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Poster Presentation Abstract

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ECG-JSG 10TH ANNIVERSARY
INTERNATIONAL SYMPOSIUM
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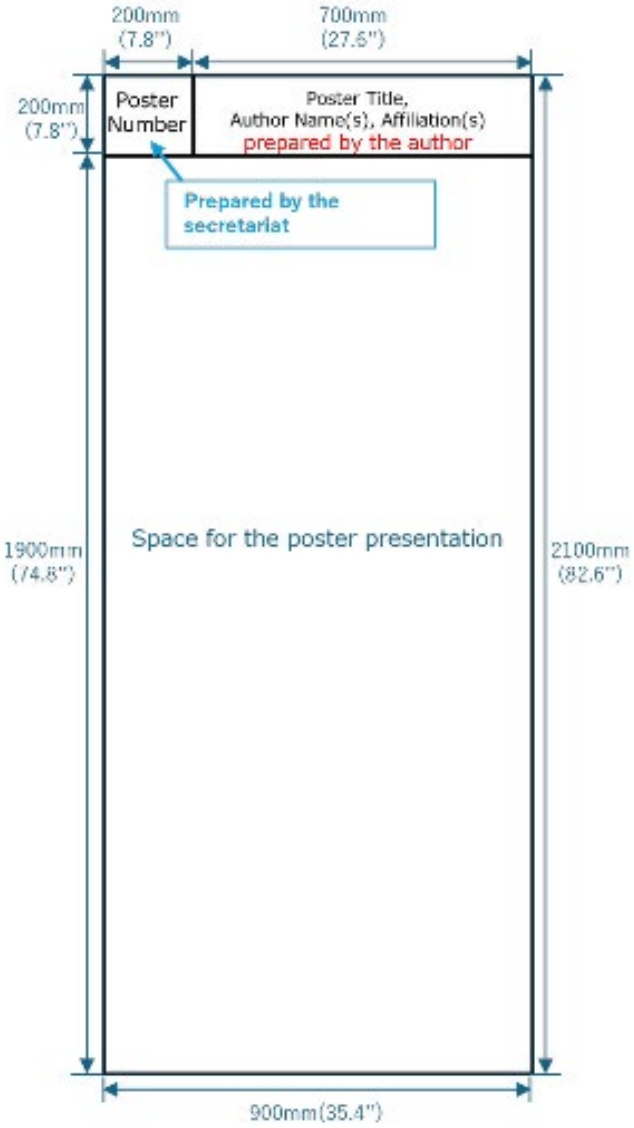

Poster Mounting

12th June 2026 (Fri), 12:00-13:00

Poster Viewing*

13th June 2026 (Sat), 08:50-09:50

**Presenters are required to be present at their poster during the poster viewing session to engage with attendees and answer questions.*

Poster Removal

13th June 2026 (Sat), 16:00-17:00

CONTENT PAGE *(Click name to see abstract)*

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Developing Competency in Geriatric Dentistry: A Multimodal Learning Approach for Undergraduate Dental Students

AUTHORS

Vipavee S.[1], Papawarin T.[1],Supachai C.[2], Orapin K.[3]

AFFILIATION

1. Postgraduate student, Department of Prosthodontics, Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand.
2. Department of Biochemistry, Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand.
3. Department of Prosthodontics, Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand.

KEYWORDS

Threshold concepts, Tacit knowledge, Simulation-based learning

Background: Developing competency in Geriatric Dentistry among undergraduate dental students is challenging because it involves threshold concepts and tacit knowledge, including empathy and patient-centered communication. Previous studies suggest that lecture-based teaching alone is insufficient to enhance students' awareness, knowledge, and clinical skills related to the care of older adults. Therefore, innovative educational approaches are needed to support competency development in Geriatric Dentistry.

Objective: This study aimed to explore barriers to learning Geriatric Dentistry—particularly threshold concepts, tacit clinical skills, and attitudes toward older adults—and to evaluate educational strategies for improving undergraduate dental students' competency. The findings were also used to inform the development of an integrated Geriatric Dentistry course.

Methods: An elective course incorporating multimodal learning activities was implemented for nine sixth-year dental students. The curriculum included the use of an age-simulation suit, case-based learning, exposure to nursing homes and dementia day-care centers, and role-play exercises to facilitate understanding of frailty across physical, sensory, and psychosocial domains. Prior to the course, students completed open-ended questions and a Google Forms questionnaire regarding their perceptions and knowledge of Geriatric Dentistry. After completing the course, students participated in focus group discussions to reflect on their learning experiences.

Results: Students reported increased empathy and reduced judgment toward older adults, particularly in relation to perceived non-compliance. The activities helped translate theoretical knowledge into practical clinical management skills, including communication adjustments, patient positioning, and risk prevention strategies. Participants also identified systemic challenges in geriatric care, such as caregiver burden and the low prioritization of oral health in long-term care settings. Overall, the multimodal curriculum was perceived as effective in fostering empathetic and patient-centered geriatric dental care.

Discussion: Several limitations should be considered. The study involved a single cohort from one institution, and perceptions were self-reported immediately after course completion. Longitudinal studies are needed to determine whether observed attitudinal and behavioural changes persist in clinical practice. Students also noted limitations of peer-based role-play in accurately simulating sensory or cognitive impairments. Future programs may benefit from incorporating standardized patients, hybrid simulation models, structured feedback, and objective performance assessments to strengthen learning outcomes.

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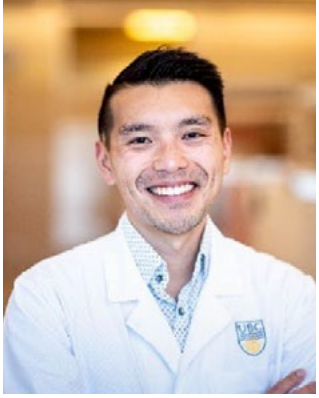

Outcomes of a Continuing Dental Education Course in Geriatric Dentistry at the University of British Columbia

AUTHORS

Nicholas Tong, Chris Wyatt

AFFILIATION

Division of Dental Geriatrics, Department of Oral Health Sciences, Faculty of Dentistry, University of British Columbia, Canada

KEYWORDS

Geriatric Dentistry education, Continuing Education, Curriculum

Background: Older adults are a clinically heterogeneous group, ranging from functionally independent to frail to functionally dependent. Clinical competency in the dental management of older adults is necessary for contemporary practice. Continuing Dental Education (CDE) in Geriatric Dentistry is becoming increasingly important to support oral health professionals with an aging dental patient demographic. The authors developed and delivered two CDE Courses in Geriatric Dentistry for the University of British Columbia Faculty of Dentistry's Division of Continuing Dental Education in 2025. The two courses focused on the oral health of frail and functionally dependent older adults. Curricular topics included rapid oral health deterioration, dental management of patients with cognitive impairment, root caries management, oral surgery considerations in geriatric patients, comprehensive geriatric patient assessment, medical risk assessment, and treatment planning in complex older adults. The course included two days of didactic instruction, a hands-on root caries simulation workshop, and one day of clinical instruction where participants observed clinical practice in a dental clinic located within a Long-Term Care facility.

Objective: The objective of this study is to document the outcomes of a Continuing Dental Education Course in Geriatric Dentistry at the University of British Columbia.

Methods: Data were collected from anonymous CDE participant surveys from April 2025 and November 2025. Data are presented using descriptive statistics.

Results: 30 dentists and dental specialists participated in two CDE programs in Geriatric Dentistry during the study period. Participants were sent a post-course evaluation survey, with a response rate of 77% (23/30). Course participants reported improvement in knowledge, skills, and attitudes related to Geriatric Dentistry. A total of 100% of participants reported that course objectives were met, with 73% reporting "Strongly Agree" and 27% reporting "Agree".

Discussion: Continuing Dental Education in Geriatric Dentistry is an important addition to the spectrum of gerodontology education, intending to support clinicians throughout their practice career. As curricular content and clinical exposure to geriatric patients is typically limited in undergraduate dental programs, CDE courses provide up to date, contemporary didactic content to improve clinician's ability to treatment plan and manage frail and functionally dependent older adults. Further expansion of educational programming in geriatric dentistry is needed to improve the oral health of older adults.

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Evaluating Postgraduate Geriatric Dentistry Dental Education: Employing Co-design in Course Development

AUTHORS

Lee Keng Yan Gabriel, Tan Wan Yong Madeleine, Tan Mei Na, Wong Mun Loke

AFFILIATION

Faculty of Dentistry, National University of Singapore

KEYWORDS

Postgraduate education, Co-design, Stakeholder

Background: Clinical postgraduate programmes in geriatric dentistry that aim to train dental practitioners with higher levels of knowledge, skills, and attitudes to manage the geriatric dental patient are few and far between. The Faculty of Dentistry at the National University of Singapore launched a Graduate Diploma in Geriatric Dentistry (GDGD) in 2019. There remains the need to evaluate its effectiveness in achieving its learning objectives, applicability for the older adult population, and ability to attract candidates.

Objective: The aim of this study was to evaluate the current course design of the GDGD programme, specifically achieving its learning objectives, fit-for-purpose-ness, and attractiveness to potential candidates, through co-design methodology.

Methods: The study employed a two-stage qualitative sequential design. First, mapping of the GDGD learning objectives to available publications and information was conducted. Next, focus group discussions (FGDs) were conducted with two major groups of stakeholders – past graduates from the programme and potential candidates. Reflective thematic analysis was conducted through a abductive approach.

Results: 8 GDGD graduates and 6 general dentists without any postgraduate training participated in the interviews. Graduates felt that while the programme gave them confidence in managing the geriatric dental patient as a whole, they lacked skillsets in managing more complex profiles such as patients with implant-related issues. The findings also suggested that there was a need for more community and long-term care based clinical sessions to enable better contextualisation of their training. Finally, both groups suggested modifications to make the course more attractive to the general dental practitioner.

Discussion: The findings of this study demonstrate the benefit of using co-design to generate a fit-for-purpose course design, beyond learning objectives alone and impacting clinical rotations and teaching schedules, that can be implemented in future iterations of the GDGD programme.

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Impact of Personalized AI-mHealth Interventions for Oral Hygiene in Non-Institutionalized Older Adults

AUTHORS

Reinhard Chun Wang Chau[1], Andrew Chi Chung Cheng[1,2], Kaijing Mao[1], Khaing Myat Thu[1], Zhaoting Ling[1], Zhuohong Gong[1], Tien Hsin Chang[3], Hong Jin Tan[4], Colman McGrath[1], Wai-Lun Lo[2], Richard Tai-Chiu Hsung[1,2], Walter Yu Hang Lam[1,5]

AFFILIATION

1. Faculty of Dentistry, The University of Hong Kong;
2. Department of Computer Science, Hong Kong Chu Hai College;
3. School of Dental Medicine, University of Pennsylvania;
4. Eastman Dental Institute, University College London;
5. Musketeers Foundation Institute of Data Science, The University of Hong Kong

KEYWORDS

Mobile Health, Artificial Intelligence, Aged

Background: Gingivitis, a preventable early-stage periodontal disease, is prevalent among seniors but often goes undetected owing to limited access to dental care. GumAI, an AI-mHealth tool that identifies gingival health and inflammation in intraoral photographs, performed satisfactorily compared with periodontists' visual assessments (sensitivity 0.9, specificity 0.5, accuracy 0.9, F1-score 0.9, and mean IoU 0.8).

Objective: This study evaluated the outcomes of a three-month community-based, personalized oral hygiene intervention (POHI) guided by GumAI.

Methods: A prospective cohort study was conducted at three centers using convenience sampling to enroll community-dwelling seniors who adopted GumAI-guided POHI. Plaque Index (PI), Gingival Index (GI), and the Geriatric Oral Health Assessment Index (GOHAI) were measured at baseline and at 3-month intervals. Participants received POHI every two weeks based on outputs from GumAI. Within-participant changes were tested with paired t-tests/Wilcoxon signed-rank tests. Differences in change scores across age, gender, and education subgroups were examined with independent t-tests/one-way ANOVA or Mann–Whitney U/Kruskal tests, as appropriate.

Results: Of 166 invited seniors, 142(86%) participated, and 101(71%) completed the 3-month follow-up. Overall, 87% showed PI improvement (mean change −1.0), 82% showed GI improvement (mean change -0.7), and 69% showed GOHAI improvement (median change +4), all statistically significant ($p<0.001$). No significant differences were observed across age, gender, or education subgroups ($p>0.05$).

Discussion: For context, a similar 3-month randomized controlled trial of an AI tool reported a control group with a non-significant PI change (mean -0.1, $p>0.05$) and a significant GI improvement (mean -0.4, $p<0.01$). Other comparable trials of traditional OHI reported inconsistent changes in GOHAI (median -1 to +2, $p>0.05$ to $p<0.01$). Together with these external comparisons, the findings suggest that GumAI-guided POHI may facilitate consistent improvements in oral health and oral health-related quality of life among seniors, supporting its potential for scalable, community-based periodontal management.

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Knowledge and Attitudes Toward Denture Hygiene and Denture-Wearing Behaviors Among Patients Attending the Special Dental Clinic at Chulalongkorn University

AUTHORS

Moe A.[1], Bichayakarn S.[2] ,Pongpisut S.[2], Orapin K.[3]

AFFILIATION

1. PhD student, Department of Prosthodontics, Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand.
2. Undergraduate students, Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand.
3. Department of Prosthodontics, Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand.

KEYWORDS

Denture hygiene knowledge and attitudes, Denture-wearing behaviors, Oral microorganisms

Background: Thailand is entering a super-aged society, and tooth loss among older adults is still increasing, resulting in greater use of removable dentures. Proper denture hygiene is essential to prevent oral and systemic diseases. However, inadequate knowledge, unfavorable attitudes, and inappropriate denture-cleaning practices may contribute to poor oral health outcomes among older denture wearers. Understanding these factors is therefore clinically important.

Objective: This study aimed to evaluate the knowledge and attitudes regarding denture cleansing and to assess denture-wearing behaviors among elderly patients attending Chulalongkorn University Special Dental Clinic (CUSDC). In addition, the study examined their associations with clinical hygiene indices and oral microbial levels.

Methods: A cross-sectional study was conducted among 48 elderly patients aged 60 years and older who had worn removable dentures for at least three months at CUSDC. Data were collected using structured questionnaires covering demographic characteristics, denture types, and denture hygiene behaviors. Clinical examinations included the Denture Cleanliness Index (DCI), Tongue Coating Index (TCI), and oral microorganism counts (CFU/mL). Associations between variables were analyzed using chi-square tests, with statistical significance set at $p < 0.05$.

Results: Among the 48 participants, most were aged 60–69 years (20, 41.7%) and female (32, 66.7%). The types of dentures included metal removable partial dentures (24, 50%), acrylic removable partial dentures (15, 31.25%), and complete dentures (9, 18.75%). Complete dentures were more common among males aged ≥80 years and females aged ≥70 years. Most participants reported cleaning their dentures twice daily (27, 56.2%), while denture-cleaning tablets were rarely used (28, 58.4%). Although the majority had received denture-care instructions (32, 66.7%) and reported no difficulties in denture use (40, 83.3%), many commonly used brushing combined with soaking (35, 72.9%) and toothpaste (23, 47.9%) for cleaning. Moderate levels of oral microorganisms (levels 2 and 3) were observed in 14 participants each (29.2%). Most participants demonstrated good denture hygiene (DCI score 0: 38, 79.17%) and low tongue coating (TCI <50%: 40, 83.3%). No significant associations were found between denture hygiene behaviors, clinical indices, microorganism levels, or demographic variables ($p > 0.05$).

Discussion: The prevalence of complete denture use increased with age, particularly among males aged ≥80 years and females aged ≥70 years. Although cleaning twice daily suggested generally good hygiene practices, denture-cleansing tablets were rarely used and abrasive toothpaste remained common, indicating gaps in patient education. Moderate levels of microbial colonization suggest that cleaning technique may be more important than cleaning frequency alone. Despite generally favourable clinical hygiene indices, no significant associations were found between denture hygiene behaviors, microbial levels, and demographic factors, indicating that oral hygiene outcomes may be influenced by multiple factors.

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Enhancing Ageing Literacy in School Children: A Pilot Study on Dementia and Oral Health Education

AUTHORS

Dr Manisha Rahaman, Professor Nikolai J Attard, Dr Alexander Schembri

AFFILIATION

Department of Oral Rehabilitation and Community Care, Faculty of Dental Surgery, University of Malta

KEYWORDS

Ageing, Dementia, Oral Health

Background: Children's perceptions of older adults and ageing are shaped early in life and can influence long-term attitudes and behaviours. Existing literature demonstrates that age-related stereotypes may develop in childhood, but can be modified through educational interventions. However, there is limited research exploring children's understanding of dementia and oral health in ageing.

Objective: To evaluate changes in awareness, perception, and knowledge of ageing, dementia, and oral health among school children following a story-based educational intervention.

Methods: A pre–post interventional study was conducted among Grade 5 and Grade 6 students (n=30) in a state school. Following parental consent and student assent, participants completed a structured questionnaire assessing awareness, perception, and knowledge. The intervention consisted of a book reading session on older adults, dentures, and dementia. Students were also provided with individual copies of the book. The same questionnaire was administered immediately after the intervention. Data were analysed using SPSS, and comparisons between pre- and post-intervention responses were conducted using the Chi-square test, with significance set at $p < 0.05$.

Results: Overall, the intervention led to improvements across awareness, perception, and knowledge domains. Grade 6 students demonstrated notable gains, with dementia awareness increasing from 46.2% to 100% and most variables reaching near-complete post-intervention scores. Among Grade 5 students, statistically significant improvements were observed in awareness of ageing-related needs ($p = 0.025$), perception towards older adults ($p = 0.020$), importance of oral care ($p < 0.001$), and knowledge of dentures ($p = 0.005$). Baseline comparisons between the two groups showed no significant differences for most variables.

Discussion: The findings suggest that a simple story-based educational intervention can significantly improve children's awareness, attitudes, and knowledge regarding ageing, dementia, and oral health. The intervention was particularly effective in younger students, highlighting the importance of early educational exposure. Further research with larger samples and long-term follow-up is recommended to assess retention of knowledge and sustained attitude change.

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Influence of Oral Health Knowledge on Community Hospital Nurses' Attitudes, Beliefs and Oral Care Practices for Older Adults

AUTHORS

Madeleine Wan Yong Tan[1, 2] , Adrian Ujin Yap[2, 3, 4], Yuen Wai Kin[4], Devi Muruganandam[5], Kelvin Wee Boon Koh[5]

AFFILIATION

1. Division of Restorative Dentistry, National University Centre of Oral Health, National University Health System, Singapore
2. Division of Dentistry, Ng Teng Fong General Hospital, National University Health System, Singapore
3. National Dental Research Institute Singapore, National Dental Centre Singapore, Singapore
4. Clinical Research Unit, JurongHealth Campus, National University Health System, Singapore
5. Department of Post-Acute and Continuing Care, Jurong Community Hospital, National University Health System, Singapore

KEYWORDS

Oral, Knowledge, Attitudes

Background: Nurses play an important role in influencing oral and general health outcomes of older adult inpatients through oral health assessment and provision of oral care. Oral health knowledge may influence nurses' personal oral health behaviours as well as their attitudes, beliefs, and clinical practices.

Objective: 1)To examine the association between nurses' oral health knowledge and their personal oral health behaviours, attitudes and beliefs, and oral care practices; 2)To determine whether oral health knowledge independently predicts attitudes and beliefs toward oral care after adjusting for demographic and professional factors.

Methods: This cross-sectional study analysed survey data from the Nursing Oral Care Education and Skills (NOCES) programme at Jurong Community Hospital, Singapore. Oral health knowledge (score range 0–10) was dichotomised into moderate and high knowledge groups (cut-off ⩾ 7). Outcomes included personal oral health behaviours, attitudes and beliefs (four subscales: importance of oral care, self-efficacy and resource adequacy, difficulty and unpleasantness of oral care tasks and professional role beliefs), and oral care practices. Group comparisons were performed using Mann–Whitney U and chi-square tests. Multivariable linear regression was used to examine independent associations (α= 0.05).

Results: Among 152 nurses (66.4% registered nurses, 33.6% nursing assistants), oral health knowledge was not associated with personal oral health behaviours (p=0.610). Higher knowledge was associated with more positive attitudes and beliefs towards oral care (p=0.033), particularly professional role beliefs (p=0.005). Nurses with higher knowledge were more likely to perform tooth brushing (p=0.021) and apply oral tissue lubricant (p=0.022). In multivariable regression, oral health knowledge independently predicted more positive attitudes and beliefs (α=0.77, p=0.024).

Discussion: Higher oral health knowledge is associated with more positive attitudes and beliefs toward oral care and selected oral care practices. Educational interventions may strengthen professional role beliefs and support consistent delivery of oral care, although additional factors beyond knowledge likely influence practice behaviours.

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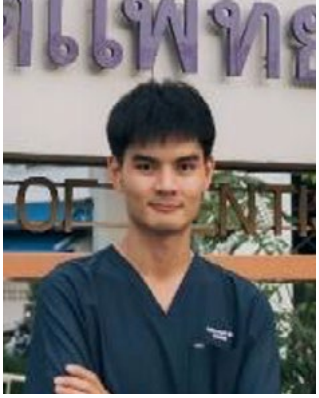
Developing a Systematic Search Strategy to Evaluate Health-related Content on YouTube



AUTHORS

Kittameth Sheranorrawanish (DDS), Supawich Morkmeud (DDS, MSc, PhD), Patimaporn Pungchanchaikul (DDS, MClinDent, PhD, FRCDS)

AFFILIATION

Division of Geriatric and Special Care Dentistry, Faculty of Dentistry, Khon Kaen University

KEYWORDS

YouTube API, Search strategy, Health-related Content

Background: For lay people, YouTube is a vast knowledge hub of health information. However, extracting and screening videos for research often lacks a systematic approach and is prone to selection bias. Developing a robust, reproducible search strategy is essential for elevating the quality of health content research on digital media.

Objective: To explore a systematic search strategy and to obtain the inclusive search terms for YouTube Data Application Programming Interface (API). The structured framework was focused on “oral care for bedridden people”.

Methods: The study consisted of two phases: Phase 1) Search term development: Free texts were grouped into two clusters i.e. “Oral Care” and “Bedridden patients” and combined using Boolean logic “AND”. All combined words were ranked by popularity using Google Trends. Final search terms were listed as input for the YouTube Data API. Phase 2) Data extraction & screening: In YouTube Data API, the top 100 relevant videos for each search term were retrieved. All videos were screened for duplication. Preliminary Data will be used for content analysis afterward.

Results: There was 12 free texts for Cluster “Bedridden patients” and 16 for Cluster “Oral Care”. Due to Thai language Grammatic Structure, 768 combinations were created. After ranking in Google Trend, 46 search terms with a Norm Score greater than “0” were retrieved. The API extraction initially yielded 4,520 videos. After duplication removal, 624 unique videos remained. Two videos that created before 2015 were excluded. The titles of videos were screened and the irrelevant were excluded. The final list for “oral care for bedridden patients” comprised 132 videos.

Discussion: Adopting the PRISMA-S checklist ensures a highly transparent and reproducible search protocol for video platforms, while integrating Google Trends objectively minimizes search term selection bias. This workflow establishes a higher sensitivity protocol than previous studies and comprehensively captures relevant videos. This might set a new standard for systematic digital searches. Ultimately, this efficient search strategy provides a robust foundation for rigorously evaluate health-related videos using standardized quality assessment tools (e.g., Global Quality Scale, modified DISCERN) and explore the correlations between content quality and engagement metrics, including likes, comments and views.

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Oral Hygiene Promotion with Motivational Hands-On Exercise using mHealth Tool for Physically Dependent Older Adults in Residential Settings: A Pilot Study in Hong Kong

AUTHORS

Khaing Myat Thu, Reinhard Chun Wang Chau, Zhouhong Gong, Kaijing Mao, Zhaoting Ling, Xiaoyu Chen, Ronnie Ruonan Zhang, Walter Yu Hang Lam

AFFILIATION

Faculty of Dentistry, The University of Hong Kong, Hong Kong SAR.

KEYWORDS

Oral Hygiene, Physically Dependent Elderly, Residential Home

Background: Oral hygiene among elderly residents in care homes is often poor due to factors such as cognitive decline, physical disabilities, mental illness, psychological distress, dependence to caregivers and caregiver inattention. The caregiver-to-resident ratio is inadequate, leading to workload-related challenges, and many caregivers face barriers to providing daily oral care. To address this, we initiated a collaborative exercise involving both residents and caregivers to teach proper oral hygiene practices and to motivate them.

Objective: 1) To assess the current oral hygiene status of elderly residents, 2) to improve their oral hygiene through a motivational exercise, and 3) to identify caregivers' difficulties in providing oral care.

Methods: Physically dependent elderly residents were recruited from two residential homes. An outreach dental team assessed their oral hygiene status and habits through clinical examinations and questionnaires. Subsequently, two trained and calibrated oral health educators conducted monthly motivational, hands-on exercise with residents and caregivers. The educators utilized a mHealth tool with artificial intelligence (AI) to instantly analyse oral photos for gingivitis and hygiene, and display results as motivational aids. Then, toothbrushing practice was performed all together. Six caregivers were also interviewed to explore their challenges in providing oral care, and encouraged them to assist and supervise residents, as demonstrated during the exercises. After three months, a follow-up clinical assessment evaluated improvements in oral hygiene. Oral hygiene before and after the intervention were compared paired T-test.

Results: Eighteen participants who has at least 3 index teeth, with a mean age of 84.56 ± 7.96 years, were involved in the study. The average number of functional teeth per person was 18.67 ± 5.36. Regarding oral hygiene habits, 5 participants (27.8%) reported brushing once daily, 12 (66.7%) twice daily, and 1 (5.6%) did not brush regularly. Additionally, 10 participants (55.6%) did not perform interdental cleansing, and 1 (5.6%) depended on caregivers for brushing. Fifteen participants (83.3%) completed follow-up, with a mean baseline plaque index of 2.14 ± 0.46, which significantly decreased to 1.51 ± 0.61 after intervention ($P < 0.05$). Caregivers cited residents' non-cooperation, limited cleansing knowledge, and fear of complications as challenges.

Discussion: The use of mHealth photo analysis provided visual proof and enhanced understanding, making oral hygiene reinforcement more effective. Group exercises and discussions helped motivate residents, who often feel lonely, supporting their learning. Hands-on training was more effective than lectures or discussions, enabling residents to practice, follow instructions, and improve their cognitive function. The caregivers could also learn proper oral care techniques, how to assist residents, and how to supervise, which also benefits their own hygiene. This pilot study highlights the need for further research into caregivers' challenges, behaviours, and attitudes toward oral health, as well as skill training and implementing similar promotion models in residential settings. Although most residents brushed regularly, their oral hygiene remained suboptimal. The hands-on motivational exercise significantly reduced dental plaque, though further improvements are needed.

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Enhancing oral hygiene in bedridden patients through domiciliary dental care: A retrospective study

AUTHORS

Ng Min Yee, Chuan-Hang Yu

AFFILIATION

School of Dentistry, Chung Shan Medical University, Taichung, Taiwan;

Department of Stomatology, Chung Shan Medical University Hospital, Taichung, Taiwan

KEYWORDS

Domiciliary dental care, bedridden, oral hygiene

Background: Domiciliary dental care (DDC) offers dental services tailored to the needs of bedridden patients, aiming to improve oral hygiene and mitigate associated risks such as pneumonia. Despite its potential, the effectiveness of DDC in enhancing oral hygiene remains underexplored, particularly in regions like Taichung, Taiwan.

Objective: This study aimed to investigate the impact of DDC on oral hygiene improvement among bedridden patients in Taichung, Taiwan.

Methods: A retrospective evaluation was conducted on 61 individuals who received DDC services in nursing homes. Oral hygiene status was assessed using the plaque index (PI), while demographic data (age, sex, cause of bedridden state) and oral findings (DMFT, number of residual roots and remaining teeth) were collected and analyzed.

Results: The study revealed a significant improvement in mean PI from 2.03 to 1.73 following DDC intervention. Stratification based on baseline median PI (2.1) showed greater improvement in the higher baseline PI group, aligning their oral hygiene levels with those of the low baseline group. Multiple regression analysis identified higher baseline PI and younger age (<43 years) as predictors of greater PI improvement, explaining 34.37% of the variance. Notably, the intervention led to a remarkable shift towards lower PI scores, with the low-to-high PI ratio improving from 1:1 to nearly 6:1.

Discussion: DDC emerged as an effective strategy for enhancing oral hygiene among bedridden patients, irrespective of baseline oral health status. These findings advocate for the expansion of DDC services to optimize oral health outcomes and accessibility for this vulnerable population in Taichung, Taiwan.

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Suction Toothbrush with Tooth Foam versus Conventional Oral Care in Dependent Older Adults: A Randomised Crossover Trial

AUTHORS

Chimruang J.[1], Saengjan W.[2] , Lunta P.[3], and Srisilapanan P.[4]

AFFILIATION

1. Department of Preventive Dentistry, Faculty of Dentistry, Naresuan University, Phitsanulok 65000, Thailand
2. Bang Krathum Hospital, Phitsanulok 65110, Thailand
3. National Health Security Office District 1, Chiang Mai 50200, Thailand
4. School of Dentistry, University of Phayao, Phayao 56000, Thailand

KEYWORDS

Oral Hygiene, Frail Elderly, Patient Satisfaction

Background: Oral health care for dependent older adults is challenging and often neglected in long-term care settings. Appropriate oral hygiene devices are essential for reducing aspiration risk and maintaining oral health. Clinical guidelines recommend suction toothbrushes for dependent older adults, supported by level 4a evidence.

Objective: To evaluate and compare satisfaction with using a suction toothbrush combined with tooth foam versus a conventional toothbrush with toothpaste for oral hygiene care in dependent older adults in hospital and community settings.

Methods: A randomised clinical crossover study (two interventions, two treatment periods of three days each) was conducted at San Sai Hospital Intermediate Care Ward, Chiang Mai (n=15 older participants, n=8 health personnel) and in the community of Bang Krathum District, Phitsanulok (n=14 older participants, n=14 caregivers). Satisfaction was measured using a 0–10 visual analogue scale at baseline and after each three-day period. Statistical analysis used paired t-tests and independent t-tests at a significance level of 0.05. The study protocol received approval from the Central Research Ethics Committee of Thailand and was registered with the Thai Clinical Trials Registry.

Results: Hospital participants and health personnel reported significantly higher satisfaction scores for the suction toothbrush and tooth foam than for conventional products ($p<0.01$). Home participants showed high satisfaction with both interventions (VAS 6.93–9.86), with no statistically significant difference between devices. Home caregivers preferred the conventional toothbrush due to familiarity and bristle softness, expressing concerns about suction device availability and bristle firmness of the suction toothbrush.

Discussion:The suction toothbrush with tooth foam was highly accepted in hospital settings. Home use requires improved device design, caregiver training, and system support to bridge the transition from intermediate to long-term community care.

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Decentralized Oral Healthcare Delivery: An Integrated Primary Care Model for Domiciliary care of Geriatric Populations in Malaysia

AUTHORS

Siti Zaleha Hamzah

AFFILIATION

Consultant and National Head of Special Care Dentistry Service, Department of Special Care Dentistry, Hospital Tengku Permaisuri Norashikin, Ministry of Health Malaysia

KEYWORDS

Domiciliary, Oral Healthcare, Geriatric

Background: The domiciliary oral healthcare service (DOHS) in Malaysia was initiated in 2015 by the Ministry of Health (MOH) under the Special Care Dentistry (SCD) purview delivered by the specialist in SCD. While the DOHS scope encompasses individuals with disabilities across the lifespan, the service is predominantly utilized by the geriatric demographic (aged ⩾ 60 years). As the national aging trend accelerates, the resulting increase in multi-morbidities necessitates a shift toward more accessible care models. Integrating DOHS into primary care settings represents a strategic decentralization intended to bypass traditional barriers to oral health care access and improve the functional health outcomes of the community-dwelling frail elderly.

Objective: 1) To empower the general dental practitioners in the primary oral health care to deliver the DOHS throughout the country; 2)To provide dental services to community members requiring oral healthcare that can only be delivered via domiciliary services by establishing an appropriate systemic framework.

Methods: The project began with online (due to COVID restriction) 2 days training in 2022 organized by the specialists in SCD in the MOH. The participants included representatives from 14 states in Malaysia. Each state was represented by one appointed DOHS team consisting of 2 general dental practitioners (GDP) and 2 dental assistants which made up of 56 participants altogether. The training focused on the DOHS guideline which was published in 2021 emphasizing on the scope of the service, patient's selection for DOHS, its implementation, method of referral, visit preparation and planning, techniques and dental charges. Upon completion of the online training, each state is responsible to organize hands-on course on DOHS for the team via a live demonstration and clinical based discussion conducted by the specialist in SCD. Subsequently, the team is able to start the service within their locality. The GDP who is involved in DOHS may consult the specialist virtually if indicated.

Results: From 2022 until June 2025, there were 118 DOHS team at primary oral health care facilities in MOH throughout the country have been trained. However, there were only 12 active DOHS team representing 10 out of 14 states.

Discussion: From 2015 to 2021, DOHS delivery was restricted to a small number of SCD specialists, creating barriers to care due to poor geographical distribution. To reach more elderly patients, the service model transitioned to include GDPs. Despite training, a lack of clinical confidence remains a significant hurdle. The 2025 guideline revision addresses these challenges by improving implementation strategies and enhancing the monitoring of trained practitioners to ensure more active participation.

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Oral Indicators associated with Depressive symptoms and Poor Sleep Quality among older adults in Bangkok long-term care facilities

AUTHORS

Siratpol S.[1], Kritsada I.[1], Salil L.[1], Pagaporn P. P.[2], Orapin K.[3]

AFFILIATION

1. Postgraduate student, Department of Prosthodontic, Faculty of dentistry Chulalongkorn University, Thailand
2. Department of Community Dentistry, Faculty of dentistry Chulalongkorn University, Thailand
3. Department of Prosthodontic, Faculty of dentistry Chulalongkorn University, Thailand

KEYWORDS

Oral health; OHAT; Xerostomia

Background: Oral hypofunction (OHF) has been associated with adverse geriatric outcomes; however, evidence from Thai long-term care (LTC) settings—particularly regarding depressive symptoms and sleep quality—remains limited. Integrating functional oral assessment (OHF) with clinical oral health status evaluation using the Oral Health Assessment Tool (OHAT) may help identify practical oral indicators related to broader well-being among institutionalized older adults.

Objective: This study aimed to investigate associations between oral hypofunction, clinical oral health status (OHAT), depressive symptoms and sleep quality among older adults living in LTC facilities in Bangkok.

Methods: A cross-sectional study was conducted among 83 residents from two LTC facilities in Bangkok. Depressive symptoms were assessed using the Thai Geriatric Depression Scale–15 (TGDS-15; cut-off ⩾8), and sleep quality was measured using the Pittsburgh Sleep Quality Index (PSQI; poor sleep >5). Oral hypofunction was evaluated across seven domains, including oral dryness assessed using an oral moisture checker, while clinical oral health status was assessed using OHAT (total score 0–16 and individual domains). Spearman correlation analyses examined associations among TGDS-15 scores, PSQI scores, OHF domain counts, and OHAT scores. Multivariable logistic regression analyses were performed to identify predictors of depressive symptoms and poor sleep quality, adjusting for age, gender, body mass index (BMI), smoking, and alcohol consumption.

Results: Depressive symptoms were present in 21.7% and poor sleep quality in 67.5%. OHF prevalence was 66.3% (mean failed domains 3.34±1.78) and mean OHAT total score was 5.80±2.67. OHAT total correlated more strongly with both depressive symptoms and poor sleep quality than OHF count.. In adjusted models, oral dryness (xerostomia) was the only OHF domain independently associated with depressive symptoms (aOR≈3.43). For poor sleep quality, no OHF domain was independently significant; however, abnormal oral cleanliness and dental pain (OHAT domains) were associated with higher odds of poor sleep (aOR≈4.82 and ≈6.24, respectively).

Discussion: Clinically observable oral problems (OHAT)—and particularly oral dryness, oral cleanliness, and dental pain—may be more informative screening indicators of depressive symptoms and poor sleep than functional impairment counts alone in LTC settings. In line with this, residents with oral dryness showed approximately threefold higher odds of depressive symptoms, while oral uncleanliness and dental pain were associated with roughly five- to sixfold higher odds of poor sleep, underscoring the potential clinical relevance of these easily observable oral findings. Findings support integrating routine OHAT and oral moisture screening with mental health and sleep screening to enable low-burden, holistic risk identification. Key limitations include cross-sectional design and sampling from two facilities; longitudinal and intervention studies are needed to test causal pathways and whether improving xerostomia and care-sensitive oral problems improves mood and sleep.

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Mapping Oral Healthcare Pathways in Long-term Care: Conceptualizing Responsibilities and Coordination Processes

AUTHORS

Sarah Koh Mun Yee[1], Luo Nan[2], Gerry McKenna[3], Sayaka Tada[1]

AFFILIATION

1. Faculty of Dentistry, National University of Singapore, Singapore
2. Saw Swee Hock School of Public Health, National University of Singapore, Singapore
3. Centre for Public Health, Queens University Belfast, Belfast, UK

KEYWORDS

Oral healthcare service, Long-term Care, Interprofessional Collaboration

Background: Globally, poor oral health remains prevalent among dependent older adults in long-term care settings (LTCs). This is partly due to poorly coordinated oral healthcare service in LTCs. To address this, strengthening interprofessional collaboration (IPC) is essential. However, without a clear understanding of how IPC in oral healthcare is structured, the development of targeted strategies to address this issue remains limited.

Objective: This scoping review aimed to map the literature on responsibilities in the provision of oral healthcare for older adults in LTCs, with a focus on how coordination is described, and to synthesize these findings into a conceptual oral healthcare pathway for LTCs.

Methods: This scoping review followed the Joanna Briggs Institute (JBI) methodological framework and is reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR). A comprehensive search was undertaken in PubMed, EMBASE, CINAHL, and SCOPUS. Studies that addressed responsibilities and coordination processes in oral healthcare provision in LTCs were included. Titles, abstracts and full-texts were screened independently by two reviewers. Data were extracted using a standardized form and analysed iteratively to map oral healthcare responsibility domains. Operational definitions were developed for each domain and subsequently organized to reflect stages of the oral healthcare pathway.

Results: A total of 1411 records were identified and 36 articles were included. The studies described a wide range of responsibilities in oral healthcare provision in LTCs. These were categorized into two stages: (i) assessment and decision-making, (ii) care provision and treatment. Responsibility domains were linked by reciprocal coordination processes such as co-development and knowledge-sharing processes. Across both stages, leadership and shared information through structured referral pathways supported alignment across professional groups.

Discussion: This scoping review conceptualized an oral healthcare pathway in LTCs. The findings suggest that oral healthcare in LTCs should be understood as a structured sequence of interdependent responsibilities and coordination processes. Policies should therefore move beyond ensuring access to dental services and instead focus on establishing integrated care models with clearly defined coordination mechanisms across professional groups. Such approaches are essential to support IPC.

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Pre-eruptive Intracoronal Resorption in Geriatric Patients: A Case Series Based on CBCT Findings

AUTHORS

Melih Ozdede

AFFILIATION

Dokuz Eylul University, Faculty of Dentistry, Izmir, Türkiye

KEYWORDS

Pre-eruptive intracoronal resorption; Cone-beam computed tomography; Geriatric dentistry

Background: Pre-eruptive intracoronal resorption (PIR) is a rare dental anomaly, most commonly reported in unerupted permanent teeth of children and adolescents. Its occurrence in geriatric patients is extremely uncommon, and data regarding its radiologic presentation in elderly populations are limited. With the increasing use of cone-beam computed tomography (CBCT), intracoronal defects that may remain undetected for decades can be incidentally identified.

Objective: To present a series of pre-eruptive intracoronal resorption cases detected in patients aged 65 years and older and to emphasize the diagnostic value of CBCT in geriatric dentistry.

Methods: CBCT images of four geriatric patients (2 males, 2 females; age range: 65–75 years) were retrospectively evaluated. All patients presented with asymptomatic intracoronal radiolucent lesions located in impacted teeth, including the maxillary left canine (tooth 23), maxillary left third molar (tooth 28), and mandibular right third molar (tooth 48; two cases). Tooth position and angulation (horizontal, mesioangular, vertical, and semivertical) were recorded. Multiplanar CBCT reconstructions were used to assess lesion extent and involvement of enamel and dentin.

Results: In all cases, well-defined intracoronal radiolucencies involving both enamel and dentin were detected on CBCT images, consistent with PIR. None of the lesions were clinically suspected prior to radiologic examination. No associated cystic changes, periapical pathology, or signs of infection were observed.

Discussion: Although PIR is predominantly described in younger populations, the present cases demonstrate that such lesions may persist asymptomatically into advanced age. In geriatric patients, intracoronal radiolucencies in impacted teeth may be overlooked or misinterpreted on conventional radiographs. CBCT enables accurate localization and characterization of these defects, supporting appropriate differential diagnosis and clinical decision-making in elderly individuals.

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Surgical Management of a Cemental Tear in a Medically Compromised Older Adult Prior to Chemotherapy

AUTHORS

Lean Heong Foo, Pei Yuan Chan

AFFILIATION

National Dental Centre Singapore, Singapore

KEYWORDS

Geriatric Dentistry, Cemental tear, Dental Clearance prior to chemotherapy

Background: Geriatric patients present a unique clinical challenge due to age-related changes in dental hard tissues and increasing medical comorbidities. Cemental tears are uncommon, often underdiagnosed, root surface defects that may cause localised periodontal destruction and pose significant infection risk in medically compromised geriatric patients.

Objective: This case report describes the diagnosis and surgical management of a cemental tear associated with a deep infra-bony periodontal defect in an older adult requiring dental clearance prior to chemotherapy.

Methods: A 63-year-old man with impaired fasting glucose, hyperlipidemia, hypertension, chronic ischemic heart disease, and follicular lymphoma was referred for pre-chemotherapy dental assessment. Clinical examination of the upper right central incisor (#11) revealed an isolated 11 mm periodontal probing depth at the mesiobuccal and mesiopalatal with Grade 1 mobility. It was not tender to percussion or palpation, was responsive to sensibility tests, and had no soft tissue anomalies. Radiographic evaluation revealed a radiopaque spicule on the mid-mesial surface of #11. Following initial non-surgical periodontal therapy, a buccal sinus tract was observed at #11 at the 6-month review, which traced to the mesial aspect of the tooth. Exploratory surgery performed under local anaesthesia revealed extensive granulation tissue within a combined one- and two-wall infra-bony defect measuring 9 mm in depth and 8 mm in width. Guided tissue regeneration was performed using deproteinised bovine bone mineral (Bio-Oss®) and a resorbable collagen membrane (Bio-Gide®), followed by flap closure with 5/0 Vicryl® sutures. Postoperative care included antibiotics, analgesics, and chlorhexidine mouthrinse.

Results: A cemental tear fragment (3 mm × 4 mm) was identified within the granulation tissue. Healing was uneventful, with probing depth reduced to 3 mm at six months and stability maintained at two-year review. Radiographic bone fill was observed on the mesial aspect of #11, and all signs of infection resolved, enabling timely dental clearance.

Discussion: Cemental tears in older adults require early recognition and definitive management to prevent oral infection prior to immunosuppressive therapy. This case demonstrates the importance of comprehensive periodontal assessment in geriatric patients and highlights successful outcomes achievable through guided tissue regeneration in medically complex individuals.

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Facial thermography and orofacial pain in adults: a prospective clinical study

AUTHORS

Rahel Häfliger, Angela Stillhart, Claudio Leles, Murali Srinivasan

AFFILIATION

Clinic of General-, Special care and Geriatric Dentsitry, Center for Dental Medicine, University of Zurich, Zurich Switzerland.

KEYWORDS

Thermography, Older adults, Pain

Background: Thermography is a non-invasive technique that can be used for diagnostic and screening purposes

Objective: This prospective clinical study assessed the changes in facial thermograms in subjects experiencing pain of orofacial origin before and after pain recovery.

Methods: Individuals reporting to the outpatient clinic with the complaint of orofacial pain were requested to participate. Eligible participants were assessed for pain intensity and facial thermographic images using a smartphone-connected thermal camera (FLIR ONE Pro for iOS; FLIR® Systems, Inc.) were made at the initial appointment (T0) and at the follow-up appointment (T1) after pain resolution. A visual analogue scale (VAS) questionnaire (Scores: 0-10) evaluating the pain intensity was also administered to each of the participant at both timepoints (T0 and T1). Additional information about the pain duration (in days) and the use of pain medications were also gathered. Participants' body temperatures were measured bilaterally using a tympanic thermometer (Braun ThermoScan®, Braun GmbH). Facial thermographic images were exported to a purpose-built software (FLIR Research Studio PRO software, FLIR® Systems, Inc.) for the thermal analysis. The overall mean temperatures of the thermogram and in the orofacial region of interest (ROI) were marked on the thermograms. Thermal data (in oC) were extracted for analysis and verified for normality using Shapiro-Wilk test ($p<0.05$). Descriptive statistics, Wilcoxon signed-rank test for paired comparison, bivariate correlation tests and Receiver Operator Characteristics (ROC) curves were used for statistical analysis.

Results: Thirty-five adults (mean age: 51.2 ± 15.9) with orofacial pain participated in this study. Reductions in the subjectively reported pain levels was observed between timepoints (T0 = 5.6 ± 2.1, T1 = 0.4 ± 0.8; $p<0.001$). All thermographic parameters were reduced at T1, concerning overall mean ($p=0.030$), ROI mean ($p= 0.001$), and maximum overall and ROI ($p= 0.006$), and body ($p= 0.003$) temperatures. Reduction in overall thermogram and ROI mean at T1 was observed in 68.6 and 82.9% of participants, respectively. Mean reduction in temperature parameters ranged from -0.46 to -0.88oC. Changes in overall and ROI were highly correlated ($rs=0.721$; $p< 0.001$), whilst no parameter correlated with pain levels. Significant differences ($p < 0.001$) were observed between overall thermogram and body temperatures at T0 (-7.5 ± 1.3) and T1 (-7.8 ± 1.5), and between ROI and body temperatures at T0 (-3.2 ± 1.1) and T1 (-3.9 ± 1.5). T0 and T1 differences were higher only for ROI (mean ± SD = +0.62 ± 1.7; $p= 0.041$). A ROC curve was obtained with AUC = 0.67 (95% CI = 0.55, 0.78; $p = 0.007$) for pain score ›3.

Discussion and Conclusions: Facial thermographic imaging can detect changes in facial temperature associated with reductions in orofacial pain levels. The findings suggest that this technique may serve as a useful, non-invasive method for identifying oral pain, particularly in vulnerable older adults.

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Dental Clearance and MRONJ Risk Management in Care-Dependent Older Adults: A Rehabilitation-Based Case Series

AUTHORS

Thani, Wan Syasliza M

AFFILIATION

Special Care Dentistry Unit, Hospital Rehabilitasi Cheras, Kuala Lumpur, Malaysia

KEYWORDS

Geriatric Dentistry, MRONJ, Dental Clearance

Background: Prior to initiating antiresorptive therapy, dental clearance is a critical prerequisite to reduce the risk of medication-related osteonecrosis of the jaw (MRONJ). In care-dependent older adults with multiple morbidity, neurological impairment, and functional limitations, achieving safe and timely dental intervention is particularly challenging, especially within a rehabilitation setting.

Objective: To describe the clinical decision-making and risk-based dental management strategies used to achieve dental clearance while mitigating MRONJ risk in medically complex older adults.

Methods: Two care-dependent older adults managed in a rehabilitation hospital are presented. The first involved an 81-year-old female with global aphasia and right hemiparesis, on long-term Alendronate therapy. The second involved a 67-year-old female with recurrent intracerebral haemorrhages and severe osteoporosis requiring dental clearance prior to commencement of Denosumab. In both cases, a comprehensive holistic assessment was undertaken, encompassing medical history, current medications, functional status, and oral health. Management strategies emphasised elimination of infectious foci, atraumatic surgical techniques, primary closure, haemostatic control, and structured longitudinal follow-up, including multidisciplinary coordination with medical teams and active caregivers involvement in daily oral care.

Results: In the first case, extraction of a retained root resulted in delayed healing with clinical features suggestive of Stage 0 MRONJ. This resolved with conservative management and vigilant monitoring, without requiring further surgical intervention. In the second case, staged extractions were necessary to safely achieve dental clearance prior to Denosumab initiation. Clinical management was complicated by hypertensive episodes, behavioural challenges during treatment, and delayed socket healing. Complete epithelialisation was achieved, enabling safe commencement of antiresorptive therapy.

Discussion: These cases highlight the complexity of dental clearance in frail older adults and underscore the importance of risk stratification, timing of intervention, and prioritisation of infection control. Atraumatic surgical techniques, primary closure, and vigilant follow-up are critical to mitigate MRONJ risk. Integration of caregivers and multidisciplinary collaboration are essential for successful outcomes. Rehabilitation-based dental care plays a pivotal role in enabling safe systemic therapy and improving overall patient stability.

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Caries Prevention Effects of Silver Diamine Fluoride on Irradiated Tooth

AUTHORS

Pheeratas Phitakthanaakul, DDS., M.Sc.[1] Pipop Saikaew, DDS., M.Sc., Ph.D.[1],
Pisol Senawongse, DDS., M.Sc., Ph.D.[1] Matsayapan Pudla, B.Sc., M.Sc., Ph.D.[2]

AFFILIATION

1. Department of Operative Dentistry and Endodontics, Faculty of Dentistry, Mahidol University, Thailand
2. Department of Microbiology, Faculty of Dentistry, Mahidol University, Thailand

KEYWORDS

Silver Diamine Fluoride, Root Caries Prevention, Radiated Dentin

Background: Radiotherapy for head and neck cancer and aging significantly increase the risk of root caries due to xerostomia and exposed root surfaces. While Silver Diamine Fluoride (SDF) is a potent, non-invasive treatment for caries prevention, standard application times can be challenging for elderly or medically compromised patients. Recent evidence suggests that light-curing may enhance silver precipitation and allow for shorter application times. This study utilizes an in vitro biofilm model to evaluate how different SDF protocols and radiation exposure of the tooth affect silver distribution and the prevention of carious lesions in root dentin.

Objective: To evaluate the caries-preventive effects of silver diamine fluoride (SDF) applied using different protocols on root dentin by assessing antibacterial activity and inhibition of carious lesion development in non-radiated (NR) and irradiated (IR) dentin.

Methods: Two hundred and forty root dentin specimens were allocated into eight groups according to dentin substrate (NR or IR) and SDF application protocol: control, 10-s application (10s), 10-s application with light-curing (10sLC), and 60-s application (60s). The distribution of silver and fluoride from the surface to a depth of 500 μm was analysed using energy-dispersive X-ray spectroscopy (n = 10). Antibacterial effects were evaluated using a multispecies biofilm model, measuring biofilm biovolume and bacterial viability after 24 h (n = 10). Carious lesion depth was assessed after 10 days of biofilm challenge (n = 10). Three-way ANOVA was used for elemental analysis, and two-way ANOVA for biofilm parameters and lesion depth (α= 0.05).

Results: The 10sLC and 60s protocols resulted in significantly greater silver precipitation at the dentin surface, with higher accumulation observed in IR dentin. All SDF-treated groups significantly suppressed biofilm formation and reduced bacterial viability compared with controls ($p < 0.05$). Lesion depth was significantly greater in IR dentin than in NR dentin ($p < 0.05$). Among the protocols, the greatest reduction in lesion depth was observed in the NR-10sLC group for NR dentin, and in the IR-10sLC and IR-60s groups for IR dentin.

Discussion: The study demonstrates that 20-light curing accelerates the chemical reaction between SDF and hydroxyapatite, promoting the rapid precipitation of silver compounds that allow a 10-second application to match or exceed the efficacy of the traditional 60-second protocol. While silver deposition was the primary factor of antimicrobial success and biofilm inhibition, fluoride levels remained consistently high across all groups, serving as a stable reservoir for remineralization. Also, radiated dentin exhibited increased porosity and susceptibility to demineralization, the incorporation of light curing can significantly enhanced surface protection and lesion prevention where a standard brief application failed. In conclusion, a 10-second SDF protocol with light curing offers a high-efficiency clinical alternative for elderly and head-and-neck cancer patients, providing potent caries prevention while minimizing chair time.

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A Case Report: Behaviour Management in a Removable Denture Patient with Cognitive Impairment

AUTHORS

Wasinee Kiatadisorn, DDS, MSc (Gerontology), Thai Board of General Dentistry

AFFILIATION

Bureau of Dental Health, Department of Health, Thailand

KEYWORDS

Cognitive Impairment, Oral Health Behaviour Management, Alzheimer's Disease

Background: Dementia is a common condition among older adults in Thailand, with prevalence estimates ranging from approximately 8–10% of the aging population (Department of Medical Services, 2023). Thailand has transitioned into an aged society and is rapidly approaching a super-aged society. Older individuals with cognitive impairment often experience difficulties in managing self-care behaviors and adhering to dental treatments, which may lead to various complications. In particular, oral health problems such as xerostomia (dry mouth), reduced salivary flow, and dysphagia (swallowing difficulties) are frequently observed in this population. These conditions can significantly impair oral function, increase the risk of oral diseases, and negatively affect nutritional status and overall quality of life.

Objective: To describe the process of complete denture repair and fabrication in a patient with late-onset Alzheimer's disease, with emphasis on optimal treatment planning and behavior management strategies.

Methods: An 85-year-old Thai male, widowed and a retired police officer, presented with difficulty chewing solid food and decayed lower anterior teeth. His medical history included Alzheimer's disease (currently treated with galantamine [Reminyl]) and controlled hypertension. Oral examination revealed retained roots at teeth 31, 32, 41, and 42, associated with gingival inflammation, heavy plaque and calculus accumulation, and severe horizontal bone loss. The maxillary arch was completely edentulous.

The existing complete dentures, fabricated by a dental technician (an inappropriate one) approximately 10 years earlier, demonstrated poor retention, inadequate stability, and compromised hygiene. Denture stomatitis Type II was observed. Oral hygiene was inadequate, and the patient reported cleaning the dentures using water only.

Systemic assessment and stress-reduction protocols were implemented throughout treatment. Behaviour management techniques appropriate for patients with dementia were emphasized, including bridging, chaining, distraction techniques, and hand-over-hand guidance during denture insertion training. Caregiver education focused on daily denture hygiene, nighttime removal of dentures, and supervised oral care. Disease control included extraction of retained roots (31, 32, 41, 42), denture adjustment and rebasing procedures, and reinforcement of oral hygiene instructions. Following adequate healing, new maxillary and mandibular complete dentures were fabricated. The patient was placed on a 3-month recall schedule for follow-up and maintenance.

Results: Following treatment, denture retention and stability improved significantly. The caregiver was able to effectively assist with denture insertion and cleaning. The patient resumed chewing solid food, showed improvement in body mass index (BMI), and demonstrated acceptable EAT-10 scores, reflecting improved swallowing function, nutritional status, and overall quality of life. Regular 3-month recall visits were scheduled to ensure ongoing maintenance and monitoring.

Discussion: This case highlights the importance of integrating behaviour management and caregiver support into oral care for patients with dementia in primary and secondary care settings.

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Poor oral health, cognitive decline, and dementia in low- and middle-income countries: a scoping review

AUTHORS

Aida Drici, Takamasa Komiyama, Daizo Seki, Yoshinori Hattori

AFFILIATION

Division of Aging and Geriatric Dentistry, Tohoku University Graduate School of Dentistry, Japan

KEYWORDS

Oral health, Dementia, LMICs

Background: In 2021, approximately 57 million people were living with dementia worldwide, over 60% of whom reside in low- and middle-income countries (LMICs). According to the WHO Global Action Plan, most new cases (71%) are projected to occur in these regions. Research has suggested a link between oral health and dementia, mainly based on studies from high-income countries. However, social, economic, and political factors strongly shape access to healthcare and health awareness, and these differ greatly between high-income and low- and middle-income countries. In low-resource settings, shared challenges may affect both oral care and dementia risk, and the lack of evidence from LMICs means findings from HICs cannot be directly applied to these populations or inform policy without further research.

Objective: In this scoping-review, we aimed to summarise the research on the association between oral health, cognitive decline, and dementia in LMICs.

Methods: A comprehensive search was conducted across PubMed, MEDLINE, Web of Science, Cochrane, CINAHL, and grey literature to perform a scoping review guided by the PCC framework: adults (›18 years), LMIC settings, and studies assessing both dementia and oral health using subjective or objective measures. Cross-sectional, cohort, case–control, and interventional studies were included.

Results: The database search identified 1,820 references; after abstract and full-text screening, 68 studies were included. These studies were mainly from middle-income countries, mostly upper-middle-income, China contributed the most (n=34), followed by India (n=14) and Brazil (n=10). Publications began in 2010 and increased in the past five years. These studies included 651,803 participants, mostly aged ›60 with a predominance of females (54.8%) and were mainly cross-sectional (n=53) or longitudinal (n=11), with case controls (n=3) and a clinical trial (n=1). These studies relied mostly on objective oral health measurements with mainly tooth loss (n=25), periodontal examinations (n=24) and oral hygiene (n=22) some examined denture use (n=15) and chewing efficiency (n=12). For subjective oral health, the use of self-reports of edentulism (n=6), tooth loss (n=11), denture wearing (n=7), oral health behaviours (n=4) and measures of oral health quality of life (n= 5) was reported. Most studies examined dementia or cognitive impairment (n=49), with fewer focusing on MCI (n=17). Outcomes were mainly assessed using objective measures, particularly the MMSE (n=35), with few studies using other tests (n=9) or self-reported measures (n=2). 62 studies reported a significant association between oral disease and cognitive impairment, while 6 reported mixed findings.

Discussion: This study summarised evidence from LMICs on the relationship between oral health and dementia. Several studies reported a significant association between the two conditions, while some reported mixed findings, indicating heterogeneity in the available evidence. Most studies explained the reported association through mechanisms such as systemic inflammation, reduced masticatory function, nutritional deficiencies, and oral pathogen-related neuroinflammation, while a few also highlighted the role of socioeconomic status. Similar limitations were reported across studies, including limited generalisability, potential biases, the predominance of cross-sectional designs, residual confounding, frequent reliance on self-reported measures, and potential reverse causality. Studies were mainly conducted in MICs, highlighting a lack of evidence from LICs. This gap may reflect competing health priorities. Additionally, the unique challenges faced by LMICs, such as limited resources, high costs and privatisation of care, as well as the migration of healthcare professionals and a focus on urgent care, may influence this association and limit the applicability of evidence from HICs. Limited policy attention and financing for both conditions further highlight the need for context-specific interventions and greater integration within frameworks such as Universal Health Coverage.

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Aging, hematinic imbalance, and oral mucosal diseases: clinical implications for geriatric dentistry

AUTHORS

Yi-Pang Lee[123], Chun-Pin Chiang[2345]

AFFILIATION

1. Taiwan Association of Geriatric Dentistry (TAGD), Taiwan
2. Department of Dentistry, Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Hualien, Taiwan
3. Institute of Oral Medicine and Materials, College of Medicine, Tzu Chi University, Hualien, Taiwan
4. Department of Dentistry, National Taiwan University Hospital, Taipei, Taiwan
5. Graduate Institute of Oral Biology, School of Dentistry, National Taiwan University, Taipei, Taiwan

KEYWORDS

Oral mucosal diseases; Hematinic deficiency; Geriatric dentistry

Background: Oral mucosal diseases (OMDs), such as oral lichen planus (OLP) and atrophic glossitis (AG), are commonly encountered in clinical practice and are particularly prevalent among middle-aged and older adults. Although traditionally regarded as localized oral disorders, increasing evidence indicates that many OMDs are closely associated with systemic conditions, including hematinic deficiencies, anemia, and metabolic abnormalities. Aging is accompanied by profound changes in immune regulation, gastrointestinal function, and nutritional status, all of which may influence the clinical presentation and pathogenesis of OMDs.

Objective: This narrative review aimed to investigate how aging influences hematinic profiles and anemia patterns in patients with OMDs, and to discuss their clinical implications for geriatric dentistry.

Methods: This review integrated findings from three clinical studies: (1) patients with OLP, with particular attention to those with hyperhomocysteinemia; (2) a cohort of AG patients stratified into younger (≤ 50 years) and older (> 50 years) groups; and (3) a cohort of female lacto-vegetarians serving as a nutritional deficiency model. These studies evaluated complete blood counts, serum iron, vitamin B12, folic acid, homocysteine levels, and gastric parietal cell antibody (GPCA) positivity. Emphasis was placed on age-related differences in hematinic imbalance, anemia phenotypes, and their potential links to oral mucosal pathology.

Results: Across OMDs, hematinic abnormalities and anemia were common but demonstrated distinct age-related patterns. In OLP, particularly among patients with hyperhomocysteinemia, higher frequencies of vitamin B12 deficiency, iron deficiency, GPCA positivity, macrocytosis, and anemia were observed, suggesting associations with autoimmune gastritis and impaired nutrient absorption. In AG patients, younger individuals more frequently exhibited iron deficiency and iron deficiency anemia consistent with nutritional insufficiency, whereas older patients showed higher rates of hyperhomocysteinemia, GPCA positivity, macrocytosis, pernicious anemia, and normocytic anemia, reflecting age-related immune dysregulation and gastrointestinal absorptive dysfunction. The lacto-vegetarian cohort demonstrated that hematinic imbalance may occur across a wide age range when dietary intake is inadequate; however, autoimmune markers were less prominent, indicating that aging contributes additional immunologic and absorptive mechanisms beyond simple nutritional deficiency.

Discussion: These findings support a conceptual shift in which OMDs may represent oral manifestations of systemic aging processes. Younger patients with OMDs are more likely to present with intake-related deficiencies, whereas older patients frequently exhibit complex phenotypes involving immune-mediated gastric pathology, impaired absorption, hyperhomocysteinemia, and mixed anemia patterns. Aging therefore modifies not only the prevalence but also the biological spectrum of OMDs.

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Clinical and gustatory profiles based on oral *Candida* culture status in patients with taste disturbances, stratified by burning mouth symptoms

AUTHORS

Sung Min Kim[1], Hong-Seop Kho[1,2]

AFFILIATION

1. Department of Oral Medicine and Oral Diagnosis, School of Dentistry and Dental Research Institute, Seoul National University, 101 Daehak-ro, Jongno-gu, Seoul 03080, South Korea (ROK)
2. Institute on Aging, Seoul National University, Seoul 03080, South Korea (ROK)

KEYWORDS

Burning mouth syndrome, *Candida*, Taste disorders

Background: Taste disturbances are common in middle-aged and older adults and can adversely affect diet, nutrition, and quality of life—issues of relevance in geriatric dentistry. These complaints often overlap with oral burning symptoms, xerostomia, and psychological distress, and subjective reports do not always correspond to objective gustatory test results. Burning mouth syndrome (BMS), characterized by persistent oral burning sensations without evident mucosal lesions, is a representative condition in which taste complaints and pain–taste interactions are frequently observed in older patients. During evaluation of taste disturbances and BMS, oral candidiasis is also frequently diagnosed, especially in individuals with reduced salivary flow. However, whether culture-detected oral *Candida* status is associated with measurable taste dysfunction remains unclear, with prior studies reporting inconsistent findings.

Objective: To describe clinical and gustatory characteristics of patients with taste disturbances according to burning mouth symptoms and oral *Candida* culture status, and to explore whether *Candida* culture positivity is associated with objective taste impairment in specific subgroups.

Methods: We retrospectively reviewed patients who presented with taste disturbances and underwent comprehensive evaluation, including oral *Candida* culture screening, taste testing using taste strips, unstimulated and stimulated whole salivary flow rate measurements, symptom questionnaires for burning mouth-related complaints, psychological assessment with Symptom Checklist-90-Revised (SCL-90-R), and routine laboratory blood tests. Patients were categorized using a six-group framework based on burning mouth symptoms (primary BMS, secondary BMS, and non-BMS) and oral *Candida* culture status (positive vs. negative). Positive *Candida* culture status was not used as a defining criterion for secondary BMS to evaluate *Candida's* independent association with study outcomes. Age-matching was applied when between-group age differences were present.

Results: Among primary BMS patients, those with a positive *Candida* culture showed no normogeusia and persistently lower objective taste scores after age-matching compared with *Candida*-negative patients. Stimulated salivary flow was lower in *Candida*-positive primary BMS and in *Candida*-positive non-BMS patients than in their *Candida*-negative counterparts. *Candida*-positive subgroups also demonstrated higher psychological distress in selected SCL-90-R domains, particularly within primary BMS and the overall BMS groups.

Discussion: Oral *Candida* culture positivity was not uniformly linked to taste impairment across all patients with taste disturbances, but it was associated with poorer objective taste function and reduced stimulated salivary flow in clinically relevant subgroups, especially primary BMS. These findings support an integrated evaluation approach combining culture-based screening, gustatory testing, salivary assessment, and psychological profiling to support etiology-based clinical management.

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Changes in the Oral Microbiota Associated with the Transition from Natural Dentition to Complete Edentulism and Complete Dentures in Older Adults: A Systematic Review and Meta-Analysis

AUTHORS

Kittipit Srisanoi*, Ayushi Tiwari, Murali Srinivasan

AFFILIATION

Clinic of General, Special Care, and Geriatric Dentistry, Center for Dental Medicine, University of Zurich, Zurich, Switzerland

* Presenting author - email: kittipit.srisanoi@zzm.uzh.ch

KEYWORDS

Oral microbiome, Edentulism, Complete denture

Background: Given the higher prevalence of tooth loss among older adults, the resulting reduction in oral niches available for bacterial biofilm formation may play an important role in reshaping the oral microbiome. In addition, the introduction of a new oral niche, such as a complete denture (CD), may further modify the microbial community and influence its ecological balance.

Objective: This systematic review aimed to investigate differences in the oral microbiome among dentate older adults, edentulous older adults, and older adults wearing CDs, regarding bacterial load, microbial diversity (alpha and beta), and relative abundance of taxa. It also aimed to examine the consequences of microbiome vchanges after CD insertion.

Methods: A systematic search of the literature was conducted across online databases [Medline (PubMed), CENTRAL, and Embase]. Studies were included if they reported on the oral microbiome in older adults (⩾65 years) in association with the exposure/intervention of interest. Meta-analysis was performed on studies comparing the oral microbiome in edentulous versus dentate individuals, as well as pre- and post-CDs insertion.

Results: A total of 260 studies were identified, and 14 studies were included. Meta-analysis revealed that edentulous older adults were less likely to harbor periodontal species (Porphyromonas gingivalis, Tannerella forsythia, Treponema denticola, Prevotella intermedia) when compared with dentate older adults (OR = 0.12; 95% CI: 0.08, 0.17). However, when edentulous older adults received CDs, they had significantly higher odds of harboring these periodontal species (OR = 3.43; 95% CI: 2.00, 5.90) during a short follow-up period. Additionally, 16S RNA sequencing studies indicated that edentulous individuals had lower bacterial diversity compared to dentate individuals, with a shift in microbial composition. Evidence to compare the microbial diversity changes post-denture insertion was not sufficient.

Discussion: Edentulous older adults may experience reduced microbial diversity and a decline in periodontal species due to the loss of natural teeth. The introduction of CDs appears to reintroduce periodontal pathogens within a short period, although alterations in overall microbial diversity have not yet been studied. Further research using advanced microbiome methodologies is needed to evaluate potentially microbial rebalancing in older adults receiving CDs.

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Comparative Profiling of the Denture Microbiome in Mild versus Severe Denture Stomatitis among Institutionalized Older Adults

AUTHORS

Jingyu Wang[1], Shi Huang[1], Doris Sau Fung Yu[2], Michael Francis Burrow[1], Colman McGrath[1], Wang Chun Kwok[3], Tuti Mohd-Dom[4], Tong Wah Lim[1]

AFFILIATION

1. Faculty of Dentistry, the University of Hong Kong
2. School of Nursing, the University of Hong Kong
3. Department of Medicine, the University of Hong Kong
4. Faculty of Dentistry, the National University of Malaysia

KEYWORDS

Denture Stomatitis; Denture Microbiome; Institutionalized Older Adults

Background: Denture stomatitis is a common inflammatory mucosal condition among removable denture wearers, with particularly high prevalence in institutionalized elderly populations who face challenges in maintaining adequate oral hygiene. It is frequently overlooked due to its often-asymptomatic nature, yet it has been identified as a key risk factor associated with bacterial pneumonia. However, the complex microbial composition of denture plaque and its pathogenic mechanisms remain incompletely understood, necessitating high-resolution, species-level profiling of the denture plaque microbiome. Moreover, while existing research primarily focuses on comparisons between health and disease, microbial changes across the spectrum of stomatitis severity are lacking, representing a significant knowledge gap.

Objective: This study aimed to characterize and compare the denture microbiome of institutionalized elderly individuals with mild versus severe denture stomatitis using 2bRAD-M (Type IIB Restriction-site Associated DNA sequencing for Microbiome), and to explore the potential associations between the denture plaque microbiome and the clinical severity of the disease.

Methods: This cross-sectional study enrolled 160 participants, all presenting with varying degrees of denture stomatitis. A trained dentist classified participants into Mild (Type I, n=63) and Severe (Type II/III, n=97) groups according to the Modified Newton's Classification. Standardized sampling of denture plaque from the tissue-fitting surface was performed, followed by DNA extraction and 2bRAD-M sequencing to generate species-level abundance profiles. Microbial αdiversity was assessed using Shannon indices. αdiversity was evaluated via PERMANOVA tests based on Bray-Curtis distance. Linear discriminant analysis Effect Size (LEfSe) analysis was employed to identify microbial taxa significantly enriched in each group.

Results: αdiversity analysis revealed a significantly higher Shannon index in the Severe group compared to the Mild group ($p=0.037$), suggesting greater microbial complexity in severe cases. No significant difference in overall community structure was detected through αdiversity analysis ($p>0.05$). LEfSe identified distinct microbial signatures associated with disease severity. The Severe group showed significant enrichment of periodontitis-associated anaerobic pathogens (e.g., Prevotella denticola, Dialister invisus), acidogenic species (e.g., Streptococcus salivarius), and other taxa linked to a variety of oral and systemic opportunistic infections (e.g., Peptidiphaga gingivicola, Centipeda noxia). In contrast, the Mild group was characterized by enrichment of potentially probiotic bacteria (e.g., Lacticaseibacillus rhamnosus) and common oral commensals.

Discussion: This study demonstrates associations between denture stomatitis severity and specific alterations in the denture plaque microbiome. The elevated Shannon diversity in severe cases, coupled with the co-enrichment of periodontitis-related anaerobes and acidogenic bacteria, suggests the establishment of a more complex, pathogenic biofilm niche, where these taxa may act synergistically to promote a pro-inflammatory microenvironment. The enrichment of probiotic-related bacteria in mild cases suggests a relatively balanced microbial state. The lack of a significant αdiversity difference may indicate that severity progression is driven more by changes in the abundance of key taxa than by a complete microbial community structure turnover. Collectively, these findings indicate that severe denture stomatitis is associated with a distinct, more pathogenic microbiome profile, characterized by a co-enrichment of acidogenic and pro-inflammatory taxa.

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Prevalence of Oral Yeast among Seniors Wearing Removable Dentures Living in Social Care Homes

AUTHORS

Diana Kibickaja[1], Sylvia Rogoža[1], Rasmutė Manelienė[1], Rita Trumpaitė-Vanagienė[1], Vika Gabė[2], Laima Tamulionytė[3]

AFFILIATION

1. Institute of Dentistry, Faculty of Medicine, Vilnius University, Lithuania
2. Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Lithuania
3. Vilnius University Hospital Santaros Klinikos, Lithuania

KEYWORDS

Candida species; acrylic dentures; geriatric patients

Background: Residents of social care homes are more susceptible to both oral and systemic infections caused by Candida species. These opportunistic fungi may become pathogenic under favourable conditions, especially in individuals with compromised immunity, following prolonged antibiotic therapy or chemotherapy. Under certain conditions, oral fungal colonisation may progress to clinically significant disease.

Objective: To assess the prevalence of oral yeast among seniors wearing removable dentures and residing in social care homes.

Methods: A cross-sectional study was conducted between October and December 2025 among seniors aged ⩾65 years residing in two social care homes in Vilnius, Lithuania (ethics approval No. 2024/1-1563-1024). Oral rinse samples and mucosal swabs from the tongue, buccal mucosa, and palate were collected from participants who met the inclusion criteria and provided informed consent. Samples were cultured on chromogenic medium (Chromo®Bio Candida, Biolab, Hungary) and incubated aerobically at 37 °C for 48 hours. Colony-forming units (CFU/mL) were quantified. Yeast species identification was performed using microscopy, germ tube testing, growth at 37 °C and 42 °C, and MALDI-TOF MS analysis. Statistical analysis was performed using SPSS v27.0, applying the nonparametric Mann–Whitney test, with significance set at $p < 0.05$.

Results: A total of 51 participants were included, of whom 66.7% were aged ⩾85 years. Candida spp. were detected in 44 participants (86.3%), while non-Candida yeasts were identified in 7 participants (13.7%). High-level Candida colonisation (>2–3 × 10^3 CFU/mL in oral rinse) was observed in 84% (n = 42) of cases. The median Candida count was 1.82 × 10^4 CFU/mL (IQR: 0–438,500). Mixed fungal colonisation (⩾2 species) was detected in 66% (n = 33) of participants. The prevalence of Candida spp. on the tongue, palate, and buccal mucosa was 82.4%, 82.4%, and 78.4%, respectively, slightly lower than in oral rinse samples. Non-Candida yeasts were more frequently detected on the tongue (19.6%) compared to the palate (15.7%), buccal mucosa (13.7%), and oral rinse (14%). The most frequently isolated species were C. albicans, C. glabrata, and C. dubliniensis. Participants with iron-deficiency anaemia tended to exhibit higher Candida CFU/mL counts; however, this did not reach statistical significance (p = 0.053). No significant associations were found between Candida colony counts and medication use.

Discussion: This study demonstrates a high prevalence of oral Candida colonisation among elderly denture wearers in social care settings. The findings are consistent with previous reports suggesting that removable dentures may serve as a reservoir for fungal biofilm and contribute to increased colonisation. However, the absence of a non-denture-wearing control group limits the ability to directly assess the effect of denture use on oral Candida colonisation. Given that oral candidiasis is frequently asymptomatic, it may remain underdiagnosed in this population, potentially contributing to systemic complications and reduced quality of life.

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Subjective Xerostomia and Objective Oral Moisture in Older Denture Wearers: Their Relationship with Denture Function

AUTHORS

Moe A.[1], Supphakorn S.[2], Navapat S.[2], Pranpreeya C.[3], Orapin K.[3]

AFFILIATION

1. PhD student, Department of Prosthodontics, Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand
2. Undergraduate students, Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand
3. Department of Prosthodontics, Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand

KEYWORDS

Removable dentures, Denture satisfaction, Oral dryness

Background: As the global older population increases, tooth loss and xerostomia commonly coexist, and may complicate removable denture therapy. Understanding the relationship between oral dryness and denture-related outcomes is important for improving prosthodontic care in older adults.

Objective: This study aimed to compare subjective xerostomia scores with objective oral moisture measurements and to investigate their association with denture-related outcomes, including retention and functional complications, among older Thai removable denture wearers at the Chulalongkorn University Special Dental Clinic (CUSDC).

Methods: A total of 63 participants aged 60 years and older who had worn removable dentures (acrylic RPD, metal RPD, or complete dentures) for at least three months at the CUSDC were recruited. Demographic and medical data were collected. The number of remaining natural teeth was recorded, and dietary variety was assessed using the Dietary Diversity Score (DDS). Subjective xerostomia was evaluated using the SXI-Thai questionnaire, while objective oral moisture was measured with the Mucus Oral Moisture Checker. Denture related outcomes, including retention, difficulty in eating, difficulty in speaking, and tissue irritation, were assessed using questionnaires.

Results: Among the 63 participants, most were female (45, 71%) and were taking xerogenic medications (38, 60.3%). The majority had fewer than 20 remaining teeth (54, 85.71%). The mean DDS indicated adequate dietary diversity across age groups (60–69: 6.18; 70–79: 5.88; ⩾80: 5.94). The mean SXI score was 6.14 ± 1.29, and subjective xerostomia was reported in 2 participants (3.2%). The median oral moisture value was 30.30 (IQR = 3.97), with suspected oral dryness (<27) observed in 10 participants (15.87%), predominantly among those aged ⩾80 years ($p = 0.024$). The mean denture retention score was 2.32 ± 1.28. Difficulty in eating (18, 28.57%) was the most frequently reported denture-related complication. No significant association was found between oral moisture levels and denture-related complications ($r = -0.056$, $p = 0.672$).

Discussion: Most participants were female and taking xerogenic medications, reflecting common characteristics of older populations. Despite having fewer than 20 natural teeth, participants demonstrated adequate dietary diversity, suggesting that dentures may contribute positively to nutrition and quality of life. Although subjective xerostomia was relatively low (mean SXI 6.14 ± 1.29; 3.2%), objective oral dryness was observed in 15.87% of participants, particularly among those aged ⩾80 years. This discrepancy highlights limitations of relying solely on symptom-based diagnosis. Denture retention was moderate overall, with difficulty in eating being the most common complaint. Oral moisture levels were not significantly associated with denture-related complications in this study population.

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Deteriorated Oral Health and Function as Risk Factors for Physical Disability and Mortality in Community-Dwelling Older Adults: A Systematic Review and Meta-Analysis

AUTHORS

Min Jung Ko[1], Seongwoo Seo[1], Jong Seob So[2], Hoi-In Jung[3], Hong-Seop Kho[4,5], Kyung Lhi Kang[6], Seung-Ryong Ha[7], Nam-Hee Kim[8], Jina Lee Linton[9], Jeong-Hyun Kang[10]

AFFILIATION

1. Division of Healthcare Technology Assessment Research, National Evidence-based Healthcare Collaborating Agency (NECA), Seoul, Republic of Korea
2. S&P Seoul Private Dental Clinic, Gwangmyeong, Republic of Korea
3. Department of Preventive Dentistry & Public Oral Health, Yonsei University College of Dentistry, Seoul, Republic of Korea
4. Department of Oral Medicine and Oral Diagnosis, School of Dentistry and Dental Research Institute, Seoul National University, Seoul, Republic of Korea
5. Institute on Aging, Seoul National University, Seoul, South Korea.
6. Department of Periodontology, Kyung Hee University College of Dentistry, Seoul, Republic of Korea
7. Department of Prosthodontics, College of Dentistry, Dankook University, Cheonan, Republic of Korea
8. Department of Dental Hygiene, Yonsei University, Wonju, Republic of Korea
9. San Private Dental Clinic, Seoul, Republic of Korea
10. Department of Dental Education, Yonsei University, College of Dentistry, 50-1, Yonsei-ro, Seodaemun-gu, Seoul, 03722 (ROK)

KEYWORDS

oral function, disability, mortality

Background: Oral health and function are increasingly recognized as important determinants of overall health in the older population.

Objective: This comprehensive systematic review examined the relationship between oral health and function and the incidence of physical disability and mortality.

Methods: Ovid-MEDLINE, Ovid-EMBASE, and the Cochrane Library were systematically searched updated February 24th, 2025. Eligible studies included community-dwelling adults aged 50 years or older who underwent oral health-related assessments or interventions and reported outcomes related to physical disability or mortality. Random-effects meta-analysis was used to pool estimates, and subgroup analyses were performed by follow-up duration, study design, and participant age. Risk of bias was assessed using the Risk of Bias for Assessment tool for Nonrandomized Studies version 2.0. tool.

Results: Of the 32 articles included, 7 explored the association between oral health or function-related factors and physical disability, 22 investigated mortality outcomes, and 3 examined both outcomes. In total, 441,508 participants were included. Edentulism (OR, 1.73, 95% CI [1.48 – 2.01], I2 = 0%) was significantly associated with physical disability. Regarding mortality, significant risk factors included reduced swallowing function (OR, 2.11, 95% CI [1.88 – 2.37], I2 = 0%), oral frailty (OR, 2.06, 95% CI [1.87 – 2.27], I2 = 0%), fewer than 20 teeth (OR, 2.04, 95% CI [1.67 – 2.49], I2 = 89.7%), edentulism (OR, 1.87, 95% CI [1.35 – 2.59], I2 = 97.0%), and chewing difficulty (OR, 1.77, 95% CI [1.08 – 2.91], I2 = 95.9%).

Discussion: This systematic review revealed that oral health and function, particularly, masticatory ability and teeth number, significantly contributed to physical disability and mortality in older adults.

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A Survey on Oral Function Status Among Older Adults Residing in Pathum Thani Province

AUTHORS

Hatairat Ountrongchit, DDS Sirima Kulvanich, DDS, Ph.D. Worachate Romalee, DDS, Ph.D.
Nichamon Chaianant, DDS, MSc, PhD. Anjinuch Rattanauradinthra, DDS

AFFILIATION

Faculty of Dentistry, Thammasat University, Thailand

KEYWORDS

Aged, Oral Function, Community-dwelling

Background: Oral health is an important indicator of overall health in older adults and encompasses not only oral diseases but also functional abilities such as mastication, swallowing, and speech. The concept of oral frailty has been introduced to identify early declines in oral function and their association with adverse health outcomes. In Thailand, although national policies emphasize oral health assessment in older adults, data on oral function among community-dwelling populations remain limited.

Objective: To explore the current characteristics of oral function status in community-dwelling older adults residing in Pathum Thani Province, Thailand.

Methods: A cross-sectional observational study was conducted among community-dwelling older adults aged

≥60 years in Khu Khot Sub-district, Pathum Thani Province, Thailand. A total of 150 participants were included in the present analysis. Data were collected using validated tools, including oral frailty status (Thai OF-5) and the Food Acceptance Questionnaire (FAQ), along with clinical oral examinations assessing dentition status (number of teeth and Eichner's index), tongue pressure, and oral diadochokinesis. Demographic and health-related data were also obtained. Comparisons between groups (oral frailty vs. non–oral frailty) were conducted across all variables.

Results: A total of 150 participants were included, of whom 111 (74.0%) were classified as having oral frailty. The majority of participants were female, and the mean age was similar between groups. Comparative analysis showed that Food Acceptance Questionnaire (FAQ) scores and dentition status (Eichner's classification) were significantly associated with oral frailty ($p < 0.05$). No significant associations were observed for age, sex, tongue pressure, oral diadochokinesis, number of teeth, or articulation. A tendency toward association was observed for the number of teeth.

Discussion: This study found a high prevalence of oral frailty among community-dwelling older adults. Significant associations observed for chewing ability (FAQ) and dentition status (Eichner's classification) support the use of these measures as screening tools for oral frailty. In the Thai community context, particularly within the study area, these measures may provide practical approaches for early identification of declining oral function among older adults in community-based settings. Further studies with larger sample sizes are needed to confirm these findings.

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Development and Preliminary Evaluation of Oral Motor Exergames for Oral Function Training

AUTHORS

Kota Amano[12], Leming Jia[2], Hiroshige Taniguchi[1], Anastasios Grigoriadis[2], Abhishek Kumar[2]

AFFILIATION

1. Department of Dysphagia Rehabilitation, Division of Oral Pathogenesis and Disease Control, Asahi University School of Dentistry, Gifu, Japan
2. Department of Dental Medicine, Karolinska Institutet, Huddinge, Sweden

KEYWORDS

oral function, oral motor training, exergame

Background: Oral motor training is useful for maintaining and improving oral function; however, long-term adherence remains a challenge. To address this issue, we developed novel oral motor exergames and investigated their effects.

Objective: This study aimed to examine the effects of the developed oral motor exergames on physical measurements, game-derived performance indices, and subjective evaluations.

Methods: Thirty healthy adults participated in this study. Each participant selected one of four exergames and completed five training sessions of 3 min each, with a 1-min rest interval between sessions. Oral dryness, maximum occlusal force, maximum tongue pressure, and handgrip strength were measured before and after training. Game-derived indices, including attempts, score, distance, time, and maximum performance measures, were analyzed. Questionnaire-based evaluations were also collected. Statistical analyses included the Wilcoxon signed-rank test, Friedman test, and Spearman's rank correlation coefficient.

Results: No significant pre–post changes were observed in any physical measurements. For total values, the Friedman test showed significant session effects for attempts ($p < 0.001$ and $p = 0.003$), and Spearman's rank correlation analysis showed significant negative correlations between session number and attempts (both $p < 0.001$). For maximum values, the Friedman test showed significant session effects for time ($p < 0.001$) and distance ($p = 0.013$). In addition, Spearman's rank correlation analysis showed significant positive correlations for score ($p = 0.007$), time ($p < 0.001$), and distance ($p = 0.004$). Questionnaire responses indicated relatively favorable ratings for enjoyment, ease of use, and perceived practicality.

Discussion: Although a single-session exergame intervention did not produce immediate changes in physical function, repeated gameplay was associated with changes in game-performance indices, suggesting improved task efficiency and motor learning. These findings indicate that oral motor exergames may serve as a promising training approach to support adherence.

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Effects of Mechanical Stimulation Using a Sonic Tongue Brush on Oral Function in older adults Individuals with Oral Hypofunction

AUTHORS

Fusa Maeta[1], Koichiro Ogami[1], Kaoru Miyamoto[1], Taiga Edono[1] , Takayuki Ueda[2],

AFFILIATION

1. Department of General Dentistry, Tokyo Dental College, Chiba Dental Center, Chiba, Japan
2. Department of Removable Prosthodontics and Gerodontology, Tokyo Dental College, Tokyo, Japan

KEYWORDS

Oral hypofunction, Mechanical stimulation, Sonic tongue brush

Background: Decline in oral function is associated with the progression of oral frailty and decreased physical function. However, training programs that require multiple exercise sessions are often difficult to sustain.

Objective: In this study, we developed a simple mechanical stimulation method using a sonic toothbrush with a tongue brush attachment. This study investigated the effects of this stimulation on oral function in older adults individuals with oral hypofunction.

Methods: In this prospective single-arm interventional study, 20 older adults who visited Tokyo Dental College Chiba Dental Center and were diagnosed with oral hypofunction were included (7 men and 13 women; mean age 76.8 ± 8.9 years). A tongue brush attachment was fitted to a sonic toothbrush, and mechanical stimulation was applied to the tongue, lips, and buccal mucosa. The intervention was performed three times daily for four months. Outcome measures included oral diadochokinesis (/pa/, /ta/, /ka/), tongue pressure, and lip closure force. Measurements were obtained at baseline (prior to the intervention), and at 1, 2, 3, and 4 months during the intervention period. Additionally, follow-up measurements were taken 10 months after baseline (i.e., 6 months after completion of the intervention). Statistical analysis was performed using the Friedman test. When significant differences were detected, multiple comparisons were conducted using the Wilcoxon signed-rank test with Bonferroni correction.

Results: The intervention resulted in a significant improvement in lip closure force from an early stage. The median value increased from 10.8 N at baseline to 11.9 N after one month. Oral diadochokinesis also improved significant after 2month, with the median frequency increasing from 6.1 repetitions per second at baseline to 6.4 repetitions per second after one month. Tongue pressure improved from a median of 25.8 kPa at baseline to 28.4 kPa at 3 months, demonstrating a significant increase.

Discussion: Significant improvements were also observed in /ta/ and /ka/, although differences were noted in the timing of improvement onset. These differences may reflect variations in muscle structure and functional response between the lips and tongue. It remains unclear whether vibratory stimulation directly affects the orbicularis oris muscle; however, the observed changes in muscle responses may be associated with sensory feedback mechanisms from oral mechanoreceptors. This stimulation method is simple and minimally invasive and may be a practical and sustainable intervention for older adults individuals with oral hypofunction.

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Jaw Movement, Head Posture, and Gaze During Food Intake in Assisted Feeding From Various Directions

AUTHORS

En-Chih Weng, Naoko Sato, Kazuhiro Hori

AFFILIATION

Division of Comprehensive Prosthodontics, Niigata University Graduate School of Medical and Dental Sciences

KEYWORDS

Assisted Feeding, Head posture, Gaze

Background: Assisted feeding is an essential component of elderly care and nursing practice. It is generally recommended that caregivers present food from the front and slightly below the care recipient while seated. However, it remains unclear whether this recommended posture is optimal for safe and efficient food intake, particularly with respect to head and trunk kinematics, mouth opening, and gaze behavior during feeding.

Objective: This study aimed to investigate how the direction of food presentation during assisted feeding influences the recipient's food intake movements and gaze behavior.

Methods: Ten healthy adults (5 males and 5 females; mean age 28 years) without swallowing or musculoskeletal disorders participated as care recipients. All trials were performed by a single caregiver. Participants were seated freely on a chair without back support. In the assisted feeding tasks, the caregiver sat on the participant's right side and delivered a 15-mm cylindrical piece of apple using a fork from three directions toward the oral fissure: 20° upward, horizontal, and 20° downward. In addition, a self-feeding task was conducted. Head, trunk, jaw, and fork movements were recorded using a three-dimensional motion capture system (VICON; Vicon Motion Systems Ltd., UK), and gaze behavior was measured using an eye tracker (Tobii Pro Glasses 3; Tobii, Sweden). Changes in fork and posture kinematics, mouth opening, and gaze timing were analyzed and compared across conditions. Statistical analyses were performed using the Friedman test, followed by post hoc comparisons with Bonferroni correction. A p-value < 0.05 was considered statistically significant.

Results: In the assisted feeding condition, participants directed their gaze toward the food before the onset of fork movement, followed by the initiation of mouth opening. As the fork approached the lip, a reduction in velocity of fork was observed, followed by gaze termination; maximum mouth opening occurred immediately before the food reached the incisors. After oral capture of the food, the fork was withdrawn, followed by mouth closure and subsequent re-opening associated with continued chewing. In contrast, in self-feeding, gaze termination, onset of mouth opening, and fork approach occurred almost simultaneously. Participants tended to extend their heads when food was delivered from an upward direction. In contrast, in self-feeding, participants moved their heads forward prior to grasping the fork. In the upward assisted feeding condition, visual tracking was maintained until the food approached the lips, resulting in a significantly shorter food–lip distance at gaze termination than in the self-feeding condition (P=0.006).

Discussion: The presenting food from an upward direction may make visual recognition more difficult, leading recipients to maintain visual tracking for a longer duration. This increased visual demand may, in turn, induce compensatory head movements, such as head extension. These findings indicate that the direction of food presentation affects both gaze behavior and head posture during assisted feeding.

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Impaired Oral Function and Sarcopenia in Older Adults with Type 2 Diabetes Mellitus

AUTHORS

Elastria Widita[1], Dewi Agustina[1], Budi Rodestawati[2], Ayu Fresno Argadianti[1], Luthfi Hidayat[3]

AFFILIATION

1. Department of Oral Medicine, Faculty of Dentistry, Universitas Gadjah Mada, Yogyakarta, Indonesia
2. Department of Preventive and Community Dentistry, Faculty of Dentistry, Universitas Gadjah Mada, Yogyakarta, Indonesia
3. Department of Orthopedy, Faculty of Medicine, Nursing an Public Health, Universitas Gadjah Mada, Yogyakarta, Indonesia

KEYWORDS

Older adults, oral functions, sarcopenia, diabetes mellitus

Background: Older adults with type 2 diabetes mellitus (T2DM) are particularly vulnerable to sarcopenia due to ageing-related muscle decline, metabolic dysregulation, and nutritional impairment. Oral functional decline may further contribute to this condition by reducing chewing efficiency and compromising dietary intake. However, the association between oral function and sarcopenia in older adults with T2DM remains insufficiently explored.

Objective: This study aimed to determine the association between oral function and sarcopenia among older adults with T2DM.

Methods: This cross-sectional study involved 190 patients aged over 60 years with type 2 diabetes mellitus. Data collection included interviews covering demographic information, medical history, health behaviours, and oral health behaviours, alongside blood sample analysis, physical examinations, as well as oral examination. Oral function evaluated through oral hygiene status, masticatory performance, maximum tongue pressure (MTP), and the 100 ml water swallowing test, and the number of functional teeth (FTU). Sarcopenia status was assessed using appendicular skeletal muscle index (ASMI), muscle strength, and physical performance and defined based on Asian Working Group for Sarcopenia 2019 (AWGS 2019). Sarcopenia was examined as a binary outcome using multivariable logistic regression adjusted for nutritional, sociodemographic, and clinical variables.

Results: After adjusting for all confounders, binary logistic regression analysis showed that higher FTU was associated with lower odds of sarcopenia (OR 0.83, 95% CI 0.71 to 0.97; p=0.021). Declined masticatory performance (OR 3.31, 95% CI 1.36 to 8.07; p=0.008) and declined MTP (OR 2.25, 95% CI 1.01 to 4.98; p=0.046) were associated with higher odds of sarcopenia. Higher Mini Nutritional Assessment (MNA) score was associated with lower odds of sarcopenia (OR 0.68, 95% CI 0.51 to 0.89; p=0.005).

Discussion: Our findings suggest that among older adults with T2DM, impaired oral function was associated with sarcopenia, particularly with FTU and mastication. Oral function parameters may therefore represent clinically relevant markers when evaluating sarcopenia risk in this population.

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Full mouth rehabilitation with dental implants on an older adult with eosinophilic granulomatosis with polyangiitis: A case report

AUTHORS

Dr Kong Rui Ling

AFFILIATION

National Dental Centre Singapore

KEYWORDS

autoimmune disease, implants

Background: With the demographic shift towards an aging population, the number of years lived with disabilities has also increased. Dental implants improve masticatory function and quality of life for edentulous or partially edentulous patients and is related to a success rate of almost 90-95% after 10 years of function. Yet, it is heavily dependent on the osseointegration to form a structural and functional connection between bone and dental implant. Autoimmune diseases may interfere with the process of osseointegration, jeopardizing thus the survival of implants.

Objective: A 74-year-old male presented with a decemented upper fixed dental prosthesis and failing underlying abutments. He wanted a fixed dental prosthesis as a replacement due to inability to adapt to a removable prosthesis. Along with osteopenia, asthma and hypertension, he also suffered from eosinophilic granulomatosis with polyangiitis (EGPA). It is a rare autoimmune disease autoimmune disease causing inflammation of small- to medium-sized blood vessels(vasculitis). As a result, he was on long term corticosteroids (prednisolone).

Methods: After extractions of the unrestorable maxillary abutments, the patient was given an interim partial denture. A 3D printed copy of the denture was used as a stent with radiographic markers for the implant planning using the dual scan technique. Areas of bone deficiency was identified on the cone beam CT and planned for bone augmentation with particulate allograft. Connective tissue grafts were performed due to insufficient keratinized mucosa. Six implants with simultaneous bone grafting were placed on the partially edentulous maxilla to obtain the best anterior-posterior spread and distribution for mechanical loading. His steroid dosage was doubled at the instructions of his rheumatologist prior to, during and immediately after the implant surgeries.

Results: Delayed implant loading protocol was followed, and the implants were given 6 months for osseointegration to complete before issuing a printed polymethyl methacrylate provisional. Early bone loss around the implant in the upper right lateral incisor position was noted. A combined decision was made with the patient to maintain it there was still good alveolar support around the implant and not proceed with soft tissue graft. A screw retained milled 3Y zirconia maxillary prosthesis with veneering pink porcelain was fabricated 3 months after. Gaps for insertion of interdental brushes around each implant was designed to facilitate optimum oral hygiene. The patient is currently on 4 monthly regular implant maintenance therapy with a periodontist and has impeccable oral hygiene.

Discussion: Because EGPA is a necrotizing vasculitis affecting vessels and tissues, it presents significant challenges to wound healing because of ischemia, tissue inflammation, and poor blood supply. However, it may still be considered as a safe and viable therapeutic option in the management of patients suffering from autoimmune diseases. Nevertheless, impeccable maintenance of oral hygiene and long-term follow-up emerge as being the common determinants for successful dental implant treatment.

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Evaluation of oral function changes in elderly Taiwanese patients with extensive edentulism following fixed or removable prosthetic rehabilitation

AUTHORS

Tzu-Pei Cheng, Tsung-Chieh Yang, Tomg-Mei Wang, Li-Deh Lin

AFFILIATION

Department of Dentistry, National Taiwan University Hospital, Taipei, Taiwan

Graduate Institute of Dentistry, School of Dentistry, National Taiwan University, Taipei, Taiwan

KEYWORDS

oral function, fixed and removable prostheses

Background: As Taiwan rapidly approaches super-aged status, oral frailty has emerged as a critical precursor to systemic health decline. Extensive tooth loss does not merely impair chewing; it triggers a neuromuscular cascade that diminishes tongue pressure and swallowing safety. While prosthetic rehabilitation is standard, the functional recovery gap between fixed and removable solutions—specifically regarding the restoration of the oral-motor complex in the Taiwanese clinical context—remains under-explored.

Objective: This study evaluated the recovery of oral functional parameters—tongue pressure, occlusal force, and masticatory efficiency—following full-mouth rehabilitation with fixed versus removable prostheses in patients with extensive edentulism.

Methods: Twenty-four patients (Mean age: 66.79; 15 men and 9 women) with extensive posterior tooth loss (⩾ 4 premolars/molars) were rehabilitated with either fixed (n=10) or removable (n=14) prostheses. A multidimensional functional battery was employed: tongue pressure (IOPI/JMS), occlusal force (Dental Prescale II), and masticatory efficiency (mixing-ability gum), alongside patient-reported outcome measures (PROMs). Data were compared against a dentate control group (n=10) at baseline and post-stabilization using within-group and between-group statistical analyses.

Results: Both rehabilitation modalities significantly improved oral function. However, the fixed-prosthesis group demonstrated a superior recovery profile, particularly in occlusal force and masticatory efficiency. Notably, objective gains in tongue pressure and swallowing performance were strongly mirrored by subjective improvements in patient-reported quality of life, suggesting that mechanical stability directly facilitates neuromuscular confidence.

Discussion: Prosthetic intervention effectively mitigates the functional collapse associated with oral hypofunction. Our findings suggest that restoring dental occlusion acts as a catalyst for broader neuromuscular recovery, enhancing tongue-palate coordination essential for safe swallowing. In the context of Taiwan's aging population, these results underscore that full-mouth rehabilitation is a vital geriatric intervention to prevent the transition from oral frailty to physical disability.

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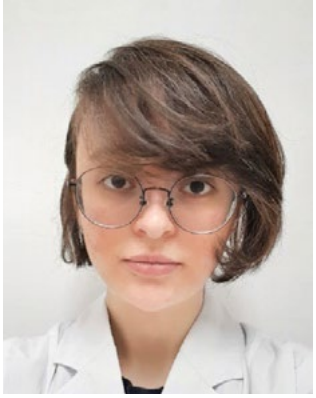
The Relationship between Oral Function Assessment and Texture-Modified Diets for Older Adults: A Comprehensive Literature Review



AUTHORS

Hala Al Khalili, Yasue Tanaka, and Yoshinori Hattori

AFFILIATION

Division of Aging and Geriatric Dentistry, Tohoku University Graduate School of Dentistry

KEYWORDS

Texture modified food, oral function, literature review

Background: Appropriate selection of food texture based on oral function is crucial for nutritional management and the quality of life in older adults. To date, various methods for assessing masticatory and swallowing functions, as well as classification systems for food textures, have been proposed. However, a clear and standardized link between these functional assessments and specific food texture levels has not yet been established.

Objective: This study aims to comprehensively map and analyse the existing literature regarding the relationship between eating-related oral functions and food textures. The goal is to clarify the current state of these correlations and identify research gaps to guide future clinical studies for older populations.

Methods: A comprehensive literature search was conducted across multiple databases. The search strategy focused on the intersection of eating-related functions and food texture/fluid properties. Studies involving adults in any care setting were included. Two reviewers independently screened titles, abstracts, and full texts based on predefined criteria, focusing on studies that proposed criteria or recommendations for food texture selection based on eating-related oral functions. Data were systematically extracted to identify correlations between objective/self-reported functional assessments and specific dietary modifications.

Results: From 10,652 identified records, 13 studies met the inclusion criteria. Most were observational cross-sectional studies conducted in Japan and East Asia, focusing on older adults in rehabilitation or long-term care settings. The analysis revealed that swallowing function was the most frequently assessed domain. Evaluations often relied on instrumental assessments, such as FEES and VFSS.

Discussion: While instrumental assessments of swallowing are commonly used to guide food texture selection, there is a need for more integrated criteria that combine multiple oral functions. Future research should focus on establishing standardized protocols to bridge the gap between clinical assessments and dietary prescriptions.

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Effect of Temperature and Time on the Apparent Biaxial Elongation Viscosity of Tissue Conditioner

AUTHORS

Min Thu Ya[1], Haruka Nakada[1], Kazuhiro Murakami[1], Ayaka Yasuno[1], Fumiko Uehara[1], Jumpei Okawa[1], Yoko Hasegawa[1], Mitsuru Higashimori[2], Makoto Miura[3], Kazuhiro Hori[1]

AFFILIATION

1. Division of Comprehensive Prosthodontics, Faculty of Dentistry & Graduate School of Medical and Dental Sciences, Niigata University
2. Department of Mechanical Engineering, Graduate School of Engineering, The University of Osaka, Suita, Japan
3. Collaborative Research Programs of SynCrest Inc., Faculty of Agriculture, Iwate University

KEYWORDS

Palatal Augmentation Prosthesis, Tissue Conditioner, Viscosity

Background: Tissue conditioners are commonly used to record dynamic functional impressions, condition damaged tissue under ill-fitting dentures and fabricate palatal augmentation prostheses (PAP). Although previous studies using subjective assessments have identified an optimal timing for functional exercises, the combined effects of temperature and time on the viscosity of these materials remain unclear.

Objective: This study investigated the effects of temperature and elapsed time after mixing on the apparent biaxial elongation viscosity of a tissue conditioner.

Methods: A creep meter was used to measure viscosity when a plunger compressed the tissue conditioner. A tissue conditioner (Tissue Conditioner II, Shofu Inc., Kyoto, Japan) was prepared by mixing powder and liquid for 30 s. Specimens were placed on a sample stage maintained at either 23°C or 37°C and compressed at 2:30, 3:00, 3:30, 4:00, and 4:30 min after the start of mixing. Apparent biaxial elongation viscosity was calculated from a common linear region of the load–deformation curve.

Results: Viscosity increased significantly over time at both temperatures. At 37°C, viscosity was significantly higher than at 23°C at all time points ($p < 0.05$). Notably, viscosity at 2:30 min at 37°C was already substantially higher than viscosity at 4:30 min at 23°C.

Discussion: These findings indicate that higher temperatures accelerate the increase in viscosity of tissue conditioners. Because viscosity at 2:30 min at 37°C exceeds the previously determined optimal range at 23°C, the clinically usable working period for functional exercises after intraoral placement may be shorter than expected from room-temperature assessments.

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Management of Maxillary Anterior Flabby Ridge Using Window Impression Technique in Complete Denture Rehabilitation: A Case Report

AUTHORS

Pagcaliwagan, Alyanna Crisha, Sta. Maria, Ma. Therese, Tianco, Ma. Leonor, Mandapat Jr., Jaime, Garcia, Ma. Cristina Aurea

AFFILIATION

Manila Central University, Philippines

KEYWORDS

Flabby ridge, Window technique, Complete denture

Background: Flabby or displaceable denture-bearing tissues present a significant challenge in complete denture fabrication, as they are prone to compression during impression procedures and subsequent recoil, leading to inaccuracies in the recorded anatomy. This can compromise denture retention, stability, and overall function. Such tissues are commonly observed in long-term denture wearers, particularly in the anterior maxillary region, where hypermobile soft tissue may replace underlying alveolar bone.

Objective: This case report aims to describe the management of a flabby ridge in a completely edentulous patient using a modified impression technique and to evaluate its effectiveness in achieving improved denture stability and adaptation.

Methods: A 58-year-old female patient presented with complete edentulism and a flabby ridge located in the maxillary anterior region. Conventional complete denture procedures were followed, including preliminary impression making using impression compound, fabrication of a custom tray, and border molding. A window technique was incorporated in the custom tray over the flabby tissue area. During final impression making, vinyl polysiloxane impression material was applied through the window to capture the flabby ridge in its undisplaced, resting state, while minimizing compression of the mobile tissue.

Results: The use of the window technique allowed for accurate recording of the flabby ridge without distortion. The final impression demonstrated improved tissue detail and minimized displacement of the hypermobile area. Consequently, the fabricated denture exhibited enhanced retention, stability, and adaptation. The patient reported improved comfort and functional performance with the prosthesis.

Discussion: Management of flabby ridges requires modification of conventional impression techniques to prevent tissue distortion. The window technique is an effective approach for recording displaceable tissues in their passive form, thereby improving the accuracy of the impression and the fit of the final prosthesis. This case highlights the importance of individualized impression strategies in complete denture therapy. Proper technique selection can significantly enhance clinical outcomes, particularly in patients with compromised denture-bearing tissues.

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Complete Denture Rehabilitation in a Geriatric Patient with Parkinson's Disease: A Case Report

AUTHORS

Dayapan, Akiko Fiorej, Tianco, Ma. Leonor, Sta. Maria, Ma. Therese, Mandapat Jr., Jaime, Garcia, Ma. Cristina Aurea

AFFILIATION

Manila Central University, Philippines

KEYWORDS

Parkinson's Disease, Geriatrics, Complete Denture

Background: Parkinson's disease (PD) is a progressive neurodegenerative condition characterized by motor impairments such as tremors, rigidity, and compromised neuromuscular coordination. These manifestations can adversely affect oral function, denture stability, and patient adaptation to prostheses. Managing complete edentulism in geriatric patients with PD presents unique clinical challenges, requiring careful prosthodontic planning and follow-up.

Objective: This case report aims to describe the prosthodontic rehabilitation of a completely edentulous elderly patient with controlled PD and to evaluate functional outcomes, denture adaptation, and patient satisfaction following complete denture therapy.

Methods: A 77-year-old male with controlled PD and complete edentulism was evaluated. The patient presented with stable vital signs but required assisted ambulation and exhibited occasional mild, transient involuntary movements. He had been edentulous in the maxilla for over ten years and recently became fully edentulous after mandibular extractions due to periodontal disease. Conventional complete denture fabrication procedures were performed, including primary and secondary impressions, jaw relation records, trial evaluation, and denture insertion. Post-insertion assessments and follow-up visits were conducted to monitor adaptation, retention, and functional performance.

Results: Initial post-insertion findings revealed inadequate denture retention and dependence on denture adhesive, likely associated with compromised neuromuscular control. However, subsequent follow-up demonstrated improved neuromuscular adaptation and satisfactory denture retention without adhesive use. Functional outcomes significantly improved, with the patient able to masticate a wider variety of food, including harder consistencies such as meat and nuts. The patient reported high satisfaction with both comfort and function of the prosthesis.

Discussion: This case underscores the impact of neuromuscular limitations associated with PD on denture retention and adaptation. Early post-insertion difficulties are common in such patients; however, gradual improvement can be achieved through continuous follow-up, patient education, and minor prosthetic adjustments. The findings highlight the importance of individualized treatment planning and sustained clinical support in medically compromised geriatric patients. Successful prosthodontic rehabilitation can significantly enhance oral function, nutritional intake, and overall quality of life in individuals with PD.

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Association between Tongue Pressure, Occlusal Support, and Malnutrition in Older Adults with Dysphagia

AUTHORS

Hiroyasu Furuya[1,2], Takeshi Kikutani[1,2], Yuri Yokota[2], Maiko Ozeki[1], Fumiyo Tamura[1,2]

AFFILIATION

1. The Nippon Dental University, Tama Oral Rehabilitation Clinic, Tokyo, Japan
2. Division of Rehabilitation for Speech and Swallowing Disorders, The Nippon Dental University Hospital, Tokyo, Japan

KEYWORDS

malnutrition, occlusal support, tongue pressure

Background: Tongue pressure and occlusal support are associated with nutritional status in older adults with dysphagia; however, their joint association with malnutrition has not been well described.

Objective: To describe the prevalence of malnutrition or risk of malnutrition across different combinations of tongue pressure and occlusal support in older adults with dysphagia.

Methods: In this cross-sectional study, we analyzed data from 212 older adults with dysphagia (mean age 79.1 ± 7.2 years). Malnutrition or risk of malnutrition was defined as a Mini Nutritional Assessment Short-Form (MNA-SF) score of ≤ 11. Low tongue pressure was defined as < 20 kPa, and impaired occlusal support was defined as Eichner classification B or C. Participants were classified into four groups based on tongue pressure and occlusal support status. Multivariable logistic regression was used to examine the association of tongue pressure and occlusal support with malnutrition or risk of malnutrition.

Results: Overall, 59.4% of participants had malnutrition or risk of malnutrition (MNA-SF ≤ 11). Compared with participants with normal tongue pressure and normal occlusal support, the odds of malnutrition or risk of malnutrition were higher among those with normal tongue pressure and impaired occlusal support (OR 3.54, 95% CI 1.27–10.99), low tongue pressure and normal occlusal support (OR 3.92, 95% CI 2.01–7.86), and low tongue pressure and impaired occlusal support (OR 4.17, 95% CI 1.54–12.72).

Discussion: Among older adults with dysphagia, low tongue pressure and impaired occlusal support were associated with higher odds of malnutrition or risk of malnutrition. Because tongue function is important for bolus formation and oral transport, and occlusal support reflects structural contacts, these findings suggest the potential value of a comprehensive oral assessment in this population.

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From pneumonia prevention to swallowing recovery: The expanding role of oral care in post-stroke dysphagia — A systematic review and meta-analysis

AUTHORS

Sungkrit Pojmonpiti[1, 2, 3], Mariska Meersschaut[2, 6], Katja Batens[4], Margot Baudelet[5], Veerle De Herdt[2, 6], Barbara Janssens[1, 7]

AFFILIATION

1. ELOHA (Equal Lifelong Oral Health for All) research group, Department of Oral Health Sciences, Faculty of Medicine and Health Sciences, University of Ghent, Ghent, Belgium
2. Department of Neurology, Ghent University Hospital, Ghent, Belgium
3. Dental Department, Chulabhorn Hospital, Chulabhorn Royal Academy, Bangkok, Thailand
4. Department of Physical Medicine and Rehabilitation, Ghent University Hospital, Ghent, Belgium
5. Department of Otorhinolaryngology, Ghent University Hospital, Ghent, Belgium
6. Department of Head and Skin, Faculty of Medicine and Health Sciences, University of Ghent, Ghent, Belgium
7. Department of Oral Health, Ghent University Hospital, Ghent, Belgium

KEYWORDS

Oral hygiene care, Post-stroke dysphagia, Oral intake recovery

Background: Post-stroke dysphagia (PSD) is a common complication following stroke and is associated with serious adverse outcomes, including stroke-associated pneumonia. Traditionally, oral care in stroke patients has been viewed primarily as a preventive strategy for pneumonia by reducing oral bacterial load. However, emerging evidence suggests that oral care interventions may also influence swallowing recovery. Despite this potential rehabilitative role, the effects of oral care interventions on swallowing outcomes in PSD have not been systematically synthesised.

Objective: This systematic review and meta-analysis aimed to evaluate the effects of oral care interventions on swallowing recovery and functional oral intake in patients with post-stroke dysphagia.

Methods: A systematic literature search was conducted to identify studies evaluating oral care interventions in adults with PSD. MEDLINE, Embase, Web of Science, Scopus, CINAHL, CENTRAL, and ClinicalTrials.gov were searched up to February 2026. Randomised controlled trials (RCTs) and non-randomised studies reporting swallowing-related outcomes were included. Outcomes were Functional Oral Intake Scale (FOIS) scores and achievement of oral intake. Pooled analyses were conducted using random-effects models to estimate mean differences (MD) and odds ratios (OR) with 95% confidence intervals (CI).

Results: Seven studies met the inclusion criteria. Meta-analysis of two RCTs showed that oral care interventions improved FOIS scores compared with control interventions (MD 0.62, 95%CI: 0.15, 1.09), with no heterogeneity. In addition, pooled analysis of oral intake status from six studies showed that patients receiving oral care interventions had higher odds of achieving oral intake compared with control groups (OR 2.32, 95%CI: 1.28, 4.21). Subgroup analysis supported consistent findings across both non-RCTs (OR 1.89, 95%CI: 0.93, 3.85) and RCTs (OR 4.85, 95%CI 3.33, 7.06), suggesting that oral care interventions may substantially increase the likelihood of regaining oral intake in PSD patients.

Discussion: This systematic review and meta-analysis demonstrates that oral care interventions may contribute to swallowing recovery in patients with PSD. Several mechanisms may explain this effect. Mechanical stimulation during tooth brushing or oral cleaning increases sensory input from the oral cavity and activates neural pathways involved in swallowing control. Experimental studies have shown that stimulation of oral structures such as the teeth, gingiva, and oral mucosa can activate cortical regions related to swallowing regulation, including the insular cortex, potentially promoting neuroplasticity and improving oral motor coordination. Moreover, improved oral health may facilitate the oral phase of swallowing by enhancing bolus preparation and manipulation. Overall, these findings highlight the need to reconsider the role of oral care in PSD management. Beyond pneumonia prevention, oral care may serve as a complementary intervention within dysphagia rehabilitation, supporting both infection prevention and functional swallowing recovery.

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Interdisciplinary Management of Post-Stroke Dysphagia with a Palatal Augmentation Prosthesis: A Case Report

AUTHORS

Anjinuch Rattanauradinthra, DDS, PhD Candidate, Asst. Prof. Sirima Kulvanich, DDS, PhD

AFFILIATION

Faculty of Dentistry, Thammasat University, Pathum Thani, Thailand

KEYWORDS

Dysphagia, Palatal augmentation prosthesis, Interprofessional collaboration

Background: Dysphagia affects 50-70% of stroke survivors, contributing to aspiration pneumonia and malnutrition. Oral-phase dysphagia caused by impaired tongue-palate contact is underrecognised in rehabilitation settings. The Palatal Augmentation Prosthesis (PAP) compensates for reduced tongue elevation to facilitate bolus transport, yet dental professionals are rarely integrated into dysphagia teams in Thailand.

Objective: To describe the interdisciplinary management of post-stroke oral-phase dysphagia using PAP and to highlight the role of gerodontology within a coordinated rehabilitation team.

Methods: A 64-year-old Thai woman with recurrent LMCA infarction (three episodes, ICAD + AF), right hemiparesis, and severe dysarthria presented with dysphagia and consistent oral residue after every meal. An interprofessional team of rehabilitation medicine, gerodontology and special care dentistry, physical therapy, and occupational therapy collaborated at Thammasat University Hospital. Swallowing was assessed by FEES. A PAP with soft liner was fabricated and a direct chairside swallowing trial conducted. The gerodontology team prescribed masticatory muscle exercise combined with direct chewing training using graded food textures. Concurrent rehabilitation included neuromotor training, CTAR, and cough strengthening.

Results: FEES confirmed aspiration (PAS 8) with IDDSI Level 6 and oral residue across all textures. Following PAP insertion, no oral residue was observed on direct trial with IDDSI Level 4 (SpO2 97-99%). With PAP use and progressive masticatory muscle exercise combined with direct chewing training, diet advanced from IDDSI Level 4 to transitional foods and the nasogastric tube was discontinued. Communication progressed to single words (~80% naming accuracy) and the Barthel Index reached 17/20.

Discussion: PAP reduced oral residue by compensating for impaired tongue-palate contact, while masticatory muscle exercise combined with direct chewing training facilitated dietary advancement. The outcomes – NG tube removal, dietary upgrade, and functional recovery – reflect synergistic interprofessional collaboration between rehabilitation medicine, gerodontology, PT, and OT, a model rarely implemented in Thailand. This case supports integrating dental professionals into post-stroke dysphagia rehabilitation teams.

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Ultrasound-Based Assessment of Peri-Implant Mucosal Thickness Using Artificial Intelligence

AUTHORS

Fabian Christleven[1,3], Peter Broessner[2], Nikol Petrova[3], Stefan Wolfart[3], Klaus Radermacher[2], Juliana Marotti[1]*

AFFILIATION

1. Division of Restorative Dentistry, Periodontology and Prosthodontics, Department of Dental Medicine and Oral Health, Medical University Graz, 8010 Graz, Austria
2. Chair of Medical Engineering, Helmholtz Institute for Biomedical Engineering, RWTH Aachen University, 52062 Aachen, Germany
3. Department of Prosthodontics and Biomaterials, Center for Implantology, Medical School RWTH Aachen University, 52062 Aachen, Germany

*Correspondence: Juliana.marotti@medunigraz.de; Tel.: +43 316 385 13965

KEYWORDS

Ultrasonography, Periodontics, Artificial intelligence

Background: Many dental procedures in elderly patients, such as implant placement and associated peri-implant tissue monitoring, require precise assessment of mucosal thickness (MT) to predict soft tissue behavior and minimize postoperative complications. Although transgingival probing and cone-beam computed tomography (CBCT) are commonly used for MT evaluation, ultrasound (US) has emerged as a promising non-invasive modality for soft tissue assessment in dentistry.

Objective: Dental implants are frequently used in geriatric patients. Peri-implant MT is a critical factor influencing soft tissue stability and long-term clinical outcomes. Accurate assessment of MT is therefore essential for treatment planning and risk evaluation, particularly in older patients with impaired oral hygiene, who are at higher risk for peri-implantitis. This ex vivo study aimed to evaluate the accuracy and agreement of peri-implant MT measurements obtained by US with expert image annotation and artificial intelligence (AI)-based image segmentation compared with conventional methods: transgingival probing and CBCT.

Methods: Porcine hemimandibles (n = 18) underwent guided implant placement, followed by mucosal thickness measurements at five standardized points (A-E). Four methods were compared: (1) transgingival probing, (2) CBCT, (3) ultrasound with expert-annotation, and (4) ultrasound with AI-segmentation. Ultrasound images were acquired using a 17 MHz transducer with a custom-designed holder. A log-transformed linear mixed-effects model analyzed method differences. Agreement was assessed via intraclass correlation coefficients (ICC(2,1)) and Bland-Altman plots.

Results: No significant overall method effect was observed ($p = 0.105$); pairwise comparisons showed no significant difference between expert-annotated ultrasound and transgingival probing ($p = 0.328$), whereas CBCT overestimated thickness ($p = 0.035$). Agreement was moderate for expert-annotated ultrasound versus transgingival probing (ICC = 0.58) and expert-annotated ultrasound versus AI-segmentation (ICC = 0.67), but poor versus CBCT (ICC = 0.14). Bland-Altman plots revealed small biases for expert-annotated ultrasound versus transgingival probing (0.08 mm) and versus AI-segmented ultrasound (0.01 mm), whereas CBCT showed larger bias (-0.30 mm).

Discussion: Expert-annotated ultrasound measurements of mucosal thickness closely matched transgingival probing on average, while AI-segmented measurements showed moderate agreement with expert-annotation. Both approaches demonstrated superior accuracy compared to CBCT. With AI-based segmentation and a custom-designed probe holder, ultrasound may provide a non-invasive, accessible tool for peri-implant mucosal assessment.

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Proof-of-Concept for AI-Assisted Detection of Anatomical Landmarks in Edentulous Jaws Using Physical Annotation and 3D Scans

AUTHORS

Dawei Dong[1], Gülce Çakmak[2], Safa Özer[3], Ahmet Berkay Bayram[3], Murali Srinivasan[1]

AFFILIATION

1. Clinic of General-, Special care and Geriatric Dentsitry, Center for Dental Medicine, University of Zurich, Zurich Switzerland
2. Department of Reconstructive Dentistry and Gerodontology, Institute of Dental Medicine, University of Bern, Bern, Switzerland
3. Department of Prosthodontics, Bahçeşehir University, Istanbul, Turkey

KEYWORDS

AI-Assistance, Edentulism, Complete Denture

Background: Conventional impression techniques remain the gold standard for edentulous patients, as they enable accurate recording of functional anatomy and border extensions. However, these methods are technique-sensitive, operator-dependent, and challenging in older or care-dependent populations. Despite advances in digital dentistry, reliable digital solutions for edentulous impressions are still lacking due to difficulties in capturing and interpreting anatomical landmarks on intraoral scans.

Objective: This proof-of-concept study aims to develop an artificial intelligence–based approach to automatically identify key edentulous anatomical landmarks on intraoral scans, with the goal of enabling a digitally achieved master edentulous impression that produces a denture base design with a completed border-molded outline within a fully digital workflow.

Methods: Ideal edentulous maxillary and mandibular models were fabricated, and predefined anatomical landmarks were physically marked using color-coded identifiers. The models were digitized using a high-resolution intraoral scanner (TRIOS 4, 3Shape, Copenhagen, Denmark) and a laboratory 3D scanner (E4, 3Shape, Copenhagen, Denmark). All datasets were stored in .ply format to preserve both geometric and color information. The annotated datasets were then used to train a supervised artificial intelligence model, with subsequent evaluation of its ability to detect the predefined anatomical landmarks.

Results: Predefined anatomical landmarks of the maxilla were successfully identified and incorporated into the AI training workflow. However, consistent definition and detection of the labial and buccal sulci were not achieved and remain a key limitation of the current model. In the mandible, anatomical landmarks proved more difficult to clearly define and annotate, which negatively affected the training process and reduced detection performance.

Discussion and Conclusions: This proof-of-concept showed that predefined edentulous landmarks can be described and transferred into an AI training workflow, particularly when the anatomical structures are clearly identifiable. However, regions with less distinct borders, especially the labial and buccal sulci, as well as the overall annotation of mandibular landmarks, remain challenging and require further refinement before reliable digital application can be achieved.

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Artificial-intelligence aided ultrasound assessment of bone thickness in dental implantology – an ex vivo study

AUTHORS

Nikol Petrova[1], Peter Broesner[2], Fabian Christleven[13], Klaus Radermacher[2], Stefan Wolfart[1], Juliana Marotti[3]

AFFILIATION

1. Department of Prosthodontics and Biomaterials, Center for Implantology, Medical Faculty of the RWTH Aachen University, Aachen, Germany
2. Chair of Medical Engineering at the Helmholtz Institute for Biomedical Engineering, RWTH Aachen University, Aachen, Germany
3. Division of Restorative Dentistry, Periodontology and Prosthodontics, Department of Dental Medicine and Oral Health, Medical University Graz, Graz, Austria

KEYWORDS

bone thickness, cone-beam computed tomography, dental implants, ultrasonography, bone-implant interface, artificial intelligence

Background: Peri-implantitis is a common complication in modern dentistry, especially in geriatric patients, with an estimated prevalence of 20%. Early diagnosis is critical for successful treatment. Ultrasound imaging has emerged as a promising alternative to evaluate peri-implant health. It is non-invasive, cost-effective, and free of ionizing radiation.

Objective: This study aimed to introduce a novel AI-aided ultrasound (US) assessment method of peri-implant bone thickness and test its feasibility. A key feature of this approach is a modified surgical splint, which ensures the positioning of the US transducer relative to the implant, thereby enabling operator-independent measurements.

Methods: Guided implantation of one implant was performed on eighteen porcine jaws. Intraoral scans and cone-beam computed tomography (CBCT) were performed pre- and post-implantation. Post-implantation bone thickness was measured directly (serving as the reference standard) and using CBCT. Following this, US imaging was performed using the splint. A Swin-transformer-based U-Net was trained and validated (k-fold cross-validation) on annotated US images to automate bone segmentation. Bone thickness for AI-segmented US was calculated, and the accuracy of the AI-aided assessment was then compared against the reference and CBCT measurements. Method differences were analyzed using a linear mixed model (LMM), and intraclass correlation coefficients (ICC=3.1) and Bland-Altman plots were used to assess agreement.

Results: The LMM showed no statistically significant differences between methods (F=1.127, p=0.26). Compared to the direct measurement reference, CBCT showed no statistically significant difference in bone thickness (mean difference: -5µm, p=0.999). The AI-aided US method also showed no significant difference (+95µm, p=0.702). Agreement analysis showed moderate agreement for CBCT (ICC=0.623) and for US (ICC=0.675).

Discussion: The results align with previous research indicating that US is a promising non-invasive technique for assessing cortical bone thickness. While CBCT is widely regarded as a reliable tool for evaluating buccal bone morphology, it remains susceptible to artifacts such as metal-induced blooming or partial-volume effects. The fact that AI-supported US measurements were comparable to CBCT despite these limitations indicates that ultrasound may represent a valuable radiation-free alternative for certain diagnostic contexts. In conclusion, US assessment of peri-implant bone is feasible using a standardized transducer positioner. The approach demonstrates significant promise as a non-invasive, radiation-free tool for monitoring peri-implant health.

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