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PREVALENCE AND PREDICTORS OF XEROSTOMIA IN ADULT PATIENTS IN GENERAL DENTAL CARE

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BACKGROUND: Symptoms associated with xerostomia primarily manifests as difficulties of speech, eating, swallowing, and disrupted sleep. Furthermore, xerostomia can lead to halitosis, increased dental caries, oral mucosal alterations, and a susceptibility of fungal infections. People with the condition report a decreased quality of life and of avoiding of social interactions. However, the prevalence of the condition in general dental care remains inadequately investigated.

AIM: To determine the prevalence and severity of xerostomia in patients visiting general dental care, and explore correlations to age, sex, comorbidities, and medications.

MATERIAL and METHODS: Cross-sectional study of patients (aged ≥ 18 years) visiting two general dental clinics in Sweden. Patients agreeing to participate were asked, "Have you experienced dry mouth in the last six months?". Participants replying "YES" (n=119) filled in the 11-item questionnaire Xerostomia Inventory (XI) to determine the variability and severity of symptoms. Participants stating no experience of dry mouth the last six months (n=225) were included in the non-xerostomia group.

RESULTS: Out of 344 participants, the prevalence of xerostomia was 34.5% of which 12.4% had mild symptoms and 22.1% moderate or severe xerostomia. Use of ≥ 1 medication was the strongest predictor for xerostomia (p <.001). Age, sex, and comorbidities were not significant predictors, when adjusting for the covariance of medication in the statistical analysis.

CONCLUSION: Patients visiting general dental care in Sweden have a high prevalence of xerostomia. Medication was a significant variable, and our results indicate that xerostomia could be predicted solely by medication use. These findings emphasise the importance of awareness of how the use of medication correlates with xerostomia.

IMPROVING PATIENT CARE FOR CRANIOFACIAL MICROSOMIA PATIENTS

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BACKGROUND: Craniofacial microsomia (CFM) is a congenital anomaly causing unilateral facial deformity. It is the second most common anomaly after cleft-lip-palate.

CFM includes underdevelopment of the ear, orbit, mandible, facial soft tissue, and facial nerve. The resultant conditions are orofacial dysfunction and sleep-related breathing with severe impact on social life and health-related quality of life.

AIM: This research ultimately aims at proposing an evidence-based strategy for improving lives of children with this devastating craniofacial anomaly and equalize offer for treatment with other anomaly groups.

MATERIAL and METHODS:

1) We would like to conduct a Delphi study to develop consensus-based guidelines for radiological evaluation of CFM-related facial deformities. The study will be a questionnaire-based study that consolidates expert opinions regarding the proposed outcome measures for 3D radiological assessment in patients with CFM.

2) A superimposition color coding study conducted to determine the treatment effect of two different modalities. A retrospective CBCT study.

3) To retrospectively, along with patient-reported outcomes, analyse the prevalence of obstructive sleep apnoea (OSA) in children and growing adults with CFM compared to non-syndromic healthy individuals. To evaluate the 3D changes that occur after orthopedic functional appliances (OFA) in the nasal cavity (NC) and the pharyngeal airway (PA) of growing patients, and to investigate whether a correlation exists between changes in skeletal width and airway volume.

Data analysis:

1) Morphometric measures will be tested to appraise reliability. Dahlberg's formula will be used to calculate the error of the method. The intra-class correlation coefficient (ICC) will be calculated. Bland-Altman plot and the limits of agreement will be used to calculate the smallest detectable differences.

2) Descriptive data will be used to describe cohort characteristics. Morphometric data will be tested for normal distribution using Shapiro-Wilk test. In case of normal distribution, inter-group differences will be assessed using unpaired t-tests. Non-normal distributed data will be analysed using Mann-Whitney U test.

3-YEAR OUTCOMES OF RECONSTRUCTIVE SURGICAL THERAPY OF PERI-IMPLANTITIS

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BACKGROUND and AIM: The goal of treatment of peri-implantitis is the resolution of inflammation in peri-implant soft tissues and thereby arrest progressive loss of bone. In most cases, surgical therapy is needed. The specific goal of reconstructive therapy is to regenerate lost tissues. The aim of this clinical trial was to evaluate the effect of the use of a bone substitute material in the surgical therapy of peri-implantitis.

MATERIAL and METHODS: The present study is a randomized control trial, conducted in a multi-center setting. 138 patients with 147 implants affected by severe peri-implantitis were enrolled at 6 clinical centers across Europe. Treatment in the control group consisted of access flap surgery alone, while participants in test group were treated by reconstructive surgery, i.e. access flap surgery supplemented by a bone substitute material. Patients were followed for 3 years, evaluating clinical, radiographic and patient-reported outcomes. The primary outcome was a composite parameter including probing pocket depth ≤5 mm, absence of bleeding on probing and soft tissue recession ≤1 mm.

RESULTS: At 3 years, 105 patients (109 implants) could be examined. During the following period, 14 implants were lost and 3 were surgically retreated. The composite outcome was achieved in a minority of implants, only. Both groups showed a significant reduction in probing pocket depths and bleeding on probing without obvious differences between groups. Marginal bone levels were stable and overall patient satisfaction was high.

CONCLUSIONS: Surgical therapy of peri-implantitis is effective in reducing soft tissue inflammation and arresting progressive bone loss over a 3-year time period. The adjunctive use of a bone substitute material did not provide any obvious benefits.

FROM BELIEF TO BRUSH: UNDERSTANDING ATTITUDES THAT SHAPE PREVENTIVE CARIES BEHAVIORS

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BACKGROUND and AIM: This study investigates how perceived ability to prevent caries, perceived severity of caries, and perceived receptiveness for caries influence attitudes towards the significance of preventive dental behaviors. These behaviors include daily toothbrushing, sugar avoidance, and the use of mouthwash/fluoride additives. The aim is to understand these relationships within a specific demographic, participants born between 1964 and 1997.

MATERIAL and METHODS: Data were anonymously collected through an online questionnaire, resulting in a total of 6404 completed surveys. However, 6195 responses were considered valid as they contained correct birth year entries, with participants born between 1964 and 1997. Participants rated the significance of various preventive strategies in preventing caries. Logistic regression analyses were conducted to determine the odds ratios (OR) and confidence intervals (CI) for attitudes towards these strategies, considering factors such as perceived ability, severity, and receptiveness. Subgroup analyses were performed for men and women.

RESULTS: For the general population, perceived ability to prevent caries significantly predicted positive attitudes towards all three preventive behaviors, with the strongest effect observed for daily toothbrushing (OR = 1.839, 95% CI: 1.549, 1.973, $p < 0.001$). Gender differences indicated that women had stronger attitudes influenced by perceived ability to prevent caries for daily toothbrushing and sugar avoidance, while men were more affected by perceived severity and receptiveness regarding the use of mouthwash/fluoride additives.

CONCLUSION: Perceived ability to prevent caries is crucial in shaping positive attitudes towards preventive dental behaviors. This finding aligns with theories such as the Health Belief Model and the Theory of Planned Behavior, as well as Bandura's self-efficacy theory. Educational interventions should focus on enhancing individuals' perceived ability to prevent caries to promote effective preventive measures. Understanding demographic-specific differences can aid in designing tailored public health strategies.

CARDIOVASCULAR RISK PROFILE AND ORAL HEALTH – A CROSS-SECTIONAL STUDY

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BACKGROUND: The understanding of the link between cardiovascular disease and oral health is still limited. Research has so far focused on patient groups with developed coronary heart disease, while subclinical forms of coronary atherosclerosis have received less attention.

AIM: To examine the relationship between oral health status and risk of cardiovascular event (myocarditis).

MATERIAL and METHODS: From SCAPIS (Swedish CArdioPulmonary bioImage Study), individuals (age 55-74 years) with high and low risk of cardiovascular events have been identified using advanced image analysis of coronary arteries. Clinical and radiological examination of oral health status was carried out on 200 individuals from each of the high-risk and low-risk groups.

RESULTS: Women had better oral health status than men. Analysis of data adjusted for gender differences showed that individuals with coronary atherosclerosis (high-risk group) had (i) higher DMFT, (ii) fewer remaining teeth, and (iii) more marginal bone loss than individuals with unaffected coronary arteries (low-risk group). Patient-perceived oral health did not differ between groups.

CONCLUSION: The results of the study indicate that patient groups with a high risk of cardiovascular events have worse dental health than individuals with a low risk. Examination of oral health status can therefore be a valuable component in risk assessment for cardiovascular events.

THE HEALTH ECONOMIC IMPACT OF INTRODUCING HEALTH PROMOTORS IN DENTISTRY AIMING TO REDUCE CARIES RISK AMONGST 3–6-YEAR-OLDS IN PRIORITIZED AREAS IN SWEDEN

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BACKGROUND: In 2021, Region Västra Götaland (RVG) launched a three-year project, employing six health promoters in clinics with high dental caries prevalence among six-year-olds. These promoters, with degrees in health-related behaviour modification and additional oral health training, worked with 3-6-year-olds and their families to reduce caries risk. The health consultations conducted have not yet been evaluated regarding their economic impact.

AIM: This study evaluates the health economic impact of using health promoters to provide consultations for 3-6-year-olds at high caries risk and their families, compared to the 'Recommended Program for Caries Treatment' (RPCT).

MATERIAL and METHODS: A business impact analysis (BIA) and health economic modelling were conducted using 2021 epidemiological data from the RVG public dental service. The BIA focused on risk assessment data for 3-6-year-olds in the region. The model adheres to ISPOR Task Force guidelines for budget impact analysis and is presented according to CHEERS2022 standards.

RESULTS: If health promoters conducted health consultations with all 3–6-year-olds with increased risk of caries in RVG, the cost would increase from 6 to 13 million SEK/year due to higher salary costs and more visits. This would free up about 20,000 hours of dental hygienists and assistants annually. The proportion of six-year-olds at risk for caries decreased by over 2% between 2021 and 2022 at clinics with health promoters. If this trend continues, the national target of 90% caries-free children could be reached in about six years. Additionally, on average, each child meeting with a health promoter has two siblings who are also likely to benefit from the improved family lifestyle habits.

CONCLUSION: Employing health promoters in dental care for health consultations costs more than the current RPCT, but it frees dental staff for other tasks. With more caries-free six-year-olds, health outcomes improve, and resources can be directed to those with greater needs.

THEORY-BASED BEHAVIOUR CHANGE AMONG PATIENTS WITH ORAL DISEASE: A SYSTEMATIC REVIEW

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BACKGROUND and AIM: Dental caries, periodontal disease, and temporomandibular disorders (TMDs) are some of the worlds' most common oral diseases affecting approximately 15 % of the populations worldwide. They share many risk factors, such as tobacco smoking, lifestyle habits but also heritage, amongst others. All of these conditions may cause pain, discomfort and functional impairment for the individual, resulting not only in declined oral health and costly treatments but also, affecting general health and quality of life. Nevertheless, they can be preventable to a large extend. Behaviour change interventions plays an important role in preventing the initiation of these diseases but also hinder them of becoming acute or a prolonged burden for the individual. Given this, the aim is to investigate the effect of behaviour change on these conditions within oral care.

MATERIAL and METHODS: Previous clinical research is sought through to systematically review the current evidence of theory-based behaviour change impact on dental caries, periodontitis, TMDs, and tobacco usage. Registered in PROSPERO (CRD42023470828). A literature search was performed by KIB in these databases: Medline, Embase, Cochrane Library, Web of Science, CINAHL, PsycINFO. The last search was conducted 2023-10-18. This study will follow the PRISMA-protocol for systematic reviews. If eligible data are available, a meta-analysis will be conducted.

RESULTS and CONCLUSION: Screening in progress, no final conclusion can be drawn at this stage. The total number of hits after deduplication were 4421, 147 articles have been read in full text. Approximately 20 articles will be included in the quality assessment that is planned to be conducted in aug-24. Previous review studies have shown heterogenous results on how theory-based behaviour change are used within research. Preliminary findings suggests that a more homogenous variety of study design approaches and outcome measures are needed to strengthen the evidence-based conclusions within the research area.

GENDER DIFFERENCES IN HEALTH-RELATED QUALITY OF LIFE IN PATIENTS WITH HEAD- AND NECK CANCER

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AIM: to analyse (I) gender differences in health-related quality of life (HRQL) before, during and up to 3 months post treatment of head and neck cancer, and (II) the importance of salivary secretion rate for HRQL post treatment.

MATERIAL and METHODS: Patients were recruited before starting curative cancer treatment. Clinical examinations were performed including determination of the stimulated salivary secretion rate. HRQL (EORTC C30 and HN35) was reported at baseline, week 2, 4 and 6 during treatment and 3 months after treatment.

RESULTS: 56 men and 19 women were included. Men reported more problems with pain and sexuality, a higher use of painkillers and need for nutritional support during oncological treatment, while women reported more problems with weight loss and dry mouth. At 3 months post treatment, women reported more problems and symptoms than men with the highest scores noted for dry mouth, weight loss and sticky saliva. Patients with hyposalivation (≤ 0.7 ml/min) post treatment reported more problems and symptoms compared with those with a secretion rate of > 0.7 ml/min, especially regarding dry mouth, sticky saliva and social eating ($p < 0.001$ for all three).

CONCLUSION: Problems and symptoms during and post oncological treatment might differ between women and men, which must be taken into consideration by health care- and dental professionals. Patients with hyposalivation post treatment have more problems and symptoms and are therefore in greater need of supportive care.

OCCLUSAL TREATMENT OUTCOMES IN ADOLESCENTS WITH CROWDING AND DISPLACED TEETH TREATED WITH FIXED APPLIANCES WITHOUT EXTRACTIONS: A MULTI-CENTER RANDOMIZED CONTROLLED TRIAL

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BACKGROUND: Crowding and displaced have a prevalence of 30-51% in European children and adolescents. To address crowding, space may be created through extractions, transverse expansion and incisor proclination. Fixed appliances may be categorised as conventional or self-ligating according to bracket design. Arguments for using one system or the other are often based on opinions rather than scientific evidence.

AIM: Assess treatment outcome during and after orthodontic treatment with two fixed appliance systems in adolescence with crowding and displaced teeth.

MATERIAL and METHODS: This multicentred RCT include 132 adolescences, 12-17 years, with crowding and displaced teeth. Non-extraction treatments with a self-ligating (Damon Q™) or a conventional (Victory APCplus™) fixed appliance system were randomly assigned and carried out in Falun, Helsingborg, Malmö and Östersund. Digital 3D-models and cephalometric radiographs were created at start (T0), after levelling (T1) and at end of treatment (T2). Treatment outcomes were assessed with PAR index, Little's index, transversal width (mm), incisor inclination (°) and treatment duration (months).

RESULTS: PAR and alignment showed no significant differences. The Damon-system expanded upper intercanine, first interpremolar width (1.35; 1.21) and lower first and second interpremolar width (0.75;0.76) (p=<0.001-0.019) more during levelling (T0-T1) than the Victory-system; at T2, no significances remained. The Victory-system created greater incisal proclination in upper and lower arch (U1NA=5.60, p=<0.001; ILsNL=5.50, p=<0.001; L1NB=3.95, p=0.001; ILiML=3.34, p=0.014) and interincisal angle (-8.97, p=<0.001) during alignment. At T2, some differences remained (U1NA=4.38, p=<0.001; ILsNL=4.24, p=<0.001; interincisal=-4.76, p=0.001). Mean time to alignment in upper arch was shorter for the Victory system (-2.39, p=0.016).

CONCLUSION: Result indicates a slight difference in type of expansion during the alignment phase and faster time to alignment with the conventional bracket system. Both may be recommended for treatment of crowding in adolescents.

IN VIVO STUDY OF EROSIVE ACTIVITY

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BACKGROUND and AIM: Dental erosion is a multifactorial condition of growing concerns. Understanding its speed and progression rate is crucial to determine the need for adequate preventive measurements at proper treatment stage, and guide decisions on restoring eroded teeth. The purpose of this research was to examine the onset, progression and wear rates of dental erosion in an established mouse model.

MATERIAL and METHODS: Dental erosion in mice was experimentally induced and the acidic effects of cola drink on their teeth were closely analyzed. Sixty mice were randomly distributed into two equal groups: provided with *ad libitum* cola drink (experimental group) and distilled water (control group). An experimental and a control subgroup of ten animals were analyzed at two, four and six- week time point, respectively. Molars were dissected out and observed by scanning electron microscopy (SEM). Mandibular first molars were subsequently embedded in Epon, ground transversely, observed again by SEM, and the tooth height and enamel/dentin loss were calculated.

RESULTS: The dental erosion on the molars showed clear progression from two to six weeks. Notably, by the two-week mark, a significant portion of enamel was already eroded, revealing the dentin on the lingual cusps. In the control group, minimal attritional changes on the lingual cusps were observed. When adjusted for attritional wear, molars exposed to cola for two weeks showed a significant 35% drop in lingual tooth height compared to controls (533 µm vs. 818 µm). At four and six weeks, the cola-exposed group continued significantly to display decreased lingual tooth heights by 40% (476 µm vs. 799 µm) and 43% (440 µm vs. 767 µm), respectively.

CONCLUSION: Significant erosive activity in mouse molars as early as two weeks, with erosion, not attrition, causing tissue loss was revealed. Hence, early identification by clinicians and preventive treatment is essential to prohibit further escalation.

ENAMEL PRESERVATION AFTER REMOVING ORTHODONTIC ALIGNER ATTACHMENTS: CONFOCAL MICROSCOPY ANALYSIS

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BACKGROUND and AIM: The increase in using aligners for orthodontic treatment highlights the necessity to preserve enamel integrity during composite attachment removals, what can result in irreversible alterations to this structure. Optimized bonding strategies are crucial to preserve it. This study evaluated the surface roughness of enamel using confocal microscopy after attachment removal prepared from different composites, adhesives and using different removal methods.

MATERIALS and METHODS: Baseline roughness evaluations were performed on flat bovine buccal enamel surfaces (6x6x2mm) by confocal microscopy. Surfaces were 37%H_3PO_4-etched for 30 s and divided into 12 groups based on (*i*)2-step etch-and-rinse bonding resins ,a conventional adhesive (Single Bond, 3M ESPE,) or an orthodontic primer (Transbond XT, 3M ESPE,) and (*ii*) composite material for attachments, a nanohybrid composite (Filtek Supreme, 3M ESPE,), a flowable composite (Filtek Supreme Flowable, 3M ESPE,) or a bulk-fill composite (Filtek Bulk Fill Flow, 3M ESPE,) After bonding, composite attachments produced using an acetate guide were subjected to accelerated artificial aging. Then, they were removed using either a 30-blade carbide finishing bur (9114F, KG Sorensen, Brazil) or a zirconia bur (Morelli, Brazil). Enamel surfaces polished with a cup-shaped rubber tip finishing system (Enhance, Dentsply Sirona) had surface roughness measured again. Data were analyzed by three-way ANOVA (α=0.05).

RESULTS: Bur type ($p<0.001$), the interaction between bur type and composites ($p<0.001$), and their triple interaction ($p<0.049$) had significant effects on roughness. The effect of bur type on roughness was not affected by bonding resins ($p>0.069$). The effect of bur type on roughness varied according to composites ($p<0.001$). Zirconia bur produced significantly lower increase in surface roughness compared to the carbide finishing bur, showing comparable roughness among all composites ($p<0.05$). For the carbide finishing bur, the bulk-fill composite produced the lowest roughness ($p<0.05$).

CONCLUSION: Composite selection and removal technique must be optimized to better preserve the integrity of enamel surfaces when aligner attachments are required.

CALCIUM HYDROXIDE-RELEASING MATERIALS ON LONG-TERM COLLAGEN DEGRADATION

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BACKGROUND and AIM: Collagen degradation in dentin is influenced by the activation of host-derived enzymes under varying pH conditions. This study investigated the effects of calcium hydroxide-releasing or S-PRG-containing alkaline materials on host-derived enzymatic degradation and elastic modulus of coronal dentin.

MATERIAL and METHODS: Sound human molar dentin beams (0.3×3×7mm) were demineralized in 0.5 M ethylenediaminetetraacetic acid (EDTA) and rinsed in distilled water at 4 °C for 2 hours under constant stirring. Following drying in a vacuum desiccator for 72 hours, beams were distributed into five groups (n=10/group) based on dry mass. Mimiciking a clinical scenario, occlusal surfaces were placed in contact with material blocks (1×3×7mm) prepared from four materials: (1) Bio-C Repair, (2) S-PRG sealer (3) Orbis MTA, and (4) TheraCal. Untreated beams served as control. Specimens were incubated in 0.5 ml artificial saliva and aged in a water-shaking bath (37°C with 60 rpm speed) for up to 6 months. Dry mass and elastic modulus (E) were reassessed, and aliquots of incubation media were analyzed for hydroxyproline (HYP) to quantify total collagen degradation. Data were analyzed using Kruskal-Wallis tests (α=0.05).

RESULTS: Bio-C exhibited the highest cumulative HYP release (23.3 µg HYP/mg dry dentin), representing a nine-fold increase compared to the control group (2.5 µg). Additionally, Bio-C showed the highest dry mass loss, reaching 62% at 6 months, significantly differing from the control, S-PRG, and TheraCal groups (p<0.05). Elastic modulus values followed a similar trend. At three weeks, Bio-C showed a dramatic decrease in E, showing a significant difference from control and TheraCal groups (p<0.05). By the end of the experiment, both Bio-C and Orbis showed significant differences between initial and final E values (p=0.002).

CONCLUSION: Calcium hydroxide-releasing materials were associated with increased degradation of the collagen matrices. This could potentially compromise the long-term treatments.

ORAL HEALTH STATUS AT AGE 60 AND 72 YEARS – A LONGITUDINAL STUDY

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AIM: This study investigated oral health status in 60-year-old individuals over 12 years.

MATERIAL and METHODS: Data were obtained from The Swedish National Study on Aging and Care (SNAC). One hundred nineteen 60 years old individuals (48% females) underwent a clinical and radiographic baseline examination (2001-2003) and follow-up examination in 2013-2015. For statistical analyses, paired t-test and McNemar's test were performed. Statistical significance was determined at $p < 0.05$.

PRELIMINARY RESULTS: At the 12-year follow-up, the mean number of teeth and the proportion of individuals having ≥ 20 teeth decreased ($p < 0.001$). The mean number of teeth with buccal/lingual and approximal caries lesions increased ($p < 0.029$ and $p < 0.031$). Individuals with a distance from cementoenamel junction to the bone of ≥ 5 mm increased in total ($p < 0.002$) and in males ($p < 0.006$). The prevalence of gingivitis increased in total ($p < 0.001$) and females ($p < 0.001$). The prevalence of periodontitis showed a significant increase in total ($p < 0.043$) and in females ($p < 0.039$).

CONCLUSION: The present study indicates that oral health status in 60-year-old individuals deteriorates over 12 years. However, the deteriorations were minor.

A LONGITUDINAL STUDY OF MAXILLARY INCISOR ROOT RESORPTION CAUSED BY ECTOPIC CANINES

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BACKGROUND and AIM: Root resorption of adjacent incisors is a well-known complication of maxillary impacted canines (MIC). The aim is to evaluate the long-term radiographical and clinical status of incisor root resorption caused by maxillary impacted canines (MIC).

MATERIAL and METHODS: Subjects with MIC and resorbed incisors (RI) examined with Cone Beam Computed Tomography (CBCT) ≥ 5 years ago were recalled. The resorption grade was assessed on CBCT images at baseline (T0) and at the follow-up (T1). A clinical examination was done at T1 including probing depth, gingival retraction, mobility, ankylosis, discoloration and vitality test. In addition, the patients fulfilled a questionnaire regarding symptoms from the incisors. Fisher's exact test was used for numerical data and for differences in grade of resorption over time.

RESULTS: Forty subjects (age at T0: 13.8 years±2.1), 34 females and 6 males with 47 incisors (87% lateral incisors, 13 % central incisors) were recruited. The follow-up range was 5.5-14.6 years (9.0 years ± 2.5). At T0, the resorption was diagnosed as slight in 38%, moderate in 36% and severe in 26 % of the incisors. At T1, none of the incisors were lost or were endodontically treated. The resorption grade was unchanged in 38 teeth, improved in 7, and aggravated in 2 teeth. Incisors with severe resorption at T0 were significantly more obliterated at T1 ($p < 0.001$). There were no significant differences between the RI and the unresorbed contralateral incisors regarding all clinical parameters. In addition, patients did not experience statistically more symptoms from the RI.

CONCLUSION: Resorbed incisors caused by MIC have a high survival rate in long-term.

CONSISTENCY BETWEEN INTER-INSTITUTIONAL PANELS USING A THREE-LEVEL ANGOFF-STANDARD SETTING IN LICENSURE TESTS OF FOREIGN-TRAINED DENTISTS IN SWEDEN

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BACKGROUND and AIM: The study examines the re-certification process for non-EU trained dentists in Sweden, exploring the consistency of the three-level Angoff method used in setting exam pass mark at two different Swedish universities.

MATERIAL and METHODS: A cross-sectional study design was used to analyse the rating consistency of two separate panels. The reference panel, from one university, was used to consecutively set the pass mark for examinations, while the external panel was recruited from another university, after the examinations. Three examinations during 2019-2020 were included in this study (267 items in total).

RESULTS: The item correlation and the absolute median difference between the panels show that the two panels ordered the items with a very strong relationship across exams, as regards the total item ratings, within dental disciplines, and within professional qualifications. Participants' scores were overall lower than the panels' ratings within dental disciplines.

CONCLUSIONS: The results strongly indicate that the expectations of the minimally qualified but still acceptable dentist are aligned at the two independent dental schools. The simplified three-level Angoff method is considered a promising solution to the resource challenges posed by the original Angoff method.

REMAINING CARIES-FREE – A PERSONAL CONCERN: SALUTOGENIC EXPERIENCES IN CARIES-FREE ADULTS

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BACKGROUND: Studies regarding the absence of caries have only appeared in recent years and the salutogenic perspective on this is therefore an almost unexplored area. A deeper understanding of the health factors behind caries freedom could lead to better help and treatment for affected individuals as well as better support for those without caries to remain caries-free.

AIM: This qualitative study aimed to explore middle-aged individuals' experiences of positively influencing factors to remain caries-free.

MATERIAL and METHODS: The inclusion criteria were age over 40 years and DFT=0. A strategic selection was made from the dental records from the Public Dental Health in the Region of Västra Götaland, Sweden, to include informants with different backgrounds in terms of gender, age, socioeconomics, and living in urban areas or in the countryside. Invitations and information were sent after which written consents were obtained. A total of 15 individuals were included and interviewed via online meetings. The audio-recorded interviews were then transcribed verbatim, and the textual data was analyzed using qualitative content analysis with an inductive approach. The study was approved by the Swedish Ethical Review Authority (registration number 2020-04819).

RESULTS: To remain caries-free were by the informants described as a personal concern. The study not only showed the importance of continuity, information and good communication in dental care, but also that the transmission of information, encouragement and good dietary and oral hygiene habits with additional fluoride intake, from family and school were important. Such early engagement and care foster good routines, firmly rooted in a personal concern to oral health and a consequentialist approach that emphasizes the long-term benefits of preventive care.

CONCLUSION: Being thorough and responsible seem to be personal qualities that promote freedom of caries. Experiences of gratitude and pride in managing to stay caries-free were also expressed.

DENTAL PROFESSIONALS' EXPERIENCES OF MANAGING ORAL DRYNESS IN GENERAL DENTAL CARE

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BACKGROUND: Oral dryness is a common condition that significantly impacts oral health and quality of life. The increasing population may make oral dryness a bigger concern for dental professionals. There is limited knowledge of how the condition is addressed in primary dental care. **AIM:** This study describes the dental professionals' experiences managing individuals with oral dryness in primary dental care.

MATERIAL and METHODS: We purposively included dental professionals with variations in, profession, years of professional experience, gender, working region, and workplace to participate in semi-structured interviews. Qualitative content analysis was used as an analysis method, which involves identifying themes and categories, with themes representing the interpretative aspect and categories the descriptive aspects of the text. **RESULTS:** Thirteen informants were interviewed (4 dentists, and 9 dental hygienists). Employed in public dental services (n=9) and private dental care (n=4) in Sweden. Analysis revealed two themes expressing the dental care professionals' experiences in managing oral dryness. The first theme *"Facing challenges in managing oral dryness"* comprised the following categories: heterogeneous patient group, lacking treatment, hindering measuring salivary secretion and needing more knowledge. The second theme was *"Having a person-centred approach in the management"* with the following categories: asking individualised questions, considering the patients' viewpoint and engaging with the patients.

CONCLUSIONS: We conclude that managing oral dryness presents challenges, but adopting a person-centred approach seems to be pivotal in the management.

CLINICAL OUTCOME OF DIFFERENT ZIRCONIA DENTAL IMPLANTS DESIGNS: A SYSTEMATIC REVIEW

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BACKGROUND: Currently, different designs of dental implants made of zirconium dioxide are available; one-piece implants (OPI), or two-piece implants, all with different lengths, diameters, and surface roughness.

AIM: to evaluate the survival and success rates of zirconia dental implants with different designs.

MATERIAL and METHODS: This systematic review was designed according to the PRISMA checklist and followed the PICO. The search was done on 4 databases and a manual search of the reference list of related reviews. Three authors reviewed on the title-abstract level and all authors reviewed on the full-text level.

RESULTS: 27 studies were included to assess the risk of bias. After quality assessment, 4 studies were included for further analysis and the remaining 23 studies with critical risk of bias were excluded. The reported success and survival rates of OPI ranged between 95-98.5% with no difference between different lengths and diameters. The acid-etched roughened surface design showed a higher survival compared to other surface designs.

CONCLUSION: five-years clinical outcomes for zirconia OPI with different diameters and lengths are encouraging, where the acid-etched surface roughened design is recommended.

RELIABILITY AND VALIDITY OF INTRAORAL PHOTOGRAPHS FOR ASSESSMENT OF ORTHODONTIC TREATMENT NEED

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BACKGROUND: Orthodontic treatment need has commonly been assessed using treatment need indices during clinical examinations, or on photographs in combination with plaster casts. Lately, the use of intraoral photographs alone for screening of malocclusions has increased.

AIM: To validate intraoral photographs for assessment of orthodontic treatment need.

MATERIAL and METHODS: The study sample consisted of case files from 30 pre-orthodontic patients 12–19 years of age. All case files included intraoral photographs and casts. The orthodontic treatment need of the cases was assessed by four calibrated orthodontists using the indices IOTN-AC, IOTN-DHC, ICON, and DAI. The four orthodontists assessed the 30 cases at three repeated occasions: 1) photos only, 2) photos + casts, 3) photos only. Finally, a consensus assessment was made by the four examiners WORKING together using both photos and casts.

Results: Inter-examiner agreement was slight for IOTN-AC and moderate for IOTN-DHC independent of whether photographs were used alone or in combination with casts. ICON had slightly higher inter-examiner agreement on photos + casts, and DAI was slightly better on photos only. In the validity analysis comparing individual assessments to consensus, equivalent differences were seen whether assessing intraoral photographs alone or in combination with casts. However, variability of assessments was substantial for both assessment methods.

CONCLUSION: Intraoral photographs are sufficient for assessing orthodontic treatment need as the inter-examiner agreement and validity is similar whether photos are used alone or in combination with casts.

METABOLIC PROFILING OF MISSING TEETH AND TOOTH LOSS

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BACKGROUND and AIM: Missing teeth have been linked to cardiovascular diseases, diabetes, and all-cause mortality. Our previous study revealed that the signs of oral infections and inflammatory conditions, i.e. periodontal disease and dental caries, are associated with disadvantageous profiles of circulating metabolites. This study investigates whether missing teeth and tooth loss, the endpoints of these diseases, are associated with similar metabolic features.

MATERIAL and METHODS: Finnish population-based studies Health-2000 (n=6,197) and FINRISK-97 (n=6,050) were included, as well as Parogene (n=465), a cohort of patients with an indication for coronary angiography. The number of teeth was recorded in clinical examinations. Serum concentrations of 157 metabolites were determined by nuclear magnetic resonance spectroscopy. Health-2000 subjects (n=3,371) provided follow-up serum samples, and 1,186 of them participated in a repetitional oral examination 11 years after the baseline. Linear regression models adjusted for age, sex, smoking, BMI, and diabetes were fitted between the number of teeth and metabolite measures. The results from the separate cohorts were combined in a fixed-effects meta-analysis. We also analysed whether the number of teeth at baseline and tooth loss during the follow-up period were associated with changes in metabolite concentrations.

RESULTS: Missing teeth were associated with increased very-low-density lipoprotein (VLDL)-related measures and triglyceride concentrations, as well as decreased high-density lipoprotein (HDL) parameters and a small particle size. Missing teeth also presented an association with low levels of unsaturated fatty acids (FAs), including omega-3 and omega-6 FAs, and elevated proportions of monounsaturated and saturated FAs. The number of teeth at baseline predicted changes in several concentrations, such as intermediate (IDL) and low-density lipoprotein (LDL)- and FA-related measures, but no associations with tooth loss during the 11-year follow-up period were observed.

CONCLUSION: Missing teeth are associated with an adverse metabolic profile characterised by systemic inflammation and several risk factors for cardiometabolic diseases.

CHEWING SIDE PREFERENCE, FACIAL ASYMMETRY AND RELATED FACTORS IN THE NORTHERN FINLAND BIRTH COHORT 1986

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BACKGROUND and AIM: The aim of this study was to find out how the preferred chewing side (PCS) affects facial asymmetry, what kind of factors affect PCS, and whether there are differences in facial asymmetry between symmetrical and asymmetrical masticators.

MATERIAL and METHODS: The study included 748 subjects born in 1985–1986 in Northern Finland (Northern Finland Birth Cohort 1986, NFBC1986). Subjects' faces were captured in facial 3D images with stereophotogrammetry technology, and they filled in a questionnaire concerning oral health. A comprehensive dental examination was done by a dentist. Subject´s chewing side preference was studied by chewing a piece of paraffin, cotton roll or parafilm, but different chewing materials had no significant effect on the distribution of chewing sides.

RESULTS: Reduced number of teeth on contralateral side affects PCS (OR = 2.39 in the case of one tooth is missing). Being female increased the whole face and lower face symmetry. Self-reported TMD pain has an effect on the sidedness of the chin; there is more pain in the larger side of the chin (OR = 9.45).

CONCLUSION: Females have a more symmetrical face compared to males. PCS does not have a statistically significant effect on facial asymmetry, but the variable affecting PCS itself is extracted teeth.

SELF-PERCEIVED ORAL HEALTH AND OROFACIAL APPEARANCE IN OLDER ADULTS - AN 18-YEAR FOLLOW-UP STUDY IN KARLSKRONA, SWEDEN

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BACKGROUND: Oral health is important at any age and, together with a pleasing facial appearance, contributes to quality of life. For older adults, good oral health and retention of natural teeth are beneficial for oral function. Deteriorating oral health may limit participation in social activities. Normal age-related changes in the oral cavity, which also contribute to visible orofacial changes, occur gradually over time. Becoming older does not mean that appearance becomes less important. Following the same individuals over time can provide insight into whether perceptions change with age.

AIM: To analyze whether self-perceived oral health and orofacial appearance change with increasing age.

MATERIAL and METHODS: This longitudinal study is based on data from a questionnaire used in the Swedish National Study of Aging and Care. The sample comprises 160 participants 60 years of age at baseline 2001–2003. The same participants were re-examined at 66-, 72- and 78 years of age. To analyze whether perceptions of oral health and orofacial appearance changed with increasing age, Cochran's Q test was conducted. Statistical significance was considered at $p \leq 0.05$ and the calculated value Q must be equal to or greater than the critical chi-square value (Q≥7.82).

RESULTS: Self-perceived mouth dryness, both day (Q=7.94) and night (Q=23.41), increased over the 18-year follow-up. When divided by gender, significant differences were only seen for mouth dryness at nighttime. A decrease in sensitive teeth was perceived with increasing age, and an increase in self-perceived satisfaction with dental appearance, and a decrease in self-perceived problems with dental gaps between the ages of 60 and 78. These changes were, however, not statistically significant. Men experienced a higher proportion of discomfort with discolored teeth at age 78 than at 60 (Q=9.09).

CONCLUSION: Self-perceived oral health and orofacial appearance were relatively stable, with few changes over an 18-year follow-up.

EVALUATION OF DENTAL CLINICIANS' ABILITY TO RATE DENTAL ANXIETY

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AIM: The aim of this study was to evaluate dental clinicians' ability to rate dental anxiety.

MATERIAL and METHODS: A total of 104 clinicians from 24 public dental clinics in the Region of Östergötland, Sweden, examined 1128 adult patients undergoing their regular dental examination. The patients rated their dental anxiety using the Modified Dental Anxiety Scale and a Visual Analogue Scale. After the examination, the clinicians rated the patients' levels of dental anxiety on a Visual Analogue Scale.

RESULTS: The correlation (r_s) between the clinicians' and patients' ratings of dental anxiety was 0.45. Among highly dentally anxious patients, there was no correlation between clinicians' and patients' ratings. Furthermore, dental clinicians rated dental anxiety lower than their patients, especially if the patients were highly anxious. The clinicians' ability to rate dental anxiety was better when both the clinician and the patient were older but there was an inverse association between clinicians' confidence and their ability to rate patient's dental anxiety.

CONCLUSION: clinicians are unsuccessful in identifying the highly dentally anxious patients. A self-assessment tools is needed in general practise for the detection of dental anxiety.

A COMPREHENSIVE ANALYSIS OF AGE-RELATED CHANGES IN THE DETERMINANTS OF ORAL FUNCTIONS

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BACKGROUND: Oral functions play a crucial role in our daily lives, contributing to essential activities such as eating, speaking, and swallowing. Aging can lead to various changes in the oral cavity, affecting these functions. Understanding the impact of aging on oral functions and their associations is imperative for healthcare professionals.

AIM: To study the association between different determinants of oral function and the corresponding changes that occur with age in older individuals.

MATERIAL and METHODS: A Comprehensive assessment of oral function was performed in 206 older individuals (mean age = 75.1±6.6) with a battery of oral function tests. These tests included measurement of orofacial muscle strength such as maximum voluntary bite force (MVBF), cheek and tongue pressure, and evaluations of chewing and swallowing functions. The chewing function was evaluated with a food comminution test where more pieces indicated better performance. Swallowing function was assessed with a standardized swallowing capacity test. Besides the dental status was also recorded. The data was subjected to Spearman's correlation analysis to explore the complexities of all the oral variables and their associations.

RESULTS: The analysis showed MVBF was significantly correlated with tongue pressure (r= 0.32), and no. of natural (r = 0.34). Further, the results also showed that MVBF ($P < 0.005$), tongue pressure ($P < 0.005$), number of natural teeth ($P < 0.005$), and swallowing capacity ($P < 0.005$) decreased significantly with age. However, there was no significant difference in the food comminution test ($P = 0.30$) with age.

CONCLUSION: Overall, the study shows a moderate to low correlation between different determinants of oral function in older individuals and a significant effect of age on the determinants of oral function.

ORAL HEALTH AND ORAL CARE IN OLDER PERSONS IN MUNICIPALITY HEALTH CARE FOR OLDER ADULTS

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BACKGROUND and AIM: Aging in combination with diseases, that predominantly affect older individuals, presents significant challenges in maintaining good oral hygiene. Older adults in the municipality health care often require assistance with oral care, which the staff may find challenging for various reasons. Despite Swedish national efforts providing free oral care training and education for the nursing care staff, as well as oral health assessment and written instructions for oral care, research indicates that older adults in municipal health care in Sweden still have substantial oral care needs. The overall aim of this thesis was to investigate how older adults in municipality health care can receive better support for oral care. The thesis will encompass four studies exploring various methods to enhance oral care supports for older adults, with the objective of promoting good oral health among those with care needs.

MATERIAL and METHODS: The four studies include: questionnaires from staff and assessment of oral status of older adults in an intervention study conducted in a nursing home with dental hygienists operating as "oral health coaches" (Study I); individual and focus group interviews regarding written oral care instructions (Study II); questionnaires filled out by care professionals and managers who were involved in a project with dental hygienists working as consultants in municipalities health care for older adults' (Study III); and interviews with older adults about their perspectives on current and future oral health and oral care, as well as potential assistances from dental, nursing, and health care services (Study IV). The studies represent research at various levels in the municipality health care for older adults and will contribute to new knowledge about older adults' and care professionals' needs regarding oral care support.

INFLUENCE OF LOW-DOSE CONE BEAM COMPUTED TOMOGRAPHY ON AUTOMATIC, ARTIFICIAL INTELLIGENCE-BASED BONE SEGMENTATION: AN EX-VIVO STUDY

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BACKGROUND and AIM: Image segmentation of the alveolar bony structures is a crucial step in the digital workflow in implant dentistry. Current recommendations in computer-aided implant planning suggest a trade-off between radiation dose and voxel size for segmentation, with a minimum of 200 μm resolution. The aim of this ongoing study is to evaluate the proposed trade-off between radiation dose and accuracy of automatic segmentation of cone beam computed tomography (CBCT) scans, utilizing factory set and dose-varying protocols.

MATERIAL and METHODS: Twenty human cadaveric mandibles were scanned in three CBCT units. The radiographic examinations included low-dose (LD), standard (SR), and high-resolution (HR) protocols based on a small field-of-view (FOV) and factory set exposure parameters. An ultra-low-dose protocol (ULD) was available and utilized for one unit. The acquired volumes were subsequently automatically segmented with regards to the mandibular bone, the mandibular canal, and the teeth using commercially available artificial intelligence (AI)-based software (Relu® Creator, Relu BV, Belgium). The segmentations were exported as STL-files.

Surface registration was performed in an open-source 3D mesh processing tool (MeshLab, ISTI-CNR, Italy) to align the segmentations for the same specimen. For these alignments, the segmentation of the HR protocol of a specific unit was used as a reference for the segmentations based on reduced dose protocols. An initial alignment was performed using point-based registration and followed by an automatic best-fit alignment using an iterative closest point (ICP)-algorithm. Data extraction regarding the geometric deviation between the segmentations will include minimum, maximum, and average distance between the models as well as the root mean square deviation (RMSD).

RESULTS: The results will arise from performing the alignments and surface registration of the segmentations. Relevant statistical analyses will be performed to compare the segmentations based on the various protocols.

ASSOCIATIONS BETWEEN CAROTID ARTERY CALCIFICATIONS ON PANORAMIC RADIOGRAPHS AND DEGREE OF VASCULAR DISEASE AMONG PARTICIPANTS IN THE VIPVIZA-STUDY

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BACKGROUND and AIM: Atherosclerosis is the major contributor to cardiovascular events like myocardial infarction and stroke that are the leading cause of death globally. The aim of this study was to investigate whether carotid artery calcifications (CAC) detected on panoramic radiographs (PR) and the shape of CAC are associated vascular disease assessed with carotid ultrasound.

MATERIAL and METHODS: VIPVIZA (VIsualiZation of asymptomatic Atherosclerotic disease for optimum cardiovascular prevention – a pragmatic randomized controlled trial nested in Västerbotten Intervention Program) included inhabitants from Västerbotten county, age 40, 50 and 60 years with at least one risk factor for cardiovascular disease. All participants underwent carotid ultrasound at baseline, 3- and 6 years follow-up. This retrospective sub-study included 206 of the 2672 VIPVIZA participants that had been examined with PR for odontological purposes during the study period. CAC on PR were compared to the carotid ultrasound findings of plaque and intima media thickness (IMT). The shape of the CAC was categorized as single/scattered features and vessel-width defining/vessel outlining features.

RESULTS: There was a statistically significant associations between CAC on PR and plaque as well as larger IMT, assessed with ultrasound ($P<0.05$). Further, participants with vessel-width or vessel outlining CAC had significantly larger IMT ($P<0.05$).

CONCLUSIONS: Carotid artery calcifications detected on panoramic radiographs are associated with findings on carotid ultrasound indicating cardiovascular disease. The shape of the calcification indicates the degree of cardiovascular disease. By detecting these calcifications, dentists could contribute to early identification of patients with asymptomatic cardiovascular disease and recommend them to seak medical attention for prevention.

PROSPECTIVE STUDY ON HEALTH-RELATED QUALITY OF LIFE, ORAL MUCOSITIS AND ORAL HEALTH DURING TREATMENT OF HEAD AND NECK CANCER

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BACKGROUND and AIM: Head and neck cancer (HNC) treatment causes several side effects that affects Health related Quality of life (HR-QoL). Oral mucositis (OM), a painful and debilitating inflammation in the oral mucosa is one of the worst side effects. Studies during HNC treatment are rare.This study charts the fluctuations in HR-QoL, OM and other clinical treatment related side effects and the impact of OM on HR-QoL wish can be useful in supportive treatment planning. The aim was to prospectively analyze HR-QoL, changes in clinical variables and the impact of OM on HR-QoL during HNC treatment.

MATERIAL and METHODS: Patients were recruited before curative cancer treatment and were given professional oral care weekly during oncologic treatment. HR-QoL was reported week 2, 4, 6, and three months after treatment using the European Organization for Research and Treatment of Cancer (EORTC) the stimulated whole salivary secretion rate was determined at the same time-points. OM was registered using the Oral Mucositis Assessment Scale (OMAS), at baseline, weekly during, and post treatment. Differences in HR-QoL between timepoints were analyzed. To analyze the impact of OM on HR-QoL the patients were categorized into no/mild OM or severe OM groups compared at three timepoints during treatment.

RESULTS: Fifty-seven patients, with a mean age of 58 years were included. Patients reported progressively impaired HR-QoL, with peak issues noted at weeks 4 and 6 and decreasing salivary secretion rates were determined. Patients with severe OM reported worse HR-QoL compared to those with no/mild OM. Persistent problems 3 months post treatment were appetite loss, dry mouth, senses (smell and taste) and problems with social eating.

CONCLUSION: Patients' experienced exacerbated symptoms and problems during oncological treatment, especially among those with severe OM they also reported persisting problems stressing the importance of supporting care to reduce and alleviate their symptoms both during and after completed treatment.

DESCRIPTION OF NK CELLS IN SALIVA FROM HEALTHY INDIVIDUALS

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BACKGROUND: Saliva is well-known to play an important role in maintaining oral health. Apart from water, which is the main component, saliva contains mucus, electrolytes and various cells including bacteria, epithelial cells and leukocytes. Natural killer (NK) cells are innate lymphocytes with the ability to eliminate virus infected cells and cancer cells. The human NK cell repertoire is highly heterogenous phenotypically and funcBonally. Human NK cells are commonly divided into two major subsets based on the surface expression of CD56 and CD16. Most NK cells in peripheral blood are $CD56^{dim} CD16^{bright}$ cells, while $CD56^{bright} CD16^{dim}$ NK cells are more common in Bssues. These two NK cell subsets differ funcBonally of which $CD56^{bright}$ cells have been seen as the immature and less cytotoxic ones, while $CD56^{dim}$ cells are more mature with higher cytotoxic capacity. Studies of NK cells in saliva are limited, and due to their important role in the defense against numerous diseases a beMer knowledge about NK cells in saliva could be of great value.

AIM: The aim of the project is to determine the baseline cellular content of NK cells and characterize NK cell phenotype in saliva from healthy individuals.

MATERIAL and METHODS: Saliva and blood is collected from healthy volunteers. NK cell phenotype is examined with flow cytometry.

RESULTS: Our preliminary results imply that the percentage of $CD56^{dim} CD16^{bright}$ NK cells in saliva from healthy individuals is lower when compared to matched peripheral blood NK cells.

CONCLUSION: The NK cell populaBon in saliva from healthy individuals differ from convenBonal NK cells in peripheral blood. On-going experiments are invesBgaBng the phenotype of saliva NK cells further.

PERIODONTITIS IS ASSOCIATED WITH INCREASED RISK OF PREVALENT METABOLIC SYNDROME

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BACKGROUND and AIM: Periodontitis increases risk of cardiometabolic diseases, such as diabetes, hypertension, obesity, and dyslipidemia. Our aim was to investigate, whether periodontitis is associated with metabolic syndrome in a population-based survey.

MATERIAL and METHODS: Study population included 1073 follow-up participants of DILGOM-2007, who gave a saliva sample. Salivary concentrations of interleukin-1β, matrix metalloproteinase-8, and *Porphyromonas gingivalis* were determined by using immunoassays and qPCR. These salivary biomarker concentrations were used to construct the mathematical diagnostic model, the cumulative risk score (CRS), where the index I, index II and index III depict low, moderate, and high risk of carrying periodontitis, respectively.

RESULTS: The mean age of the population was 58.8 (13.2) years and 487 (45.4%) were females. The number (%) of participants scoring CRS I, II, and III were 267 (24.9%), 498 (46.4%), and 308 (28.7%), respectively. In participants with metabolic syndrome, the ratio of CRS category III (32.8%) was significantly higher (p=0.015) when compared to category I (22.1%). In a logistic regression model, high CRS (category III) was associated with metabolic syndrome with an OR of 1.54 (95% CI 1.10-2.16, p=0.012) when CRS category I was taken as reference.

CONCLUSIONS: Periodontitis, which is composed of elevated bacterial burden, inflammatory response, and tissue destruction, is associated with the increased risk of having metabolic syndrome.

DENTAL HEALTH AND DENTAL CARE NEEDS IN CHILDREN PLACED IN OUT-OF-HOME CARE

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BACKGROUND and AIM: Health problems are overrepresented in children placed in out-of-home care (OHC). Since April 2017, the provision of health and medical care for children and young people in social care has been regulated in Swedish law. In the Convention on the Rights of the Child, children's right to health on equal terms is a fundamental right. The aim of this registry-based cohort study was to compare the dental health and dental care needs of children placed in OHC with other children in Sweden, by linking data from different registries. A further aim was to analyze whether children in OHC received more dental health examinations after 2017, after the implementation of the new law.

MATERIAL and METHODS: We identified an exposed cohort of Swedish children, 0–19 years, who had been placed in OHC at some point during the years 2010-2018 (N=59,348), and a five-times larger unexposed cohort, matched for age, sex, and municipality (N=296,730). Registry data on dental health, dental care, socio-economic background and medical diagnoses were obtained from the National Board of Health and Welfare, Statistics Sweden and the Swedish Quality Registry for caries and periodontal disease (SKaPa).

RESULTS: During the study period, children placed in OHC had fewer regular dental check-ups. More children placed in 2018 received dental check-ups compared to 2016, but this was still lower than for the controls. Children in OHC had more caries, more extracted teeth and more emergency visits to the dentist than children who had never been placed in OHC.

CONCLUSION: Children placed in OHC not only have poorer dental health than other children, but they also receive less support from dental care. There is an urgent need for effective organisational models for providing dental care to children in social care.

OBSERVATIONAL INTERPROFESSIONAL STUDY OF SELECTIVE SCREENING FOR PREDIABETES AND DIABETES IN A REAL-WORLD SETTING

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AIM: Describe a method in a real-world setting to identify persons with undiagnosed prediabetes and type 2 diabetes through interprofessional collaboration between Public Dental Services and Primary Health Care in Region Stockholm.

MATERIAL and METHODS: A descriptive observational study. Conducted at seven sites in region of Stockholm with a primary health clinic and dental clinic. Participants included adults over 18 years visiting Public Dental Services without previous medical history of prediabetes or type 2 diabetes. Selective screening conducted with the Public Dental Services risk assessment protocol. In the method, DentDi (Dent for dental and Di for diabetes), adults diagnosed with caries and/or periodontitis over a cut-off value were referred to the Primary Health Care clinic for screening of prediabetes and type 2 diabetes.

RESULTS: DentDi, introduced at seven sites between the years 2017 to 2020, all still using the method today. 863 participants from the Public Dental Services were referred to the Primary Health Care. 396 accepted the invitation screening for type 2 diabetes at the primary health care. 24 individuals did not meet inclusion criteria, with a total of 372 persons being included in the study. Among the participants, 27% (101) had elevated glucose levels, and 12 were diagnosed with type 2 diabetes and 89 with prediabetes according to the classification.

CONCLUSION: DentDi is a feasible method where each profession contributes with the competence included in their everyday clinical practice in a complete chain of care. The goal is to disseminate this method throughout Region Stockholm and possibly to regions around Sweden.

IS ROUTINE ANTIBIOTIC PROPHYLAXIS WARRANTED IN DENTAL IMPLANT SURGERY? – A SYSTEMATIC REVIEW

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BACKGROUND and AIM: The question of whether antibiotic prophylaxis should be routinely administered for dental implant surgery is unresolved. Lack of clear evidence notwithstanding, antibiotics are often administered to reduce the risk of infection, which could lead to early implant failure. Increasing antibiotic resistance is a major concern and it is therefore important to reduce the overall use of antibiotics, including in dentistry. The aim of the present systematic review and meta-analysis was to evaluate the effectiveness of preoperative antibiotics in preventing early implant failure in healthy patients.

MATERIAL and METHODS: An electronic search was undertaken of PubMed (Medline), Web of Science and the Cochrane Library up to January 23, 2023, to identify randomized clinical trials (RCTs). All RCTs comparing antibiotic prophylaxis with placebos were included. The primary outcome was patients with early implant failure. Risk of bias was assessed, data were extracted, a meta-analysis was done, and GRADE certainty-of-evidence ratings were determined.

RESULTS: With duplicates removed, 906 abstracts were screened, and 16 articles were reviewed in full text. Seven RCTs with moderate or low risk of bias and with a total of 1859 patients, were included. With reference to early implant failure, the meta-analysis failed to disclose any statistically significant difference (RR: 0.66 95% CI: 0.30-1.47) between antibiotic prophylaxis and a placebo. The risk difference was 0.7% (95% CI: -0.035-0.020) leading to a number needed to treat (NNT) of 91.

CONCLUSION: Antibiotic prophylaxis for dental implant surgery does not seem to have any clinically meaningful effect on early implant failure ($\oplus\oplus\oplus\bigcirc$). The results do not support routine antibiotic prophylaxis for dental implant surgery.

EFFECT OF DOMICILIARY DENTAL CLEANING ON ROOT CARIES IN CARE DEPENDENT OLDER ADULTS – RANDOMIZED TRIAL

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BACKGROUND: Brushing twice per day with fluoride toothpaste is often included in the daily routine. However, for care dependent older adults the routine is often forgotten either by themself or by nursing staff that results in poor oral hygiene and could lead to poor oral health. Also, older adults due to general health problem often fail to appear for regular check-ups at dental care.

AIM: To study the effect of domiciliary dental cleaning on root caries lesions (RCLs) in care dependent older adults with in-home care.

MATERIAL and METHODS: In-home care dependent individuals (n=196), 65 years or older with at least one natural tooth, were consecutively recruited during their annual oral health care assessment to this evaluator-blinded randomized controlled trial (RCT). Data regarding oral health parameters were collected at baseline and after twelve months by dental hygienists and registered in the web application REDCap (Research Electronic Data Capture). The intervention group received domiciliary professional brushing and oral hygiene instructions by dental assistants every third month and were supplied with toothbrushes and high fluoride (HF)- toothpaste. The control group received toothbrushes and HF-toothpaste every third month by in-home care assistants.

PRELIMINARY RESULTS: The dropout rate among the participants seems to be higher than anticipated. Many have moved to nursing homes or have deceased. Regarding the HF-toothpaste, the participants seem to have followed the recommended routine of brushing their teeth twice a day. Only a few dropouts have occurred due to perceived strong taste and burning sensation related to the toothpaste. Most study participants appreciated the visits by dental staff.

CONCLUSION: To conduct a study with older adults with in-home care require staff with experienced in scheduling and examining older adults in a domiciliary dental care setting. The possible effect on RCLs remains to be evaluated since the work of analyse the data has begun.

DEVELOPMENTAL CHANGES IN THE DETERMINANTS OF ORAL FUNCTION

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AIM: To evaluate development and age-related changes in the determinants of oral functions in growing children and explore the sex-related differences in these determinants.

MATERIAL and METHODS: The study involved 167 children between the ages of 3 to 17. Determinants of oral function such as maximum voluntary bite force (MVBF), tongue pressure, lip pressure, and cheek pressure were measured. Further, the participants were asked to perform a food comminution test, and two-color chewing gum mixing ability test to measure their masticatory performance. A multiple regression analysis was performed to investigate the relationship between age and the measured determinants of oral functions. The sex-related differences of the determinants of oral function were also investigated.

RESULTS: The (preliminary) results of the multiple regression analysis showed that MVBF ($P= 0.013$), tongue pressure ($P < 0.001$), lip pressure ($P= 0.021$), the number of pieces ($P= 0.045$) and the time ($P = 0.009$) of the food comminution test, and the mixing ability ($P < 0.001$) were significant predictors of age. The overall model was statistically significant ($F=21.889$, $P < 0.001$), explaining 55.4% of the variance in age (Adjusted $R^2 = 0.529$). Additionally, the results revealed a significant difference between boys and girls in both the number of chewing cycles ($P = 0.032$) and the total duration ($P = 0.004$) for consuming the viscoelastic test food in the food comminution test.

CONCLUSION: Determinants of oral function such as MVBF, tongue pressure and lip pressure, and performance in the masticatory function tests are important predictors of developmental changes in children. Furthermore, the results showed that girls eat with significantly more chewing cycles and for a longer duration than boys.

10 YEAR FOLLOW UP OF SINGLE IMPLANTS WITH ZIRCONIA OR TITANIUM ABUTMENTS ON NOBEL BRÅNEMARK IMPLANTS – A RETROSPECTIVE ANALYSIS

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AIM: The objective of this study was to compare technical and biological complications of single implants with titanium or zirconia abutments after ten years in function.

MATERIAL and METHOD: All single implant surgeries at the Brånemark clinic in Gothenburg during the years 2011-2013 was evaluated. After inclusion criteria was applied, 174 implants on 132 patients were included for analysis. Marginal bone loss compared to baseline and technical complications such as porcelain fractures was detected in the data records.

RESULTS: 65 patients and 87 implants were followed until the 10-year control, where 29 implants were connected to a zirconia abutment and 58 implants to a titanium abutment. One implant with a zirconia abutment was lost due to periimplantitis after seven years in function, all other implants survived.

Marginal bone loss differed slightly between the two abutment groups, where single implants with titanium abutments showed 0,314 mm bone loss at year ten, as compared to single implants with zirconia abutments which had 0,278 mm bone loss.

Peri-implant mucositis was seen on 34 % of the implants with zirconia abutments, as compared to 16 % of the ones with a titanium abutment.

Technical complications occurred on 5,6 % of the implants from five-year control up to ten years in function. Chipping of covering porcelain was the most common complication found, followed by detachment of abutment screw.

CONCLUSION: Low marginal bone loss values were seen on the ten-year control, however single implants with titanium abutments displayed slightly more progression of bone loss from year five to year ten. Peri-implant mucositis was more commonly seen around zirconia abutments. Technical complications were rare, mostly seen as chipping of covering porcelain.

LONG-TERM SURVIVAL OF ROOT-FILLED TEETH IN THE ADULT SWEDISH POPULATION

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AIM: To investigate tooth survival after root canal treatment (RCT) and to analyse factors associated with extraction in the Swedish adult population over 11–12 years.

MATERIAL and METHODS: Searches for all registrations of treatment codes of RCT to the government agency SSIA (Swedish Social Insurance Agency) during 2009 formed the cohort of individuals followed in the registry until the end of 2020. For individuals with several RCTs, only the first registered tooth was included in the analyses. Sex, age, tooth type and registrations of further treatments such as coronal restorations and post and cores were obtained from SSIA. Kaplan-Meier survival and multivariable logistic regression analyses were used and $p < 0.05$ was considered statistically significant.

RESULTS: A total of 215,611 individuals with at least one RCT were registered in 2009. During the follow-up period 43,238 teeth were extracted, resulting in a tooth survival of 79.9% over 11–12 years. Logistic regression analysis found significant associations for all variables except sex ($p = 0.853$). The highest odds ratios (OR) for extractions were associated with the type of restoration: teeth with composite filling and post and core (OR = 2.61; 95% CI 2.16−3.16; $p < 0.001$) and teeth with composite crown combined with post and core (OR = 2.48; 95% CI 1.88−3.27; $p < 0.001$) were more likely to undergo extraction compared to teeth with an indirect restoration without any post and core (reference).

CONCLUSIONS: Overall, root-filled teeth had a tooth survival of approximately 80% over 11–12 years and high OR for extractions were associated with type of restoration, more specifically composite restorations. In summary, after RCT in the Swedish adult population, several individual- and tooth-specific variables were associated with extraction.

DIAGNOSTIC IMAGE QUALITY IN BITEWING EXAMINATIONS

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BACKGROUND: In general dentistry, intraoral bitewing images are commonly used to diagnose non-clinically visible approximal carious lesions and estimate marginal bone level. Suboptimal image quality due to improper imaging technique can lead to unnecessary radiation, misdiagnosis, inadequate treatment, or treatment omission.

AIM: To evaluate diagnostic image quality in bitewing examinations (BWE) and deficiencies in applied imaging technique.

MATERIAL and METHODS: In total, 1000 randomly selected BWEs performed with CMOS-technique in 2019 as part of routine check-ups at general dental clinics in Västerbotten county council, Sweden, were retrospectively analysed. The assessment of image quality focused on the possibility to diagnose caries and marginal bone level. Deficiencies related to applied imaging technique were analysed. If present, radiographic images of other categories than bitewings that compensate for deficiencies in the BWE were considered. Differences between age-groups, gender, sensor size and number of exposed images were analysed.

PRELIMINARY RESULTS: Twenty-four of 304 (8%) BWEs were of optimal diagnostic quality considering both caries and marginal bone level; 80 (26%) met requirements for caries diagnostics and 67 (22%) for marginal bone level evaluation. Considering clinical factors in a holistic evaluation, 134 (44%) BWEs were of acceptable diagnostic quality. Gender didn't impact the image quality (p=0.678). However, the image quality was better with larger sensor size (p=0.001), among patients aged ≥13 years (p<0.001) (the larger sensors were more prevalent among these patients) and finally image quality correlated with extended examinations meaning higher number of exposures (p=0.002). Common deficiencies were related to incorrect sensor placement and beam angulation.

CONCLUSION: Less than 1 of 12 BWEs performed with CMOS-technique fulfilled the diagnostic requirements for caries and marginal bone level assessment. Opting for the larger sensor size and utilizing complementary exposures to improve the BWEs, would improve the outcome.

PROTEOMIC CHARACTERIZATION OF CD177 NEUTROPHIL SUBTYPES

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BACKGROUND and AIM: CD177 is a glycoprotein differentially expressed on the surface of neutrophils dividing them into the positive and the negative population. The distribution in peripheral blood remains constant in any given individual throughout life. Distinct functions of CD177 are not yet discovered. It has previously been shown that the CD177 positive population is preferentially recruited to the inflamed gingival pockets of the patients who suffer from periodontitis. Aiming to uncover potential differences between CD177 positive and negative neutrophil populations we conducted a proteomic analysis of the two subtypes.

MATERIAL and METHODS: We sampled whole peripheral blood from 8 individual donors. Cells were isolated into the CD177 positive and negative populations and proteomic analysis was conducted. Flow-cytometry and fluorescent microscopy were used to further investigate the differences between the populations.

RESULTS: The proteomic content of CD177 positive cells had distinct differences in all donors combined. Proteins with FC larger than 2 included CD177, Bone marrow proteoglycan, Proteoglycan 3, Eosinophil peroxidase and Galectin-10. The proteins expressed more in the positive population are mostly deemed classic eosinophilic. Flowcytometry and microscopy suggest that eosinophil peroxidase is binding to neutrophils, potentially preferably to CD177 positive cells.

CONCLUSION: The proteomic analysis suggests there is a difference between the positive and the negative population. The CD177 positive population seems to have an enhanced expression of proteins traditionally considered to belong to eosinophils. We aim to conduct deeper research to determine the nature of eosinophilic protein content and how it relates to the function of the CD177 positive neutrophils. Further research is also needed to determine how the potential differences relate to periodontitis and other diseases where CD177 seems to play a role.

EXPLORING ASSOCIATIONS BETWEEN MEDICATION USE, FRAILTY AND ORAL HEALTH IN ACUTELY ILL OLDER ADULTS

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BACKGROUND and AIM: Polypharmacy and frailty are common among the older adults and impose risks of deteriorated oral health. The aim of our current study was to explore the impact of polypharmacy, xerogenic medications and frailty on oral health of older adults experiencing acute illness.

MATERIAL and METHODS: This interprofessional study was conducted at Oslo municipal in-patient acute care unit (Jan-Sep 2023). Included patients were ≥70 years and gave written informed consent. Polypharmacy was defined as using ≥6 regular medications. Definition of xerogenic medications (XM) was based on current literature and adapted to Norwegian conditions. Frailty was defined as a score ≥5 on the Clinical Frailty Scale (CFS). Xerostomia was examined with the Summated Xerostomia Inventory (SXI). Objective signs of dry mouth were assessed using the Clinical Oral Dryness Score (CODS) and unstimulated whole saliva (UWS). Patients' dentitions were characterised by number of missing teeth (MT) and posterior occluding teeth (OT).

RESULTS: A total of 382 patients were included (mean age 84 years). Polypharmacy was identified in 282 (74%) patients. The mean numbers of regular and xerogenic medications were 8 and 2, respectively. Frailty was categorised in 210 (55%) patients. Mean values of SXI, CODS and UWS were 7.6, 3.5 and 0.18 ml/min.

Patients with polypharmacy had significantly higher SXI scores. Patients using ≥1 regular XM had significantly higher SXI scores and number of MT. With each additional XM, the UWS secretion rate decreased with 0.01 ml/min. Significantly elevated numbers of regular medications, XM, SXI score, number of MT and significantly reduced OTs, were observed in patients with frailty compared to the non-frail individuals.

CONCLUSION: This interprofessional study highlights the important connection between oral and general health in acutely ill older adults. Our findings align with WHO strategy of 2030, acknowledging oral health as an essential part of general health and overall well-being.

PHARMACOLOGICAL MANAGEMENT OF PAIN IN CHILD DENTISTRY - A SURVEY STUDY

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AIM: The aim was to investigate the frequency of use of different types of pharmacological pain management strategies in children, among General Dental Practitioners (GDPs) and Specialists in Paediatric Dentistry (SPDs).

MATERIAL and METHODS: 102 Swedish SPDs and 243 GDPs in Skåne county (southern Sweden) answered a questionnaire, which comprised 4 clinical scenarios covering filling therapy and tooth extraction in children aged 4 through 12 yrs. Each scenario had questions about how often the dentist would use local anaesthetics or recommend pre- and postoperative analgesics, that were answered on a 5-point Likert-type scale (Always, Often, Sometimes, Seldom, Never).

RESULTS: 90.9% of GDPs and 98.0% of SPDs reported always or often using local anaesthetics when performing filling therapy in a primary molar ($p = 0.019$). Corresponding figures for filling therapy in a permanent molar were 91.7% of GDPs and 99.0% of SPDs ($p = 0.006$). Postoperative administration of analgesics after extraction of a premolar was recommended always or often by 60.4% of GDPs and by 80.4% of SPDs ($p < 0.001$). The most often recommended analgesic agent for postoperative administration was paracetamol/acetaminophen, which 63.4% of GDPs and 60.4% of SPDs recommended.

CONCLUSIONS: This study shows that GDPs generally used local anaesthetics and recommended postoperative analgesics less frequently than SPDs. If there is a general underuse of pharmacological pain management strategies in child dental care, it is problematic since pain is a major contributing factor for developing dental fear and anxiety in children.

POTENTIAL EFFECT OF POLAR SOLVENTS-CONTAINING PRETREATMENTS ON PUSHOUT BOND STRENGTH OF MINERAL TRIOXIDE AGGREGATE

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AIM: To investigate the potential effect of dentin- pretreatments containing dimethyl sulfoxide (DMSO) and/or ethanol (EtOH) on the push-out bond strength of mineral trioxide aggregate.

MATERIAL and METHODS: Forty-two freshly extracted premolars were horizontally sectioned at the level of 0.5 mm mm radicular to the cemento-enamel junction using a water-cooled low speed diamond saw (Buehler Ltd., Lake Bluff, IL, USA) to produce 15 ± 2 mm long roots. To determine the working lengths of each root, the tip of a size 15K-file (Brasseler, Savannah, GA, USA) was used and extending beyond the apical foramen and subtracting 1 mm from that length of the file, followed by instrumentation of canals with Protaper rotary instruments (Dentsply Maillefer, Ballaigues, Switzerland). The master apical instrument was the Protaper F4. For irrigation after each instrumentation, 5 mL of 2.5% sodium hypochlorite (Asfer, São Caetano do Sul, SP, Brazil) and 5 mL distilled water were used. Fiber post preparation burs (3M ESPE RelyX, St. Paul, USA) were used up to size #3 to standardize the canal diameter, and a final rinse of 1 mL 17% ethylenediaminetetraacetic acid (EDTA) was applied for each root for 1 min, followed by 5 mL distilled water. Each root canal was dried with paper points (Dentsply, York, PA, USA). Teeth were randomly distributed into 6 groups (n=7) and dentin pretreatments with 1.5 µL for 10 s was performed using the following solvents: pure ethanol (EtOH), pure DMSO, 50% DMSO dissolved in water (DMSO/H_2O) or ethanol (DMSO/EtOH), and an aqueous 50% ethanolic solution (EtOH/H_2O), and finally no treatment. Mineral trioxide aggregate (MTA, Orbis oy, Espoo, Finland) was applied in a 2 mm-thick increments and light cured for 20 s until the whole canal was filled. Data were analyzed by Kruskal-Wallis test (α=0.05).

RESULTS: The group with pure DMSO- pretreatment demonstrated the highest bond strength compared to other groups, followed by the no pretreatment group. Although the differences were not statistically significant (*p*>0.05). Among the tested pretreatments, the groups subjected to DMSO/H_2O pretreatments exhibited the lowest bond strength (p>0.05).

CONCLUSION: A detrimental effect may occur when utilizing non-aqueous polar solvents as dentin-pretreatment agents on the bond strength of mineral trioxide aggregates. Therefore, caution must be exercised when incorporating ethanol or DMSO to enhance the performance of mineral trioxide aggregates.

ORAL HEALTH RELATED QUALITY OF LIFE AMONG INDIVIDUALS UNDERGOING BARIATRIC SURGERY: A SCOPING REVIEW

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BACKGROUND: Bariatric surgeries (BS) have been associated with improved systemic health as well as a number of physical and mental side effects.

AIM: To describe the literature on oral health related quality of life (OHRQoL) in BS patients.

INCLUSION CRITERIA: Analytic observational and experimental studies on OHRQoL and BS.

METHODS: PubMed/MEDLINE, Embase and Web of Science databases were searched with no time limits as part of an ongoing larger search on BS and oral health. Two reviewers independently screened all abstracts and those that met the inclusion criteria were reviewed in detail. Extracted data included details about study setting, country, participants, inclusion criteria, type of BS, oral health variables and key findings. A narrative synthesis of the available evidence was adopted.

RESULTS: After 1797 initially retrieved records, 42 remained following deduplication, eligibility assessment and screening procedures. These included 33 original studies and 9 systematic reviews. Out of the 33 records, 15 assessed subjective oral health indicators, of which 6 focused on the OHRQoL via different versions of the Oral Health Impact Profile (OHIP) questionnaire. Three out of the 6 related studies demonstrated that BS had a negative impact on the OHRQoL. The domain "Functional Limitation" was particularly low following BS.

CONCLUSION: Within the review limits, the oral health related quality of life following bariatric surgery was relatively low. Further large span, long term research is required to confirm these findings.

DENTAL STATUS OF ESTONIAN ADULTS

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BACKGROUND and AIM: Oral diseases pose a burden to many populations. Creating a national oral health strategy for preventing and treating dental diseases and funding public dental services presumes an overview of the population's oral health. Previous studies have not assessed the dental status of the Estonian adults. This study aimed to give an overview of Estonian adult populations' dental health by age and gender.

MATERIAL and METHODS: The study was based on data from a nationwide Estonian Adult Oral Health Survey conducted by the authors. The sample was designed to represent Estonia's adult population aged 35 and over. Participation in the survey was voluntary. Information on adults' oral health was collected through clinical dental examinations (n=3045) conducted by calibrated dentists. The sample included 1864 women (61%) and 1181 (39%) men, divided into five age groups.

RESULTS: The primary conditions in the oral cavity were caries, periodontal diseases, and early tooth loss due to the diseases mentioned. Changes in the status of single teeth were seen in both males and females with age. In younger adults, teeth lost were mainly third and first molars; in older adults, front teeth remained in the mouth, predominantly in the lower jaw. Treatment and disease affected more maxillary teeth and less mandibular. The loss of almost all upper teeth, including incisors, in the age group 75+ was seen in both genders.

CONCLUSION: Across all age groups, males exhibited a slightly higher count of intact teeth than females. A decline in the number of intact teeth was observed with each passing decade, and the incidence of tooth loss escalated significantly with advancing age in both genders. Our study encourages further studies to develop age and gender-based intervention strategies for improving the population's dental health and public funding of dental services.

EVIDENCE MAPPING AND QUALITY ASSESSMENT OF SYSTEMATIC REVIEWS ON VARIOUS ASPECTS RELATED TO PATIENTS WITH CLEFT LIP AND PALATE

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BACKGROUND and AIM: Management of cleft lip and palate is interdisciplinary. An evidence-mapping approach was envisaged to highlight the existing gaps in this field, using only the highest level of evidence. To conduct evidence mapping and quality analysis of systematic reviews and meta-analyses related to any aspect of cleft lip and palate.

MATERIAL and METHODS: The cleft lip and palate field was divided into 9 domains and 50 subdomains and a method of categorization of systematic reviews was established. A comprehensive search strategy was carried out in seven databases along with the search of gray literature and references of included articles. Systematic reviews related to any aspect of cleft lip and palate, conducted by a minimum of two reviewers, with a comprehensive search strategy and adequate quality analysis were included. A self-designed, pre-piloted data-extraction sheet was used to collect information that was analyzed through an expert group discussion. Quality analysis was performed using ROBIS-I, AMSTAR 2, and the PRISMA checklist.

RESULT: A total of 144 systematic reviews published between 2008 and 2022 were included. The largest number of these could be categorized in the therapeutic domain (n = 58). A total of 27% of the studies were categorized as inconclusive, 40% as partially conclusive, and 33% as conclusive. As per ROBIS-I, 77% of reviews had high risk of bias while 58% were graded as critically low in quality as per AMSTAR 2. The majority of systematic reviews showed low reporting errors.

CONCLUSION: The majority of systematic reviews related to cleft lip and palate relate to therapeutic and prognostic domains and show high risk of bias and critically low quality regardless of the source journal. The results of this paper might serve as a starting point encouraging authors to carry out high-quality research where evidence is lacking.

ANALYSIS OF RESIN INFILTRATION TO MANAGE UNAESTHETIC WHITE SPOT LESIONS AFTER ORTHODONTIC TREATMENT

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BACKGROUND: White spot lesions (WSLs) are one of the most common adverse effects following fixed orthodontic treatment. If not treated, these white, opaque lesions can cause aesthetic concerns, symptoms and can progress to carious lesions. A new way to interceptively treat WSLs, using the minimal invasive technique, resin infiltration (RI) has been proposed.

AIM: To analyze resin infiltration (RI) as a treatment to improve the objective and subjective aesthetic perception of teeth with WSL.

MATERIAL and Method: Ten patients: 4 male and 6 female (mean age: 19,4) with WSL on 44 maxillary anterior teeth following orthodontic treatment were included. The teeth were treated with RI using the instructions from the manufacturer (Icon, DMG, Hamburg). Measurements was made before and after 2 weeks. The objective evaluation was assessed on intraoral photos for each tooth. The subjective evaluation was assessed with the "How do you experience the color of your teeth?" using a Likert scale: 0-10 (0=very dissatisfied, 10= very satisfied). Esthetical improvement and greater score of satisfaction was registered: Yes, Unchanged, or No.

RESULTS: Objective outcome: Out of 44 teeth, 43 were graded as improved and one tooth as unchanged in appearance of the WSL after RI treatment. Subjective outcome: Eight out of ten patients were more satisfied, one unchanged and one less satisfied with the color of their teeth after RI treatment.

CONCLUSION: Resin infiltration improves the objective and subjective aesthetic perception of teeth with WSL after orthodontic treatment.

THE ASSOCIATIONS BETWEEN ELECTRONIC SMOKING AND ORAL HEALTH: A SYSTEMATIC REVIEW

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BACKGROUND and AIM: Smoking and the use of electronic cigarettes (e-cigarettes) are common practices that have significant consequences for oral health. Although the negative impact of traditional tobacco products on oral tissues is widely known, the emergence of e-cigarettes poses a new obstacle. This review summarizes existing data on the influence of e-cigarettes on oral health, with a specific emphasis on dental caries and pro-inflammatory agents.

MATERIAL and Method: A comprehensive search was conducted via PubMed, Web of Science, Embase, and Scopus to identify relevant studies published till April 2024. A structured search strategy was followed and resulted in a total of 42 articles which were read in full text. The included articles consisted of clinical trials, observational studies, and laboratory investigations that examined the impact of e-cigarette aerosol on oral bacteria and inflammatory markers and its potential to contribute to dental caries.

RESULTS: The findings indicate that those who use e-cigarettes may have a higher prevalence of dental caries and elevated levels of pro-inflammatory markers compared to those who do not use any smoking. This indicates a notable oral health risk associated with vaping. However, the effects of e-cigarettes on dental caries need more investigation since data does not give a clear picture.

CONCLUSION: The review emphasises the necessity for ongoing research to clarify the mechanisms that cause these consequences and to guide public health policies aimed at reducing the harm caused by using e-cigarettes.

DOES CHOICE OF ORAL HEALTHCARE SERVICES HAVE ANY EFFECT ON ORAL HEALTH-RELATED QUALITY OF LIFE?

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AIM: This study aimed to evaluate the mediating effect of selecting either public or private oral healthcare services in the relationship between oral disease and OHRQoL.

MATERIAL and METHODS: This study utilized the data from two birth cohorts from the two northernmost provinces of Finland, the Northern Finland Birth Cohort 1966 (NFBC1966) and the Northern Finland Birth Cohort 1986 (NFBC1986). Clinical oral examination was conducted when NFBC1966 were 45–46-year-olds (n = 1964), and NFBC1986 were 33–35-year-olds (n=1807). Participants in both cohorts were asked to fill-up an oral health-related questionnaire before clinical examination. Structural Equation Model was used to study the mediating effect.

RESULTS: Almost half of the study participants in the older cohort and almost two-thirds of the participants in the younger cohort used private oral healthcare services. Oral health treatment needs had a significant direct effect on OHRQoL (β = 0.350, $p < 0.001$) as well as on choice of public oral healthcare services (β = 0.368, $p < 0.001$). Additionally, choice of public oral healthcare services had a negligible effect on OHRQoL (β = -0.065, $p = 0.034$). Choice of any oral health care did not mediate the relation between oral disease and OHRQoL (β = 0.024, 95 % CI: - 0.094 to 0.007).

CONCLUSION: The present study highlights that the individuals with higher treatment needs prefer public oral healthcare services in Finland. However, there was no mediating effect of choice of oral healthcare services in the relationship between oral health treatment needs and OHRQoL

DISTINCT SALIVARY INFLAMMATORY PROFILES IN PATIENTS WITH PERIODONTITIS AND PERI-IMPLANTITIS

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BACKGROUND and AIM: Periodontitis (PD) and peri-implantitis (PI) are characterized by an inflammatory response and immune reaction initiated by pathogenic bacteria and biofilm. The chronic inflammation in turn can cause the degradation of connective tissue and tooth-supporting bone leading to PD and PI, respectively. This study aimed to compare the salivary inflammatory mediator profile in patients with periodontitis, peri-implantitis and healthy controls.

MATERIAL and METHODS: Samples of stimulated saliva were collected from patients (n=138), with a mean age of 63.2 ± 11.6 years. Healthy individuals (n=41) and individuals with periodontitis and/or peri-implantitis (n=97) who had implants installed for a minimum of 10 years were included. Samples were analyzed using a multiplex-immunoassay panel including the tumor necrosis factor (TNF), interferon (IFN), and interleukin (IL) superfamily (Bio-Rad Laboratories).

RESULTS: The levels of BAFF (belonging to the TNF ligand family), sIL6Rβ, IFN-β, and sIL6Rα were significantly ($p < 0.05$) higher in saliva samples of patients with PD and/or PI compared to healthy subjects without periodontal disease. Using the diagnosis periodontitis and/or peri-implantitis as the dependent variables and salivary inflammatory mediators, sex and smoking as independent variables demonstrated that smoking and sIL6Rβ were significantly ($p < 0.05$) correlated (OR=4.69 and OR=52.77 respectively) with PD and/or PI diagnosis.

CONCLUSION: Within the limits of this cross-sectional study, our findings suggest a potential difference in salivary cytokine levels between patients according to periodontal and peri-implant diagnosis. Moreover, our study suggests that sIL6Rβ shows promise as a candidate biomarker for salivary diagnostics of periodontitis and/or peri-implantitis. Using the detection of salivary inflammatory mediator levels might serve as an adjunctive diagnostic method for early detection of signs of disease. Additional investigation with a larger sample size is needed to further determine the role of salivary cytokines in the pathogenesis and progression of PD and PI.

DIABETES AND DIABETES-RELATED COMPLICATIONS ARE ASSOCIATED WITH PERIODONTITIS: POPULATION DATA FROM SWEDEN

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BACKGROUND and AIM: Previous evidence suggests that periodontitis is associated with type 2 diabetes (T2D) and may contribute to diabetes-related complications. Corresponding data on type 1 diabetes (T1D) and periodontitis are limited. We aim to evaluate the association between T1D / T2D and periodontitis, and assess the influence of periodontitis on diabetes-related complications.

MATERIAL and METHODS: This observational study was based on data from multiple Swedish registries. We identified two groups of individuals with diabetes (T1D: 28801; T2D: 251645) and two groups without diabetes (non-T1D: 57839; non-T2D: 539805), matched for age, gender and county of residence. Data on glycemic control, periodontitis and diabetes-related complications were obtained for a 10-year period (2010-2020). Regression models adjusted for age, gender, education and income, were utilized to evaluate the association between diabetes and periodontitis, as well as incidence of complications.

RESULTS: Periodontitis was more common among T2D (22%) than non-T2D (17%). Differences were larger in younger age groups (adjusted RR at age 30-39 years 1.92; 95%CI 1.81 to 2.03) and exacerbated by poor glycemic control. Periodontitis prevalence was 13% in T1D and 11% in non-T1D; only the subgroup with poor glycemic control was at higher risk for periodontitis. Periodontitis was associated with a higher incidence of retinopathy (T1D HR 1.08, 95%CI 1.02 to 1.14; T2D HR 1.08, 95%CI 1.06 to 1.10) and albuminuria (T1D HR 1.14, 95%CI 1.06 to 1.23; T2D HR 1.09, 95%CI 1.07 to 1.11). Periodontitis was not associated with a higher risk for stroke, cardiovascular disease, or higher mortality.

CONCLUSIONS: The association between type 2 diabetes and periodontitis was strong and exacerbated by poor glycemic control. For type 1 diabetes, the association to periodontitis was limited to subgroups with poor glycemic control. Periodontitis contributed to an increased risk for retinopathy and albuminuria in type 1 and type 2 diabetes.

EFFECT OF SILVER FLUORIDE TREATMENT ON DEGRADATION OF DENTIN COLLAGEN MATRIX

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AIM: Silver fluorides find extensive applications in dental practice due to their antimicrobial and anticaries effects. This study aims to evaluate the impact of various silver fluoride treatments on the degradation of the dentin collagen matrix.

MATERIAL and METHODS: Dentin beams (0.3 x 3 x 7mm, n=10/group) were demineralized in 10% phosphoric acid for 30 minutes**.** Subsequently, the beams were rinsed in distilled water for 1h and equally distributed into six groups based on baseline dry mass measurements. Test groups were treated with (1) 38% Silver Diamine Fluoride = SDF (Riva Star, SDI), (2) SDF+Potassium Iodide = KI (Riva Star, SDI), (3) 38% Aqueous Silver Fluoride = AgF (Riva Star Aqua, SDI), (4) AgF+KI (Riva Star Aqua, SDI), (5) KI (Riva Star Aqua, SDI) for 60sec. Untreated demineralized dentin beams served as control group. Following treatment, the beams were dehydrated in a desiccator for 72 h and the dry mass of dentin beams was measured individually. Subsequently the beams were incubated in 500 µL artificial saliva at 37ºC for 1- and 3-week in a water-shaking bath. After each incubation period, the dry mass of beams were re-measured and aliquots of incubation medias were analyzed to determine the amount of hydroxyproline (HYP), which served as an estimate of total collagen degradation. The data were analyzed using a two-way ANOVA with a significance level of $\alpha=0.05$.

RESULTS: The cumulative dry mass loss increased in all groups over time. After 1- and 3-week incubation, the loss of dry mass for SDF and AgF groups were lower than the control. However, the SDF+KI (-24%±0.03) and AgF+KI (-10.0%±0.02) groups showed significantly higher mass loss compared to untreated control ($p<0.05$). Analysis of hydroxyproline (HYP) as an indicator of total collagen degradation revealed that SDF and AgF treatments did not significantly affect collagen degradation ($p>0.05$). In contrast, SDF+KI and AgF+KI treatment resulted in a 10-20-fold increase in collagen degradation. ($p<0.05$).

CONCLUSION: Treatment with silver fluoride alone may reduce the overall degradation dentin organic compartment. However, the addition of potassium iodide (KI) leads to an increased degradation of the collagen matrix.

DIABETES-RELATED MICROVASCULAR COMPLICATIONS AND PERIODONTITIS: HEALTH IN CENTRAL DENMARK

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BACKGROUND and AIM: Inconsistent findings indicate a potential relationship between diabetes-related microvascular complications and periodontitis. Thus, this study evaluated the link between individual and combined diabetic microvascular complications (i.e., neuropathy and retinopathy) and the severity of periodontitis in a Danish population-based study. We also explored the influence of dyslipidemia on these relationships.

MATERIAL and METHODS: This study included 15,922 individuals with type 2 diabetes from the Health in Central Denmark study. Multinomial logistic regression was employed to determine the odds ratios (ORs) and 95% confidence intervals (CIs) for both individual and combined complications related to microvascular diabetes. Adjustments were made in the models for potential confounding variables, which included sociodemographic status, lifestyle habits, and health conditions. To equalize the measured confounding factors among participants with and without periodontitis, inverse probability of treatment weighting (IPTW) was applied. The robustness of the results was verified through sensitivity analyses, which involved calculating E-values for unmeasured confounders and modifying the definitions of microvascular complications.

RESULTS: Post-IPTW adjustments, the models demonstrated an association between diabetic neuropathy (OR 1.36, 95% CI 1.14 – 1.63) and retinopathy (OR 1.21, 95% CI 1.03 – 1.43) and 'moderate/severe' periodontitis. The presence of concurrent microvascular complications was linked to a 1.5 times increase in the likelihood of 'moderate/severe' periodontitis (OR 1.51, 95% CI 1.23 – 1.85). We observed an additive scale effect modification by dyslipidemia on periodontitis, with relative excess risks of interaction between 0.11 and 0.44. The sensitivity analysis confirmed that neither unmeasured confounders nor definitions of microvascular complications influenced the results.

CONCLUSION: Diabetic neuropathy and retinopathy, independently and concomitantly, were associated with periodontitis. Furthermore, dyslipidemia exhibited an additional positive effect modification of microvascular complications. These results could help to identify which subgroups are more susceptible to diabetes-associated microvascular complications and periodontitis, enhancing strategies to reduce the impact of these conditions.

MODIFICATION OF FLUORIDE ION RELEASE BEHAVIOUR DISPERSED IN DENTAL POLY METHYL METHACRYLATE MATERIAL BY INCORPORATING POLYETHYLENE OXIDE

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BACKGROUND and AIM: Polymethyl methacrylate (PMMA) is a polymer commonly used in clinical dentistry, including denture bases, occlusal splints, and orthodontic retainers. Sodium fluoride (NaF) is a commonly used anti-caries drug. However, NaF could not disperse well in PMMA, and it is not conducive to the release of fluoride ions. Therefore, we designed a strategy to add Polyethylene Oxide (PEO), an amphiphilic and biocompatible material, to the mixture of PMMA and NaF to improve the release behaviour of fluoride ions.

MATERIAL and METHODS: To augment the polymethyl methacrylate-based dental appliances in counteracting dental caries, we designed a polymer blend film composed of polymethyl methacrylate and polyethylene oxide by solution casting and added sodium fluoride. The surface and cross-section of the films were observed by scanning electron microscopy, and the surface roughness and contact angle of the films were also measured. The fluoride ion release rate of the films was tested by immersion experiments and their *in vitro* biocompatibility was tested by cytotoxicity experiments.

RESULTS: Polyethylene oxide facilitated the dispersion of sodium fluoride. The NaF clusters inside the film without PEO were also larger than those inside the film with PEO added, and there was no phase separation or delamination phenomenon between PMMA and PEO. The addition of PEO also decreased the surface average roughness, and positively influenced the hydrophilicity of the films. The blend film made of polymethyl methacrylate, polyethylene oxide and NaF with a mass ratio of 10: 1: 0.3 showed sustained release of fluoride ions and acceptable cytotoxicity. Antibacterial activity of all the films to *Streptococcus mutans* was negligible.

CONCLUSION: This study demonstrated that the polymer blends of polyethylene oxide and polymethyl methacrylate could realize the relatively steady release of fluoride ions with high biocompatibility. This strategy has promising potential to endow dental appliances with anti-cariogenicity.

INFLUENCE OF OTHER GENES LIKE AMY1 CNV ON CARIES AND P4A-P6-P1 CARIES PHENOTYPES

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BACKGROUND and AIM: Dental caries remains the most common chronic disease, affecting millions of children and billions of adults, impairing their quality of life and posing a general global burden and health concern. Although well-established risk factors exist, there are poor individual predictors of caries development. To better understand the relationship between genetic evolution and biological mechanisms, this study aimed to investigate the AMY1 CNV and its association with general health diseases, caries, and obesity in a cohort of 452 adolescents, where lifestyle, saliva immunity, and infection profiles were well characterized. The hypothesis is that the number of copies of AMY1 affects the amount and activity of salivary amylase, contributing to different isoforms of amylase and different cleavage profiles of mono- and disaccharides in saliva, which in turn affects the microflora, SCFAs, and caries.

PRELIMINARY RESULTS: The preliminary results revealed a wide variation in CNV, from 2 to 16 copies, with an average of 6-8 copies. We found no correlation between AMY1 CNV and caries experience, caries progression, or BMI for the group as a whole. However, in defined PRH1, PRH2 high (P4a), moderate (P6), and low (P1) caries, there was an inverse relationship between AMY1 CNV and the increment of caries in P4a and P1 individuals, respectively. Higher CNV in P4a individuals amplified higher caries development, while lower CNV amplified higher caries development in P1 individuals. The present findings suggest that AMY1 CNV can predict caries in patients with varying saliva immunity. The explanatory model for this needs to be further investigated by studying the effect of AMY1 CNV on the amount and activity of amylase, the isoforms of amylase, mono- and disaccharide profiles, infection statuses of S. mutans adhesion types (A/B/C and Cnm/Cbm), and the amount and profile of short-chain fatty acids (SCFAs).

INHIBITION OF INFECTIOUS-ASSOCIATED ORAL BACTERIA ADHESION BY PROBIOTICS: IN VITRO AND IN VIVO MODELS

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BACKGROUND: Maintaining a healthy oral microbiota balance is one of the aspects that prompts successful regenerative endodontic treatment (RET) for immature permanent teeth. Alternatively, the interactions between bacteria entering and residing in the root canal and the essential stem cells required for RET, may be the reason for RET failure.

AIM: This study aimed to examine the potential application of probiotic bacteria *Lactobacillus* gasseri in RET by studying their co-aggregative and anti-adhesive properties against oral opportunistic species *Fusobacterium nucleatum* and *Enterococcus faecalis* in *in vitro* and *in vivo* models.

MATERIAL and METHODS: Aggregation tests were conducted by mixing *L. gasseri with F. nucleatum* and *E. faecalis* in various combinations and concentrations to assess bacterial aggregation properties. Fluorescence labelling and flow cytometry (FC) methods were employed to analyse the anti-adhesive properties of *L. gasseri* towards opportunistic species to stem cells from the apical papilla (SCAP). Using immunofluorescence staining and microscopy, we assessed *E. faecalis* binding in the presence of *L. gasseri* in an *in vivo Drosophila melanogaster* model. We applied the antioxidant N-acetyl cysteine (NAC) to a bacterial suspension containing both species to investigate the potential mechanism of co-aggregation.

RESULTS: We observed that auto-aggregation occurs only in opportunistic species, while probiotic bacteria exhibited co-aggregative properties towards both opportunistic bacteria. However, FC results showed significant inhibition of *E. faecalis* binding to SCAP when mixed with *L. gasseri* at a ratio nine times higher than that of the opportunistic bacteria. Immunofluorescence of *D. melanogaster* intestines showed that *L. gasseri* significantly inhibits tissue adhesion of *E. faecalis*. Additionally, dose-specific NAC administration to the *L. gasseri* and *E. faecalis* mixtures demonstrated anti-co-aggregative properties.

CONCLUSION: This study demonstrates that probiotic *L. gasseri* effectively co-aggregates with and inhibits *E. faecalis* adhesion in the *in vitro* and *in vivo* models, suggesting its potential application in RET procedures.