 80 collagen films. The films were evenly divided into five groups and treated for 3 min with 4% cinnamaldehyde, 4% vanillin, 4% dialdehyde starch, 4% glutaraldehyde (positive control) and deionized water (negative control). Enzymatic degradation was induced using collagenase type II for 20 min. Degradation was assessed using a hydroxyproline assay and transmission electron microscopy (TEM). Statistical analysis was performed using the Kruskal-Wallis test followed by Dunn's multiple comparison. **Results:** Following degradation, hydroxyproline was measured in samples pretreated with cinnamaldehyde (11.1 ± 6.7 μg), vanillin (13.6 ± 8.0 μg), dialdehyde starch (6.1 ± 4.3 μg), glutaraldehyde (0.9 ± 0.8 μg), and deionized water (15.5 ± 6.4 μg). Compared to water, dialdehyde starch and glutaraldehyde significantly reduced hydroxyproline levels ($p < 0.05$). TEM revealed preservation of the collagen network in samples pretreated with dialdehyde starch and glutaraldehyde, whereas the other groups showed degradation, characterized by the presence of loose or fragmented collagen fibrils. **Conclusion:** Dialdehyde starch at 4% is a biocompatible alternative to glutaraldehyde for stabilizing collagen in demineralized dentin. Its protective effect against enzymatic degradation and the preservation of the collagen network may support subsequent remineralization, which merits further investigation.

Keywords: Dentin, collagen, cross-linking reagents, aldehydes

Examining the Correlation Between Dental Caries and Chewing Proficiency in Pediatric Populations: A Cross-Sectional Observational Study Utilizing Color-Changeable Chewing Gum

Agatha R. Vidiaratri¹, Fitriana R. Siregar¹, Muhammad F. Alfian¹, Elastria Widita², Lisdrianto Hanindriyo¹, Sachiko Takehara³, Hiroshi Ogawa³

¹ Department of Preventive and Community Dentistry, Faculty of Dentistry, Universitas Gadjah Mada, Indonesia

² Department of Oral Medicine, Faculty of Dentistry, Universitas Gadjah Mada, Indonesia

³ Division of Preventive Dentistry, Department of Oral Health Science, Graduate School of Medical and Dental Sciences, Niigata University, Niigata, Japan

Background: Dental caries is common in children and may impair chewing ability. Evidence on its association with chewing performance in Indonesian children remains limited. **Objectives:** This study investigates the correlation between caries status and chewing performance among Indonesian children aged 6–8 years, utilizing color-changeable chewing gum as a novel assessment tool. **Methods:** A cross-sectional study was conducted among 69 children aged 6 to 8 years, recruited through multistage random sampling in Yogyakarta, Indonesia. Caries status was assessed using the DMF-T index, while masticatory ability was evaluated using a 5-point color scale. Participants chewed color-changeable chewing gum for one minute at a rate of one stroke per second, after which the results were visually interpreted based on the 5-point scale. Participants were children with deciduous and/or permanent teeth, whose parents provided informed consent. Children with cognitive impairments, severe medical conditions, or food allergies were excluded. To ensure robust results, 69 children were included. Data analysis involved chi-square, independent t-tests, and binary logistic regression to identify significant predictors of chewing performance. **Results:** Severe dental caries significantly impaired chewing ability (OR = 0.84; 95% CI 0.71–0.99). Despite most children brushing twice daily (62.3%), inappropriate timing was common (84.1%). The prevalence of dental caries was notably high, with an average of 7.48 decayed, missing, or filled teeth (DMFT/dmft) per child. This included 7.04 affected teeth in the deciduous dentition and 0.44 in the permanent dentition. More than half of the participants exhibited poor masticatory performance. Heatmaps illustrated significant correlations between poor chewing ability and caries severity but no significant association with sociodemographic factors, BMI, or toothbrushing habits. Logistic regression revealed caries status as a critical determinant of masticatory performance. **Conclusions:** Severe caries adversely affect chewing performance, potentially impacting children's nutrition and growth. Limited oral health literacy and parental dental anxiety may further contribute to delayed dental treatment and caries progression. Preventive measures, routine dental screenings, and oral health literacy programs are recommended to address this critical public health issue.

Keywords: Oral health, pediatric dentistry, cross-sectional studies, chewing performance, chewing gum, dental caries.

Empowering Educators: Evaluating The Impact and Satisfaction of Oral Health Training for Kindergarten Teachers

Joanna Cheuk Yan Hui^{1,2}, Chun Hung Chu², Jieyi Chen^{1,2}

¹ Hospital of Stomatology, Sun Yat-sen University, Guangzhou, China

² Faculty of Dentistry, The University of Hong Kong, Hong Kong, Hong Kong SAR, China

Background: A territory-wide oral health education (OHE) program was implemented in Hong Kong to equip kindergarten teachers with the skills to promote oral health among preschoolers through structured training. **Objectives:** This study evaluated teachers' satisfaction with the training, their self-reported competence in delivering OHE, and their recommendations for program improvement. **Methods:** A cross-sectional anonymous survey was distributed to all teachers who participated in the training. The questionnaire assessed satisfaction (via Likert-scale items), knowledge gain, self-reported competence in identifying childhood oral diseases, and open-ended suggestions for program enhancement. **Results:** Of the 6,180 invited teachers, 4,882 completed the survey (79% response rate). Almost entirely all respondents (96%) reported satisfaction with the training, and 96% agreed that it improved their ability to recognize oral health issues in children. Over 90% found the lectures informative and valued interactive discussions. Key recommendations included supplementary teaching aids such as instructional videos, hands-on sessions, and additional training on managing dental emergencies and referrals. **Conclusion:** The OHE training program was highly satisfactory to kindergarten teachers and effectively enhanced their ability to promote oral health. Teachers emphasized the need for practical resources to further support OHE delivery in classrooms. This study validates oral health training for kindergarten teachers as an effective, scalable strategy to improve early childhood dental care while identifying actionable steps to strengthen program delivery and emergency preparedness.

Keywords: Oral health, early childhood caries, health education, preventive dentistry, public health

The Remineralization Effect of Glycerol Stabilized Calcium Phosphate Clusters in Artificial Caries Lesions: An *in Situ* Study

Xi Chen¹

¹Department of Preventive Dentistry, Shanghai Ninth People's Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, China

Background: While Glycerol stabilized calcium phosphate cluster (GCPC) exhibits proven remineralization in laboratory and animal models, its clinical utility in treating early caries remains unverified. **Objectives:** Evaluation of the remineralization efficacy of materials on artificial caries lesions under human oral conditions. **Methods:** A double-blind, randomized crossover trial (approved by the Ethical Committee of Shanghai Ninth People's Hospital, No.: SH9H-2022-T31-2) enrolled 6 healthy adults. Customized occlusal splints were fabricated for each participant to mount demineralized enamel blocks (37wt% phosphoric acid, 60s). Participants randomly underwent three treatment phases (GCPC, CPP-ACP paste or control). Baseline and each treatment phase were separated by a ≥ 3 -day washout period in which participants brushed their teeth with standardized fluoride-free toothpaste. Retrieved specimens at 30 min and 24 h were characterized by a Vickers hardness tester and scanning electron microscopy. Statistical analyses were performed using one-way ANOVA test and Tukey's multiple comparisons test. **Results:** The enamel specimens of GCPC group at 30 min have the highest hardness, reaching to 254.38 ± 25.05 HV, which is significantly superior to CPP-ACP group (217.03 ± 20.91 HV, $p < 0.001$) and control group (209.71 ± 20.16 HV, $p < 0.001$). In comparison, there is no significant difference between CPP-ACP group and control group ($p = 0.4369$). At 24 h, GCPC group still has significantly higher hardness (267.93 ± 27.76 HV) compared with control group (219.28 ± 29.65 HV, $p < 0.001$), but displays no significant difference with CPP-ACP group (238.60 ± 26.95 HV, $p = 0.2422$). SEM results show that repaired enamel surface of GCPC group forms denser minerals, and displays smoother surface than the other groups. **Conclusion:** This study confirms the clinical potential of GCPC for enamel remineralization.

Keywords: Enamel remineralization, early caries, calcium phosphate cluster, clinical trial

Quality of Life Analysis in Patients with Genuine and Pseudo-Halitosis

Wei Ye¹, Shengen Cheng¹, Kalam Lo¹

¹ Department of Preventive Dentistry, Ninth People's Hospital, College of Stomatology, Shanghai Jiao Tong University, School of Medicine, China

Background: Halitosis is an unpleasant and odorous smell emanating from the mouth and the nostrils. Halitosis has a significant effect on mental health. This study aimed to compare the social avoidance and distress of Chinese patients with and without halitosis. **Objectives:** To analyze the differences in quality of life between patients with genuine halitosis, pseudo-halitosis, and healthy people. **Methods:** In this case-control study, 178 subjects were divided into a genuine halitosis group (64 cases), a pseudo-halitosis group (60 cases), and a control group (54 cases) based on halitosis complaints and detection results. The Short Form-36 (SF-36) questionnaire was used for quality of life assessment, and data were analyzed with SPSS 24.0. **Results:** Both halitosis groups scored significantly lower than the control group on SF-36 dimensions: the genuine halitosis group showed lower scores in General Health (GH: $P = 0.002$), Social Functioning (SF: $P < 0.001$), Vitality (VT: $P < 0.001$), and Mental Health (MH: $P < 0.001$). The pseudo-halitosis group scored lower in Social Functioning (SF: $P = 0.003$), Vitality (VT: $P = 0.001$), and Mental Health (MH: $P < 0.001$). **Conclusion:** Patients with genuine or pseudo-halitosis exhibit significant quality of life impairment in vitality, mental health, and social functioning, highlighting the need for targeted psycho-social support.

Keywords: Halitosis, quality of life, sf-36

Understanding Factors Influencing Utilization, Accessibility and Awareness of Dental Care Among Antenatal Patients: A Study in Kudat District, Sabah

Zuhty binti Hamzah¹, Fenytinytha Jasrita Justin¹, Shiraain binti Rahim¹, Nurul Ainaa Syamimi binti Ahmad Bakri¹, Nur Hanisah binti Kadir¹, Wan Shahirah binti Mohd Fauzi¹, Muhammad Asyraf bin Zulkifli¹, Muhamad Hafizul bin Azman¹, Muhammad Afiq bin Ahmad Shafri¹, Muhammad Qayyum Maseran¹, Nurin Izyani binti Othman¹.

¹ Oral Health Division of Kudat, Sabah, Ministry of Health, Malaysia.

Background: Oral health during pregnancy affects maternal and fetal outcomes. Despite free dental services in Malaysia, uptake remains low. In rural areas like Kudat, Sabah, barriers such as access and awareness may further limit utilization among antenatal patients. **Objectives:** This study aims to explore factors influencing utilization, accessibility and awareness of dental care among antenatal patients in Kudat district, Sabah. **Methods:** A cross-sectional study was conducted using face-to-face interview administrated questionnaire involving 250 over a total of 1427 antenatal patients registered under Maternal and Child Health Clinics (MCH) in Kudat district Sabah from April 2024 until April 2025. The questionnaire comprises of five sections; socio-demographic, perceived oral health status, oral health knowledge, access to oral health and barriers to utilization of dental services. **Results:** Only 57.3% mothers visited a dentist during their current pregnancy. The most significant factors associated with a dental visit was easier access to dental clinic (AOR 1.69; p=0.001), aware of free government dental services (AOR 1.57; p=0.010) and received oral health education prior to pregnancy (AOR 1.83; p=0.038). The majority of the mothers claimed that their oral health status as either good or very good (58.0%). Despite this, a significant portion (44.4%) reported having at least one cavitated tooth. Commonly cited barriers to utilizing dental services included are busy with household chores (83.5%), fear of dental pain (67.9%), and long waiting time (64.2%). **Conclusion:** While over half of mothers rated their oral health positively, many had untreated issues like cavitated teeth. Only 57.3% visited a dentist during pregnancy. Access to clinics, awareness of free services, and prior oral health education encouraged visits, while household duties, fear of pain, and long wait times remained key barriers. Improving access, education, and service delivery is essential to enhance maternal oral health.

Keywords: Antenatal, dental care, pregnant mothers

A Retrospective Cross-Sectional Study to Assess the Oral Health Status, Oral Hygiene Status, and Treatment Needs Among the Inmates at Lahad Datu Prison.

Tan Qin Kai¹, Thaddius Herman Anak Maling², Muhammad Faiz bin Mohd Hanim², Lester Lai Yung Tze³, Linus Kou⁴, Masturina Anati binti Mohd Azwar³, Lam Yuk Syn⁴, Norasiah Binti Ahmad¹

¹ Lahad Datu Divisional Dental Office, Ministry of Health Malaysia

² Sabah State Health Department (Dental Division), Ministry of Health Malaysia

³ Tungku Dental Clinic, Lahad Datu, Malaysia

⁴ Lahad Datu Dental Clinic, Lahad Datu, Malaysia

Background: Imprisoned individuals are among the most underserved in terms of healthcare access, with oral health being significantly neglected. Numerous international reports have demonstrated that prisoners experience substantially poorer oral health outcomes than the general population. Despite this global trend, there is a notable lack of data on the oral health status of inmates in Malaysia and across the entire Southeast Asian region. **Objectives:** To assess the oral health status, oral hygiene status, treatment needs of inmates at Lahad Datu Prison, and determine their association with age and citizenship status. **Methods:** A retrospective cross-sectional study was conducted using 1100 dental records of prisoners at Lahad Datu Prison in the year 2024. Data including DMFX scores, Gingival Index scores and Plaque score were recorded using the Malaysian Ministry of Health's Modified ICDAS protocol. Statistical analysis was performed using SPSS software with descriptive and inferential statistics. Pearson's correlation was used to explore the relationship between age and DMFX scores. Linear regression analysis was conducted to examine the influence of age and citizenship status on DMFX scores. Regression coefficients and corresponding p-values were reported, with statistical significance set at $p < 0.05$. **Results:** Analysis indicated a high prevalence of dental caries and poor oral hygiene among prisoners, with a high proportion requiring dental treatment such as scaling, extractions, fillings, and dentures. Data showed significant variation across different age groups and between citizens and non-citizens. **Conclusion:** The findings of the current study highlight the need to increase the provision of dental care and related facilities in Malaysian prisons. The findings can help guide national oral health policy and reinforce future efforts at strengthening both preventive and rehabilitative dental care in prisons. The findings have the potential to serve as a catalyst for other Southeast Asian countries to acknowledge this gap and include oral healthcare into their prison reform.

Keywords: Oral health, prisoners, dental caries, Malaysia

Leadership and Change Management in Scaling Up Preventive Dentistry Initiatives

Nora Lelyana¹, Caecilia Indarti¹

¹Dental Public Health and Preventive Dentistry Department, Faculty of Dentistry, Universitas Hang Tuah, Indonesia

Background: Preventive dentistry plays an essential role in preserving oral health and alleviating the long-term burden of curative dental treatments. Despite its known benefits, the adoption of preventive dental care remains uneven, particularly in underserved and remote areas. Contributing factors include a lack of public awareness and a shortage of dental professionals. **Objectives:** This presentation aims to explore the critical role of leadership and change management in the successful scale-up of preventive dental programs. It seeks to underscore the importance of strategic vision, policy development, and cross-sector collaboration in advancing oral health promotion. **Methods:** A conceptual framework based on Kotter's 8-Step Change Model is employed to guide the systemic transformation required for implementing preventive strategies. The presentation includes a detailed case study of Indonesia's "Caries-Free School Program," highlighting the operationalization of various interventions such as task-shifting, expanded training of auxiliary dental personnel, and school-based education campaigns. **Results:** The case study illustrates that applying structured change management techniques can significantly improve the effectiveness and reach of preventive dental programs. Notable improvements were observed in caries prevalence rates, the frequency of oral health education sessions, and levels of patient satisfaction. Capacity-building efforts through auxiliary personnel and school-based outreach played a pivotal role in increasing accessibility and community engagement. **Conclusion:** Visionary leadership, supported by effective change management strategies, is essential for overcoming barriers and scaling up preventive dentistry initiatives. By leveraging structured transformation frameworks and multi-stakeholder collaboration, oral health systems can achieve broader and more sustainable impact, particularly in resource-limited settings.

Keywords: Change management, community health initiatives, leadership in health programs, oral health policy, preventive dentistry

Association Between Oral Health-Related Behaviors and Quality of Life of Adolescents Among Three Provinces in Northwest China

Xiao Hu¹, Can Wang¹, Jianghong Gao¹, Jiangang Tian¹, Lingling Li², Zhige Li³, Kaixin Guo¹, Ruizhe Huang¹

¹Key laboratory of Shaanxi Province for Craniofacial Precision Medicine Research, College of Stomatology, Xi'an Jiaotong University, Xi'an, Shaanxi, China

²Yinchuan Stomatological Hospital, Yinchuan, Ningxia Hui Autonomous Region, China

³College of Stomatology, Lanzhou University, Lanzhou, Gansu, China

Background: Adolescents are in a period of rapid growth, and oral status will not only affect oral function, aesthetics and social interaction, but also have an impact on growth and development. Oral health-related quality of life (OHRQoL) refers to a person's subjective assessment of their oral status, function, social-emotional, well-being, and satisfaction, reflecting the impact of oral disease on physical, psychological, and social satisfaction in daily life. China has a wide geographical area, and the economic development is unbalanced. **Objectives:** To analyze Association between oral health-related behaviors and quality of life of adolescents among three provinces in Northwest China. **Methods:** A cross-sectional survey of adolescents aged 12-15 years in Shaanxi Gansu province and Ningxia Hui Autonomous Region of Northwest China was conducted by stratified cluster random sampling. Oral examinations were performed with World Health Organization standards. Adolescents' OHRQoL were collected by questionnaire. Chi-square test and binary logistic regression analysis were used to examine the relationship. **Results:** A total of 7648 subjects were included. The prevalence of low OHRQoL which defined as a score higher than 0, was 83.8%. A low OHRQoL was most prevalent in Gansu Province and least prevalent in Shaanxi Province. Younger (OR=0.73, CI=0.60-0.87, female (OR=1.27, CI=1.11-1.44, rural (OR=1.44, CI=1.21-1.72, and mother with less education (OR=0.69, CI=0.60-0.81) all showed statistically significant influence on teenagers' OHRQoL. From a behavior perspective, teens' OHRQoL was correlated with their frequency of sugar consumption (OR=1.72, CI=1.41-2.10, dental appointment rate (OR=1.29, CI=1.064-1.57, self-assessment of oral health (OR=3.09, CI=2.29-4.19, DMFT index (OR=1.19, CI=1.04-1.37, number of teeth calculus (OR=1.20, CI=1.01-1.43, and dental trauma (OR=0.47, CI=0.39-0.57. **Conclusion:** Generally speaking, oral health-related behaviors—such as eating more sugary foods and scheduling dental appointments within the last year—have a negative impact on the quality of life of adolescents.

Keywords: OHRQoL, adolescents, province, china, oral health-related

Training And Mentoring of Dental Health Cadres for Elementary School Teachers Through the SQUID SMILE Program

Hollanda GH.,¹ Pinasti RA.,² Maharani AD.,² Mustami'ah D.³

^{1,2}Faculty of Dentistry, Universitas Hang Tuah Surabaya

³Faculty of Psychology, Universitas Hang Tuah Surabaya

Background: High rates of dental caries and low oral hygiene status are oral health problems that are often found in children's age groups. Based on Riskesdas data in 2018, it was reported that the prevalence of dental and oral problems in Indonesia was 57.6% and only 10.2% received dental medical treatment. An optimal level of public dental health can be achieved if each individual and community group has the knowledge, awareness, ability, and willingness to maintain good dental health.

Objectives: The training program for elementary school teachers can be an alternative to optimize the improvement of the dental and oral health status of students at the elementary school level, namely the "Squid Smile" training program and synergize with the School Dental Health Effort program. **Methods:** The type of research used is an experiment, Quasi-Experimental Design. The data collection techniques used were pre-test and post-test. **Results:** This training activity is carried out in several stages as follows: a) Training and education related to the psychological development; b) Training and education related to dental and oral health; c) Preparation of the School Dental Health Efforts (UKGS) Program; d) Monitoring and Evaluation of the implementation of the UKGS program. The results of this training had a positive impact on the participants or teachers who participated. The increase in knowledge possessed by teachers are an initial provision for the implementation of UKGS at SD Muhammadiyah 9 Surabaya. **Conclusion:** There is also a need for training and professional development for teachers to improve their understanding of children's cognitive development. With better knowledge, teachers can design learning experiences that are more effective and support students' cognitive development.

Keywords: Training, elementary school teachers, ukgs program

Association of Peer Influence and Secondhand Smoke Exposure with Tobacco Use Among Thai Dental Students

Raksanan Karawekpanyawong¹, Nathawut Kaewsutha²

¹ Department of Community Dentistry, Faculty of Dentistry, Mahidol University, Thailand

² Department of Pedodontics and Preventive Dentistry, Faculty of Dentistry, Srinakharinwirot University, Thailand

Background: Global Health Professions Student Survey (GHPSS) is a standardized tool developed to monitor tobacco use among health professional students in WHO member states. In 2025, Thailand conducted a nation-wide GHPSS. Data on tobacco use among dental students has been analyzed. **Objectives:** To examine the association between environmental factors and tobacco use status among Thai dental students. **Methods:** An anonymous online survey was conducted in 2025 among 952 Thai dental students from 15 dental schools. The questionnaire, adapted from the GHPSS, collected data on demographics (age, gender, year of study, and dental school), tobacco use status, and environmental factors. Environmental factors included the number of friends who use tobacco, number of days exposed to secondhand smoke, and exposure to anti-tobacco signage inside and outside dental school buildings. Descriptive statistics and logistic regression analyses were performed to identify factors associated with current tobacco use. **Results:** Of the 952 respondents, 18 students (1.9%; 95% CI: 1.0–2.8) reported current tobacco use. Logistic regression analysis revealed that both the number of friends who use tobacco and the number of days of secondhand smoke exposure were significantly associated with tobacco use. Specifically, each additional friend who used tobacco increased the odds of tobacco use by 27% (Odds Ratio = 1.273, 95% CI [1.13, 1.44], $p < .001$), while each additional day of secondhand smoke exposure increased the odds by 30% (Odds Ratio = 1.304, 95% CI [1.05, 1.62], $p = .017$). **Conclusion:** Prevalence of tobacco use among Thai dental students is low. Environmental factors strongly influence tobacco use among them, with peer tobacco use and secondhand smoke exposure significantly increasing the likelihood of smoking. These findings emphasize the need for targeted prevention strategies addressing social and environmental risk factors within dental school environments.

Keywords: Tobacco use, e-cigarette use, smoking, dental students, ghpss

Effectiveness of Chewing Hard Gummy Candy to Enhance Masticatory Function in Japanese Children

Keishi Sato¹, Kaichi Hayashi¹, Kengo Oka¹, Satoru Morishita¹, Kei Kurita¹, Kaori Ishii², Shinichi Negishi²

¹ Advanced Oral Health Science Research Laboratories, Research and Development Headquarters, LION Corporation, Japan

² Department of Orthodontics, Nihon University School of Dentistry at Matsudo, Japan

Background: There is growing concern about decreased masticatory function among Japanese children, which may be due to evolving dietary trends toward softer foods. **Objectives:** This study assessed the impact of chewing hard gummy candy for 4 weeks on masticatory function among Japanese children aged 6–12 years. **Methods:** This clinical trial recruited 26 children who were asked to chew hard gummy candy twice daily for 4 weeks period. Key metrics, including lip-closing force, occlusal force, and masticatory performance, were measured at three stages: baseline (T1), after completing the 4-week intervention (T2), and 4 weeks after the intervention (T3). The children's guardians also completed a questionnaire at T2. Changes in key metrics over time were statistically analyzed using the Wilcoxon rank-sum test and Wilcoxon signed-rank test, incorporating Bonferroni correction. **Results:** Compared to T1, there was a significant increase in lip-closing force and right-side occlusal force by T2, which remained stable at T3. Although masticatory performance was improved at T2, it had decreased by T3. Questionnaire responses indicated that 57.6% of guardians answered “strongly agree” or “somewhat agree” to the question “Do you feel that your child chews more with both sides compared to T1?” and 42.3% answered “strongly agree” or “somewhat agree” to the question “Do you feel that the mouth of your child is less open during the day compared to T1?” (Question about improving mouth breathing). **Conclusion:** This study supports that regularly chewing hard gummy candy enhances lip-closing force, occlusal force, and masticatory performance in children, indicating this is a viable method for masticatory function training.

Keywords: Masticatory function, hard gummy candy, Japanese children, clinical study, oral health.

Development and Validation of a Web-Based Application for Assessing Oral Diadochokinesis

Satoshi Tomeoka¹, Mano Ando¹, Shota Minami², Momoka Takeshige², Aoyama Yukihide¹, Araki Hiroto¹, Ren Kin², Chiyoko Uchiyama¹, Kei Kurita¹

¹ Research & Development Headquarters, LION Co, Japan

² Digital Strategy Department, LION Co, Japan

Background: In Japan, the aging population has increased concerns related to various health issues, particularly oral health of elderly people. Recently, the concepts of “oral frailty” and “oral hypofunction” have become increasingly recognised. Oral hypofunction describes a decline in oral functions, such as sensation, mastication, swallowing, and saliva secretion, due to aging. This decline can lead to malnutrition, frailty, and sarcopenia, thereby affecting the overall health. Although diagnosing oral hypofunction requires the examination of seven key items at dental clinics in Japan, the requirement for specialised equipment results in high costs, limiting its widespread use. **Objectives:** This study focused on oral diadochokinesis (ODK), one of the seven diagnostic indicators of oral hypofunction. We developed a user-friendly web-based application designed to provide a simple and cost-effective method for assessment of ODK, and verified the accuracy of this newly developed application. **Methods:** We evaluated 78 healthy adults aged between 25 and 74 years. ODK measurements were obtained using two methods: the traditional manual counting of speech sounds by researchers and an automated process using the newly developed application. The correlation between these methods was determined using Pearson's correlation coefficient. **Results:** A strong correlation was observed between the ODK counts measured by the researchers and those generated by the web application. **Conclusion:** This result suggests that the newly developed web-based application is a valuable tool for oral assessment. Its compatibility with smartphones, PCs, and tablets, without device restrictions, makes it highly versatile and cost-effective. This application could promote oral function tests in various healthcare settings such as dental clinics, dental checkups, and elderly care facilities, thus increasing the awareness about oral hypofunction among individuals.

Keywords: Oral hypofunction, oral diadochokinesis, web applications

Preventive Dental Care Inequities: Sealant Access Among Children with Disabilities in South Korea (2013–2023)

Junho Choi¹, Dong-Hun Han²

¹ Department of Electrical and Computer Engineering, Seoul National University, Republic of Korea

² Department of Social Dentistry, Seoul National University School of Dentistry, Republic of Korea

Background: Children with disabilities face multiple barriers to accessing dental care, especially preventive treatments like dental sealants. Understanding these disparities is essential for improving oral health equity. **Objectives:** To evaluate disparities in dental sealant utilization among children with disabilities in South Korea from 2013 to 2023, focusing on comparisons with the general population, gender differences, and regional disparities. **Methods:** We analyzed national health insurance claims data from the Health Insurance Review and Assessment Service (HIRA) using procedure codes UH390 (disabled) and U2390 (general population). These codes represent patients with brain lesions, intellectual disabilities, autism spectrum disorder, and psychiatric disabilities. Monthly patient counts were normalized using annual population statistics from Statistics Korea to calculate sealant access rates per 1,000 individuals. Python and R were used for data processing and visualization. **Results:** Access to dental sealants among children with disabilities was significantly lower than in the general population throughout the study period, increasing from less than 5% of the general rate in 2013 to approximately 20% in 2023. Within the disabled group, women had consistently lower access than men (average female-to-male ratio: 0.66), whereas the general population showed near parity (1.06). Regionally, children with disabilities in provincial and regional metropolitan areas had lower access than those in the capital metropolitan area. **Conclusion:** Despite gradual improvements, substantial disparities in dental sealant access persist among children with disabilities in South Korea. Disabled women and those living outside the capital region are especially underserved. Targeted interventions—including improved clinic accessibility and regional support policies—are needed to close these gaps in preventive dental care.

Keywords: Sealant access, disability, oral health disparities, gender disparity, regional disparities

Implementation of Lean Management Concept in Dental Teaching Hospital: Opportunity And Challenge

Fitrina Rachmadanty Siregar^{1,2}, Julita Hendrartini¹, Lisdrianto Hanindriyo¹

¹ Department of Preventive and Community Dentistry, Faculty of Dentistry, Universitas Gadjah Mada, Indonesia

² Doctoral Study Program, Faculty of Dentistry, Universitas Gadjah Mada, Indonesia

Background: Healthcare organization worldwide are under growing external pressure to become more efficient in containing or reducing healthcare costs while delivering better quality care. Lean management is a continuous improvement methodology which has been widely adopted in healthcare, but has not been widely applied in dental service especially in dental teaching hospital due to its characteristics of providers and the managerial system. **Objectives:** The objective of this review is to summarize the opportunities and challenges of lean management implementation in dental teaching hospital. **Methods:** A comprehensive search of literature concerning the implementation of lean management in dental service and teaching hospital was used to generate a synthesis of the literature around the chosen research questions. **Results:** Dental service face many challenges including high turnaround time and waiting time, which is strongly affecting patients' satisfaction. Deploying lean as one of the quality improvements in dental services has not been widely implemented, including in teaching hospital. Waste identification could be used to understand added-value and non-added-value activities. Streamlining patient flow could improve the process performance, reduced chair side time, improving patient satisfaction and reducing negative comments. The challenges of lean implementation in dental teaching hospitals were the lack of continuous improvement understanding of all providers including students, the cultural changes, and the leadership. **Conclusion:** Although there were a lot of challenges, studies emphasize the importance and opportunities of lean implementation in dental service in teaching hospital.

Keywords: lean management, dental teaching hospital, implementation, challenges

Comparative Evaluation of Perplexity Ai and Elicit as Ai-Assisted Clinical Decision-Making and Evidence Synthesis in Orthodontics

Ramya Vijeta Jathanna¹, Simarpreet Bhamra²

¹ Department of Orthodontics and Dentofacial Orthopedics, Manipal College of Dental Sciences, Manipal Academy of Higher Education, Karnataka, Manipal, India

² Department of Orthodontics and Dentofacial Orthopedics, Manipal College of Dental Sciences, Manipal Academy of Higher Education, Karnataka, Manipal, India

Background: Artificial intelligence (AI) tools are increasingly used to support evidence-based clinical decision-making in orthodontics. Among emerging platforms, Perplexity.ai and Elicit are gaining prominence as AI-assisted research tools. **Objectives:** To compare the performance of Perplexity.ai and Elicit in answering clinically relevant orthodontic questions based on comprehensiveness, clarity, scientific accuracy, and relevance. **Methods:** Ten orthodontic clinical questions were independently submitted to both Perplexity.ai and Elicit. Two evaluators rated the responses using a 10-point scale across four domains. Inter-evaluator reliability was assessed using Cronbach's alpha. Paired t-tests and Wilcoxon signed-rank tests were used to compare mean scores, and Pearson's correlation assessed relationships between average domain scores. **Results:** Perplexity.ai outperformed Elicit in comprehensiveness (7.5 ± 0.6 vs. 5.7 ± 0.9 ; $p = 0.00068$), clarity (7.0 ± 0.4 vs. 6.0 ± 0.5 ; $p = 7.37e-05$), and relevance (7.3 ± 0.5 vs. 6.6 ± 0.6 ; $p = 0.00067$). Scientific accuracy was comparable ($p = 0.10$). Reliability was high for Perplexity ($\alpha = 0.809$), moderate for Elicit ($\alpha = 0.447$), and excellent overall ($\alpha = 0.885$). Significant Pearson correlations were observed in scientific accuracy ($p = 0.001$), clarity ($p = 0.001$), and relevance ($p = 0.012$). **Conclusion:** Perplexity.ai demonstrated superior reliability and performance in generating clinically relevant orthodontic content. While both tools showed potential in evidence synthesis, Perplexity.ai may serve as a more robust support for orthodontic decision-making.

Keywords: Artificial intelligence, orthodontics, evidence-based dentistry, decision support systems, quality education.

Study on the Differences in Oral-Gut Microbial Characteristics Between Periodontally Healthy and Periodontitis Patients

Limin Zhang¹, Liang Song¹

¹Department of Stomatology, Shanghai Fifth People's Hospital, Fudan University, Shanghai, China

Background: Periodontopathic bacteria induce gut dysbiosis and related pathology, possibly connecting periodontitis to non-oral diseases. However, the effects on the gut ecosystem in periodontitis patients are not fully understood. **Objectives:** This investigation explored oral-gut microbial signatures with potential to distinguish among periodontal conditions. **Methods:** We analyzed the salivary and fecal microbiota of 21 periodontally healthy participants and 33 periodontitis patients using PacBio full-length 16S rRNA gene sequencing. We processed the samples using high-throughput sequencing technologies. **Results:** We observed significantly higher salivary microbiota diversity in PD compared to PH ($P < 0.05$), whereas fecal microbiota showed no significant difference ($P > 0.05$). The principal coordinate analysis revealed significant differences in β -diversity of salivary and fecal microbiota between PH and PD ($P = 0.002$; $P = 0.021$). Compared with controls, the salivary microbiota of PD patients showed increased abundance of several species, including *Porphyromonas gingivalis*, *Fusobacterium nucleatum*, *Prevotella intermedia*, *Filifactor alocis*, *Tannerella forsythia*, *Parvimonas micra*, *Streptococcus gordonii*, *Megasphaera micronuciformis*, *Dialister invisus*, *Selenomonas sputigena*, *Leptotrichia wadei*. *Bacteroides dorei* and *Ruminococcus gnavus* were increased, whereas *Faecalibacterium prausnitzii* were decreased in abundance in patients with PD compared to PH ($P < 0.05$). Salivary and fecal bacterial biomarkers showed Area Under ROC Curve of 0.892 and 0.756, respectively, which determined the potential of diagnostic markers in distinguishing patients with PD from controls, and it increased to 0.942 when salivary and fecal biomarkers were combined. **Conclusion:** Periodontitis may cause dysbiosis of the intestinal microbiota through the influx of microorganisms from saliva. The findings suggest that certain salivary and fecal microbiome features may identify periodontitis-susceptible individuals.

Keywords: Periodontitis; salivary microbiota; fecal microbiota; full-length 16S rRNA sequencing; biomarker

Evaluating the Accuracy and Response Time of Artificial Intelligence Large Language Models on Indonesian Dentist Competency Exam Questions

Achmad Zam Zam Aghasy¹, Hari Kusnanto Josef², Lutfan Lazuardi³, Lisdrianto Hanindriyo¹, Taufan Bramantoro⁴, Mardhani Riassetiawan⁵

¹ Department of Preventive and Community Dentistry, Faculty of Dentistry, UGM, Indonesia

² Department of Family Medicine, Community, and Bioethics, Faculty of Medicine, Public Health, and Nursing, UGM, Indonesia

³ Department of Health Policy and Management, Faculty of Medicine, Public Health, and Nursing, UGM, Indonesia

⁴ Department of Community Dentistry, Faculty of Dental Medicine, Universitas Airlangga, Indonesia

⁵ Department of Computer Science and Electronics, Faculty of Mathematics and Natural Sciences, UGM, Indonesia

Background: The rapid advancement of Large Language Models (LLMs) offers significant potential for healthcare applications, particularly as Clinical Decision Support (CDS) in Electronic Health Records. However, comprehensive evaluation of LLM accuracy and efficiency within specific professional competency exam contexts, such as the Indonesian Dentist Professional Competency Exam (UKMP2DG), remains limited. **Objectives:** This study aimed to compare the answer accuracy ('score') and response time ('time') of Gemma, GPT, Gemini, Claude, and Deepseek LLM AI models when answering UKMP2DG practice questions. **Methods:** This comparative study implemented Gemma, GPT, Gemini, Claude, and Deepseek models as CDS systems via API. A single examiner administered 50 UKMP2DG practice questions to each model. Answer accuracy was scored (100% correct, 0% incorrect), and response time was recorded in seconds. Data were analyzed using the non-parametric Kruskal-Wallis test, followed by Dwass-Steel-Critchlow-Fligner pairwise comparisons. **Results:** Kruskal-Wallis tests revealed significant differences for both 'score' ($\chi^2=36.686$, $p<.001$) and 'time' ($\chi^2=151.104$, $p<.001$). For 'score', post-hoc analysis showed Gemma performed significantly lower than all other models (GPT, Gemini, Claude, Deepseek; all $p\leq 0.001$). Among the remaining models, while no statistically significant differences in accuracy were observed, Claude (mean 76.0) and GPT (mean 74.0) demonstrated the numerically highest mean accuracy. Regarding 'time', Claude was significantly slower than all other models ($p<.001$), while Deepseek was significantly the fastest ($p\leq 0.019$). No significant differences in response time were observed among Gemma, GPT, and Gemini. **Conclusion:** LLM AI answer accuracy for UKMP2DG questions varies significantly, with Gemma exhibiting the lowest performance. Models like Claude and GPT showed numerically the highest accuracy, performing comparably well and significantly better than Gemma. While these top-performing models demonstrated comparable accuracy, substantial differences were observed in response time efficiency, with Deepseek being the fastest and Claude the slowest. These findings underscore the critical need for comprehensive AI model evaluation prior to their deployment as CDS tools.

Keywords: Large language models, clinical decision support, indonesian dentist professional competency exam, accuracy, response time

Early Childhood Caries and Its Associated Factors in Shenzhen City, China: A Cross-Sectional Study

Anthony Yihong Cheng¹, Faith Miaomiao Zheng¹, Chun Hung Chu¹, Kitty Jieyi Chen^{1,2}

¹ Faculty of Dentistry, The University of Hong Kong, Hong Kong SAR, China

² Guanghua School of Stomatology, Sun Yat-sen University, Guangzhou, China

Background: Early childhood caries (ECC) remains a critical public health challenge, yet recent prevalence data and risk factors are scarce in rapidly urbanizing regions like Shenzhen City, China. **Objectives:** This study aimed to assess ECC prevalence and identify risk factors among 5-year-old children in Shenzhen City. **Methods:** A cross-sectional survey conducted in Shenzhen City in 2024 recruited 5-year-old children through multistage sampling from kindergartens. Data collection included self-administered parental questionnaires assessing demographic characteristics, dietary habits, oral health behaviors, parental education and their dental knowledge. Clinical examinations by a trained dentist assessed caries status using the decayed, missing, and filled primary teeth (dmft) index. Zero-inflated negative binomial (ZINB) regression models were applied to identify associations between risk factors and ECC. **Results:** Among 1,462 participants (86% response rate), ECC prevalence was 58% (mean dmft: 2.5 ± 3.4), with untreated decay (dt) accounting for 92% of cases. Socioeconomic factors, including living with siblings, low family income, and low caregiver education level, were significantly associated with higher dmft scores. Behavioral factors such as frequent sugary drink consumption, delayed toothbrushing initiation, lack of parental brushing assistance, and non-fluoride toothpaste use also contributed to the risk of ECC. **Conclusion:** Over half of Shenzhen City's 5-year-olds suffer from ECC, predominantly untreated, driven by socioeconomic disparities and modifiable behavioral factors. Public health strategies must prioritize parental education, fluoride use, and early preventive practices to reduce the burden of ECC.

Keywords: Early childhood caries, prevalence, risk factors, preschool children, China

Association Between Periodontal Inflammation, Systemic Biomarkers, And Rheumatoid Arthritis Among Community-Dwelling Older Adults: A Cross-Sectional Analysis

Fania Chairunisa^{1,2}, Sachiko Takehara¹, Kaname Nohno³, Hiroshi Ogawa¹

¹ Department of Oral Health Science, Graduate School of Medical and Dental Sciences, Niigata University, Japan

² Department of Preventive and Community Dentistry, Faculty of Dentistry, Universitas Gadjah Mada, Indonesia

³ Department of Oral Health and Welfare, Graduate School of Medical and Dental Sciences, Niigata University, Japan

Background: Rheumatoid arthritis (RA) is a chronic autoimmune disease characterized by systemic inflammation and joint destruction. Evidence suggests a link between RA and periodontitis, with both conditions sharing common pathways. Periodontal Inflamed Surface Area (PISA) quantifies periodontal inflammation and may reflect systemic inflammatory burden. Additionally, several systemic biomarkers have also been associated with both periodontal and rheumatic disease. However, limited studies investigated this association, and none have specifically evaluated it in the very old population. **Objectives:** This study aims to investigate the link between periodontal inflammation, systemic biomarkers, and rheumatoid arthritis in older population. **Methods:** A total of 333 participants aged 77 from The Niigata Elderly Study in Japan were included. Demographic and behaviour data were collected through interviews and questionnaires. Systemic biomarkers were collected from a venous blood sample and measured under non-fasting conditions. Periodontal examination was performed by dentists, evaluating CAL, BOP, PPD, and gingival recession. PISA was then calculated and categorized into groups. Rheumatoid factor (RF) exceeding 20 units/mL was considered the outcome. Mann-Whitney U test and Spearman's correlation analysis were performed to explore the potential association in this population. **Results:** This study included 177 males (53.2%) and 156 females (46.8%), with average oral and systemic biomarker levels within a normal range. We found a significant association between PISA (197.88 ± 156.43), BMI (23.95 ± 3.13), and HbA1c ($5.75 (5.45, 5.86)$) with RF ($p < .05$). In addition, RF was also significantly associated with CRP ($p=.163$), liver serum ALT ($p=.122$), and GGT ($p=.129$) in the correlation analysis ($p < .05$). **Conclusions:** In older participants, PISA scores might be associated with RA conditions. Additionally, BMI, HbA1c, CRP, AST, and GGT also appear to have a potential link with RA. However, further research is needed to confirm these associations.

Keywords: Periodontal inflammation, rheumatoid factor, liver serum, systemic biomarkers

Development And Validation of An Oral Health Literacy Assessment for Parents of Children Aged 3–6 Years

Nichamon Chaianant¹, Aticha Adha¹, Siriporn Kanchanaphangkha¹, Wichakorn Suwijuk¹, Teerawat Tussanapirom², Piyada Gaewkhiew², Nicha Luksamijarulkul², Thanida Pothidee³, Pinpinut Wanichsaithong⁴, Watana Thongpatsano⁵,

¹Faculty of Dentistry, Thammasat University, Pathum Thani, Thailand,

²Faculty of Dentistry, Mahidol University, Bangkok, Thailand

³Faculty of Dentistry, Naresuan University, Phitsanulok, Thailand

⁴Faculty of Dentistry, Chiang Mai University, Chiang Mai, Thailand

⁵Bang Krathum Hospital, Phitsanulok, Thailand

Background: Oral health literacy is a key factor influencing parents' decisions regarding their children's oral health behaviors and dental care access. Low oral health literacy is linked to a higher risk of early childhood caries. However, validated tools to assess this among Thai parents of young children are lacking. **Objectives:** To develop and evaluate the validity and reliability of an oral health literacy assessment for parents of children aged 3–6 years **Methods:** The study began with the translation and cultural adaptation of the Health Literacy in Dentistry scale (HeLD-14) into Thai. After completing this process, the final Thai versions were used in a cross-sectional survey of 111 parents whose children studied at Tha Thong Child Development Center (Phitsanulok) or received care at Mahidol University's Faculty of Dentistry or Don Kaew Subdistrict Community Hospital (Chiang Mai). Participants completed a questionnaire and their children received dental examinations. Data were analyzed using SPSS28 to assess content, concurrent, predictive, and construct validity, as well as internal consistency. **Results:** Content validity was confirmed with minor revisions recommended by experts. Thai-HeLD-14 scores were positively associated with parents' education level, and predicted their and their children's dental service use and oral health behaviors. In contrast, Thai-PHeLD-14 scores were only associated with the practice of re-brushing children's teeth. Thai-HeLD-14 also showed a modest but significant correlation with ThREALD-30 ($\rho = 0.138, p < 0.01$), while Thai-PHeLD-14 did not ($p = 0.135$). Both tools demonstrated high internal consistency (Cronbach's alpha: 0.865 and 0.883). **Conclusion:** Thai-HeLD-14 is a valid and reliable tool for assessing parents' oral health literacy and predicting related behaviors. However, Thai-PHeLD-14 requires further refinement to improve its utility in evaluating parental knowledge in preventing early childhood caries.

Keywords: Oral health literacy, oral health literacy assessment, questionnaire validation, parental

Dental Care Experiences of North Korean Refugees: A Qualitative Phenomenological Study

Yuyi Park¹, Dong-Hun Han²

¹ Department of Dentistry, School of Dentistry, Seoul National University, Seoul, Korea

² Department of Preventive and Social Dentistry, School of Dentistry, Seoul National University, Seoul, Korea

Background: North Korean refugees experience a distinct healthcare journey shaped by systemic barriers and sociopolitical conditions, which has a significant impact on their oral health. Understanding their dental care experiences provides valuable insights into health disparities and unmet needs among this vulnerable group. **Objectives:** This study aimed to explore the essence and meaning of dental care experiences among North Korean refugees, spanning from their time in North Korea through to their resettlement in South Korea. **Methods:** A qualitative phenomenological approach was used to conduct in-depth semi-structured interviews with 13 North Korean refugees. Participants were purposively selected to reflect diversity in age, gender, and length of resettlement. Interviews were conducted between April and May 2023. Data were analyzed using Colaizzi's method to identify key themes and the core structure of experiences across both healthcare systems. **Results:** Participants described significant dissatisfaction with dental care in North Korea, citing a collapsed healthcare system, limited resources, and low-quality services, which led to widespread distrust and reliance on informal or self-care methods. In South Korea, while access to advanced dental care improved, participants faced new challenges such as low oral health literacy, financial burdens, and difficulty navigating the complex system. These issues, compounded by psychological and behavioral factors, often prevented full utilization of available services and maintained oral health vulnerabilities. **Conclusion:** South Korea's advanced dental infrastructure does not guarantee equitable access for North Korean refugees. Systemic barriers and low health literacy remain key obstacles. Targeted interventions—including oral health education, accessible information resources, and provider training tailored to refugee needs—are essential for improving care utilization and promoting oral health equity in this population.

Keywords: North Korean refugees, dental care, health disparities, qualitative research, oral health literacy

Effectiveness of an Interactive Oral Health Courseware on Children's Oral Health Knowledge and Practices: A Randomized Controlled Trial

Xiaoli Zeng¹, Yiwei Jiang¹, Ying Zhang¹, Jin Yu¹, Huning Wang¹, Hao Zhang¹, Dongxing Da¹

¹ Department of Preventive Dentistry, Shanghai Stomatological Hospital and School of Stomatology, Fudan University, Shanghai, China

Background: Childhood oral health is vital for lifelong wellness. Traditional lectures have limitations, whereas interactive courseware offers flexible, engaging education with practical feedback mechanisms to enhance learning. **Objectives:** To evaluate the intervention effects of interactive oral health courseware on children's oral health knowledge and practices, providing a basis for designing school-based oral health promotion programs targeting children. **Methods:** By using stratified random sampling, 872 third-grade students from 10 primary schools across 10 districts in Shanghai were selected and randomly assigned to a control group (n=421) and an intervention group (n=451). At baseline and 3 months after enrollment, the control group received traditional lectures, while the intervention group was taught using interactive courseware. Oral health knowledge and practices was assessed at baseline, 3 months and 6 months post-intervention. Data analysis was performed using SPSS 21.0, employing Chi-square tests, t-tests, and ANOVA. **Results:** The mean scores for oral health knowledge significantly increased at both 3 and 6 months post-intervention compared to baseline in both groups ($P < 0.01$), with a significantly greater improvement observed in the intervention group compared to the control group ($P < 0.05$). At 6 months post-intervention, the proportion of children brushing twice daily in the intervention group (86.3%) was significantly higher than at baseline (78.0%) ($P < 0.01$). The proportion using fluoride toothpaste significantly increased from baseline in both groups (Control group: baseline 55.8%, 6-month 72.9%; Intervention group: baseline 61.0%, 6-month 78.9%), with the intervention group showing a significantly higher proportion than the control group ($P < 0.01$). **Conclusion:** Interactive courseware can effectively enhance children's oral health knowledge levels and practices. Its teaching effectiveness is superior to the traditional.

Keywords: Interactive courseware, children's oral health, knowledge and practices, intervention study

The Discovery, Biological Evaluations, and Modified Applications of Peptide AVHS Derived from Dental Plaque Biofilms

Hai-Xia Lu¹, Yuan-Meng Yang¹, Edward Chin Man Lo²

¹Department of Preventive Dentistry, Shanghai Ninth People's Hospital, Shanghai Jiao Tong University School of Medicine; College of Stomatology, Shanghai Jiao Tong University, Shanghai, China.

²Dental Public Health, Faculty of Dentistry, The University of Hong Kong, Hong Kong, SAR, China.

Background: With the growing prevalence of early childhood caries (ECC), there is an urgent need to develop effective strategies for caries prevention. Investigation of oral metabolomic microenvironments among caries-free children provides valuable insights. **Objectives:** To identify a “dominant metabolite” from plaque biofilms in children with varying levels of dental caries, and to assess the biological attributes of this metabolites. **Methods:** A case-control study, combined with untargeted metabolomics, was conducted among three groups: caries-free (CF), low ECC (LECC), and high ECC (HECC). Then the biological properties of this “dominant metabolite” was evaluated by biocompatibility analysis, bacterial growth and acid production assessment, biofilm targeting and remineralization test, respectively. This “dominant metabolite” was conjugated with a known antibacterial peptide Arg-Trp-Trp-Arg-Trp-Trp (RWWRWW), and the caries preventive effect of this compound was evaluated in vitro and in vivo. **Results:** This study included 102 children aged 36 months. Metabolomic analysis revealed that Ala-Val-His-Ser (AVHS) was the most abundant metabolite in CF group ($P < 0.05$), with moderate predictive performance ($AUC = 0.675$). AVHS has good biocompatibility, it can slow down the growth and acid production rate of *Streptococcus mutans* and effectively target plaque biofilm. The AVHS@RWWRWW conjugate exhibited superior antibiofilm effects in vitro and significantly reduced caries of rat than that of the control group ($P < 0.05$). **Conclusion:** AVHS not only has modest predictive performance for healthy children in clinical research, but also owes multiple biological performances. AVHS@RWWRWW shows better antibiofilm effect and can improve caries prevention, making it a promising candidate for development as a preventive agent.

Keywords: Early childhood caries, plaque biofilms, metabolomics, antimicrobial peptide

Effectiveness of Educational Applications Based on Notification and Reminder in Improving Oral Health Literacy of Mothers and Preschool Students' Dental Health Status in Pancoran Mas

Pani Matin Anugrah¹, Risqa Rina Darwita², Melissa Adiatman², Anton Rahardjo², Atik Ramadhani², Wisnu Jatmiko³

¹ Doctor Program of Faculty of Dentistry, Universitas Indonesia, Depok, Indonesia

² Department of Preventive and Public Health Dentistry, Faculty of Dentistry, Universitas Indonesia, Depok, Indonesia

³ Faculty of Computer Science, Universitas Indonesia, Depok, Indonesia

Background: In Indonesia, low oral health literacy in mothers has an impact on children's dental and oral health, highlighting the need to improve oral health literacy. In this digital era, the improvement of oral health literacy (OHL) can be achieved through the existence of smartphones and artificial intelligence (AI). Therefore, this study aims to determine the effectiveness of educational applications based on notification and reminders in improving oral health literacy of mothers and dental as well as oral health status of preschool children. **Objectives:** This study used a pretest-posttest control group design with purposive sampling. The sample amounted to 200 mother-child pairs divided into two groups, 100 participants in the control group (booklet) and 100 in the intervention group (educational application Peri Bugi). Data was collected in the form of an oral health literacy questionnaire using REALD-30 on mothers and clinical examination with mGI and DI-S assessment on preschool students conducted at pretest and posttest with an interval of one month. **Methods:** This study used a pretest-posttest control group design with purposive sampling. The sample amounted to 200 mother-child pairs divided into two groups, 100 participants in the control group (booklet) and 100 in the intervention group (educational application Peri Bugi). Data was collected in the form of an oral health literacy questionnaire using REALD-30 on mothers and clinical examination with mGI and DI-S assessment on preschool students conducted at pretest and posttest with an interval of one month. **Results:** There was a significant difference in oral health literacy between the pretest and posttest, both in the booklet and Peri Bugi application groups ($P < 0.05$). However, only the application group experienced a significant difference in students' oral health status (mGI and DI-S) between the pretest and posttest ($p < 0.05$). Meanwhile, there was a significant difference between the booklet and Peri Bugi application groups, both on the oral health literacy of mothers and students' oral health status ($p < 0.05$). **Conclusion:** Educational applications based on notification and reminders have an impact on improving oral health literacy of mothers and oral health status of preschool students.

Keywords: Application, artificial intelligence, oral health literacy, mothers, preschool children

Characteristics, Knowledge, and Oral Health Status of Elementary School Students in Bontang, East Kalimantan

Lia Hapsari Andayani¹, Maria Karta², Abdul Gani Souliissa¹, Sri Lestari¹

¹ Department of Dental Public Health and Preventive Dentistry, Faculty of Dentistry, Universitas Trisakti, Indonesia

² Dentist Professional Study Program, Faculty of Dentistry, Universitas Trisakti, Indonesia

Background: Dental and oral health issues among elementary school students in Bontang were found to be as high as 62.6%. Tooth decay and poor oral hygiene negatively impact children's quality of life. Several factors were found to be associated with children's dental and oral health, such as demographic characteristics and levels of knowledge regarding dental and oral health. **Objectives:** This study aimed to determine the association between demographic characteristics and level of knowledge with the oral and dental health status of elementary school students in Bontang, East Kalimantan. **Methods:** Convenience sampling was used in this cross-sectional study, which involved 182 elementary school students in Bontang, East Kalimantan. Demographic data and dental and oral health knowledge were taken by using self-administered questionnaire. Level of knowledge was measured with a validated questionnaire consisting of 14 items. Dental caries status was measured by the Decay Missing Filling Teeth (DMFT) index, while oral hygiene status was measured by the Oral Hygiene Index Simplified (OHI-S). Chi-Square test was conducted with the level of significance ($p < 0.05$; 95%CI). **Results:** The majority of children had low level of knowledge regarding dental and oral health (71.4%), low level of dental caries (86.3%), and poor oral hygiene status (54.4%). There was a significant association between age and dental caries status ($p = 0.012$; POR = 3.29; 95% CI = 1.248–8.676). **Conclusion:** Age was the only characteristic that significantly associated with dental caries status. Knowledge regarding dental and oral health among elementary school students in Bontang, East Kalimantan, as well as their dental and oral health status still needs to be improved.

Keywords: Children, demographic characteristics, dental caries, knowledge, oral hygiene

Preventive Effect of Toothpaste Containing Calcium and Phosphate Ions Combined with Sodium Pyrrolidone Carboxylate on Root Dentin Demineralization

Ryohei Nakada¹, Shiori Ishii¹, Kohei Ishii², Hikaru Takabayashi³, Hironobu Iwasawa³, Yusuke Kawanobe¹

¹ Oral Healthcare Research Laboratories, Research and Development Headquarters, LION Corporation, Japan

² Global Development Center, Research and Development Headquarters, LION Corporation, Japan

³ Advanced Analytical Science Research Laboratories, Research and Development Headquarters, LION Corporation, Japan

Background: Fluoride is the active ingredient for preventing root caries. Since NaF which is a common fluoride compound in toothpastes shows high solubility, fluoride ions (F) are easily washed away. To help retain fluoride in the mouth, we developed a toothpaste containing F, along with calcium ions (Ca) and phosphate ions (P), and sodium pyrrolidone carboxylate (PCA), which adsorbs dentin collagen. **Objectives:** The inhibitory effect of the new toothpaste on demineralization was evaluated in vitro to evaluate its efficacy in preventing root caries. Additionally, the mechanism of these effects were investigated. **Methods:** Sound bovine dentine blocks were treated with diluted toothpastes (1,450 ppm F [TP-1450F], 1,450 ppm F + PCA [TP-1450F+PCA], 1,450 ppm F + Ca + P [TP-1450F+Ca+P], 1,450 ppm F + Ca + P + PCA [TP-1450F+Ca+P+PCA], 5,000 ppm F [TP-5000F]) twice a day for three days. The blocks were immersed in artificial saliva between treatments. After washing, the amount of Ca released into a demineralized solution was measured. F on the treated blocks were extracted and measured. Also, the treated dentin surfaces were analyzed by SEM-WDS, EDS and Raman spectroscopy. **Results:** The amount of released Ca was significantly smaller in [TP-1450F+Ca+P+PCA] group compared to [TP-1450F], [TP-1450F+PCA] and [TP-1450F+Ca+P] groups. No statistically significant difference was observed between [TP-1450F+Ca+P+PCA] and [TP-5000F] groups. The amount of F deposition was significantly larger in [TP-1450F+Ca+P+PCA] group compared to those in [TP-1450F], [TP-1450F+PCA], and [TP-1450F+Ca+P] groups. Deposits containing F, Ca and P were identified on the surface after treatment with F, Ca, P, and PCA. PCA was uniformly detected. **Conclusion:** The addition of Ca, P and PCA to toothpaste synergistically increased F deposition, resulting in an inhibitory effect on dentin demineralization comparable to that of toothpaste containing 5,000 ppm F.

Keywords: Toothpaste, root caries, fluoride

The Effectiveness of Utilizing Manual Book and Poster on Improving Oral Health Knowledge and Skill of Health Volunteers in Integrated Health Services Post Depok City

· Risqa Rina Darwita¹, Febriana Setiawaty¹

¹ Department of Dental Public Health and Preventive Dentistry, Faculty of Dentistry Universitas Indonesia

Background. The 2018 General health basic research of Health Ministry of Indonesia report states that the level of oral disease is still very high (57,6%), to suppressing the incidence of oral disease could be through community empowerment which is namely health volunteers who work in Integrated Health Services Post. **Objective.** To analyse the effectiveness of using manual book, poster Media and slide power point in improving the knowledge and practical ability of health volunteers in Integrated Health Services Post Depok city. **Method.** A quasi-experimental using a non-equivalent control group design study. The respondents were 100 health volunteers located in Depok city which were divided into intervention and control groups. Then both groups were given a pre-test before receiving education in 4 weeks, then given a manual book at the time of the education after which a post-test and evaluation were conducted. All data were analyse using Wilcoxon and Mann Whitney tests. **Result.** Based on the results shows the number of respondents who have knowledge score very good in the intervention group was 30% greater significantly ($p < 0.05$) than the control group, and also the ability skill of health volunteers after being given oral health education in 4 weeks. **Conclusion.** there was a significant increase in knowledge and practice ability of health volunteers in Integrated Health Services Post Depok City ($p < 0.05$). The manual book and poster media were effectively used to increase the knowledge and skill of health volunteers in Integrated Health Services Post Depok City.

Keywords: Health volunteers, manual book, poster media, slide ppt

A Novel Multifunctional Chiral Nanoparticle for Comprehensive Periodontitis Management

Yue Zhou¹, Yifei Chen¹, He Cai¹, Hejin Jiang², Jiajing Zhou², Tao Hu¹

¹ State Key Laboratory of Oral Diseases & National Center for Stomatology & National Clinical Research Center for Oral Diseases & Frontier Innovation Center for Dental Medicine Plus & Department of Preventive Dentistry, West China Hospital of Stomatology, Sichuan University, Chengdu, Sichuan, China

² College of Biomass Science and Engineering, Sichuan University, China

Background: Periodontitis is a common inflammatory disease requiring integrated control of infection, inflammation, and bone loss. Chiral nanomaterials, through stereospecific interactions, hold unique potential for modulating cell behavior and tissue regeneration, yet remain underexplored in periodontal therapy. **Objectives:** To develop a multifunctional chiral nanoparticle via electrostatic self-assembly for targeted periodontitis management by simultaneously eliminating pathogens, modulating inflammation, and promoting bone regeneration. **Methods:** Nanoparticles were characterized by SEM, DLS, zeta potential, and CD. Biocompatibility was assessed using CCK-8, live/dead staining, and cytoskeletal analysis. Antibacterial efficacy against *P. gingivalis* was evaluated by co-culture. Anti-inflammatory effects were measured through ROS scavenging and macrophage polarization. Osteogenic potential was examined through ALP/ARS staining, gene expression, and *in vivo* bone regeneration in a rat periodontitis model. **Results:** The synthesized chiral nanoparticles were uniform (< 200 nm), stable, and cytocompatible. They exhibited potent antibacterial activity, efficiently scavenged ROS, and promoted M2 macrophage polarization. Compared with racemic controls, the chiral nanoparticles- especially the right-handed enantiomer- showed enhanced osteogenesis, evidenced by increased ALP activity, mineralization, upregulated osteogenic gene expression, and significantly improved bone formation *in vivo* ($P < 0.05$). **Conclusion:** This study highlights the promising role of chirality-engineered nanomaterials in periodontitis therapy. The chiral nanoparticle offers a multifunctional platform for coordinated infection control, immune modulation, and tissue regeneration, advancing integrated strategies for future periodontal.

Keywords: Chirality, nanoparticle, periodontal regeneration, osteogenesis, anti-inflammatory agents

Sea Cucumber Jelly Candy to Decreased Dental Caries Index Children in Coastal Area: A Randomised Trial

Restika Anindya Pinasti¹, Nurul Damayanti², Fani Pangabdian³, Caecilia Indarti⁴

^{1,4}Public Health Department, Universitas Hang Tuah, Surabaya

²Pharmacology and Clinical Pharmacy Department, Universitas Hang Tuah, Surabaya

³Conservative Dentistry Department, Universitas Hang Tuah, Surabaya

Background: The dietary habits of students attending schools on the coast tend to be higher in cariogenic foods. Interviews revealed that 100% of students reported consuming chocolate and instant foods daily. This contrasts sharply with coastal areas where the majority of parents earn their living as fishermen, where students prefer instant foods and perceive seafood as being solely for sale. **Objectives:** This study aimed to evaluate the effectiveness of Sea Cucumber Jelly to decreased dental caries index children in coastal area. **Methods:** This study is a Randomized Controlled Trial with an intervention-control group design, conducted at Muhammadiyah 9 Elementary School Surabaya and involving 150 children aged 7 to 10 years. The school studied is where the author received community service funds from the Bima grant 2025. Children were divided into two groups, each group consisting of 75 children. The first group was given sea cucumber jelly treatment with 8 grams of sugar intake (intervention group) and the second group was not given any treatment, and they continued to consume cariogenic snacks (control group) among students aged 7-10 years. **Results:** Univariable analysis in this study conducted a homogeneity test with results ($p > 0.05$) so that there is significance in the data. Continued with chi-square analysis, the significance value obtained was $p < 0.05$ and $CI = 1.23$. This shows that there is a significant difference between the group treated by sea cucumber jelly with 8 grams of sugar intake and the second group was nothing treated and they were still eating cariogenic snacks. **Conclusion:** Based on the research conducted, the conclusion that can be drawn is that giving children the habit of consuming sea cucumber jelly candy can reduce the risk of caries in children aged 7 to 10 years and can eliminate children's bad habit of consuming cariogenic snacks.

Keywords: Coastal area, cariogenic, caries, jelly

Oral Health Outcomes in Older Adults Following Decentralization of Primary Care Services in Thailand: A Scoping Review

Wasinee Kiatadisorn, Patama Chaowanamayta¹

¹Bureau of Dental Health, Department of Health, Thailand

Background: Thailand is transitioning to a super-aged society, with projections indicating over 30% of the population will be over 65 by 2050. Recognizing the importance of equitable access to health services, the Thai government initiated decentralization of primary healthcare in 2022. Oral health, a key aspect of healthy ageing, has been prioritized as part of this reform. **Objectives:** This study aims to evaluate the impact of decentralization on oral health outcomes among older adults in primary care units. It investigates both service utilization trends and perspectives of dental health personnel involved in the decentralized system. **Methods:** This scoping review follows Arksey and O'Malley's framework. A systematic search of published and grey literature (2020–2024) was conducted using databases such as PubMed, Scopus, and ThaiJo, alongside official reports from Thailand's Health Data Center. Keywords included: "oral health," "older adults," "Thailand," "decentralization," and "primary care." Inclusion criteria focused on studies describing oral health service utilization, outcomes, or system change related to public health decentralization in Thailand. Data synthesis was analyzed under the WHO's six building block framework. **Results:** Thirteen studies and five government reports met the inclusion criteria. Key indicators included frequency of dental visits, rates of oral examination coverage, and improved oral health promotion activities in provinces piloting decentralization. However, disparities persisted in remote and underfunded districts. **Conclusion:** Decentralization holds promise for enhancing oral health equity among older Thais by increasing local access to care. However, sustainable success depends on strategic investments in human resources, interprofessional collaboration as a seamless care team, and standardized service delivery. Monitoring outcomes and addressing disparities in underserved regions remain essential to ensure the right to oral healthcare for all older citizens in Thailand.

Keyword: Oral health, older adults, primary care, services, decentralization

Impact Of a Community Oral Health Welfare Program on Children's Oral Health

Rong, Wensheng¹, Ma, Lili²

¹Peking University School of Stomatology, Beijing, China

²China Oral Health Foundation

Background: since 2019, the “Your care for their smile” oral health community welfare program for rural children organized by China Oral Health Foundation (COHF) has been implemented annually for six years at Hongjun Primary School in Yonghe County, Shanxi Province. **Objective:** to evaluate the impact of the community welfare initiative on children's oral health by collecting data on oral health status and oral hygiene practices of 12-year-old children after participating the activity for six consecutive years and comparing these findings with data from the National Oral Health Survey. **Methods:** each year, dentist volunteers organized by the COHF conducted activities for all students, including an oral health education session, supervised toothbrushing, an oral examination, fluoride application, and sealants for eligible permanent molars. Informed consent was obtained from all parents prior to project initiation. In 2024, all sixth-grade students underwent an oral examination and completed a questionnaire. Examiners were trained and calibrated in accordance with the requirements of the National Oral Health Survey. The questionnaire was adapted from the national survey form for 12-year-old children and completed independently under teacher supervision. **Results:** a total of 226 sixth-grade students, aged 12 years, completed both the oral examination and questionnaire. The caries prevalence (DT%) among participants was 29.1%, with a mean decayed teeth (DT) score of 0.29, both lower than those reported in the Fourth National Oral Health Survey (national 12-year-old children: 34.5%, 0.86; rural 12-year-old children: 36.7%, 0.88). The proportion of children brushing twice daily was 63.1%, significantly higher than the national (31.9%) and rural (27.2%) averages. The proportion of fluoride toothpaste used was 84.4%, markedly exceeding the national (55.0%) and rural (53.7%) rates. **Conclusion:** after six consecutive years of implementation, the community oral health welfare initiative significantly improved children's oral health status and promoted their better oral hygiene practices.

Keywords: Oral health community welfare program, dental caries, fluoride toothpaste, toothbrushing

Site-Specific Variations in The Subgingival Microbiome Across Periodontal Conditions and Their Association with Clinical Parameters

Xexin Chen¹, Xiaolin Ren¹, Ruolan Du¹, Lei Lei¹, Ran Cheng¹, Tao Hu¹

¹ State Key Laboratory of Oral Diseases & National Center for Stomatology & National Clinical Research Center for Oral Diseases & Frontier Innovation Center for Dental Medicine Plus, West China Hospital of Stomatology, Sichuan University, Chengdu, 610041, Sichuan, China

Background: Microbial changes across periodontal conditions and probing depths (PD) during disease progression remain unclear. **Objectives:** To explore site-specific subgingival microbiota across different periodontal conditions and to assess their associations with clinical parameters. **Methods:** 218 subgingival biofilm samples from 60 participants were collected from 3–6 sites per participant based on probing depth (PD), including 60 from healthy (n=20), 64 from gingivitis (n=20), and 94 from periodontitis (n=20). Genomic DNA was extracted, and the full-length 16S rRNA sequencing was performed to characterize the subgingival microbial composition. Associations between species abundance and clinical parameters were assessed using Spearman correlation. LEfSe analysis (LDA > 3.5) was used to identify indicator taxa. **Results:** *Aggregatibacter aphrophilus* was more abundant in the healthy group and showed a positive correlation with BOP% and PI. Interestingly, in periodontitis, its abundance was negatively related to BOP% and PI. Cluster analysis revealed that microbiota in 4-mm-depth sites in gingivitis (pseudopockets) resembled those in periodontitis, indicating an early microbial shift to periodontitis. β -diversity showed distinct microbial compositions in periodontitis compared to specific sites in healthy and gingivitis groups. Sites with PD $\geq$ 4 mm in periodontitis exhibited a dysbiotic microbial profile, characterized by increased abundance of *Fusobacterium* spp. and *Porphyromonas* spp. Key indicator taxa in this dysbiotic state included *Porphyromonas gingivalis*, *Prevotella intermedia*, and *Filifactor alocis*. **Conclusion:** *A. aphrophilus* may serve as a microbial marker for periodontal health, while the presence of *P. gingivalis*, *P. intermedia*, and *F. alocis* can characterize dysbiosis in periodontitis. Notably, the microbial composition in gingivitis pseudopockets (PD = 4 mm) appears to reflect an early periodontitis-like profile, highlighting the importance of early detection and intervention in sites showing increased PD during gingival inflammation.

Keywords: Periodontitis, probing depth, subgingival microbiota, 16S rRNA gene sequencing, *aggregatibacter aphrophilus*

Parental Oral Health Literacy and Its Behavioral Determinants in Preventing Dental Caries and Tooth Persistence Among Indonesian Schoolchildren (A Cross-Sectional Study Using the Precede Model)

Gilang Rasuna Sabdho Wening¹, Ghita Hadi Hollanda², Restika Anindya Pinasti², Yufitri Mayasari³, Caesary Cloudya Panjaitan⁴

¹ Department of Dental Public Health, Faculty of Dental Medicine – Universitas Airlangga, Indonesia

² Department of Dental Public Health, Faculty of Dentistry – Universitas Hang Tuah, Indonesia

³ Department of Community and Preventive Dentistry, Faculty of Dentistry – Universitas Prof.Dr.Moestopo(Beragama), Indonesia

⁴ Department of Community and Preventive Dentistry, Faculty of Dentistry – Universitas Trisakti, Indonesia

Background: Dental caries and retained deciduous teeth remain significant public health issues among Indonesian children, with implications for nutrition, growth, and psychosocial development. Emerging evidence suggests that parental oral health literacy is a crucial determinant of children's daily toothbrushing behavior and oral health outcomes. **Objectives:** This study aimed to evaluate the influence of parental oral health literacy, framed through the PRECEDE model on toothbrushing supervision and its association with caries and tooth persistence among children aged 7–11 years in an urban Indonesian setting. **Methods:** A cross-sectional study was conducted at SDI Kiyai Amin, Surabaya, involving 167 parent–child pairs. Data on parental behavior were collected using a validated questionnaire addressing predisposing (knowledge), reinforcing (social support), and enabling (access) factors. Clinical assessments were performed to determine caries status (dmf-t index) and identify persistent primary teeth. Data were analyzed using chi-square tests and contingency coefficients. **Results:** Caries prevalence was recorded at 80%, with 70% of children presenting retained primary teeth. Significant associations were found between parental supervision and all three behavioral domains: predisposing ($p < 0.001$; $cc = 0.606$), reinforcing ($p < 0.001$; $cc = 0.748$), and enabling factors ($p < 0.001$; $cc = 0.606$). Parental supervision was also significantly related to caries and tooth persistence (both $p < 0.001$), while no significant correlation was observed with child's age ($p = 0.974$). **Conclusion:** Parental oral health literacy and its behavioral dimensions significantly influence children's oral hygiene behaviors and related outcomes. Interventions aiming to reduce caries and improve exfoliation timelines should incorporate literacy-sensitive, family-centered oral health education programs.

Keywords: Oral health literacy, parental supervision, dental caries, retained primary teeth, toothbrushing behaviour, school-aged children, Indonesia

Factors Associated With Salivary Iga Variation in Healthy Young Adults

Sena Sato¹, Kazuaki Matsuo¹, Kaoru Doi¹, Reina Minoshima¹, Akira Imakiire¹, Yumiko Kawashita¹, Sakiko Soutome¹, Tatsuo Yamamoto², Koichiro Irie¹

¹Department of Oral Health, Medical and Dental Sciences, Graduate School of Biomedical Sciences, Nagasaki University, Japan

²Department of Preventive Dentistry and Dental Public Health, Kanagawa Dental University, Japan

Background: Secretory immunoglobulin A (IgA) is a key component of mucosal immunity and is abundant in the saliva. Although various behavioral, physiological, and local factors are thought to influence secretion, these mechanisms remain incompletely understood. In particular, salivary lactate dehydrogenase (LDH), a marker of epithelial damage and inflammation, has been hypothesized to be related to mucosal immune responses; however, its relationship with IgA remains unclear. **Objectives:** To investigate the factors that influence salivary IgA concentration in healthy young adults, including oral health status, salivary lactate dehydrogenase (LDH) activity, and a range of lifestyle factors such as toothbrushing frequency, physical activity, and body mass index (BMI). **Methods:** Unstimulated whole saliva was collected from 50 healthy young adults (men: 50%, mean age: 23.9 ± 2.8 years). Salivary IgA concentrations were measured using an enzyme-linked immunosorbent assay (ELISA), and LDH activity was evaluated using a colorimetric test kit (rated on an integer scale from 1 to 8). All participants underwent a comprehensive oral examination. Lifestyle data, such as toothbrushing frequency, physical activity, and stress perception, were obtained via self-administered questionnaires. Spearman's rank correlation and multiple regression analysis were used to identify potential associations. **Results:** Salivary IgA concentrations showed substantial inter-individual variability among participants, ranging from 64.2 to 394.4 pg/mL (mean $\pm$ SD: 174.5 ± 69.5 pg/mL). However, no significant correlations were observed between IgA levels and any of the evaluated factors, including oral health indices, salivary LDH activity, or lifestyle variables, such as toothbrushing frequency, breakfast consumption, physical activity, stress perception, or BMI. **Conclusion:** Although salivary IgA levels varied across individuals, no clear determinants were identified among the assessed lifestyle or physiological factors. These findings suggest that other biological factors, such as the composition of oral microbiota, may play a key role in regulating mucosal immune responses. Future studies should focus on the oral microbiome to further elucidate the mechanisms underlying IgA secretion.

Keywords: Saliva, IgA, LDH, mucosal immunity

Knowledge and Attitude of Chronic Kidney Disease Among Health Science Students

Herry Novrinda¹, Dhea Arinanda Dwi Putri², Gita Ariffa Sjarkawi¹, Risqa Rina Darwita¹, Iwany Amalliah Badruddin¹, Diah Ayu Maharani¹, Han Dong-Hun^{3,4}

¹Department of Dental Public Health and Preventive Dentistry, Faculty of Dentistry, University of Indonesia, Jakarta, Indonesia

²Faculty of Dentistry, University of Indonesia, Jakarta, Indonesia

³Department of Preventive and Social Dentistry, Seoul National University School of Dentistry, Seoul, Korea

⁴Dental Research Institute, Seoul National University, Seoul, Korea

Background: The Chronic kidney disease (CKD) is a significant worldwide health problem. Students currently studying health science will be the future medical professionals and play a crucial role in preventing Chronic Kidney Disease at primary, secondary, and tertiary levels in healthcare facilities. Future healthcare professionals who interact directly with patients suffering from chronic kidney disease are expected to possess sufficient knowledge to execute their roles effectively and demonstrate a positive attitude that aligns with their capabilities when dealing with CKD patients. **Objectives:** This study sought to evaluate the knowledge and attitude of health science students regarding chronic kidney disease at the University of Indonesia. **Methods:** This study employed a cross-sectional descriptive design, conducted via a self-administered online questionnaire. 369 participants had completed the questionnaire. **Results:** The average total knowledge score was 8.68 ± 2.706 , based on 15 questions (a p-value of 0.001). The median total attitude score of the students was $33.56 (\pm 2.958)$. A statistically significant difference existed between the knowledge score and the year of enrollment, indicated by a p-value of 0.001 ($p < 0.05$). A statistically significant difference was found ($p < 0.05$) between the knowledge score and the source of information from books, articles, and journals compared to congresses and seminars. The minimum attitude score recorded was 22, while the maximum was 41 (p-value 0.001). **Conclusion:** A significant statistical difference was found between the attitude score and the gender variable with a p-value of 0.009.

Keywords: Chronic kidney disease, knowledge, attitude, students

Dietary Patterns Mediate the Association Between Oral Health and Cardiovascular Disease

Yanbei Lu¹, Lei Lei¹, Yanjia Zhuang¹, Dasen Yuan¹, He Cai¹, Tao Hu¹

¹State Key Laboratory of Oral Diseases & National Center for Stomatology & National Clinical Research Center for Oral Diseases & Frontier Innovation Center for Dental Medicine Plus, West China Hospital of Stomatology, Sichuan University, Chengdu, China

Background: Poor oral health has been linked to increased cardiovascular disease (CVD) risk, yet the underlying mechanisms remain unclear. Dietary patterns, as a changeable part of daily life, may mediate this association and offer a potential intervention pathway connecting oral and systemic health. **Objectives:** This study aims to explore the associations between multiple oral diseases and cardiovascular disease risk, and analyze the mediating role of dietary patterns therein. **Methods:** This study used data from 8,142 adults with available oral health data in the 2024 follow-up of the Chinese Multi-Ethnic Cohort in Southwest China. Logistic regression/linear regression and were employed to comprehensively investigate the relationship between oral health indicators and cardiovascular disease. Counterfactual framework based causal mediation analysis was employed to investigate the mediating role of dietary patterns. **Results:** After adjusting for demographic and metabolic factors, oral mucosal lesions, dental caries, residual roots, severe periodontitis, (functional) tooth loss, functional denture, occlusal pairs/units, and oral frailty were significantly positively associated with carotid plaques detected by ultrasound and Framingham risk score ($P < 0.05$). The risk of carotid plaques in males aged ≥ 65 years was significantly influenced by Healthy eating index and Mediterranean diet score. Specifically, the oral-CVD association was mediated by fruit and vegetable intake (6%-32%) and staple food intake (3%-20%). **Conclusion:** Oral health is an important predictor of cardiovascular disease risk, and dietary patterns (especially fruit/vegetable intake and staple food structure) may partly explain this connection and offer a potential path for prevention. Longitudinal studies are warranted to verify causal relationships and clinical intervention potential.

Keywords: Oral health, cardiovascular disease, dietary patterns, nutrition

The Difference of Dental Anxiety Scale Before and After Educational Interventions Using Pop-Up Book, Audiovisual, and Tell-Show-Do

Mohammad Khafid¹, Zhafira Junannisa², Yakini Al Khaaliq²

¹ Department of Dental Public Health, IIK Bhakti Wiyata, Indonesia

² Undergraduate Dental Student of Faculty of Dentistry, IIK Bhakti Wiyata, Indonesia

Background: Dental anxiety can severely affect adolescents' cooperation and the success of dental procedures, making it a persistent obstacle in pediatric care. While educational interventions such as pop-up books, audiovisual, and Tell-Show-Do are widely used, no study has yet directly compared all three methods within a single experimental setting, leaving their relative effectiveness unclear. **Objectives:** Given the high prevalence of dental anxiety among adolescents, this study aims to evaluate the effectiveness of pop-up books, audiovisual, and Tell-Show-Do in reducing anxiety levels. **Methods:** This quasi-experimental study was conducted in May 2024 at SMK Bhakti Wiyata Kediri, involving 192 students randomly assigned into three intervention groups (n = 64 each): pop-up book, audiovisual, and Tell-Show-Do, which served as educational media to reduce anxiety. Dental anxiety was measured using the Modified Dental Anxiety Scale (MDAS), assisted by the Facial Image Scale (FIS) before and after a standardized educational session. Data were analyzed using paired t-tests and independent-sample t-tests ($\alpha = 0.05$), processed with SPSS software. **Results:** All three interventions significantly reduced dental anxiety levels ($p < 0.001$). Post-intervention mean scores were 50.5 ± 11.112 for pop-up book, 51.77 ± 12.898 for audiovisual, and 52.62 ± 16.42 for Tell-Show-Do. The pop-up book group showed the highest increase in the low-anxiety category (from 17.18% to 79.68%) and had no participants remaining in the high-anxiety category post-intervention. Similar improvements were observed in the audiovisual and TSD groups. However, intergroup comparison using independent-sample t-tests showed no statistically significant difference ($p = 0.780$). **Conclusion:** Pop-up book, audiovisual, and Tell-Show-Do are equally effective in reducing dental anxiety among adolescents. Although the pop-up book yielded the greatest average reduction, the difference was not statistically significant. As one of the first studies to directly compare these three methods, the findings highlight the value of interactive and narrative-based media as promising tools for pediatric dental education.

Keywords: Dental anxiety, modified dental anxiety scale, pop-up book, audiovisual, tell-show-do

An Oral Health Survey About the Prevalence of Root Caries Among Older Adults Aged 65-74 In Jiangsu Province

Chenbin Shu¹

¹Department of Preventive Dentistry, Shanghai Ninth People's Hospital, Shanghai JiaoTong University School of Medicine, China

Background: The prevalence of root caries in older adults has shown dynamic changes over time. In July 2022, our research team conducted an oral health survey among individuals aged 65–74 in Jiangsu Province, China. **Objectives:** To describe an oral health survey about the prevalence of root caries among older adults aged 65–74 in Jiangsu Province. **Methods:** Randomly selected residents aged 65–74 from designated monitoring sites in Jiangsu Province were enrolled as study subjects. Oral examinations assessed the prevalence of root caries across 32 tooth positions. **Results:** Among the 531 participants, 187 (35.22%) were diagnosed with at least one tooth affected by root caries. The most frequently affected tooth positions were #26 (20 cases), followed by #16 (18 cases) and #17 (16 cases), while the least affected were #31 (0 cases), #41 (2 cases), and #42 (3 cases). Overall, posterior teeth (232 cases) exhibited significantly higher root caries prevalence than anterior teeth (81 cases). Additionally, maxillary teeth roots accounted for 203 carious lesions, which nearly doubled the number observed in mandibular teeth (110 cases). **Conclusion:** The prevalence of root caries remains high among older adults aged 65–74 in Jiangsu Province. Dental professionals and institutions should provide comprehensive support, including targeted cleaning guidance for maxillary and posterior teeth, while maintaining basic oral care for mandibular and anterior teeth. Regular epidemiological surveys on caries and interventions to address financial barriers to dental treatment access are also recommended.

Keywords: Root caries prevalence, older adults, healthy survey

Transformative Silk Fibroin-Based Hydrogel for Oral Hard Tissue Repair and Disease Management

Wanshan Gao^{1,2}, Jun Luo², Jianshu Li², Tao Hu¹

¹ State Key Laboratory of Oral Diseases, West China Hospital of Stomatology, National Center for Stomatology, National Clinical Research Center for Oral Diseases, Frontier Innovation Center for Dental Medicine Plus, Sichuan University, Chengdu, P. R. China;

² College of Polymer Science and Engineering, State Key Laboratory of Advanced Polymer Materials, Sichuan University, Chengdu, P. R. China.

Background: Dentin hypersensitivity (DH) and periodontitis, affecting millions globally, pose significant challenges due to inadequate treatment durability and functionality. DH causes pain from exposed dentin tubules, while periodontitis drives chronic inflammation and bone loss. **Objectives:** We aim to develop silk fibroin (SF)-based hydrogels for rapid, deep dentin tubule occlusion in DH and multifunctional therapy for periodontitis, enhancing clinical outcomes. **Methods:** For DH, SF-tannic acid (TA) hydrogels were applied drop-by-drop, forming compact gels in dentin tubules. An adaptive SF-TA-urea hydrogel was developed for enhanced penetration. For periodontitis, SF-TA hydrogels integrated lipoic acid nanozymes, tested for ROS scavenging, antibacterial, and anti-inflammatory effects in vitro and in vivo. **Results:** DH hydrogels achieved occlusion depths of 250–660 μm , maintaining stability over 21 days with restored dentin hardness (0.8 GPa) and biocompatibility in rabbit models. For periodontitis, the hydrogel cleared pathogens, reduced inflammation, and preserved alveolar bone, promoting M2 macrophage polarization. **Conclusion:** These innovative SF-based hydrogels offer transformative, minimally invasive solutions for DH and periodontitis, with exceptional occlusion and therapeutic efficacy, poised for clinical translation.

Keywords: Silk fibroin hydrogel, dentin hypersensitivity, periodontitis, multifunctional oral regenerative platform

Analysis of Oral Health, Knowledge, Attitudes, and Practices Among Teachers at Pertiwi Elementary School, Makassar

Ilmianti¹

¹Department of Dental Public Health, Faculty of Dentistry, Universitas Hasanuddin

Background: To achieve the goals of health education and promotion programs, schools are considered one of the most effective settings to deliver health information to children. Bibliometric studies have shown a steady increase in research related to school-based health promotion over the past decade. Several analyses highlight that keywords such as oral health promotion, school-based education, and teacher's role are frequently used in international publications on this topic. **Objectives:** The aim of our study is to provide information, gather data, and contribute to the development of knowledge and attitudes of elementary school teachers regarding the oral health of students at SD Pertiwi Makassar. **Methods:** This is a questionnaire-based cross-sectional study, involving 33 teachers selected using the total sampling method. The questionnaire consists of two sections: the first covers sociodemographic data such as age and gender, while the second focuses on knowledge and attitudes. Data were entered and analyzed using SPSS software. The Chi-square test was applied to evaluate participants' knowledge, with the significance level set at $p < 0.05$. **Results:** A total of 33 elementary school teachers, with a mean age of 32.25 ± 8.46 years, participated in this study. Among them, 78.8% were female, who correctly identified that the appropriate times for brushing teeth are in the morning after breakfast and at night before bedtime. The relationship between gender and knowledge showed a p-value of 0.002 ($p < 0.005$), indicating a significant association between teachers' gender and their knowledge regarding the optimal times for students to brush their teeth. In contrast, age was not significantly associated with knowledge ($p = 0.299$, $p > 0.005$). **Conclusion:** Teachers' knowledge and involvement in oral health promotion at school, combined with parental supervision, are essential in raising awareness and improving dental hygiene habits among elementary school students.

Keywords: Knowledge, student oral health, teachers

Effectiveness of an Oral Health Education Program for Primary School Children

Ployplai N¹, Pisamturakit PP¹

¹ Faculty of Dentistry, Chulalongkorn University, Thailand

² Department of Community Dentistry, Chulalongkorn University, Thailand

Background: Dental caries is prevalent among primary school children in Thailand, both in rural and urban areas. Increasing oral health awareness and implementing behavior-related programs may help prevent early-stage dental caries. **Objectives:** This study aims to compare the oral health care knowledge of primary school children before and after participating in a teacher-led oral health education program. **Methods:** The Principal of Phyathai School selected two Grade 5 classes for an oral health education program, which included resources, lesson plans, and exercise workbooks. Integrated into the semester lectures, the program aimed to improve students' knowledge and behaviors related to oral health. To evaluate the program's effectiveness, Students completed a 60-question multiple-choice test before and after the program, and their oral hygiene was assessed using the decayed, missing, and filled teeth index (DMFT) and simplified oral hygiene index (OHI-S). One class participated in the program, while the other followed a standard health curriculum. Socio-demographic and oral health-related variables were analyzed using descriptive statistics and t-tests, with a paired t-test comparing pre- and post-test scores. **Results:** A total of 79 participants, including 40 boys (50.6%), were recruited for this study. The participants, aged 9–11 years with an average age of 10.24 years, included 39 students in the experimental group. The average DMFT and OHI-S score were 1.21 and 1.13 for the experimental group, and 1.28, and 0.88 for the comparison group. Pre- and post-test average knowledge scores (SD) for the experimental group were 30.64(6.38) and 34.46(7.66), while the comparison groups had scores of 27.83(8.98) and 37.15(6.15). Both groups showed a significant increase in knowledge scores (pair T-test, $p < 0.001$), indicating the program's effectiveness in enhancing oral health knowledge. **Conclusion:** The oral health educational program successfully enhanced students' knowledge of oral health.

Keywords: Knowledge, oral health status, oral health education, plaque, primary school

Toothpaste Usage Trends and Fluoride Awareness Among Malaysian Adults: Findings From The National Oral Health Survey

Dewi Mayang Sari binti Kamarozaman¹, Siti Kamilah binti Mohamad Kasim¹, Nurulasmak binti Mohammed¹, Habibah binti Yaacob Ya'akub¹

¹ Oral Health Programme, Ministry of Health, Malaysia

Background: Regular toothbrushing with fluoride toothpaste is strongly associated with improved oral health outcomes and better oral health-related quality of life. The World Health Organization recognizes fluoride as an effective preventive measure against dental caries at the population level. This study aimed to examine current trends in toothpaste usage among Malaysian adults. **Method:** Data were obtained from the Malaysian National Oral Health Survey for Adults 2020. Enumerators recorded the type of toothpaste used by respondents through direct observation, while respondents' perception of the toothpaste type was collected via questionnaires. A total of 15,399 weighted datasets were analyzed, encompassing sociodemographic and socioeconomic information. Analyses were conducted using SPSS version 26 with complex sampling procedures. **Results:** Among the estimated 23.4 million dentate adults represented in the study, 99.4% (95% CI: 99.23–99.58) reported using toothpaste during daily toothbrushing. Most respondents (94.65%, 95% CI: 93.89–95.32) were observed using fluoridated toothpaste, while 5.4% (95% CI: 4.68–6.11) used non-fluoridated toothpaste. Notably, nearly half of all respondents (45.0%, 95% CI: 42.75–47.35) were unaware of the type of toothpaste they used. Among those verified as using fluoridated toothpaste, only 54% (95% CI: 51.60–56.30) correctly identified it as such. Misperceptions about fluoride content were more prevalent among individuals with lower education levels, older adults, and those from lower socioeconomic backgrounds. **Conclusion:** While fluoridated toothpaste use is high among Malaysian adults, a significant proportion of users remain unaware of its fluoride content. This knowledge gap may affect informed decision-making, particularly in a market where various toothpaste formulations are available. These findings highlight the need to strengthen oral health literacy, particularly regarding fluoride awareness, to support better personal oral care practices.

Keywords: Fluoride, toothpaste, toothbrushing

Willingness to Pay for Preventive and Curative Oral Health Care Among Malaysian Adults: A Comparison Between Urban and Rural Areas in Malaysia.

Muhammad Huzaifah bin Jusoh^{1,3}, Annapurny Venkiteswaran², Budi Aslinie Md Sabri¹

¹ Centre of Population Oral Health & Clinical Prevention Studies, Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Malaysia

² Centre of Paediatric Dentistry & Orthodontics Studies, Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Malaysia

³ Oral Health Programme, Ministry of Health, Malaysia

Background: Oral health is a significant public health issue in Malaysia, with the rising prevalence of oral diseases posing a substantial economic burden. While preventive oral care is a cost-effective strategy to mitigate these issues, its effectiveness is dependent on the public's willingness to pay (WTP). **Objectives:** The aim of this study is to estimate the willingness to pay for preventive and curative oral health care among Malaysian adults and to compare the willingness to pay for preventive and curative oral health care in urban and rural areas in Malaysia. **Methods:** A cross-sectional study was conducted from March to July 2025. A total of 387 adults from UTC Selangor and rural UTC Keningau areas were recruited via stratified and systematic random sampling. Data were collected using a content-validated, self-administered questionnaire based on the Contingent Valuation Method. Urban-rural comparisons were analyzed using independent t-tests with SPSS version 29. **Results:** The mean value of WTP for dental checkup is RM103.99 (80.46), for scaling and polishing is RM120.21 (90.37), for oral hygiene advice is RM76.48 (73.72), for fluoride varnish treatment is RM91.30 (71.96) for preventive fissure sealants is RM104.03 (76.72), for dental filing is RM178.86 (160.82) and for dental extraction is RM114.76 (80.05). The findings revealed a greater mean willingness to pay for curative procedures, such as dental fillings RM178.86 (160.82), compared to preventive services like a routine dental check-up RM103.99 (80.46). The willingness to pay for preventive dental care is higher in urban areas compared to rural areas in Malaysia. **Conclusion:** Malaysian adults are more willing to pay to treat existing oral health issues than to prevent them, indicating a need to shift public perception towards proactive care. The significant urban-rural WTP gap highlights socioeconomic inequalities as a barrier to accessing essential preventive services. These findings suggest an urgent need for targeted public health campaigns focused on the benefits of prevention.

Keywords: Willingness to pay, preventive dental care, oral health care, health economic, contingent valuation method

The Property of a Root-Extended Endocrown Utilizing 3D Printing For A Four-Wall Defect In Endodontically Treated Molars: An In Vitro Study

Yifei Chen¹, Lei Lei¹, Ran Cheng¹, Tao Hu¹

¹State Key Laboratory of Oral Diseases & National Center for Stomatology & National Clinical Research Center for Oral Diseases & Frontier Innovation Center for Dental Medicine Plus, Preventive Dentistry Department, West China Hospital of Stomatology, Sichuan University, Chengdu, Sichuan, China

Background: Restoring endodontically treated molars with extensive structural loss remains clinically challenging. Conventional endocrowns may suffer from insufficient retention under compromised conditions. **Objectives:** To compare the mechanical properties and marginal integrity of a novel 3D-printed Ti-6Al-4V endocrown featuring a root-extension design with direct resin composite restorations in molars with 4-wall defects. **Methods:** Forty-two extracted third molars with standardized four-wall defects were randomly assigned to 3D-printed endocrowns group (n = 21) and resin restoration group (n = 21). All specimens were subjected to 5000 thermal cycles. Eight teeth per group were subjected to vertical loading till failure using a universal testing machine. Samples without macroscopic fracture were analyzed for microcracks using micro-CT. Microleakage was evaluated in eight samples per group utilizing methylene blue staining. Marginal integrity was further assessed in five specimens per group using SEM. **Results:** The endocrown group endured a maximum load of 4682 ± 981 N, markedly surpassing the resin group (1334 ± 615 N, $P < 0.05$). No samples in the endocrown group exhibited visible fractures, while all samples in resin group demonstrated different fractures. Micro-CT identified microcracks in two endocrown samples, continuing along the canal wall. The endocrown group exhibited reduced microleakage scores (0.625 ± 0.744) compared to the resin group (2.625 ± 0.517 , $P < 0.05$). In SEM, the endocrown group exhibited fewer marginal cracks and less crack width, significantly smaller than those of the resin group ($P < 0.05$). The endocrown group also demonstrated a mean external marginal gap of 66.19 ± 14.66 μ m and a mean external marginal gap of 48.19 ± 9.69 μ m in SEM, both falling within the clinically acceptable parameters. **Conclusion:** This novel root-extended endocrown helps prevent failure due to poor retention, weak support, or marginal breakdown. It provides stronger internal anchorage and better stability for restoring severely damaged molars.

Keywords: 3D printing, endocrown, resin restorations, marginal adaption, fracture resistance

Comparative Evaluation of the "Mindtain Caries Prediction & Prevention Need" Prototype Versus the AAPD Caries Risk Assessment In Clinical Screening Outcomes: A Case of Indonesia

R. Darmawan Setijanto¹, Taufan Bramantoro², Merlya³

¹ Departement of Dental Public Health and Preventive Dentistry, Faculty of Dental Medicine, Universitas Airlangga, Indonesia

² Departement of Dental Public Health and Preventive Dentistry Faculty of Dental Medicine, Universitas Airlangga, Indonesia

³ Departement of Dental Public Health and Preventive Dentistry Faculty of Dentistry, Universitas Brawijaya, Indonesia

Background: The high prevalence of dental caries in Indonesia—especially among children aged 5–9 and 10–14 years, as reported by Riskesdas (2018)—demands effective prevention strategies that integrate clinical assessments with behavioral interventions. Accurate caries risk assessment tools are essential for guiding early intervention and promoting long-term oral health. **Objective:** This study aimed to compare clinical screening outcomes between the "MindTain Caries Prediction & Prevention Need" prototype and the AAPD (American Academy of Pediatric Dentistry) Caries Risk Assessment tool. **Methods:** A comparative quantitative analysis was conducted involving elementary school children in Batu City, divided into two age groups: 6–9 and 10–12 years. The MinDTain tool assessed caries risk based on the DMF-T index, while the AAPD tool used indicators such as caries within the last 24 months, enamel demineralization, visible plaque, and gingivitis. Children were classified into low, moderate, or high caries risk categories. **Results:** Among 6–9-year-olds, MinDTain identified 63% as low risk, 1% as moderate, and 36% as high risk. In the 10–12 age group, 52% were low risk, 16% moderate, and 32% high risk. In contrast, the AAPD tool generally indicated higher caries risk levels. This discrepancy is likely due to AAPD's emphasis on early clinical signs such as enamel lesions and gingivitis, and its classification of children as "high risk" based on the presence of even a single high-risk indicator. **Conclusion:** While the AAPD tool is more sensitive to early clinical signs, the MinDTain prototype offers a more comprehensive risk prediction framework, particularly useful for guiding preventive strategies among parents, schools, and public health programs.

Keywords: MinDTain prototype, caries prediction, prevention need, aapd caries risk assessment, clinical screening

The Effectiveness of Preoperative Virtual Reality Exposure on Paediatric Dental Anxiety: A Three-Arm Parallel-Group Randomised Controlled Trial.

Leezallini Selvaraj¹, Noorhidayah Zainal Aalam¹, Nurul Zeety Azizi¹, Zamros Yuzadi Mohd Yusof², Nor Nadia Zakaria¹

¹Department of Paediatric Dentistry & Orthodontics, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia

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

Background: Managing children's dental anxiety is a significant challenge commonly faced by dentists in clinical practice. Behaviour guidance with innovative approaches like Virtual Reality (VR) can help dentists address this issue. Utilising VR before dental procedure can assist in preparing children for the impending treatment and alleviate their anxiety levels. This randomised controlled trial aimed to evaluate the effectiveness of preoperative Immersive Virtual Reality Exposure (IVRE) and Non-Immersive Virtual Reality Exposure (NIVRE) in reducing dental anxiety in children. **Methods:** Sixty-six children aged 9-to-12-years-old with dental anxiety were randomised into three groups: Immersive VR exposure (IVRE), Non-immersive VR exposure (NIVRE) and control. While waiting for treatment, IVRE group navigated a virtual dental clinic; NIVRE group watched dental-themed cartoons; and control group waited as usual. All participants received a resin fissure sealant on one of their permanent molars. Dental anxiety before and after intervention was assessed using Malay-translated Faces version of the Modified Dental Anxiety Scale (Malay-MCDAS_f) and pulse rate (PR) and analysed with ANOVA and paired t-tests. **Results:** Of the 66 participants enrolled, two dropped out. Both IVRE and NIVRE significantly reduced dental anxiety compared to control ($p < 0.05$), with large effect sizes. Although PR reductions were greatest in the IVRE group, followed by the NIVRE and control groups, the differences were not statistically significant ($p > 0.05$). A significant positive correlation was found between Malay-MCDAS_f and PR ($r=0.29$, $p=0.022$). **Conclusion:** Preoperative IVRE and NIVRE significantly reduced dental anxiety, with IVRE showing greatest impact.

Keywords: Virtual reality, dental anxiety, preoperative, immersive virtual reality

The Association Between Health Belief Model Components and Oral Health Behavior Among Hypertensive Patients in Puskesmas Kalijudan Service Area: An Epidemiological Study

Tasya Horax¹, Syafriaz Zulfa Maulina¹, Shafa Naila Maharani Madjid¹, Wardah Yusriyah¹, Caya Kartika Putri¹, R. Darmawan Setijanto², Epriliana Rahmawati³

¹Faculty of Dental Medicine, Universitas Airlangga, Surabaya, Indonesia

²Department of Dental Public Health, Faculty of Dental Medicine, Universitas Airlangga, Surabaya, Indonesia

³Health Officer, Puskesmas Kalijudan, Surabaya, Indonesia

Background: Hypertension is a significant public health issue and a leading cause of premature death globally. Hypertension is a prevalent chronic condition that significantly impacts the elderly, influencing their social interactions, quality of life, and mental health. Oral health is also crucial for overall well-being, and poor oral health can exacerbate chronic conditions like hypertension. The Health Belief Model (HBM) provides a framework to understand health behaviors, including perceived susceptibility, severity, benefits, barriers, cues to action, and self-efficacy. **Objectives:** The study aims to analyze the health behavior of hypertensive patients in the Puskesmas Kalijudan service area in relation to their oral health maintenance practices. **Methods:** The quantitative study used an analytical observational approach with a cross-sectional design. A total of 60 respondents were selected using purposive sampling, consisting of 30 individuals with hypertension and 30 without (control group). Data were collected through a structured closed-ended questionnaire measuring HBM constructs and oral health behavior. Data analysis was conducted using Pearson correlation test in SPSS to assess the relationships between variables in both groups. **Result:** In the control group, perceived susceptibility, perceived benefits, cues to action, and self-efficacy showed significant positive correlations with oral health behavior ($p < 0.05$), ranging from moderate to strong correlation levels. Perceived severity and perceived barriers were not significantly associated. In the hypertensive group, perceived benefits, cues to action, and self-efficacy also demonstrated significant correlations with behavior ($p < 0.05$), while perceived susceptibility, severity, and barriers were not significant. **Conclusion:** There is a significant relationship between Health Belief Model components and oral health behavior. Specifically, perceived benefits, cues to action, and self-efficacy are key factors influencing oral health maintenance among individuals with and without hypertension in the Puskesmas Kalijudan service area.

Keywords: Hypertension, health belief model, oral health behavior

Effectiveness of Dental Health Education with and Without Tooth Brushing Training on Reducing Plaque Scores in Students of SDN 060915 Medan

Siska Ella Natassa¹, Gema Nazri Yanti¹

¹Department of Public Health Dentistry/Preventive, Faculty of Dentistry, Universitas Sumatera

Background: Dental plaque that is not optimally removed is a major etiological factor in the development of dental caries and gingivitis. Tooth brushing is an effective method for plaque removal. Efforts to establish proper tooth brushing behavior can be carried out through education and tooth brushing training. Dental Health Education (DHE) serves as a promotive intervention to improve knowledge and behavior in maintaining oral and dental hygiene, one example being tooth brushing training using the Fone's technique. **Objectives:** To determine the effectiveness of Dental Health Education (DHE) with and without tooth brushing training on the reduction of plaque scores among students at SDN 060915 Medan Sunggal. **Methods:** This study employed a quasi-experimental design with a pre-post test control group design. A total of 76 students were selected as samples and divided into four groups: a control group without intervention; an intervention group receiving DHE without tooth brushing training; an intervention group receiving DHE with tooth brushing training once; and an intervention group receiving DHE with tooth brushing training three times. Plaque measurements were conducted using the Personal Hygiene Performance (PHP) index on the first day and the 21st day. Data were analyzed using the Wilcoxon test and Post Hoc analysis. **Results:** There was a reduction in the mean plaque score across all groups, with the greatest decrease observed in the group receiving DHE with tooth brushing training three times, amounting to $(2,09 \pm 0,643)$. Significant differences were found in all three intervention groups ($p < 0,05$), except in the control group without intervention ($p = 0,062$). Additionally, there were significant differences in plaque scores between groups ($p < 0,05$), except between the group receiving DHE with tooth brushing training once and the group receiving training three times ($p = 0,381$). **Conclusion:** Education combined with tooth brushing training is an effective method for reducing plaque scores.

Keywords: Dental health education, tooth brushing, plaque score, PHP index

LSMR Model for AI-Assisted Educational Songs Based on Music, Mood, and Movement Theory: A Content Validation Study for Children's Oral Health Promotion

Nisa Muthiah¹, Cristiani Nadya Pramasari¹, Cicih Bhakti Purnamasari¹

¹ Faculty of Dentistry, Mulawarman University, Indonesia

Background: The Music, Mood, and Movement (MMM) Theory posits that music can influence mood, stimulate movement, and enhance the enjoyment of physical activities. Music and songs have been proven more memorable and offer longer-lasting retention for delivering engaging educational messages for children. Currently, no specific framework exists to incorporate AI-generated musical elements in designing educational songs that deliver health messages in a structured and coherent manner. **Objectives:** This study aims to introduce and perform a content validation of the LSMR model in AI-assisted educational songs for children to promote community oral health. **Methods:** This study applied a non-experimental quantitative research design. The educational song developed in this research was created as a prototype based on the LSMR model, using the premium version of the Suno application. The song was structured using four main components: L (Lyric), S (Structure), M (Melody), R (Rhythm). Six experts carried out content validation using the Content Validity Index. **Results:** The CVI analysis results showed that nine items received an I-CVI score of 1.00, indicating complete agreement among experts on the relevance of the lyric components (Q1–Q4), song structure (Q6), melody (Q8–Q9), and rhythm (Q10–Q11). However, two items (Q5, Q7) scored below the 0.83 threshold (I-CVI = 0.667), indicating disagreement regarding the repetition of lyrics and the song's hook. Nevertheless, the overall S-CVI/Average was 0.939, which exceeds the minimum required threshold and confirms the overall validity of the scale. **Conclusion:** The LSMR model offers a practical and time-efficient formula for composing AI-assisted songs and ensures that the essence of health education is not compromised. It's important to note that AI-generated songs do not imply that the creator is the composer or instrumentalist. Instead, the model emphasises the importance of lyric writing and mood creation.

Keywords: Artificial intelligence, educational song, oral health promotion

Proanthocyanidin B2 Attenuates Periodontal Inflammation and Bone Resorption in Experimental Periodontitis

Junwei Zhao¹, Mengxian Wang¹, Xiaoyan Ou¹

¹ The Affiliated Stomatological Hospital, Jiangxi Medical College, Nanchang University, Nanchang, China; Jiangxi Province Key Laboratory of Oral Biomedicine, Nanchang, China; Jiangxi Province Clinical Research Center for Oral Diseases, Nanchang, China.

Background: Periodontitis is a highly prevalent inflammatory disease characterized by progressive alveolar bone destruction, with current treatments often failing to fully halt disease progression. Natural compounds targeting multiple pathological pathways represent promising therapeutic strategies. Proanthocyanidin B2 (PB2), a bioactive flavonoid, exhibits potent anti-inflammatory and antioxidant properties, suggesting its potential for modulating periodontitis-associated tissue damage and cellular senescence. **Objectives:** To elucidate the mechanism by which PB2 attenuates alveolar bone resorption in ligature-induced murine periodontitis, specifically through modulation of NF- κ B signaling and senescence-associated secretory phenotype (SASP). **Methods:** A mouse periodontitis model was established using wire ligation around maxillary molars. Animals were allocated to four groups: Control (Blank group), Ligature (Model group), Ligature+Low-dose PB2 (PB2-LD, 100 mg/kg/day), and Ligature+High-dose PB2 (PB2-HD, 200 mg/kg/day). Periodontal destruction was quantified via Micro-CT (cementoenamel junction-alveolar bone crest distance, CEJ-ABC). Histomorphometric analysis employed H&E staining for inflammatory infiltration and bone resorption, alongside TRAP staining for osteoclast detection. Molecular profiling included immunohistochemistry and Western blotting for senescence markers (p16, p21, p53), SASP factors (IL-6, IL-1 β , IL-8, TNF- α), osteogenic proteins (OPN, RUNX2), and NF- κ B pathway components (phospho-p65, phospho-I κ B α). **Results:** An experimental periodontitis model was successfully constructed. Ligature induction significantly increased CEJ-ABC distance, exacerbated bone resorption, elevated osteoclast activity, and downregulated OPN/RUNX2 versus controls. PB2 treatment dose-dependently reversed these effects, reducing CEJ-ABC distance, osteoclast numbers, and histological inflammation while restoring osteogenic marker expression. Critically, PB2 suppressed SASP factor secretion and decreased senescence protein levels. This was mechanistically linked to inhibition of NF- κ B pathway activation, evidenced by reduced phosphorylation of p65 and I κ B α . All comparisons were statistically significant ($p < 0.05$). **Conclusion:** Through suppression of the NF- κ B signaling pathway, PB2 mitigates periodontal inflammation in experimental periodontitis, consequently delaying premature cellular senescence and mediating bone-protective functions. This identifies PB2 as a promising candidate for developing targeted prophylactic strategies against inflammatory bone destruction.

Keywords: Periodontitis, procyanidin b2, senescence-associated secretory phenotype.

Stunting and Its Impact on Dental Caries Experience in Children Aged 36-60 Months in Unte Mungkur Village, Kolang Subdistrict, Tapanuli Tengah

Gema Nazri Yanti¹, Darmayanti Siregar¹, Gema Nazri Yanni², Rida Khairunnisa Nasution³

¹Department of Public Health Dentistry/ Preventive, Faculty of Dentistry, Universitas Sumatera Utara, Medan, Indonesia

²Departement of Paediatric, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia

³Undergraduate Student, Faculty of Dentistry, Universitas Sumatera Utara, Medan, Indonesia

Background: Stunting is a form of malnutrition caused by chronic nutritional deficiencies, which typically becomes evident after the child reaches 2 years of age. This condition can lead to oral health problems, including dental caries. **Objectives:** The aim of this study is to analyze stunting and its impact on the occurrence of dental caries in children aged 36-60 months. **Methods:** This research uses an analytical survey with a cross-sectional design. The population includes all children aged 36-60 months residing in Unte Mungkur III and IV villages, Kolang subdistrict, Central Tapanuli district, with a sample of 174 children selected using random sampling. The children's height was measured using a microtoise stature meter, and dental caries was assessed using the def-t index (Klein). Data analysis was conducted using multiple linear regression. **Results:** This study show that 78.7% of children in the normal category had an average def-t score of 4.12 ± 2.30 , while 18.4% of stunted children in the short category had an average def-t score of 5.47 ± 2.31 , and 2.9% of stunted children in the very short category had the highest average def-t score of 5.80 ± 1.64 . Statistical analysis revealed a significant relationship between stunting and the child's age with the experience of dental caries in children aged 36-60 months ($p < 0.05$). **Conclusion:** It can be concluded that the shorter the child with stunting, the higher the experience of caries, and as the child's age increases, the occurrence of caries also increases.

Keywords: Stunting, caries, children aged 36-60 months.

The Role of Dentists in Reducing Gingivitis in Adolescents Through Dental Health Education Innovation Program Using Digital Technology

Marta Juslily¹, Emilia Gustika hadi²

¹ Dept. Of Dental Public health and preventive Dentistry, Universitas Trisakti, Indonesia

² Dental Polyclinic Community Health Centre District Taman Sari, DKI Jakarta, Indonesia

Background: Dentists play a strategic role in carrying out their duties and functions in individual health efforts (UKP) and community health efforts (UKM) at Community Health Center. **Objective:** To reduce the prevalence of gingivitis among adolescents in the Taman Sari sub-district of West Jakarta, an innovative programme named 'SIGIMUT (Oral Health Information System)' was designed. SIGIMUT is an interactive digital platform that empowers dentists not only to provide accurate and easily accessible education but also to facilitate self-monitoring of oral health among adolescents and their parents, as well as strengthen communication with dentists. **Methods:** Experimental observational longitudinal study with an intervention, dental health education, and monitoring oral health behavior through SIGIMUT. The population consists of adolescent students aged 15–18 years grades 10 and 11 at senior high schools (SMA) in Taman Sari Subdistrict, West Jakarta. The sample size was 446 adolescent students. Gingivitis levels were measured at the beginning of the programme and 1,5 years intervals every semester. **Results:** The implementation of SIGIMUT significantly reduced gingivitis levels in the intervention group, accompanied by improved knowledge and oral hygiene behaviour. This innovation reaffirms the crucial role of dentists as key agents in promoting and preventing oral health at the community level. **Conclusion:** Dentists play a strategic role in improving oral healthcare through innovative digital platform-based programmes. SIGIMUT serves as an effective technology-based intervention model empowering communities to maintain their oral health independently and sustainably.

Keywords: Dentist, gingivitis, SIGIMUT, adolescents

Perceived Barriers in Accessing Dental Care Among Rural Communities in Ranau, Sabah: A Qualitative Study

Salwatul Izzra Binti Mahadi², Riss Roland¹, Karthini A/P Gunasegran²

¹ Klinik Pergigian Ranau, Pejabat Pergigian Kawasan Kota Belud, Bahagian Kesihatan Pergigian Negeri Sabah, Malaysia

² Klinik Pergigian Kundasang, Pejabat Pergigian Kawasan Kota Belud, Bahagian Kesihatan Pergigian Negeri Sabah, Malaysia

Background: Oral health disparities persist in rural communities due to multifaceted challenges in accessing dental care. This study aimed to explore the perceived barriers faced by residents in remote areas of Ranau, Sabah in seeking dental services. **Objectives:** To explore the social, geographic, financial, and perceptual barriers that limit access to dental care among rural populations in Ranau. **Methods:** A qualitative study was conducted involving in-depth interviews with rural residents who had experienced dental issues and/or utilized dental services. Ten study participants were purposely selected from various rural villages in the Ranau district. Interviews were transcribed, anonymized, and thematically analyzed using manual coding to derive emerging themes. Prolonged engagement and participant validation were conducted to ensure trustworthiness of the data. **Results:** Four main themes emerged: Geographical and Transport Barriers – Participants reported difficulties in reaching clinics due to long distances, poor road conditions, and limited public transport. Financial Constraints and Cost Sensitivity – Although dental treatment fees were affordable, high transportation costs deterred many. Daily Life and Time Constraints – Household responsibilities, school runs, and illness reduced time available to seek care. Perceptions Toward Dental Services – Some perceived dental care as necessary only during emergencies, while others expressed hope for a permanent dental clinic in Paginatan to reduce travel burdens. **Conclusion:** Rural communities in Ranau face considerable barriers in accessing dental care, largely stemming from distance, transport, and competing responsibilities. While public dental services are valued, their accessibility remains a challenge. Efforts to expand outreach programs and establish permanent clinics in semi-remote areas like Paginatan may improve utilization and promote greater equity in oral health access.

Keywords: Dental access, rural health, barriers, qualitative research, oral healthcare utilization

Supportive Care for Head and Neck Cancer Survivors In Asia: A Policy Review And Gap Analysis

Nur Izzah Shapiee¹, Ainol Haniza Kherul Anuwar^{1,2}

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

² Oral Cancer Research and Coordinating Centre, Universiti Malaya, Kuala Lumpur, Malaysia

Background: Head and neck cancer (HNC) imposes significant physical, psychosocial, and financial burdens on survivors, particularly in Asia, which reported the highest incidence of HNC in 2022 and continues to face persistent disparities in health systems capacities. **Objectives:** To review and analyse healthcare policies in 15 selected Asian countries to determine how they address the multidimensional needs of HNC survivors namely physical, psychological, financial, and social aspects. **Methods:** A document analysis using the READ approach was conducted on national policy documents related to cancer care, retrieved from the International Cancer Control Partnership (ICCP) database, ministries of health, and MOH-linked websites across 15 selected Asia countries. Thematic analysis was applied to identify how policies addressed key domains of HNC survivorship. **Results:** Of the 121 documents, 82 met the inclusion criteria. Thematic analysis revealed four main themes: (i) financial protection and health financing; (ii) palliative and supportive care; (iii) rehabilitation and survivorship; and (iv) legal, community, and primary care support. While most countries (86.7%) have National Cancer Control Plans and general health financing schemes, few incorporate comprehensive survivorship components such as vocational rehabilitation, psychological services, or structured community caregiving. In Malaysia, there is a lack stand alone frameworks for long-term psychosocial care, and no National health Insurance (NHI) scheme, despite 80% of the countries having implemented NHI. Rehabilitation and supportive services in Malaysia are often NGO-driven rather than formally integrated into public healthcare systems. In contrast, countries like Singapore and Japan demonstrate more structured approaches, offering community-based palliative care and savings-based financing models. Gaps were identified in legal protections, financial protection, and coordinated supportive services across many settings. **Conclusion:** The results highlight a critical need for integrated, multidisciplinary survivorship policies that are responsive to the complex needs of HNC in Malaysia and other Asian countries.

Keywords: Head and neck cancer, supportive care, survivorship, policy review, document analysis

Three-K (Kartu Kontrol Karies): Program to Prevent Early Childhood Caries at TK ABA Kauman

Dhestina Syarifiah Berliani¹, Annisa Rifna Wardati¹, Nadila Mareta Cahyani¹, Isti Dyah Prastiwi¹

¹ Dental Hygiene, Faculty of Dentistry UGM, Yogyakarta

Background: Early Childhood Caries (ECC) is a significant oral health problem with long-term impacts on children's growth and quality of life. The Indonesian Health Survey of 2023 reported a high prevalence of dental caries among children aged 3–9 years, including in the Special Region of Yogyakarta. One of the schools with a high incidence of caries is TK ABA Kauman, with an average dmft index of 4.34. **Objectives:** This program aimed to address the high rate of dental early childhood caries by enhancing teachers' capacity in caries detection and oral health education through a participatory approach. **Methods:** A community service initiative was conducted by the Faculty of Dentistry, Universitas Gadjah Mada, using a Participatory Learning and Action (PLA) approach. The intervention focused on empowering teachers through the “Three-K: Kartu Kontrol Karies” program. Activities included training on simple caries detection, proper toothbrushing education, guidance on using the caries control card, and a Training of Trainers (ToT) to expand the reach of oral health promotion. **Results:** The program resulted in an increase in participants' understanding from a score of 88 to 94 (6.82% improvement). Additionally, practical skills improved from a moderate to a good category (an increase of 11.76%). These findings demonstrate the effectiveness of PLA-based interventions in enhancing teachers' promotive and preventive skills in early childhood oral health. **Conclusion:** Active involvement of teachers in promotive and preventive oral health programs proved effective in increasing knowledge and skills related to children's dental health. The “Three-K” program holds promise for sustainable implementation and serves as a foundation for the establishment of a well-organized School Dental Health Program.

Keywords: Early Childhood Caries, dental caries, teacher empowerment, participatory learning, school dental health program.

Passive Smoking and The Risk for Non-Syndromic Cleft Lip/Palate: A Case-Control Study

Araya Pisek¹, Christy M. McKinney², Benja Muktabhant³, Waranuch Pitiphat¹

¹ Division of Dental Public Health, Department of Preventive Dentistry, Faculty of Dentistry, Khon Kaen University, Khon Kaen, Thailand.

² Division of Craniofacial Medicine, Department of Pediatrics, University of Washington, and Seattle Children's Research Institute, Seattle, WA, USA.

³ Department of Public Health Administration, Health Promotion and Nutrition, Faculty of Public Health, Khon Kaen University, Khon Kaen, Thailand.

Background: While exposure to tobacco smoke during pregnancy is a known risk factor for congenital anomalies, the evidence regarding maternal passive smoking and its link to cleft lip with or without cleft palate (CL/P) remains inconsistent. Furthermore, there is a lack of data on the dose-response relationship, particularly within Southeast Asian populations. **Objective:** This case-control study aimed to evaluate the associations between maternal passive smoking and the risk of CL/P in offspring. **Methods:** This study included 94 children with CL/P (cases) from a teaching hospital in Khon Kaen, Thailand, and 94 unaffected children (controls) from well-baby clinics in the same region. Controls were frequency-matched to cases on date of birth and maternal education. Data on smoke exposure and other confounders were collected via a structured interview. Multiple logistic regression was used to calculate adjusted odds ratios (aORs) and 95% confidence intervals (CIs). **Results:** After adjusting for confounders, maternal passive smoke exposure was associated with a sixfold increased odds of having a child with CL/P (aOR 5.88; 95% CI, 2.47-14.04, $p < 0.001$). A strong dose-response relationship was observed; compared to no exposure, low daily exposure was associated with a fourfold increased risk (aOR 4.03; 95% CI, 1.54-10.54), while high daily exposure was associated with a 12.5-fold increased risk (95% CI, 3.26-47.52; p for trend < 0.001). This association remained significant in a subgroup analysis of mothers with no family history of oral clefts. **Conclusion:** Maternal passive smoking is a significant, dose-dependent, environmental risk factor for CL/P. This evidence strengthens public health recommendations that avoiding secondhand smoke exposure during pregnancy is critical for preventing this congenital anomaly.

Keywords: Passive smoke, orofacial clefts, risk factors, cleft lip and palate

Influence of Different Access Cavity Designs on The Fracture Resistance of Endodontically Treated Teeth

Ahmad Fareez Abdul Aziz¹, Tahir Yusuf Noorani¹, Nik Rozainah Nik Abdul Ghani¹, Mohamad Syahrizal Halim¹.

¹Conservative Dentistry Unit, School of Dental Sciences, Universiti Sains Malaysia, Health campus, Kubang Kerian, Kelantan, Malaysia

Background: This research aim to determine the effect of various endodontic access cavity designs on the fracture strength of endodontically treated teeth. **Objectives:** To compare the fracture resistance of teeth accessed with TEC, CEC and truss access cavity and to understand the synergism between the design of the cavity preparation and fracture resistance of teeth. **Methods:** Eighty intact human first mandibular molars extracted for periodontal or other reason were collected and randomly assigned to four groups (n=20), control (intact teeth), Traditional endodontic access cavity (TEC), Conservative endodontic access cavity (CEC) and Truss endodontic access cavity (TREC). Teeth in the TEC group were prepared following the principles of TEC. Minimally invasive and orifice directed endodontic access were prepared in CEC and TREC groups respectively. All access cavities were then restored with composite and teeth in all groups were loaded until fracture using a mechanical testing machine. The maximum load at fracture and fracture patterns (restorable or unrestorable) were recorded. Fracture loads were compared statistically using ANOVA, and Chi-Square test for multiple comparisons. Level of significance was set at $P=0.05$. **Results:** The mean load at fracture for TEC was significantly lower than CEC, TREC and control groups ($P<0.05$). No significant difference was observed between CEC, TREC and control groups ($P>0.05$). Unrestorable fractures were significantly more frequent in all three endodontic access groups ($P<0.05$) as compared to intact teeth. **Conclusion:** Teeth with TEC showed lower fracture strength than teeth with CEC or TREC. TREC did not increase the fracture strength of teeth as compared to CEC. Intact teeth showed more restorable fractures than all prepared ones.

Keywords: Traditional endodontic access cavity, conservative endodontic access cavity, fracture resistance, truss endodontic access cavity

Betel Quid Chewing Among Indigenous Communities in Malaysia: Findings from the Oahs 2022

Nurulasmak Mohamed¹, Habibah Yacob Ya'akub¹, Suzana Sharif², Chan Ying Ying³, Muhamad Khairul Nazrin Khalil³

¹Epidemiology and Oral Health Research Unit, Oral Health Programme, Ministry of Health Malaysia.

²Negeri Sembilan State Oral Health Division, Ministry of Health Malaysia.

³Centre for Family Health Research, Institute for Public Health, National Institutes of Health, Ministry of Health Malaysia.

Background: Widely practiced across many Asian countries, betel quid chewing remains a deeply rooted cultural habit among Malaysia's indigenous Orang Asli population. However, mounting evidence highlights its association with significant health risks, including oral cancer, metabolic and cardiovascular disorders, and negative maternal outcomes such as low birth weight. **Objectives:** This study aims to determine the prevalence of betel quid chewing and it's associated among Orang Asli communities in Peninsular Malaysia. **Methods:** Data were derived from the Orang Asli Health Survey (OAHS) 2022, a nationwide community-based cross-sectional study though a face-to-face interview by trained enumerators. A total of 10,877 Orang Asli individuals aged 13 years and above were included in the analysis. Descriptive and inferential statistics were used to analyse prevalence and associated factors. **Results:** The overall prevalence of betel quid chewing was 45.5%. The most consumed component was betel leaf (66.3%). Factors significantly associated with betel quid use included being female, belonging to the Proto-Malay tribe, marital status (married/living with a partner), employment status (employed or housewife/homemaker), tobacco use, and alcohol consumption. **Conclusion:** Betel quid chewing remains highly prevalent among Orang Asli populations, particularly among women and those with concurrent risk behaviours. Culturally appropriate and targeted cessation programmes are urgently needed to address this issue and promote health equity in indigenous populations.

Keywords: Betel quid chewing, orang asli, indigenous health, risk behaviours, malaysia

Effect of Water Intake and Water Swishing Immediately After an Acidic Challenge on the Salivary Ph

Klarisse L. Antonio¹, Angelica C. Napiza¹, Kayela Reine A. Patiag¹, Gay A. Raralio²

¹ Department of Community Dentistry, College of Dentistry, University of the Philippines Manila, Philippines

² Department of Clinical Dental Health Sciences, College of Dentistry, University of the Philippines Manila, Philippines

Background: The increasing consumption of sugar-sweetened beverages (SSBs) among Filipinos, as reported in the 2013 Food Consumption Survey (FNRI-DOST), raises concern for oral health due to their role in lowering salivary pH and promoting enamel demineralization. SSB consumption, particularly soft drinks, increases with age and contributes to a drop in salivary pH below the critical level of 5.5, promoting enamel demineralization and caries risk. While saliva gradually neutralizes acidity, brushing immediately after consuming acidic drinks can aggravate enamel erosion. Current guidelines recommend a 30 to 60-minute wait before brushing, though this is not consistently followed. Water intake may aid in accelerating pH normalization, potentially reducing this waiting time and for better compliance. **Objectives:** This study aimed to determine the effect of four different treatment interventions on the rate of salivary pH recovery following an acidic challenge. **Methods:** A Two-Factor Repeated Measures Design with participant blocking was conducted with 22 students from the UP Manila College of Dentistry. Participants underwent four post-acid exposure interventions: no treatment, drinking water, water swishing, and drinking plus swishing. Unstimulated salivary pH was recorded at baseline, post-acidic challenge, and at 0, 5, 10, and 15 minutes using the Horiba LAQUAtwin pH meter. Data were analyzed using Three-Way ANOVA and Tukey's post hoc test ($\alpha = 0.05$). **Results:** Significant effects were found for treatment method ($p = 1.594e-06$), time ($p < 2.2e-16$), and participant variability ($p = 3.397e-16$). Water swishing for 20 seconds, upon measuring immediately after, significantly improved salivary pH recovery compared to other methods (p -values < 0.006). Regardless of intervention, salivary pH returned to baseline after 15 minutes. **Conclusion:** All interventions aided salivary pH normalization after an acidic challenge, with swishing being the most effective due to its stimulation of salivary flow via oral mechanoreceptors. A 15-minute wait was sufficient for pH recovery regardless of method.

Keywords: salivary pH, acidic challenge, water swishing, water intake, drinking water

Impact of an AI-Based Oral Health Program Utilizing Dental Plaque Analysis on Oral Health in The Elderly

Hye-Ran Eun ¹, Min Park¹, Jae-Young Lee^{2,3}

¹ Department of Public health Science, The Graduate School of Dankook University, Republic of Korea

² Research Institute, Thomastone, Republic of Korea

³ Department of Dental Hygiene, College of Health Science, Dankook University, Republic of Korea

Background: By 2025, Korea is expected to become a super-aged society, with older adults making up over 20.6% of the population. Oral health is essential to overall well-being in the elderly and requires greater attention. As “active seniors” continue to participate in social and economic activities, supporting their oral health is crucial for maintaining quality of life in an aging society. **Objectives:** This study aimed to evaluate the effects of an AI-based dental plaque analysis program on the oral health of elderly individuals and to propose a sustainable digital health model that complements traditional face-to-face oral care approaches. **Methods:** This study was conducted from March 2024 to March 2025 and was approved by the Institutional Review Board of Dankook University (DKU 2024-05-037-002). All groups received a total of three interventions at one-month intervals. The control group ($n=24$) received only oral hygiene education, while Experimental Group 1 ($n=13$) received education along with a plaque-disclosing mouthwash, and Experimental Group 2 ($n=15$) additionally received a health monitoring app. Surveys were administered before and after the interventions during sessions 1 and 3, and RMNPI was measured at every session. **Results:** Following three repeated visits involving oral health education and interventions, RMNPI scores significantly decreased over time in all groups ($p < 0.05$). While the overall pattern of reduction across the control group, intervention group 1, and intervention group 2 was not statistically different, a significant difference was found between the control group and intervention group 2 ($p < 0.05$). No statistically significant difference was observed between intervention group 1 and intervention group 2 ($p > 0.05$). **Conclusion:** Although not superior to all interventions, the combination of self-assessment and app-based feedback in group 2 improved oral hygiene compared to the control group. To maximize long-term impact, future digital oral health programs should incorporate AI-guided feedback, personalized recommendations, and features that promote sustained user engagement.

Keywords: Aged, artificial intelligence, dental plaque, oral health, mobile applications

Impact of The Denti-I Mobile Application on Oral Health Knowledge, Attitudes, and Self-Care Behaviors: A Two-Week Pilot Study Among Pregnant Women in Vietnam

Tae-Jae Choi¹, Ji-Na Lim^{1,2}, Min Park¹, Ja-Won Cho³, Hyun-Jun Yoo³, Nitthasack Phommavongsa⁴, Yoon-Sik Cho⁵, Gi-Youn Kim⁵, Jae-Young Lee^{2,6}

¹Department of Public Health Science, The Graduate School of Dankook University, Republic of Korea, ²Research Institute, Thomastone, Republic of Korea, ³Department of Preventive Dentistry, College of Dentistry, Dankook University, Republic of Korea, ⁴Department of Pediatric Dentistry, Faculty of Dentistry, University of Health Science, Vientiane, Laos, ⁵Department of Oral Health, The Graduate School of Dankook University, Republic of Korea, ⁶Department of Dental Hygiene, College of Health Science, Dankook University, Republic of Korea

Background: Hormonal changes during pregnancy increase gingival permeability and inflammation, leading to a heightened risk of gingivitis and dental plaque accumulation. Pregnant women in disadvantaged or rural communities often have limited access to dental care and oral health education. In Vietnam, mobile health (mHealth) applications are increasingly recognized as cost-effective and scalable tools for addressing such disparities. **Objectives:** This study aims to evaluate the effectiveness and usability of a mobile application in improving oral health knowledge, attitudes, and self-care behaviors among pregnant women in Vietnam. **Methods:** This study was conducted from January to June 2025 and was reviewed and approved by the Institutional Review Board of Dankook University (DKU 2022-04-032-005). A total of 100 pregnant women were recruited from local maternal and child health centers in Vietnam. Participants used the mobile application for two weeks, which included features such as AI-based dental plaque visualization and instructional oral hygiene videos. Structured pre- and post-intervention surveys were used to assess changes in oral health knowledge, behavioral intentions, and user satisfaction. Descriptive statistics and paired t-tests were used for data analysis. **Results:** After the two-week intervention, participants' oral health knowledge scores increased significantly from 3.21 to 4.05 ($p < .001$). Awareness of proper toothbrushing techniques also improved, rising from 3.45 to 4.28 ($p < .001$). The frequency of toothbrushing and interdental cleaning showed a statistically significant increase as well ($p < .001$). The mean usability score of the application was 4.3 out of 5. These results suggest that even a short-term use of the mobile application can positively influence oral health knowledge and self-care behaviors among pregnant women. **Conclusion:** The findings of this study demonstrated that providing oral health education programs through a mobile application is effective in improving oral health knowledge and promoting positive behavioral changes.

Keywords: Oral Health, health behavior, pregnancy, mobile health units, vietnam

Validation of the Oral Health Literacy Survey Questionnaire Malaysia (Ohls-M-Q18) for Use Among Malaysian Adults

Nurulasmak Mohamed¹, Azlan Jaafar², Muhammad Zulkefli Ramlay¹, Wan Salina Wan Sulaiman³, Norkhafizah Saddki⁴, Sharol Lail Sujak⁵, Norintan Ab Murat⁶, Haslina Rani⁷, Komathi Perialathan⁸

¹ Oral Health Programme, Ministry of Health Malaysia, Malaysia, ² Faculty of Dentistry, Universiti Sains Islam Malaysia, Malaysia

³ Pahang Oral Health Division, Ministry of Health Malaysia, Malaysia, ⁴ School of Dental Science, Universiti Sains Malaysia, Malaysia

⁵ Faculty of Dentistry, Manipal University College Malaysia, Malaysia, ⁶ Faculty of Dentistry, Universiti Malaya, Malaysia, ⁷ Faculty of Dentistry, Universiti Kebangsaan Malaysia, Malaysia, ⁸ Institute for Health Behavioural Research, Ministry of Health Malaysia, Malaysia

Background: Oral health literacy (OHL) is a vital determinant of health outcomes, reflecting an individual's ability to access, understand, evaluate, and apply health-related information. There is a need for a culturally appropriate, valid, and reliable instrument to measure OHL in the Malaysian population. **Objectives:** This study aimed to develop and validate a new oral health literacy questionnaire (OHLS-M-Q18) for use among Malaysian adults aged 18 and above. **Methods:** The OHLS-M-Q18 was adapted from the Health Literacy Survey Malaysia (HLS-M-Q18) and refined through expert input, pre-testing, and psychometric validation. Content and face validity were assessed by a panel of experts and pre-tested with target users. A cross-sectional study was conducted involving 384 respondents from selected dental clinics. Construct validity was evaluated through convergent correlation with HLS-M-Q18 and Malay HeLD-14, and known-group validity using one-way ANOVA based on education level and dental visit history. Internal consistency and test-retest reliability were assessed using Cronbach's alpha and Intraclass Correlation Coefficient (ICC). **Results:** The OHLS-M-Q18 demonstrated excellent content validity (S-CVI/Ave = 0.99) and face validity. It showed strong convergent correlation with HLS-M-Q18 ($r_s = 0.78$) and moderate correlation with Malay HeLD-14 ($r_s = 0.37$). Known-group validity was confirmed by significantly higher OHLS-M-Q18 scores among respondents with higher education and recent dental visits. Internal consistency was high (Cronbach's alpha = 0.96), and test-retest reliability was excellent ($ICC > 0.90$). **Conclusion:** OHLS-M-Q18 is a valid and reliable tool for assessing oral health literacy in Malaysian adults. It holds promise for use in population research and oral health promotion initiatives.

Keywords: Oral health literacy, questionnaire validation, OHLS-M-Q18, Malaysia, psychometric analysis

Assessing The Impact of an AI-Based Oral Health Monitoring Platform for Children in Hanoi, Vietnam

Ji-Na Lim^{1,2}, Jae-Young Lee^{2,3}

¹ Department of Public health Science, The Graduate School of Dankook University, Republic of Korea

² Research Institute, THOMASTONE, Republic of Korea

³ Department of Dental Hygiene, College of Health Science, Dankook University, Republic of Korea

Background: According to the 2022 Country-specific Oral Health Profile, Vietnam lacks oral health professionals and comprehensive policies, limiting treatment and prevention for children. Although preventable, oral health services is not well integrated into national health systems. Digital health technologies—like teleconsultation, mobile self-care, and AI diagnostics—offer innovative, scalable solutions, especially in developing countries, to support sustainable remote oral health programs. **Objectives:** This study aims to evaluate the impact of an AI-based remote oral health management platform on the Simplified Oral Hygiene Index (OHI-S) among children in Hanoi, Vietnam. The results may support Official Development Assistance (ODA) initiatives and serve as foundational data for developing remote oral health care models in developing countries. **Methods:** This study was conducted from February 2022 to March 2023 and was reviewed and approved by the Institutional Review Board of Dankook University (DKU 2024-02-002-003). A total of 204 primary school students aged 8 to 10 years residing in Hanoi were enrolled. Participants were randomly assigned to either an intervention group (n=107), which used an AI-based oral health management platform, or a control group (n=97), which received conventional oral health education pamphlets. Oral hygiene behaviors, the Simplified Oral Hygiene Index (OHI-S), and dental caries indices (dft and DMFT) were assessed before and after the intervention. **Results:** The plaque index (DI) significantly decreased from baseline to the third visit in both the intervention and control groups, whereas there was no significant change in the calculus index (CI) ($p < 0.05$). The OHI-S decreased significantly from 2.49 ± 0.65 to 1.70 ± 0.76 , indicating a statistically significant improvement. **Conclusion:** This study suggests that AI-based remote oral health management platforms can be effectively utilized in developing countries with limited physical access, workforce, and healthcare resources, contributing to the improvement of children's oral health and overall well-being.

Keywords: Artificial intelligence, child, dental plaque, health behavior, vietnam

Risk Factors for Decayed Teeth Among Japanese Workers: A 2-Year Follow-Up Study Using Dental Checkup Data

Hikaru Okubo¹, Yoshiyuki Soyama², Sachiko Takehara³,
Noboru Kaneko¹, Hiroshi Ogawa³

¹ Department of Preventive Dentistry, Niigata University Medical and Dental Hospital, Japan

² Soyama Dental Clinic, Japan

³ Division of Preventive Dentistry, Department of Oral Health Science, Niigata University Graduate School of Medical and Dental Science, Japan

Background: Dental caries is common among individuals in their prime working years in Japan. Oral health behaviors and lifestyle factors can influence the development of new caries lesions; however, there is currently limited long-term evidence in the occupational setting. **Objectives:** To investigate the risk factors that contribute to the incidence of new decayed teeth in Japanese workers over 2 years. **Methods:** The subjects of this study were individuals who underwent dental examinations at their workplace in Japanese metalworking factories in 2021 and 2023 and responded to a questionnaire on lifestyle habits in 2022. The number of untreated decayed teeth in 2021 and 2023 was evaluated, and new decayed teeth were defined as subjects who had no untreated decayed teeth in 2021 but had an incidence of them in 2023. We performed a binary logistic regression analysis using the presence of new decayed teeth as the dependent variable to identify related factors. Age and gender were used as covariates, while work schedule (Shift work), BMI (Body Mass Index), family dentist availability, brushing teeth before bed, and snacking habits were considered independent variables. **Results:** A total of 2,110 workers (mean age 48.4 ± 9.1 years, 1,455 men and 655 women) were enrolled in the study, and 301 (14.3%) developed new caries. Logistic regression revealed that brushing teeth before bed ($p < 0.05$) was significantly associated with the incidence of new decayed teeth. Although not statistically significant, shift work showed a tendency toward association with new decayed teeth ($p = 0.59$). **Conclusion:** The incidence of new decayed teeth among workers was significantly associated with oral hygiene behavior, and a correlation with shift work was also suggested.

Keywords: Dental caries, occupational health, oral health, shift work schedule, longitudinal study

Dietary Factors and Oral Diseases: An Epidemiological Study

Yue Zhou¹, He Cai¹, Li Chen¹, Tao Hu

¹ State Key Laboratory of Oral Diseases & National Center for Stomatology & National Clinical Research Center for Oral Diseases & Frontier Innovation Center for Dental Medicine Plus & Department of Preventive Dentistry, West China Hospital of Stomatology, Sichuan University, Chengdu, Sichuan, China

Background: Dietary patterns are recognized as significant modifiable factors influencing oral health, yet the specific associations between diverse dietary components and various oral diseases within multi-ethnic populations, particularly in geographically distinct regions like Southwest China, warrant further epidemiological investigation. **Objectives:** To investigate the associations between various dietary habits and multiple oral diseases (including dental caries, periodontal status, and functional dentition) among residents of Southwest China, providing epidemiological evidence for oral disease prevention and control. **Methods:** Utilizing survey data from 8,142 permanent residents in Southwest China, information on dietary intake and oral health status was collected. Dietary factors served as independent variables, and oral diseases as dependent variables. Univariate and multivariate logistic regression models were constructed, controlling for confounding factors including age, gender, education level, altitude, ethnicity, and BMI. **Results:** Several dietary factors demonstrated significant associations with oral diseases. After adjusting for confounders, the consumption of tea, beef, dairy products, aquatic products, smoked meat, vegetables, and fruits remained significantly correlated ($P < 0.05$) with the prevalence of dental caries, periodontal diseases, and the maintenance of functional dentition. This suggests an independent influence of diet on oral health outcomes. **Conclusion:** A balanced diet represents a crucial modifiable factor for improving oral health. Implementing personalized dietary guidance tailored to population characteristics holds promise for reducing the risks of dental caries and periodontal diseases, and promoting the preservation of oral function.

Keywords: Dietary patterns, oral diseases, epidemiology, logistic regression

Developing A School Network Model for The 'Thai Children with Good Teeth' Program in Phanomphrai, Thailand.

Naruephorn Choosen¹, Waranuch Pitiphat²

¹ Phanomphrai Hospital, Roi-ET, Thailand.

² Division of Dental Public Health, Department of Preventive Dentistry, Faculty of Dentistry, Khon Kaen University, Khon Kaen, Thailand.

Background: Dental caries is a prevalent health issue for Thai school children. Existing school-based programs often lack the comprehensive, sustainable integration of schools, families, and communities needed for long-term success. This highlights the need for a robust, participatory operational model to improve children's oral health outcomes. **Objective:** This study aimed to develop, implement, and evaluate a participatory operational model for the 'Thai Children with Good Teeth' school network using an action research methodology in Phanomphrai. **Methods:** This action research was conducted from 2015 to 2023 in all 50 primary schools in the district. Phase1(2015) established a baseline oral health status for 3,719 students (grades 1-6). Phase2(2016-2023) involved a two-cycle development of the network model: first focusing on in-school interventions like supervised tooth brushing and managing unhealthy foods, then expanding to formalize community stakeholder participation. Phase 3 involved a final evaluation using national criteria and comparing oral health outcomes to the 2015. Descriptive statistics were used for analysis. **Results:** Baseline data from 2015 showed that 45.1% of students had caries-free permanent teeth, and 60.3% were cavity-free. After the intervention, four school networks (26 schools) successfully implemented the model, and all achieved 'excellent' national ratings. Comparative analysis revealed significant improvements by 2023: the proportion of students with caries-free permanent teeth increased to 80.5%, and the cavity-free rate rose to 84.2%. **Conclusion:** The operational model integrating schools, families, and community partners demonstrated high effectiveness. Sustained implementation of this participatory network can produce significant and lasting improvements in the oral health of school-aged children.

Keywords: School, children, dental caries

Association Between Periodontal Disease and Cardiovascular Diseases Among Indonesian Adults: Evidence from The 2018 National Basic Health Research Survey

Atik Ramadhani¹, Vita Vianti¹, Risqa Rina Darwita¹, Armasastra Bahar¹, Iwany Amalliah Badrudin¹, Anton Rahardjo¹

¹Department of Dental Public Health and Preventive Dentistry, Faculty of Dentistry Universitas Indonesia, Jakarta, Indonesia

Background: Cardiovascular diseases (CVDs) are among the leading causes of mortality worldwide, with their prevalence nearly doubling from 271 million in 1990 to 523 million in 2019, as reported by the Global Burden of Disease study. Periodontal disease (PD) has been increasingly recognized as a potential risk factor for CVDs. However, evidence from low- and middle-income countries, including Indonesia, remains limited. **Objectives:** This study aimed to investigate the association between PD and CVDs in the Indonesian adult population. **Methods:** A cross-sectional study was conducted using secondary data from the 2018 Indonesian Basic Health Research (RISKESDAS). Adults aged 20–64 years who underwent clinical periodontal examination were included ($n = 24,317$). Periodontal status was assessed based on World Health Organization criteria, including bleeding on probing (BOP), periodontal pocket depth (PPD), and loss of attachment (LOA). CVDs were identified based on self-reported medical diagnoses of stroke and/or coronary heart disease. Bivariate associations were analyzed using Chi-square tests, while multivariate logistic regression was performed to assess the adjusted association between PD and CVD, controlling for relevant covariates. **Results:** The sample was predominantly female (59.16%), and 1.96% reported a history of CVD. Participants with LOA had significantly higher odds of CVD compared to those without LOA (AOR: 2.213; 95% CI: 1.53–3.21). The logistic regression model demonstrated good fit (Omnibus test, $p = 0.001$; Hosmer–Lemeshow test, $\chi^2 = 5.95$, $p = 0.653$) and explained 17.1% of the variance in CVD status. **Conclusion:** This study demonstrates a significant association between periodontal disease and cardiovascular disease in an Indonesian adult population. These findings highlight the need for integrated care models and collaborative efforts between dental and medical professionals to reduce the burden of CVD through preventive oral health interventions.

Keywords: periodontal disease, cardiovascular disease, Indonesia, oral-systemic health, epidemiology

Divergent and Interacting Systemic Inflammatory Signatures of Apical Periodontitis and Severe Periodontitis: A Population-Based Study

Yalan Yang¹, Lei Jia², Simai Chen³, Liang Qiao³, Sulan Jiang¹, He Cai¹, Li Cheng¹, Tao Hu¹

¹ State Key Laboratory of Oral Diseases & National Center for Stomatology & National Clinical Research Center for Oral Diseases & Frontier Innovation Center for Dental Medicine Plus & Department of Preventive Dentistry, West China Hospital of Stomatology, Sichuan University, Chengdu, Sichuan, China

² School of Mathematical Sciences, University of Electronic Science and Technology of China, Chengdu, China

³ State Key Laboratory of Oral Diseases & National Clinical Research Center for Oral Diseases, West China School of Stomatology, Sichuan University, Chengdu, China

Background: While both apical periodontitis (AP) and severe periodontitis (SP) are prevalent chronic oral infections driving alveolar bone loss, they arise from distinct micro-etiological origins—the sterile root canal system versus the polymicrobial subgingival biofilm. Whether these fundamentally different pathomechanisms evoke differential or interacting systemic inflammatory responses remains unelucidated. **Objectives:** This study aimed to delineate the specific systemic inflammatory footprints of AP and SP using hematological markers in a large, well-characterized population cohort. **Methods:** A cross-sectional analysis of 448 participants (mean age 63.97 years; 63.84% female) from a natural population cohort in Southwestern China. AP and SP were diagnosed via panoramic radiography based on established criteria for bone loss. Hematological inflammatory indicators were obtained through standard complete blood count tests. Multivariable ordinary least squares regression models quantified associations, with robust adjustment for age, sex, smoking, BMI, income, comorbidities and so on. **Results:** After full adjustment, AP was robustly associated with platelet quantity and activation markers: plateletcrit (PCT) ($\beta = 0.018$, 95% CI: 0.009–0.029, $P < 0.001$), platelet count ($\beta = 16.620$, $P = 0.004$), platelet-lymphocyte ratio (PLR) ($\beta = 11.658$, $P = 0.022$), and the systemic immune-inflammation index (SII) ($\beta = 47.413$, $P = 0.049$). Conversely, SP was uniquely associated with elevated red cell distribution width (RDW-CV) ($\beta = 0.249$, 95% CI: 0.033–0.465, $P = 0.024$). A significant negative interaction between AP and SP was observed across all platelet-related indices (PCT, platelet count, PLR, SII; all interaction $P < 0.05$), indicating attenuation of AP's pro-thrombotic signature in SP coexistence. **Conclusion:** Our findings reveal that AP and SP possess distinct systemic inflammatory signatures. AP is linked to a pro-thrombotic, platelet-mediated pathway, while SP is associated with altered erythrocyte homeostasis. The observed antagonistic interaction suggests complex immunomodulatory crosstalk, challenging the paradigm of a uniform systemic response to oral infections and underscoring the necessity of disease-specific approaches in assessing systemic health risks.

Keywords: Apical periodontitis, severe periodontitis, systemic inflammation, hematological markers, oral-systemic health

Bridging The Gap: A Geospatial Analysis of Dental Care Access for Older Adults in Malaysia

Lenny Lesa¹, Budi Aslinie Md Sabri ², and Nor Faezah Md Bohari²

¹Tawau Dental District, Ministry of Health, Malaysia

²Centre of Population Oral Health and Clinical Prevention, Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Sungai Buloh, Selangor, Malaysia

Background: In Malaysia, the rising number of older adults and the higher prevalence of comorbidities raise important concerns about access to oral healthcare. As this population grows, so does the demand for dental care and health support. Therefore, ensuring equitable access to oral healthcare is a key challenge that must be addressed. **Objectives:** This study aims to map the distribution of dental clinics and identify districts with limited access to oral care among Malaysia's older adults. **Methods:** A total of 696 government and 3,751 private dental clinics were mapped against a population of 3.3 million older adults across 160 districts using ArcGIS Pro. Population data were obtained from Malaysia's Population and Housing Census 2020, and clinic locations were obtained from the Ministry of Health Malaysia. Proximity analysis was used to create 5 km, 10 km, and 20 km buffer zones around each clinic to calculate the percentage of older adults living within these distances. **Result:** Nationally, the dental clinic-to-older adult ratio is 13.3 clinics per 10,000 older adults, with government clinics contributing only 2.1 per 10,000, compared to 11.2 per 10,000 from private clinics. There is an uneven distribution of dental clinics across Malaysia's districts. The Putrajaya Federal Territory recorded the highest ratio, with 60 clinics per 10,000 older adults. Out of 160 districts, 147 (91.9%) have at least one dental clinic, while 13 districts lack any clinics. Notably, 93.1% of older adults in Malaysia live within a 20 km catchment area of a dental clinic. **Conclusion:** Significant disparities exist in the distribution of primary dental clinics for older adults, particularly in East Malaysia. Private clinics are largely concentrated in major urban centres. There is an urgent need to strengthen healthcare infrastructure in East Malaysia to address these access gaps.

Keywords: Access, dental clinic, geospatial analysis, older adults

Bright Smiles Begin Early: Community Fluoride Varnish Program in Nakhon Si Thammarat, Thailand

Thanatnon Assawattaki¹

¹Nakhon Si Thammarat Provincial Public Health Office, Thailand

Background: Early childhood caries (ECC) is a major health challenge in Thailand. In response, a province-wide fluoride varnish program targeting children aged 0–2 was launched in Nakhon Si Thammarat in 2021. Funded by the Prevention and Promotion Area-Based (PPA) scheme under the National Health Security Office (NHSO), the program integrated maternal oral care, preventive services at child development centers, and digital education to reduce ECC risk. **Objectives:** To assess the effectiveness of a community fluoride varnish program in improving service coverage and reducing ECC in children under three. **Methods:** Secondary data from the Health Data Center (2021–2024) were analyzed. Interventions included fluoride varnish at 9–24 months, caregiver brushing education, annual dental exams, and a Facebook-based chatbot campaign. ECC was measured via dmft in 3-year-olds. Z-tests compared provincial and national outcomes. **Results:** Service coverage improved over time (fluoride varnish: 24.9% in 2022 to 49.6% in 2023). In 2023, the average dmft in Nakhon Si Thammarat was 2.7 compared to the national average of 3.5. Caries-free prevalence rose from 70.7% in 2022 to 75.8% in 2023. Differences were statistically significant ($p < 0.001$). **Conclusion:** The program successfully reduced ECC by integrating preventive care, caregiver education, and digital engagement. The collaboration between local health providers and academia offers a replicable model for ECC prevention in LMICs.

Keywords: fluoride varnish, early childhood caries, oral health promotion, chatbot, secondary data

Short-Term Effectiveness of Silver Diamine Fluoride in Arresting Root Caries

Chloe Meng Jiang¹, Stephaine Tse¹, Chun Hung Chu¹, Edward Chin Man Lo¹

¹Faculty of Dentistry, The University of Hong Kong

Objective: To evaluate the short-term effectiveness of silver diamine fluoride (SDF) application in arresting root caries. **Method:** This study was part of a randomized controlled trial conducted in Hong Kong (IRB approval obtained). Older adults having active root caries were recruited and randomly allocated into two groups to be applied with either 38% SDF or placebo (tonic water) on their root carious lesions. Lesions with symptoms, such as pain, abscess and pulp exposure, were excluded from the study. Status of all root caries lesions (active or arrested) was assessed 10 weeks after SDF/placebo application. Clinical parameters, including surface and size of lesion, proximity to removable partial denture, and presence of dental plaque, were recorded. Multi-level data analysis model was employed to investigate the factors that may influence the effectiveness of SDF application. **Result:** A total of 129 older adults (mean age of 76 ± 7) were randomly allocated to SDF group ($n=64$) and control group ($n=65$). Their mean number of decayed teeth (with caries in the crown and/or root) was 3.4 ± 2.6 , and 86% of the participants had visible dental plaque on half or more of their teeth. At baseline, 209 active root caries lesions were included (SDF group, $n=101$, control group, $n=108$). Majority of the lesions were single surface ($n=186$, 89%) involving only mesial/distal surface ($n=136$, 65%). Approximately half of the lesions were near denture ($n=93$, 45%) and of small size ($n=101$, 48%). Ten weeks after SDF/placebo application, the root caries arrest rate of the SDF group was significantly higher than that of the control group (77% vs 18%; chi-square test, $p < 0.001$). Other studied factors, such as baseline caries experience, presence of plaque, lesion surface and size, and proximity to denture were not significantly associated with the percentage of arrested lesions ($p > 0.05$). **Conclusion:** SDF application is effective in arresting root caries in short-term irrespective of the lesion location, baseline caries experience and oral hygiene condition.

Keyword: Silver diamine fluoride, root caries, caries arrest, short-term effectiveness

Mapping The Prevalence of Current E-Cigarette Use Among Secondary School Children and The Proximity Of Schools to E-Cigarette Retailers in Terengganu

Name

Affiliation

Background: E-cigarette use among adolescents is a growing public health concern in Malaysia, with Terengganu reporting notably high prevalence (11.6%) in 2022. Despite the state's implementation of a sales ban in August 2025, concerns remain about prior accessibility, particularly due to the presence of retailers near schools. Examining the spatial distribution of these outlets provides valuable insights into how environmental factors may have contributed to e-cigarette use among adolescents. **Objectives:** This study aimed to assess the prevalence of current e-cigarette use among secondary school students in Terengganu and to investigate the spatial relationship between secondary school locations and the proximity of e-cigarette retailers using Geographic Information System (GIS) analysis. **Methods:** This was a retrospective cross-sectional study utilizing data obtained from school dental records data in 2024. Socio-demographic data and smoking status, including e-cigarette use, were extracted from incremental dental care records of secondary school students in Terengganu. Information on all e-cigarette retail locations for 2024 was obtained from the Non-Communicable Sector, Terengganu State Health Department. GIS was employed for spatial mapping, buffer analysis to determine proximity, and spatial analytics to examine associations. **Results:** The prevalence of current e-cig use from the total of 89,276 secondary schoolchildren, 3.34% were current e-cigarette users (2978 students are either dual or single users). Spatial mapping revealed a strong concentration of both secondary schools and e-cigarette retailers, including 24-hour establishments, primarily along Terengganu's coastal areas. A substantial proportion (109 from 142) of secondary schools were found to be within a 5km radius of these retailers. Furthermore, the analysis demonstrated a clear spatial overlap where areas with a higher density of e-cigarette retailers corresponded to higher observed densities of e-cigarette users among students. **Conclusion:** The high prevalence of e-cigarette use among secondary school students in Terengganu and the close proximity of retailers to schools prior to the ban highlight the role of environmental accessibility in influencing their behavior. The observed spatial association supports the rationale behind the statewide sales ban. Moving forward, effective enforcement of the ban, combined with continuous spatial monitoring and targeted health education is essential to curb e-cigarette use among secondary school children.

Keyword: E-cigarette use, secondary school children, retailer proximity, prevalence, terengganu

Development and Evaluation of An Ai-Based Oral Health Education Software for Children

Boyan Guan¹, Hongxin Ding², Baixiang Huang², Si Yan¹, Shuguo Zheng¹, Junfeng Zhao², Shanshan Zhang¹

¹ Department of Preventive Dentistry, Peking University School and Hospital of Stomatology, China

² School of Computer Science, Peking University, China

Background: Children's oral diseases pose a significant health burden and improving parental awareness can markedly reduce disease incidence. **Objectives:** We aimed to develop an AI-powered Q&A software tailored for children's oral health education and to evaluate the accuracy of responses to pediatric oral prevention-related questions. **Methods:** Based on "Xiaobei Health", a Chinese medical large language model, we built a specialized children's oral health knowledge base, and collectively integrated with Xiaobei Health model, using proprietary t-talk retrieval augmented generation technology. The software was deployed via a web interface and WeChat chatbot. Twelve senior pediatric dentists evaluated the software across three dimensions: accuracy, relevance, and comprehensiveness, using 100 common questions categorized into basic (n=35), intermediate (n=35), and advanced (n=30) levels. **Results:** The software achieved high expert ratings: accuracy (89.90±3.62), relevance (90.17±3.17), and comprehensiveness (90.52±3.22) out of 100. It outperformed other models like ChatGPT3.5 (68% accuracy) and ChatGLM-6B (67% accuracy), meeting clinical standards for knowledge coverage and education capability. **Conclusion:** The AI-based Q&A software is the first clinically validated application for children aged 0–12 and their parents. Future work includes randomized controlled trials to assess its impact on caries management and further software enhancements to evaluate clinical and health-economic outcomes.

Keywords: Artificial intelligence, children, oral health education, large language model, clinical evaluation

Development of a Possible Sarcopenia Risk Index in Elderly. A Study by Analyzing Oral Health Status and Function, Health Status, and Healthy Habits in Manado, North Sulawesi

Krista Veronica Siagian¹

¹Dentistry Program Study, Universitas Sam Ratulangi, Kleak, Manado, North Sulawesi, Indonesia

Background: The increasing elderly population in Indonesia presents significant health challenges, including sarcopenia, a syndrome characterized by the decline in muscle strength, muscle mass, and physical performance. This condition adversely affects quality of life and elevates the risk of complications. Sarcopenia experts globally, particularly in Asia, introduced new criteria for the screening and early detection of this condition, termed "*possible* sarcopenia." The relationship between oral health, healthy lifestyle habits, and the risk of possible sarcopenia has not been extensively studied. **Objectives:** This study aims to develop a *possible* sarcopenia risk index based on an analysis of oral function, general health status, and healthy lifestyle habits among the elderly in Manado, North Sulawesi. **Methods:** The research employs a cross-sectional design, involving 322 elderly respondents. Data were collected through interviews, oral health examinations, and physical measurements. Multivariate logistic regression analysis was utilized to identify significant risk factors and to develop the risk index. **Results:** The significant risk factors identified in this study indicate that individuals aged 70–79 years have an odds ratio (OR) of 3.81 (p=0.000), while aged 80 years and older present an OR of 25.07 (p=0.009), swallowing function with an OR of 6.21 (p=0.015), hypertension with an OR of 6.02 (p=0.000), healthy lifestyle habits with an OR of 14.30 (p=0.000), and inadequate nutritional status with an OR of 0.15 (p=0.011). The developed risk index demonstrated high accuracy, with an area under the curve (AUC) of 0.82. **Conclusion:** This research successfully developed an evidence-based *Possible* Sarcopenia Risk Index relevant to the elderly population in Indonesia. This index can serve as an early detection tool, supporting strategies for sarcopenia prevention, enhancing quality of life, and reducing public health burdens.

Keywords: Possible sarcopenia, elderly, health, oral function, health risks, healthy lifestyle habits, risk index

Dual Burden of Disability and Mortality from Oral Frailty Among Japanese Older Adults: A Competing Risk Approach

Safira Khairinisa¹, Yusuke Matsuyama¹, Sakura Kiuchi¹, Jun Aida¹

¹Department of Dental Public Health, Institute of Science Tokyo, Japan

Background: Oral Frailty (OF) is a comprehensive indicator of oral function that is associated with adverse outcomes and may contribute to both individual and population-level burden of disability and mortality. **Objective:** To examine the associations of OF with disability and mortality, also to quantify its impact at individual and population levels, accounting for their interrelationship. **Methods:** We analyzed data from 11,080 older adults aged ≥ 65 years in the 2016 Japan Gerontological Evaluation Study (JAGES), followed through March 2023 (median follow up=6.2 years). OF was assessed using five indicators: number of teeth, masticatory disability, cough reflex, dry mouth, and trouble speaking, and categorized as non-OF (0), pre-OF (1–2), or OF (3–5). Fine-Gray competing risk regression estimated disability risk, and Cox proportional hazards estimated mortality risk. Laplace regression quantified median reductions in event-free survival days. Population attributable fraction (PAF) estimated the proportion of disability and death attributable to OF. Models adjusted for sociodemographic, comorbidities, and lifestyle confounders, with missing values imputed using a random-forest approach. **Results:** Compared with non-OF participants, pre-OF participants had higher risks of disability (sub hazard ratio [SHR]= 1.22; 95% confidence interval [CI]= 1.05–1.42) and mortality (hazard ratio [HR]= 1.24; 95%CI= 1.07–1.43), with 155 fewer disability-free days and 164 fewer overall survival days. OF participants had even higher risks of disability (SHR= 1.30; 95%CI= 1.07–1.59) and mortality (HR= 1.34; 95%CI= 1.11–1.62), with 189 fewer disability-free days and 228 fewer overall survival days. PAF indicated that 10.2% of disability cases and 11.1% of mortality were attributable to pre-OF, and 3.1% and 3.5% to OF, respectively. **Conclusion:** OF was associated with higher risks of both disability and mortality, with significantly shorter event-free survival. Screening and prevention strategies targeting OF could reduce disability and death cases each year, supporting integration of oral function assessment into routine geriatric and primary care practice.

Keyword: Older adults, disability, mortality, oral frailty

Persistent Inequities in Dental Scaling Access Focusing on People with Disabilities in South Korea: Based on National Health Insurance Claims Data (July 2013 to December 2023)

Yejin Park¹, Dong-Hun, Han²

¹ Department of Food and Nutrition, College of Human Ecology, Seoul National University, South Korea

² Department of Preventive and Social Dentistry, School of Dentistry, Seoul National University, South Korea

Background: Dental scaling is an essential preventive procedure enhancing periodontal health, and since July 2013, Korea's National Health Insurance (NHI) has covered one free scaling per year for all insured individuals. Despite NHI and the establishment of Regional Dental Centers, utilization among people with disabilities remains disproportionately low. It remains unclear whether such policies have effectively reduced disparities, particularly across gender, region, and type of institution. **Objectives:** This study aimed to identify long-term disparities in dental scaling utilization by disability status, gender, region, timing of Regional Dental Center establishment, and type of dental institution. By quantifying these inequities, it seeks to guide policy to improve access to preventive oral healthcare for people with disabilities. **Methods:** We analyzed scaling utilization rates from July 2013 to December 2023 using HIRA and KOSIS data, reflecting changes in eligibility criteria and insurance cycles. Analyses and visualizations were conducted using Excel and Python. **Results:** Scaling utilization among people with disabilities remained markedly lower (0.26–1.09%) than among non-disabled individuals (10.85–27.06%), with a 24.7- to 67.3-fold gap. Gender trends showed that males with disabilities had consistently higher rates than females (male-to-female ratio: 1.11–1.46), while non-disabled females had higher rates than males (ratio: 0.90–0.96). Regionally, Seoul recorded the highest and Jeollanam-do the lowest utilization in both groups, resulting in a 30.0-fold gap among people with disabilities and 1.96-fold among the non-disabled. After the establishment of Regional Dental Centers, utilization among people with disabilities increased more rapidly, with hospitals—despite being 30 times fewer than clinics—showing 2.36 times higher usage. **Conclusion:** Disparities in scaling access remain substantial despite national policies. Expansion of Regional Dental Centers and strengthening services in dental clinics—through funding, insurance incentives—may be key to reducing inequality in preventive oral healthcare.

Keywords: Dental scaling, insurance, disability, preventive dentistry, healthcare disparities

Factors Associated with Regular Dental Check-Ups Among Japanese Residents in Southeast Asia

Yu Kubota¹, Shota Nakagawa², Hatsumi Kanatsu³, Shigeharu Tanaka⁴,
Sho Nakamura¹

¹ School of Health Innovation, Kanagawa University of Human Services, Japan.

² Malis Dental Clinic, Cambodia.

³ World Life Mapping, Inc., Vietnam.

⁴ Physical Therapy Major, Department of Rehabilitation, Faculty of Health Sciences,
Tokyo Kasei University, Japan.

Background: Regular dental check-ups play an important role in maintaining oral health. Overseas residents often face challenges in accessing dental check-ups in their countries of residence. **Objectives:** This cross-sectional study aimed to investigate the factors associated with regular dental check-ups among Japanese residents in developing Southeast Asia. **Methods:** Data were collected from 310 Japanese residents in Cambodia and Vietnam (males, 174; females, 136; mean age = 46.5 ± 11.3 years) using an online self-administrated questionnaire. The frequency of regular dental check-ups was classified into three outcome groups: every three or four months, six months, and never. Associated factors included sex, age, language skills, oral health insurance, lifestyle, nutritional status, oral symptoms, and oral health behaviors. **Results:** The prevalence of dental check-ups occurring every three or four, and six months, and never was 13.9%, 37.7% and 48.4%, respectively. Multinomial logistic regression analysis revealed that individuals who flossed daily and those who did not experience dry mouth were significantly more likely to have dental check-ups every three to four months a year. Alternatively, females, individuals who flossed daily had high chewing ability, did not experience tooth pain, and did not have dry mouth, were significantly more likely to undergo dental check-ups twice a year compared to the non-dental check-up group. **Conclusion:** These findings suggest that sex, oral symptoms and oral health behaviors were associated with regular dental check-ups in this population.

Keywords: Regular dental check-up, overseas residents, Southeast Asia, questionnaire

Living Alone and Oral Health Disparities in Chinese Elderly: A National Cross-Sectional Study

Qingqing Weng^{1,2}, Jiaxin Li¹, Hao Zhang^{1,2}, Xiaoli Zeng^{1,2}, Ying Zhang^{1,2*}

¹ Department of Preventive Dentistry, Shanghai Stomatological Hospital & School of Stomatology, Fudan University, Shanghai, China

² Shanghai Key Laboratory of Craniomaxillofacial Development and Diseases, Fudan University, Shanghai, China

Background: With China's rapidly aging population, the oral health of elderly people living alone has become a growing concern due to their limited social support and potential health disparities. **Objectives:** This study aimed to: (1) Compare oral health status between Chinese adults aged 65–74 living alone versus those cohabiting with others; (2) Identify factors influencing oral health disparities. **Methods:** A cross-sectional analysis utilized data from China's 4th National Oral Health Survey, including 4,406 participants (312 living alone; 4,094 cohabiting). Oral examinations assessed caries, periodontal status, and tooth loss; structured questionnaires captured demographics, socioeconomic status, behaviors, and self-perceived oral health. The survey was conducted according to the basic methods proposed by the World Health Organization (WHO). **Results:** Elderly living alone (7.1%) showed worse oral health: higher tooth loss (8.26 ± 8.14 vs. 6.76 ± 7.89 , $p < 0.001$), poorer periodontal status ($p = 0.005$), lower oral health knowledge scores (5.88 ± 2.51 vs. 6.32 ± 2.31 , $p = 0.016$), and worse self-perceived oral health ($p = 0.028$). Regression confirmed living situation, age, gender, education, brushing frequency, and oral health knowledge/attitudes as key predictors of oral health outcomes ($p < 0.05$). **Conclusion:** Oral health is significantly poorer among Chinese seniors living alone, driven by socioeconomic and behavioral factors. Targeted interventions—including enhanced social support, financial aid, and oral health education—are urgently needed for this vulnerable group.

Keywords: Oral health, living alone, elderly, china

Understanding Factors Affecting Mhealth Use in Oral Healthcare for Older Adults: An Application of the UTAUT Model

Tanti Irawati Rosli¹, Halima Sadia Hakim¹, Atika Ashar², Haslina Rani¹

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

²Department of Craniofacial Diagnostic and Bioscience, Faculty of Dentistry, Universiti Kebangsaan Malaysia, Malaysia.

Background: The use of mobile health technologies (mHealth) in oral healthcare has significant potential for improving the oral health status of the community. Despite its benefits, the uptake of mHealth among older adults remains limited. **Objectives:** This study aims to assess the factors influencing older adults' intention to adopt mHealth in oral healthcare by employing the Unified Theory of Acceptance and Use of Technology (UTAUT) model, with the addition of trust, mobile literacy, and mobile self-efficacy moderators. **Methods:** A cross-sectional study was conducted through a face-to-face questionnaire survey to 217 members of older adults' activity centres (*Pusat Aktiviti Warga Emas, PAWE*) in Kuala Lumpur and Selangor, Malaysia. The hypothesis was tested using factor analysis and multiple linear regression. **Results:** Data analysis demonstrated that behavioural intention was significantly associated with social influence and facilitating conditions. Mobile self-efficacy significantly moderated the relationship between effort expectancy and behavioural intention. Overall, if older people believe that decision to adopt mHealth are influenced by family members and social surroundings, and also available resources and knowledge, there is an increase in their intention to use them. **Conclusion:** The findings correspond with the UTAUT model and may contribute to the development of evidence-based strategies for mHealth in oral healthcare for older people.

Keywords: mHealth, older people, oral health

An AI-Based Intraoral Assessment Tool for Caries, Prostheses, Restorations, and DMFT Status to Support Oral Health Surveillance and Policy Planning

Ahmad Khairil Denta Aulia¹, Khansa Putri Humaira¹, Iwan Dewanto²

¹ Faculty of Dentistry, Universitas Muhammadiyah Yogyakarta, Indonesia

² Department of Dental Public Health, Faculty of Dentistry, Universitas Muhammadiyah Yogyakarta, Indonesia

Background: Standardized oral health data remains limited in many public health systems, particularly in underserved populations. In the digital era, there is a growing need for tools that can automate and standardize dental assessments to support accurate diagnosis, data-driven planning, and scalable surveillance. Identifying dental conditions—such as caries, restorations, and prostheses—through digital imaging and AI can enhance individual care and population-level policy design, while also improving data quality for national oral health systems. **Objectives:** This study evaluates the performance of DentMY-IOA (Intra Oral Assessment), an AI-based imaging system for detecting caries, prostheses, restorations, and calculating DMFT status from standardized intraoral photographs. **Methods:** A total of 1,000 intraoral photographs were collected at 1600×768 resolution with standardized angulations from patients at Universitas Muhammadiyah Yogyakarta Dental Hospital (RSGM UMY). DentMY-IOA, trained on annotated datasets, analyzed each image to detect dental conditions and compute DMFT scores. Its outputs were compared to manual charting performed by four calibrated dental examiners. Sensitivity, specificity, Cohen's Kappa, and paired t-tests were used to assess diagnostic and numerical agreement. **Results:** DentMY-IOA achieved sensitivity and specificity exceeding 90% across all diagnostic categories. Agreement with manual charting yielded a Cohen's Kappa of 0.89, reflecting excellent concordance. The system reliably detected caries, restorations, and prostheses, and computed accurate DMFT scores. Paired t-tests showed no significant difference between DentMY-IOA and manual DMFT results ($p > 0.05$), supporting its numerical validity. Additionally, DentMY-IOA generated structured, interoperable data suitable for health system integration and public health planning. **Conclusion:** DentMY-IOA is a valid, scalable AI tool for structured oral health assessments and digital data integration in clinical and public health contexts.

Keywords: Dental AI, caries detection, dmft analysis, oral health data

Validation of DentMY-ID: A Portable Dental Imaging Tool for Generating Digital Odontograms in Low-Resource and Disaster-Affected Settings

Dheana Aurelia Zikry¹, Khairunnisa Nafisah Sabira¹, Iwan Dewanto²

¹ Faculty of Dentistry, Universitas Muhammadiyah Yogyakarta, Indonesia

² Department of Dental Public Health, Faculty of Dentistry, Universitas Muhammadiyah Yogyakarta, Indonesia

Background: Indonesia has over 129 active volcanoes and densely populated areas; it often experiences volcanic eruptions, earthquakes, floods, and tsunamis. Awareness of forensic dentistry is high—89% acknowledged its importance, and 99.4% understood the role of dental records in human identification—yet only 26% reported consistently compiling complete dental charts for new patients. Common barriers include the absence of standardized charting templates and time constraints, highlighting the need for accessible, efficient tools to improve oral health record-keeping. **Objective:** This study aims to assess the diagnostic concordance between odontograms generated by DentMY-ID—a novel, portable dental imaging system—and conventional manual charting performed by calibrated dental examiners. **Methods:** A total of 1,000 standardized intraoral photographs were collected from patients at Universitas Muhammadiyah Yogyakarta Dental Hospital (RSGM UMY) using fixed angulations and 1600×768 pixel resolution. DentMY-ID, a smartphone-based platform, converted these images into structured digital odontograms. Simultaneously, four calibrated final-year dental students independently completed manual odontograms. Each manual chart was compared to the corresponding DentMY-ID output. Paired t-tests and Cohen's Kappa were used for statistical analysis. **Results:** Cohen's Kappa value of 0.88 indicated strong inter-examiner reliability. The average discrepancy between DentMY-ID and manual charting was below 4%, mostly involving differences in tooth status classification and notation of restorations or missing teeth. DentMY-ID demonstrated high fidelity in reproducing odontogram components aligned with INTERPOL's standards. Paired t-tests revealed no significant differences ($p > 0.05$), indicating DentMY-ID performs comparably to manual methods. Its outputs were complete, structured, and suitable for both health data systems and ante-mortem identification records. **Conclusion:** DentMY-ID reliably produces standardized digital odontograms, supporting integration into health information systems and contributing to ante-mortem dental data collection in diverse settings.

Keywords: Digital Odontogram, Portable Dental Tool, Dental Data System, Oral Health Records

Effects of Dioxin Exposure on Teeth Enamel in Children from Da Nang Birth Cohort Perinatally Exposed to Dioxins Originated from Agent Orange in Vietnam

Tomoya Takiguchi¹, Nghi Tran-Ngoc^{2, 6}, Muneko Nishijo¹, Masaru Sakurai¹, Yoshikazu Nishino¹, Tai Pham-The³, Thao Pham-Ngoc⁴, Hoa Vu-Thi⁵, Huong Nguyen-Thi⁶, Huy Vu-Quang⁶, Trung Vu-Ngoc⁶

¹ Kanazawa Medical University, 1-1 Daigaku, Uchinada, Japan

² Ministry of Health, Vietnam Government, Lane Nui Truc, Kim Ma, Hanoi city, Vietnam

³ Institute of Biomedicine and Pharmacy, Vietnam Military Medical University, Phung Hung, Hanoi, Vietnam

⁴ Department of Functional Diagnosis, 103 Military Hospital, Vietnam Military Medical University, Phung Hung, Hanoi, Vietnam

⁵ Department of Military Hygiene, Vietnam Military Medical University, Phung Hung, Hanoi, Vietnam

⁶ Faculty of Clinical Medicine, Hanoi University of Public Health, 1A Duc Thang, Bac Tu Liem, Hanoi, Vietnam

Background: In Vietnam, the prevalence of developmental defects of enamel (DDE) was 2.2 times higher in the Agent Orange-contaminated area than in the unaffected area. However, this previous study did not involve taking quantitative measurements of dioxin exposure levels in each participant. **Objectives:** This study aims to measure dioxin levels in breast milk and evaluate their impact on tooth development during the perinatal period. **Methods:** This study included 136 children (80 boys and 56 girls) aged 14–15 years from the Da Nang birth cohort, who were recruited from a dioxin-contaminated area around the Da Nang airbase between 2008 and 2009. Dioxin levels in breast milk donated by their mothers one month after birth were measured and used as markers for perinatal exposure. The top 25% of exposure levels were defined as the high exposure group. An Oral examination was conducted following the Oral Health Surveys: basic methods - 5th edition and the modified DDE index, and included: demarcated or hypoplasia teeth of incisors and 1st molars (DDE-IM score); decayed, missing, filled teeth of incisors and 1st molars (DMFT-IM). Poisson regression analysis was utilised to assess the relationships between oral indicators and toxic equivalency quantity (TEQ) levels of polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and PCDDs/Fs after adjusting for confounding factors. **Results:** The mean values of DDE-IM and DMFT-IM scores were 0.63 and 2.23, respectively. DDE-IM scores were increased with decreasing levels of TEQ-PCDDs and TEQ-PCDD/Fs. A DNFT-IM score was significantly decreased with increasing levels of TEQ-PCDDs, TEQ-PCDFs, and TEQ-PCDDs/Fs. **Conclusion:** These results suggest that high dioxin exposure during the perinatal period, originating from Agent Orange, may decrease the prevalence of DDE and dental caries.

Keywords: Agent orange, dental caries, developmental defects of enamel

Cutoff -Values of Patient Denture Assessment Based on Denture Treatment Need in Removable Complete Dentures

Tin Thinzar Linn¹, Phichaya Phimonwongsaphorn¹, Pinpinut Wanichsaithong², Pimduen Rungsiyakull¹

¹ Department of Prosthodontics, Faculty of Dentistry, Chiang Mai University, Thailand

² Department of Family and Community Dentistry, Faculty of Dentistry, Chiang Mai University, Thailand

Background: Removable complete dentures require varying levels of care, from routine maintenance to full replacement, due to alveolar bone resorption and daily wear. Patient denture assessment (PDA) questionnaire is a useful adjunct tool to evaluate denture prognosis. **Objectives:** To identify accuracy of PDA cutoff score among the four categories of denture treatment need by dentist assessment. **Methods:** A total of 107 edentulous patients, 57 patients with conventional complete denture and 46 patients with two implants-retained overdentures in mandibular arch, with opposing maxillary arch with conventional complete denture rated PDA questionnaire composed of 20 question items and containing five subscales: function, lower denture, upper denture, aesthetic and speech and importance with 100-mm VAS. A prosthodontist decided the denture treatment need by denture quality assessment. Correlation between PDA and denture treatment needs was analyzed using Spearman's rank correlation coefficient. PDA cutoff values for four groups of treatment-need: group (1) no need of treatment, group (2) maintenance need and group (3) laboratory correction necessary, and group (4) new denture necessary were determined by receiver operating characteristic curve with sensitivity $\geq 80\%$ with the highest possible accuracy rate. **Results:** Spearman's correlation coefficient between denture treatment need and PDA score was 0.622 with significant of 0.001, indicating a moderate positive correlation. PDA cutoff scores were established as follows: 0–91 mm for group (1), 91–83 mm for group (2), 83–54 mm for group (3), and ≤ 54 mm for group (4). The area under the curve (AUC) was 0.80. Accuracy rates were 47% for distinguishing between group (1) and group (2), 68% for group (3), and 96% for group (4). **Conclusion:** Patient denture assessment (PDA) can determine cases requiring laboratory correction or new denture in removable complete denture with high accuracy.

Keywords: Removable complete denture, denture treatment need, patient denture assessment (PDA), cutoff value

Effectiveness of an Interactive Oral Health Courseware on Children's Oral Health Knowledge and Practices: A Randomized Controlled Trial

Xiaoli Zeng¹, Yiwei Jiang¹, Ying Zhang¹, Jin Yu¹, Huning Wang¹, Hao Zhang¹, Dongxing Da¹

¹ Department of Preventive Dentistry, Shanghai Stomatological Hospital and School of Stomatology, Fudan University, Shanghai, China

Background: Childhood oral health is vital for lifelong wellness. Traditional lectures have limitations, whereas interactive courseware offers flexible, engaging education with practical feedback mechanisms to enhance learning. **Objectives:** To evaluate the intervention effects of interactive oral health courseware on children's oral health knowledge and practices, providing a basis for designing school-based oral health promotion programs targeting children. **Methods:** By using stratified random sampling, 872 third-grade students from 10 primary schools across 10 districts in Shanghai were selected and randomly assigned to a control group ($n=421$) and an intervention group ($n=451$). At baseline and 3 months after enrollment, the control group received traditional lectures, while the intervention group was taught using interactive courseware. Oral health knowledge and practices was assessed at baseline, 3 months and 6 months post-intervention. Data analysis was performed using SPSS 21.0, employing Chi-square tests, t-tests, and ANOVA. **Results:** The mean scores for oral health knowledge significantly increased at both 3 and 6 months post-intervention compared to baseline in both groups ($P < 0.01$), with a significantly greater improvement observed in the intervention group compared to the control group ($P < 0.05$). At 6 months post-intervention, the proportion of children brushing twice daily in the intervention group (86.3%) was significantly higher than at baseline (78.0%) ($P < 0.01$). The proportion using fluoride toothpaste significantly increased from baseline in both groups (Control group: baseline 55.8%, 6-month 72.9%; Intervention group: baseline 61.0%, 6-month 78.9%), with the intervention group showing a significantly higher proportion than the control group ($P < 0.01$). **Conclusion:** Interactive courseware can effectively enhance children's oral health knowledge levels and practices. Its teaching effectiveness is superior to the traditional.

Keywords: Interactive courseware, Children's oral health, Knowledge and practices, Intervention study

Factors Associated with Salivary IgA Variation in Healthy Young Adults

Sena Sato¹, Kazuaki Matsuo¹, Kaoru Doi¹, Reina Minoshima¹, Akira Imakiire¹, Yumiko Kawashita¹, Sakiko Soutome¹, Tatsuo Yamamoto², Koichiro Irie¹

¹Department of Oral Health, Medical and Dental Sciences, Graduate School of Biomedical Sciences, Nagasaki University, Japan

²Department of Preventive Dentistry and Dental Public Health, Kanagawa Dental University, Japan

Background: Secretory immunoglobulin A (IgA) is a key component of mucosal immunity and is abundant in the saliva. Although various behavioral, physiological, and local factors are thought to influence secretion, these mechanisms remain incompletely understood. In particular, salivary lactate dehydrogenase (LDH), a marker of epithelial damage and inflammation, has been hypothesized to be related to mucosal immune responses; however, its relationship with IgA remains unclear. **Objectives:** To investigate the factors that influence salivary IgA concentration in healthy young adults, including oral health status, salivary lactate dehydrogenase (LDH) activity, and a range of lifestyle factors such as toothbrushing frequency, physical activity, and body mass index (BMI). **Methods:** Unstimulated whole saliva was collected from 50 healthy young adults (men: 50%, mean age: 23.9 ± 2.8 years). Salivary IgA concentrations were measured using an enzyme-linked immunosorbent assay (ELISA), and LDH activity was evaluated using a colorimetric test kit (rated on an integer scale from 1 to 8). All participants underwent a comprehensive oral examination. Lifestyle data, such as toothbrushing frequency, physical activity, and stress perception, were obtained via self-administered questionnaires. Spearman's rank correlation and multiple regression analysis were used to identify potential associations. **Results:** Salivary IgA concentrations showed substantial inter-individual variability among participants, ranging from 64.2 to 394.4 pg/mL (mean $\pm$ SD: 174.5 ± 69.5 pg/mL). However, no significant correlations were observed between IgA levels and any of the evaluated factors, including oral health indices, salivary LDH activity, or lifestyle variables, such as toothbrushing frequency, breakfast consumption, physical activity, stress perception, or BMI. **Conclusion:** Although salivary IgA levels varied across individuals, no clear determinants were identified among the assessed lifestyle or physiological factors. These findings suggest that other biological factors, such as the composition of oral microbiota, may play a key role in regulating mucosal immune responses. Future studies should focus on the oral microbiome to further elucidate the mechanisms underlying IgA secretion.

Keywords: Saliva, IgA, LDH, mucosal immunity

Predictive Accuracy of Caries Risk Assessment and Recommendations: Comparison Between Mindtain Prototype and AAPD: A Case of Indonesia

Merly¹, R. Darmawan Setijanto², Taufan Bramantoro³

¹Departement of Dental Public Health and Preventive Dentistry Faculty of Dentistry, Universitas Brawijaya, Indonesia

²Departement of Dental Public Health and Preventive Dentistry Faculty of Dental Medicine, Universitas Airlangga, Indonesia

³Departement of Dental Public Health and Preventive Dentistry Faculty of Dental Medicine, Universitas Airlangga, Indonesia

Background: Dental caries in permanent teeth affects over 2 billion children worldwide, with a global prevalence of 29%, according to WHO data. In Indonesia, high caries rates among school-aged children highlight the need for early detection tools that go beyond clinical symptoms and consider behavioral and environmental risk factors. **Objective:** This study aimed to compare the predictive accuracy and recommendations of the MinDTain Caries Risk Assessment Prototype with the AAPD (American Academy of Pediatric Dentistry) assessment tool, focusing on caries risk in permanent teeth using a multilevel prevention framework. **Methods:** A quantitative study was conducted among 233 elementary school children and their mothers in Batu City, Indonesia, aged 6–12 years. Participants were divided into two age groups: 6–9 and 10–12 years. The MinDTain prototype assessed caries risk using a multilevel approach: individual (e.g., oral hygiene, diet, fluoride use), family (e.g., maternal health behavior, socioeconomic status), and school environment (e.g., dental education, preventive programs). In contrast, the AAPD tool focused primarily on clinical indicators such as recent caries, visible plaque, and enamel demineralization. **Results:** The MinDTain assessment provided detailed, layered risk profiles and specific preventive recommendations. For instance, one 9-year-old child was categorized as high risk at the individual level and moderate risk at both the family and school levels. The AAPD tool, by comparison, classified the same child into a single high-risk category without context-specific recommendations. **Conclusion:** The MinDTain prototype offers a more comprehensive and actionable assessment of caries risk by integrating individual, family, and school-level factors. Although it requires more time to complete, it supports more precise preventive strategies tailored to different domains of a child's life.

Keywords: Predictive Accuracy, Caries Risk Assessment, MinDTain Prototype, AAPD, Preventive Recommendations

Oral Health-Related Exposome and Cognitive Impairment: A Multimodal Pathway Study Based on an Aging Cohort

Yanjia Zhuang¹, Tingting Song¹, He Cai¹, Tao Hu¹

¹State Key Laboratory of Oral Diseases & National Center for Stomatology & National Clinical Research Center for Oral Diseases & Frontier Innovation Center for Dental Medicine Plus, West China Hospital of Stomatology, Sichuan University, Chengdu, Sichuan, China, Renmin South Road, Chengdu, Sichuan, China

Background: Cognitive impairment is a growing burden with aging populations. While oral health is increasingly linked to cognition, most studies focus on periodontal disease, leaving the broader role of caries, occlusion, and dentures underexplored. **Objectives:** To introduce the concept of the oral health-related exposome (OHREx), and explore the multimodal pathways linking oral health and cognitive impairment. **Methods:** Data were derived from the 2024 follow-up of the China Multi-Ethnic Cohort (mean age 68±6). Among that, participants underwent standardized oral examinations and completed structured questionnaires covering demographics, health behaviors, GOHAI, and oral frailty. Cognitive impairment was assessed using the MMSE with education-adjusted cutoffs. Exposome-Wide Association Studies (ExWAS) and inverse ExWAS were used to examine bidirectional associations between OHRExes and cognitive outcomes, adjusting for age, BMI, income, etc. Elastic Net regression identified key exposure groups. Subgroup and sensitivity analyses were stratified by sex, age and altitude, and mediation analysis was conducted to explore inflammatory and metabolic biomarkers as potential mediators. **Results:** Cognitive impairment affected 44% of participants (n=2,757). ExWAS identified residual roots ($\beta=0.04$, $P<0.001$) and decayed teeth ($\beta=0.03$, $P<0.002$) as risk factors of cognitive impairment, functional tooth loss (FTL, $\beta=-0.07$, $P<0.001$) was negatively associated with scores of orientation, Language and recall ability, while more occlusal pairs and greater chewing ability were linked to higher MMSE scores. FTL and occlusal pairs were selected as key predictors. Sensitivity analysis revealed stronger associations in women and low-altitude residents. Mediation analysis suggested indirect effects via lymphocyte%, monocyte%, hematocrit, and AST/ALT ratio. **Conclusion:** This study identified key OHRExes associated with cognitive impairment in an aging multi-ethnic cohort, potentially mediated by inflammatory and metabolic biomarkers. These findings highlight the relevance of comprehensive oral assessments in aging populations and support integrative strategies for cognitive health promotion.

Keywords: Oral health, cognitive impairment, healthy aging, functional tooth loss, ExWAS

KABOC Questionnaire: A Culturally Tailored Tool for Assessing Oral Cancer Knowledge, Attitudes and Risk Behaviours Among Orang Asli Youth in Malaysia

Doryalisa binti Zakaria¹, Zamros Yuzadi Mohd Yusof²

¹Faculty of Dentistry, Universiti Malaya, Malaysia

² Department of Community Oral Health and Clinical Prevention, Faculty of Dentistry, University Malaya, Malaysia

Background: Oral cancer poses a significant burden in Malaysia, with late diagnosis and poor outcomes disproportionately affecting underserved populations, including the Orang Asli (OA). Limited awareness and engagement in high-risk behaviours underscore the need for culturally sensitive assessment tools. To date, no validated instrument exists to evaluate oral cancer-related knowledge, attitudes, and behaviours (KAB) among OA adolescents. **Objectives:** This study aimed to develop, validate, and pilot-test a structured questionnaire to assess knowledge, attitudes, and risk behaviours related to oral cancer among OA secondary schoolchildren in Peninsular Malaysia. **Methods:** The questionnaire was developed based on national oral cancer guidelines and relevant literatures. Content and face validity were established through expert review and cognitive interviews with target users. A pilot study involving 100, 15-year-old OA students in Perak was conducted to assess the psychometric properties. Exploratory factor analysis (EFA) was used to determine construct validity. Internal consistency and test-retest reliability were assessed using Cronbach's alpha and intraclass correlation coefficient (ICC), respectively. **Results:** EFA revealed a seven-factor structure within the knowledge and attitude domains, accounting for 66.16% of the total variance. The Knowledge section demonstrated high internal consistency ($\alpha = 0.867$) and excellent test-retest reliability (ICC = 0.913). The Attitude section showed acceptable reliability ($\alpha = 0.761$; ICC = 0.865). The final KABOC questionnaire comprised 55 items across five sections, including demographic and behavioural components. **Conclusion:** The KABOC questionnaire is a valid and reliable instrument for assessing oral cancer-related KAB among OA adolescents. It offers potential for use in future research, oral health surveillance, and the development of targeted health promotion strategies in indigenous communities.

Keywords: Oral cancer, questionnaire validation, adolescent health, indigenous populations, health behaviour