



Abstracts Presented at the Combined 23rd Congress of the European Association of Dental Public Health (EADPH) and 24th Congress of Sociedad Española de Epidemiología y Salud Pública Oral (SESPO) Held in Palma de Mallorca, 18 - 20 October 2018

The first four abstracts were presented in competition for the GSK/EADPH research prize 2018. This prize is worth €3,000 and was awarded to Dr William Wright of the University of Glasgow Dental School. The four presenters were not required to produce a poster and each spoke for 15 minutes, during the morning of Friday, 19 October 2018. The four abstracts were:

4123 CONDUCTING THE PROTECTING TEETH @3 RANDOMISED CLINICAL TRIAL IN A COMMUNITY SETTING

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Aim: Protecting Teeth @3 was a randomised controlled trial that aimed to explore the effectiveness and cost-effectiveness of additional preventive fluoride varnish application (FV) over and above Childsmile nursery tooth-brushing – treatment as usual (TAU). This presentation describes preliminary results and the process of linking trial data with routine administrative “big data”, to assess the potential impact of events and outcomes from routine dental services on the trial results.

Methods: PT@3 was a two year, parallel-group randomised controlled trial with 3-year-old children. Participants were recruited, with parental consent, in 11 cohorts between late-2012 and early-2015 and randomised into either the intervention arm or the control arm. The children were followed up from nursery school for two years until their first year of primary education. Dental inspections and four, six-monthly, interventions were undertaken in 112 nursery school classes and approximately 265 primary schools in four NHS Health Boards in Scotland. After NHS-governance approval, a secure portal was used to manage and link individual-level data via probability matching to the unique NHS-ID-number. Ethical approval for the study was given by the West of Scotland Research Ethics Committee.

Results: In total 1150 children completed the programme and 153 (12%) did not. Three or four interventions were delivered to 978 (85%) of participants. Overall the d3mft worsened in 155 (27%) of the FV group and in 181 (32%) of the TAU group ($p=0.078$). Trial data for 99% of the children were successfully linked to the NHS primary dental care dataset.

Conclusions: In the population studied there was a modest reduction in the worsening of d3mft in the FV group compared with the TAU group. The investigators successfully recruited, retained and delivered trial interventions; and were able to link data uniquely to routine dental health service activity.

Acknowledgements: The authors would like to acknowledge the help and support of the four NHS Health Boards (Greater Glasgow and Clyde, Lothian, Fife and Tayside) particularly the PIs, Community Dentists and Childsmile teams, along with the Nursery school staff and the parents / guardians of the trial participants.

PT@3 was funded by the Scottish Government

4145 ASSOCIATION BETWEEN OVERWEIGHT/OBESITY AND NUMBER OF TEETH AMONG FINNISH MIDDLE-AGED ADULTS

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Aim: The aim of this study was to investigate possible association between overweight/obesity and number of teeth among Finnish middle-aged (46-year-old) adults.

Methods: This cross-sectional study was part of the longitudinal Northern Finland Birth Cohort 1966 (NFBC1966) study comprising a comprehensive sample of individuals from Northern Finland. The follow-up of 46-year-olds included mailed questionnaires and clinical examinations in 2012–2014. The Ethics Committee of the Northern Ostrobothnia Hospital District in Oulu, Finland approved the study protocol, which followed the principles of the Declaration of Helsinki. Participation in the study was voluntary and the participants (5,974; participation rate 58%) provided their written informed consent. Overall, 4,420 adults (1,860 men and 2,560 women) provided information on overweight/obesity, self-reported number of teeth and background variables (education, smoking, diabetes). Body mass index (BMI, kg/m²) with three categories (normal weight: <25 – as reference; overweight: ≥25, <30; obese: ≥30) served for the overweight/obesity assessment. Number of teeth (the outcome) was defined in two categories: 0–27 and 28–32. Chi-square test and multiple logistic regression, with adjusted odds ratios (OR) and 95% confidence intervals (CI), served for statistical analyses.

Results: Among participants, 899 (20%) were obese and 1,738 (39%) were overweight. A higher proportion of men were overweight or obese than women: 1,275 (69%) vs 1,362 (53%) (p<0.001). Overweight/obesity was associated with a lower number of teeth (0–27 as the outcome): men with overweight and obesity had OR=1.0 (CI=0.8–1.3) and OR=1.3 (CI=1.0–1.7), respectively; women with overweight and obesity had OR=1.3 (CI=1.1–1.6) and OR=1.5 (CI=1.2–1.9), respectively.

Conclusions: Among Finnish middle-aged overweight and obesity indicated a lower number of teeth than normal weight. The findings point to the importance of prevention to reduce oral health risks.

4148 EVALUATION OF CHILDSMILE SCOTLAND'S CHILD ORAL HEALTH IMPROVEMENT PROGRAMME VIA DATA LINKAGE

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Background: Childsmile delivers oral health interventions to children and their families from an early age through daily supervised tooth-brushing and fluoride varnish application (FVA) in nurseries and schools; FVA, tooth-brushing and dietary advice in dental practices; and Dental Health Support Worker support in community settings.

Aim: To utilise routine administrative datasets to evaluate outcomes of components of the programme.

Methods: Following information governance approvals and using the NHS Scotland National Safe Haven, a secure research portal that allows researchers to gather, manage, share and analyse Electronic Patient Records, 51,606 children from a range of socioeconomic backgrounds with a 5-year-old National Dental Inspection Programme (NDIP) record

in 2014/2015 (86% of the five-year-old population) were linked to multiple national datasets containing individual level data on Childsmile interventions. Geographical and deprivation data were added. Intervention rates (adjusted for area based deprivation) were analysed against obvious caries experience.

Results: Cohort obvious caries experience rates matched the published NDIP report. Increased risk of obvious caries experience (adjusted odds ratio=1.2, 95% CI 1.12-1.28) for children not consented to take part in supervised tooth-brushing. Obvious caries experience risk decreased significantly as the frequency of Childsmile dental practice contacts increased from zero contact only to ≥ 5 (adjusted odds ratio=0.5, 95% CI 0.46-0.54).

Conclusions: In the population studied, daily supervised tooth-brushing and regular attendance at Childsmile dental practice were associated with reduced risk of obvious caries experience. It is feasible to link multiple child level datasets to create a unique resource for evaluating Childsmile.

Acknowledgement: This work was funded by Scottish Government for NHS Scotland's Electronic Data Research and Innovation Service and the ISD Dental Team.

4207 CARIES VARIATION DURING A PERIOD OF 15 YEARS IN GALICIAN SCHOOLCHILDREN

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Aim: To assess the distribution of dental caries in Galician 6 and 12-year-olds during a 15 year period (1995-2010). Changes in the Significant Caries Index (SiC) and the average DMFT dmft were observed.

Methods: Oral health epidemiological surveys of random samples of children aged 6 and 12 years from the North-west of Spain (Galicia) were repeated every 5 years from 1995 to 2010, following international standards established by WHO (Oral Health Surveys. Basic Methods). The surveys were national-level systematic ones. Overall sample size was 4,094 individuals aged 6 years and 4,122 children aged 12 years. Parental consent was obtained for each subject (refusal of examination was less than 10%). Mean DMFTdmft and SiC index were studied. The SiC index was calculated using the SiC calculator provided by the WHO collaboration centre in Malmö University.

Results: In the 6-year-old group, DMFTdmft decreased from 1.92 (SD=2.99; 95% CI 1.69-2.15) in 1995 to 0.84 (SD=1.77; 95% CI 0.73-0.95) in 2010. The SiC index decreased from 5.29 (SD=3.05; 95% CI 4.88-5.70) in 1995 to 2.51 (SD=2.28; 95% CI 2.27-2.75) in 2010. In the 12-year-old group, the mean DMFTdmft decreased from 1.87 (SD=2.11; 95% CI 1.71-2.04) in 1995 to 0.87 (SD=1.42; 95% CI 0.79-0.96) in 2010. There was also a SiC index reduction ranging from 4.3 (SD=1.82; 95% CI 4.06-4.55) in 1995 to 2.45 (SD=1.47; 95% CI 2.29-2.6) in 2010. In this group aged 12 years, DMFT for first molars was 1.31 in 1995 (SD=1.45; 95% CI 1.20-1.43) and 0.61 (SD=1.10; 95% CI 0.54-0.67) in 2010; the SiC index in first molars decreased from 3.12 (SD=0.81; 95% CI 3.01-3.23) in 1995 to 1.82 (SD=1.20; 95% CI 1.69-1.94) in 2010.

Conclusions: In the population studied a remarkable reduction was observed between 1995 and 2010 in the mean DMFT/dmft and SiC index of Galician children aged 6 and 12 years. However, the distribution of the caries showed inequalities; caries continues to be present in higher levels in a small portion of the population.

Oral Presentations of Posters, Friday, 19 October 15:00- 17:30

All other abstracts were presented as posters, which were displayed throughout the day and in seven minute oral presentations, which took place in parallel sessions. They were as follows:

Session 1

- 1a Oral Epidemiology (Caries 1)
- 1b Oral Epidemiology (Caries 2)
- 1c Health Services Research (1)
- 1d Health Services Research (2)
- 1e Oral Health Promotion (1)

Break

Session 2

- 2a Quality of Life
- 2b Oral Cancer and Gerodontology
- 2c Information and Communication
- 2d Tooth Surface Loss and Periodontology
- 2e Other Topics

Session 1a

Oral Epidemiology 1 (Caries 1)

Chairs: Roxanna Oancea and Dorjan Hysi

4047 THE DMFT SCORE OF MACEDONIAN CHILDREN IN ASSOCIATION WITH FLUORIDE FROM DRINKING WATER

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Aim: The aim of the study was to assess possible correlation between the DMFT score of 12-years old children and the concentration of fluoride in drinking water in the south-east region of the Republic of Macedonia.

Methods: The study took place in 2013. A sample of 129 twelve year-old children was recruited using a multistage random sampling technique from four Primary Schools. Consent for the children to take part in the study was obtained from their parents and from the schools concerned. Ethics approval was obtained from the Macedonian Ministry of Health. The children were examined by one dentist in a dental clinic and their DMFT score was recorded. The children lived in a city (Strumica) and three villages (Murtino, Bansko and Sacevo).. Drinking water samples were taken in Strumica, Murtino and Bansko and their fluoride concentration was determined using a special ion Analyser (pH/ISE meter-Thermo-Orion) with a special F-electrode (Thermo Orion Ion Plus Fluoride Electrode) at the Institute of Public Health. Spearman Rank Order Correlation was used for statistical analysis.

Results: The study sample comprised 59 (46 %) girls and 70 (54%) boys with 63 from Strumica, 28 from Murtino, 35 from Bansko and only 3 from Sacevo. The mean DMFT for Strumica was 1.44 (SD+ 2.08) , for Murtino it was 3.64 (SD+ 3.23) and for Bansko it was 1.37 (SD+ 1.88). Their mean DMFT was 1.94 (SD + 2.5). The highest concentration of fluoride (1.36 ppm) was found in drinking water from the village of Bansko, in Strumica it was 0.08ppm and in Murtino 0.38. The Spearman Rank Order Correlation R = -0.167 which was statistically significant at a p <0.05 level.

Conclusions: In the children studied, there was a negative i.e. indirect correlation between mean DMFT scores in the Strumica, Murtino and Bansko and drinking water fluoride concentration.

The presenter of this abstract received a Colgate travel award

4050 PREVALENCE OF EARLY CHILDHOOD CARIES IN BELGRADE – A PILOT STUDY

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Aims: Currently there are no relevant and updated data regarding prevalence of early childhood caries (ECC) in Serbia. Furthermore, there is no preventive programme regarding promotion of oral health in children. The aim of this pilot study was therefore to assess the prevalence of ECC among children in Belgrade and to test the feasibility of collecting data and collaboration with primary health care centres.

Methods: This pilot study was retrospective cross-sectional survey. The study sample included 100 children aged 3 years and 100 children aged 6 years. The sample was formed by a stratified cluster technique using the Basic Methods for Oral Health Surveys by World Health Organization (2013). It was conducted in two suburban and two urban sites. The data were obtained from dental charts of children who had regular dental examinations by their primary health care dentist in the kindergarten during October 2017. In Serbia for studies such as the current one, if patients are not directly involved and their anonymity is maintained, ethics approval is not required.

Results: 130 (65%) of all the children examined had more than one primary tooth with dental caries. Significantly more children in the 6-year-old age group had $dmft \geq 1$ (72 (72%) compared to 3-year-old group (58 (58%) ($p=0.038$). One hundred and three (51.5%) of all children had at least one untreated carious lesion.

Conclusions: The results of this study showed cumulative prevalence of ECC which confirmed the necessity for preventive interventions in early childhood. The results also showed that it was possible to have good collaboration with primary health care providers. Further research into ECC, involving a larger and representative sample of the population is needed to help develop a cost-effective and equitably accessible national prevention plan for ECC in Serbia.

The presenter of this abstract received a Borrow travel award

4055 ORAL HEALTH STATUS OF AN ADULT POPULATION WITH SPECIAL NEEDS FROM CONSTANTA COUNTY, ROMANIA

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Aim: To investigate the prevalence of dental caries and oral hygiene status among adults with mental disabilities and to establish their treatment need. **Methods:** This study took place in 2016. The subjects were adult special needs patients with an IQ of 70-80. A total of 84 adults aged between 18 and 55 years who were attending a special institution in Constanta County, Romania were included in the study. Written consent for dental examinations and treatments was given by their legal guardians. Clinical assessment of dental caries was performed, according to the WHO criteria (1997), by three examiners, who calibrated and achieved a kappa score of 0.7 for inter-examiner agreement. Oral hygiene status assessment was performed using the PI-Index (Silness and Løe, 1964). The adults were divided into

three age groups which consisted of 34 adults aged between 18-30 years (mean age 23.4, SD 3.1), 32 adults aged between 31-44 years (mean age 36.5, SD 3.5), and 18 adults aged between 45-55 years (mean age 49.7 SD 3.1). Ethics approval for the study was given by the Romanian Association for Dental Public Health.

Results: During the study, due to lack of cooperation there were 7 drop outs. Mean age of the resulting sample was 34 years SD 10.6 and 46 (55%) were male and 38 (45%) female. There were no significant differences in the caries prevalence between men and women. Mean DMFT value for the total sample was 11.9. Treatment requirements increased with age. The DMFT score for the first group was 10.4, for the second group 11.7 and for the third group 15.2. The mean PI-Index was 2.2.

Conclusions: This group of adults had a high prevalence of dental caries and bad oral hygiene, indicating poor oral health status. The study emphasizes the need for special attention and dental health education lessons for this group and its carers.

The presenter of this abstract received a Colgate travel award

4056 ALCOHOL CONSUMPTION ADVICE BEHAVIOURS AMONG LEEDS UNIVERSITY DENTAL AND MEDICAL STUDENTS

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Background: Alcohol Identification and Brief Advice (IBA) is an effective and cost-effective way of reducing alcohol consumption, which can be routinely delivered by health care professionals (McQueen, et al., 2011).

Aims: To identify if alcohol IBA counselling behaviour varies between medical and dental students and the predictors of such behaviours.

Methods: A cross-sectional survey was conducted in May 2017 with University of Leeds 4th and 5th year medical and dental students. A 28 item semi-structured questionnaire was designed using the Theory of Planned Behaviour (TPB) (Ajzen, 1985) to explore students' behaviours and intention associated with routinely delivering alcohol IBA. The Mann-Whitney U-test was used to detect significant differences between key variables of the two groups. Multiple regression analysis was performed to identify predictive validity of behavioural domains and intention. Ethical approval was granted by University of Leeds Dental Research Ethics Committee [060317/IP/224].

Results: Responses were returned by 27 medical and 24 dental students. Response rates of 0.5% and 6.8% respectively limit the representativeness of the sample. Dental students reported undertaking alcohol IBA more often with patients than medical students ($p < 0.02$). Dental students had a more positive attitude towards alcohol IBA ($p < 0.002$). Behaviour was predicted by intention in dental students ($p < 0.027$), but no significant predictors of medical students' behaviour were found. Intention was predicted by perception of subjective norms in both medical ($p < 0.016$) and dental students ($p < 0.022$).

Conclusions: Of those who completed the questionnaire, dental students reported a higher level of engagement in alcohol IBA, than medical students. Whilst only intention, and only in dental students, predicted behaviour, there is potential to increase provision of alcohol IBA by influencing the perception of professionals on subjective norms i.e. that IBA is well accepted by patients and considered as highly appropriate in society and among other professionals

Acknowledgement of sources of funding: This work was made possible through Russian government Global Education programme as well as the University of Leeds financial support.

The presenter of this abstract received a Borrow travel award

4064 CARIES EXPERIENCE RELATED TO SOCIO-ECONOMIC STATUS AND SELF-REPORTED ORAL HYGIENE HABITS DURING PREGNANCY IN ALBANIA

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Background: Pregnancy is associated with several physiological and behavioural changes that might elevate the risk of oral diseases. This can result in adverse consequences for pregnant women.

Aim: The aim of this study was to assess dental caries experience related to education, income and oral hygiene habits among pregnant women in Albania.

Methods: This cross sectional epidemiologic study was conducted in two main cities of Albania. Pregnant women visiting counselling centres were invited to participate in the study during the period April-December 2017. Consent was obtained from the health centres and the patients. A structured questionnaire including questions on income, level of education, oral hygiene habits and dental visits was given to the pregnant mothers. A clinical examination of all mothers was performed to assess dental caries. Single use instruments. were used. Dental caries experience was measured using the DMFT and SiC indices and for treatment needs the ratio of D/DMFT representing the prevalence of untreated caries. The WHO (2013) methods were followed and caries was recorded at the D3 level. A standard dental examination form was completed for each participant. Descriptive statistics and the Pearson correlation statistic were applied to the data, which were entered into an SPSS 20 database.

Results: One hundred and fifty seven women with a mean age of 28 years old agreed to participate in this study. The participants had a mean DMFT score of 8.5 (SD +/- 3.9) with a 100% caries prevalence, D/DMFT=0.39, SiC=12.9 (SD +/- 2.7). Fifty two percent reported brushing twice a day and 113 (72%) had not made a dental visit during pregnancy. Bivariate analysis showed a small positive relation between dental visits and DT index ($r= 0.16$, $p<0.05$) and a small to moderate negative relation between DT index and brushing habits ($r= -0.26$, $p<0.05$), level of education ($r= -0.33$, $p<0.05$), income ($r= -0.23$, $p<0.05$).

Conclusions: The participants in the study had a high caries experience and treatment needs and appeared only to visit a dentist if they perceived that they had a need for dental treatment.

The presenter of this abstract received a Borrow travel award.

4066 CARIES EXPERIENCE OF 12-YEAR-OLDS IN THE DAGESTAN REPUBLIC IN 1999 AND 2017

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Background: Caries experience among children in Dagestan is high, according to data from the National Oral Health Survey (1999).

Aim: The aim of the study was to evaluate the caries experience of 12-year-olds in Dagestan over a 18-year period.

Methods: One hundred fifty 12-year-olds living in different areas of the Dagestan Republic (capital Makhachkala, a city Buinaksk and a village Kasumkent) were randomly selected and examined for oral health status in 2017 at a clinic in Makhachkala. An oral health examination was performed by calibrated dentists according to WHO criteria (2013). Dental caries prevalence at the D3 level was scored using DMFT. The prevalence of dental caries was compared to results from the year 1999. The survey was cross-sectional. The Students t-test was used to compare differences in mean scores. Fluoride concentration in drinking water was evaluated in the three areas. The study was approved by the Ethical Committee of the Dagestan State Medical Academy.

Results: The prevalence of dental caries among 12-year-olds increased from 90% to 100% in Machachkala, from 84% to 100% in Buinaksk and from 96% to 100% in Kasumkent over the 18 year period. The mean DMFT values increased significantly ($p < 0.001$) in all three areas: from 4.16 ± 0.23 to 8.10 ± 0.39 – in Makchachkala, from 3.49 ± 0.32 to 9.10 ± 0.35 – in Buinaksk, and from 6.98 ± 0.36 to 13.72 ± 0.28 - in Kasumkent. The mean number of decayed teeth increased from 3.09 ± 0.23 to 7.62 ± 0.38 , from 2.30 ± 0.27 to 8.62 ± 0.34 and from 6.38 ± 0.34 to 9.08 ± 0.39 respectively ($p < 0.001$). The mean number of filled and missed teeth in urban areas were significantly lower in 2017, than in 1999. In the rural area, in contrast, the “F” and “M” components of DMFT increased during the 18-year period. The concentration of fluoride in drinking water was low in all three areas: 0.20 mg/l - in Makchachkala, 0.18 mg/l - in Buinaksk, 0.32 mg/l - in Kasumkent.

Conclusions: The results of the study showed a significant increase in dental caries prevalence among 12-year-olds in three areas of Dagestan between 1999 and 2017. The data indicate importance of further evaluation of possible confounding factors associated with increase of caries experience of 12-year-olds, as well as planning caries preventive strategies in this region.

The presenter of this abstract received a Colgate travel award.

4083 DENTAL CARIES AND ITS ASSOCIATION WITH ORAL HEALTH-RELATED BEHAVIOUR AMONG NEPALESE SCHOOLCHILDREN

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Aim: The aims of this study were to investigate the prevalence of dental caries and its association with oral health-related behaviour in Nepalese schoolchildren.

Methods: In 2016, after a power calculation, this school-based, cross-sectional study enrolled 1151 children from 18 out of 75 randomly selected districts of Nepal. The children were from the age groups 5-6, 12 and 15 years-old. A structured questionnaire was used to evaluate oral hygiene practices and dietary habits. Clinical examinations were conducted according to the World Health Organization 2013 guidelines by three trained and calibrated Nepali dentists. Only 5-6-year-old children accompanied by their parents were examined. The study protocol was approved by the Institutional Review Committee, Kathmandu University School of Medical Sciences (IRC No. 60/15) and the Northern Ostrobothnia Hospital (18/2016) also gave permission. Permissions were also obtained from the Ministry of Health and Ministry of Education. One school refused to participate. Results were presented as means (SD) and proportions; the chi-square test was performed to compare the proportions within genders, and age groups. The association between oral health-related behaviours and untreated dental caries (both primary and permanent teeth, dt + DT) was evaluated using logistic regression models.

Results: 1038 (90%) of the children (242 aged 5-6 years, 413 aged 12 years and 383 aged 15 years) completed the questionnaire and received an examination. Both inter-examiner (kappa 0.87) and intra-examiner (kappa 0.84 - 0.97) consistency for caries assessment were excellent. The mean (SD) dmft/DMFTs were 4.97 (4.27) for 5-6-year-olds, 1.37 (1.80) for 12-year-olds, and 1.99 (2.36) for 15-year-olds. The majority 688 (67%) of the children had the habit of tooth brushing once daily with toothbrush and toothpaste. The proportion of 12-year-old males who used charcoal was 23 (11%), the difference between the age groups being statistically significant ($p = 0.007$). Similarly, 32 (16%) of the 15-year-olds males used miswak/datwan (twigs), and the difference between the age groups was statistically significant ($p < 0.001$). The consumption of sweets, and tea with sugar (once or more daily) was significantly associated with high dental caries experience ($dt+DT > 0$) both in crude and adjusted models. In contrast, dental caries experience was not associated with frequency of tooth brushing, consumption of fizzy drinks, and consumption of milk with sugar.

Conclusion: The prevalence of dental caries and daily consumption of food containing refined sugar is high among Nepalese schoolchildren. School-based oral health promotion and education programs might be one of the public health agendas.

4084 CARIES DEVELOPMENT IN NORWEGIAN CHILDREN AGED 5 TO 12 YEARS

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Background: Children in Norway are offered all dental services free of charge.

Aim: To describe caries prevalence in children aged 5 and 12 years and to explore caries development from 5 to 12 years.

Methods: All 7002 children born in 2002 in one Norwegian county were invited to attend for a dental examination when they were 5 years old and were offered a re-examination at 12 years of age. Data were collected by clinical examinations and extracted from dental records. Caries was recorded as enamel caries (grades d1 and d2) and dentine caries (grades d3 to d5). At age 5 years, caries was registered in primary teeth, and at 12 years, only caries in permanent teeth was registered. A dentist and dental hygienists in the community dental services performed the examinations. Inter- and intra-examiner agreements were assessed by Cohen's kappa and showed substantial to almost perfect agreements. Informed consent was obtained from parents and the study approved by an ethics committee (notification 2013/1881).

Results: 5623 children were examined at 5 years of age of whom 3282 were re-examined at 12 years of age. At age 5 years, 510 (15%) of the children had dentine caries, and at age 12 years 1060 (32%) of the children had dentine caries. Enamel caries was registered in 689 (21%) of the children at age 5 years and 1542 (47%) at age 12 years. The longitudinal results showed that 1998 (61%) of the children had no caries at both ages. Of children that were caries free at age 5 years, 774 (24%) developed caries from 5 to 12 years of age. Children with caries at both ages had more surfaces with caries 3.1 (SD 2.6) than other children 2.2 (SD 1.8) at age 12 years ($p < 0.05$).

Conclusions: In the population studied, the majority had no caries. Children with caries at 5 years developed more caries between 5 and 12 years of age than other children. The results indicate that the dental care offered to children in this period failed to prevent these children from developing caries.

4085 CHANGE IN DENTAL FEAR AMONG ADOLESCENTS OVER 3.4-YEARS OF THE MANAGEMENT OF DENTAL CARIES

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Aim: The aim of this study was to assess changes in dental fear among adolescents over a 3.4 year period during which they attended clinics for the management of dental caries.

Methods: This longitudinal study took place between 2001 and 2005. It used data from a randomized clinical trial (RCT) for controlling caries and an oral health promotion programme (OHP). The study population consisted of all 1,691 11-12-year-olds in 2001 from the elementary schools in Pori, Finland. Adolescents with active initial caries lesions participated in the RCT and were randomized to experimental ($n=250$) and control groups ($n=247$). The experimental group was exposed to the RCT experimental regimen (with individualized recall intervals and caries preventive treatments). The control group was exposed only to OHP and ordinary Finnish dental care, provided out-with the study, as did the third group (OHP group) who had no active initial caries lesions at baseline. Dental fear was assessed (in 2001, 2003 and 2005) by questions with six response alternatives (1= not afraid to 5= very afraid, 6=I don't know). The changes in mean values of dental fear were evaluated using the Friedman test and SPSS 25 software. The Ethics Committee of the Northern Ostrobothnia Hospital District and the City of Pori approved the study and a written consent was obtained from the parents for their child's participation. Participation was voluntary.

Results: In total, 1,362 (80.5%) adolescents returned all three questionnaires. Those answering 'I don't know' were excluded from the analysis. The final data were from 1,181 (69.8%) of the original 11-12 year-olds, of whom 196 were in the experimental group, 179 in the control group, and 806 in the OHP-group. In the experimental group,

dental fear decreased among boys (mean values 1.82; 1.49; 1.67, $p=0.043$, in years 2001, 2003 and 2005, respectively) but not among girls (mean 2.11; 2.09; 2.08, $p=0.541$). In the control group, dental fear increased among girls (mean 1.97; 2.05; 2.36, $p=0.002$) but not among boys (mean 1.91; 1.72; 1.91, $p=0.392$). In the OHP-group, dental fear increased among girls (mean 1.98; 1.95; 2.19, $p<0.001$) and decreased among boys (mean 1.63; 1.50; 1.60, $p=0.007$).

Conclusions: In the population studied, preventive treatments may have worked as desensitization and led to differences between experimental and control groups.

4091 EVALUATION OF AN INTERDISCIPLINARY PREVENTIVE PROGRAMME IN GERMANY TO PREVENT EARLY CHILDHOOD CARIES

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Background: In 2010, an interdisciplinary programme to prevent early childhood caries (ECC) was developed and launched in Dormagen (North Rhine-Westphalia, Germany).

Aim: To evaluate caries experience and prevalence among the three- to four-year-olds participating in the ECC prevention programme compared to children of the same age who did not take part in the programme (control group).

Methods: In the programme the parents of the test group of three to four-year-old children received preventive advice on 7 different days from an interdisciplinary team. Paediatricians gave the advice three times, Gynaecologists twice and Midwives and Social Workers once. A group of Dormagen children of the same age but with birth dates four years before those of the test group did not take part in the prevention programme and formed the control group. The municipal social services and the public health office were also involved. The effect of the programme was assessed by means of a "historical" comparison. The dental diagnoses were performed by two calibrated dentists using the International Caries Detection and Assessment System (ICDAS). Data on diet and preventive behaviour were gathered from parents using a standardized questionnaire. Statistical significance was tested using the nonparametric Mann-Whitney-U test. The study was approved by the Ethics Committee University of Marburg. Informed consent was obtained from the parents.

Results: Seven hundred and six (94% of the population of three to four year olds) formed the test group. Six hundred and sixty one (88% of the population) formed the control group. The mean d3-6mf-t for the control group (0.92) was significantly higher than for the test group (0.46; $p<0.001$). While 521 (79%) of the children examined in the control group and 609 (86%) of the test group exhibited a predominantly sound primary dentition. The proportion of children with S-ECC was 7.9% in the test group and 14.5% in the control group. The test group differed significantly from the control group both in terms of reported diet as well as dental hygiene habits.

Conclusions: The interdisciplinary prevention program was effective in preventing ECC.

Acknowledgement: Sponsors from industry (CP Gaba GmbH, Hamburg, Germany; Hager & Werken GmbH & Co. KG / Miradent, Duisburg, Germany; Procter & Gamble GmbH Schwalbach am Taunus, Germany) donated the contents of the gift packages for the programme.

Session 1b

ORAL EPIDEMIOLOGY 2 (Caries 2)

Chairs: Andreas Schulte & Manuel Bravo

4099 DENTAL BEHAVIOURS AND EARLY CHILDHOOD CARIES IN THE CANARY ISLANDS

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Aim: To explore the associations of dental visits and tooth-brushing frequency with caries experience among pre-school children living in Lanzarote, Canary Islands.

Methods: A random sample of 343 children, aged 3 to 5 years, who visited a Primary Care Paediatric Clinic for consultation in 2015, was selected. Informed consent was obtained from the parents or guardians of the children. The Ethics Committees of the European University of Madrid and the Maternal and Child Hospital of Las Palmas de Gran Canaria, approved the study protocol. A calibrated dentist examined the children's oral health status following the WHO 2013 criteria and helped parents complete the questionnaires regarding their children's dental behaviours. The dft index was the outcome measure during analysis. Comparisons were made using parametric statistical tests.

Results: The mean dft index was higher among children with earlier visits to the dentist than among those who had never visited the dentist (2.23 versus 1.04, $p < 0.001$). In addition, the mean dft index was lower in patients who started brushing before 2 years of age than in those who started brushing after this age (0.93 vs. 1.69, respectively, $p = 0.046$). Caries prevalence followed a linear trend mirroring tooth-brushing frequency, with the highest and lowest estimates found among children who did not brush daily (33 (47%)) and those who brushed twice a day (27 (25%)). $p = 0.007$. Children who brushed daily before going to bed had a mean dft index of 1.24 compared to those who did not have this habit (1.89, $p = 0.043$).

Conclusion: This study showed that in the population studied dental visits were associated with a poorer dental status among preschool children. Early start of tooth-brushing, daily tooth-brushing and brushing teeth before going to bed were associated with lower caries experience.

Acknowledgement: The work was funded by the first author as part of her doctoral thesis. The authors thank the Canary Health Service for allowing the use of premises and materials for the study.

4112 DMFT INDEX ASSOCIATION WITH DIETARY HABITS OF 3- AND 5-YEAR-OLD CHILDREN IN RURAL AREAS OF LITHUANIA

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Aims: To evaluate decayed, missing and filled teeth (dmft) of 3- and 5-year-old children in rural areas of Lithuania and to assess possible correlations with reported dietary habits.

Methods: A cross-sectional study was conducted which included 354 children aged 3 and 5 years from randomly selected schools and kindergartens in rural areas of Lithuania. Clinical examination was carried out by a single researcher in accordance to World Health Organisation (2013) guidelines including assessment of decayed, missing, filled teeth. Participants' parents were asked to complete a questionnaire about their own and their child's oral health-related behaviours and dietary habits. Statistical analysis was performed using descriptive statistics and Spearman correlation test. Ethics approval was obtained from the Lithuanian Bioethics Committee.

Results: Out of 354 children examined, 176 (49.72%) were female and 178 (50.28%) were male. Seventy four (41.6%) males and 78 (44.3%) females did not require any treatment. The mean dmft score was 3.93 (\pm 4.38). Dmft value was higher among 5-year-olds 4.73 (\pm 4.19) compared to 3-year-olds 2.91 (\pm 4.41) ($p < 0.001$). Dmft score correlated positively with consumption of various sugary drinks: tea with sugar ($r = 0.12$, $p = 0.01$), soft drinks ($r = 0.19$, $p = 0.0001$) and juice ($r = 0.22$, $p < 0.001$). Parents' self-reported oral health status correlated with dmft scores ($r = 0.16$, $p = 0.0009$).

Conclusions: In the population studied, there was a high prevalence of decayed, missing and filled teeth. Dmft value was associated with children's dietary habits and parents' self-reported oral health status. Under these circumstances, the implementation of preventive programs is crucial. This data could be helpful in the planning of oral health care services by the authorities concerned.

4119 THE EFFECT OF FLUORIDE VARNISH ON CARIES IN RURAL CHINESE CHILDREN

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Background: Children living in remote, isolated areas of China with poor infrastructure, have limited access to services and require public health approaches to improve oral health.

Aims: To evaluate effect of topical fluoride varnish on caries in rural school children in an area of high prevalence and to assess the suitability of using this method to control caries among children with high need.

Methods: A total of 2003 children between 6-8 years were selected to take part in a Randomised Controlled Trial using multi stage cluster random sampling from a convenience sample of 9 schools out of 325 primary schools in Dahua County, Guangxi, China. Children were randomly divided into an experimental group of 999 who received fluoride varnish NaF 22,600ppm and oral health education (OHE) and a group control of 1004 who received (OHE) only, six monthly for a three year period from 2014 to 2017. Parental consent was obtained for all participants and ethics approval was granted by the ethics committee of Guangxi Medical University. Dental caries was assessed by calibrated clinicians, using the modified ICDAS II scoring system, at baseline, 24 and 36 months. The resulting data were entered into SPSS version 22 prior to statistical analysis with the chi-squared and Kruskal-Wallis tests. .

Results: 1754 children (857 in the test and 897 in the control group) participated in the full three years of study. The response rate was 88%. Migration from region was main cause of lost subjects. After three years, there were

significant differences in the caries rate (65.7% vs 58.7%), the incidence of caries (42.4% vs 34.7%) and DMFT(1.60 vs 1.4) and DMFS (2.4 vs 2.1) in the first permanent molars between the experimental and control groups, all at the $p < 0.05$ level .

Conclusions: In this experimental population fluoride varnish and OHE produced statistically significant reductions in caries in children after 3 years in comparison with control group receiving OHE only. Application of fluoride varnish is simple, safe and effective requiring minimal manpower and technology. It is suitable for use in school dental public health programmes in rural areas of China.

4120 ORAL HYGIENE AND ENAMEL CARIES AMONG FINNISH ADULTS

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Aim: To examine the association between tooth brushing behaviour and enamel caries in Northern Finland.

Methods: The study population comprised a subpopulation of the Northern Finland Birth Cohort 1966. The cohort originally consisted of nearly all babies born in the year 1966 in two of the northernmost provinces of Finland. The subpopulation consists of 1961 participants of the original cohort who attended for a dental examination in 2011-2012 and consented to the use of their cohort data. The study was approved by the Ethics Committee of the Northern Ostrobothnia Hospital District (74/2011). The clinical dental examinations included recording of caries using the International Caries Detection and Assessment System (ICDAS). Visible plaque was recorded from buccal surfaces of the teeth as present or absent. Brushing frequency was investigated in a postal questionnaire. In the subsequent data analyses, ICDAS scores 1-3 represented enamel caries. Plaque data were transformed as a proportion of teeth with plaque and further dichotomized to evaluate the quality of tooth brushing using 20% as a cut-off value. Wisdom teeth were excluded from all the analyses. Brushing frequency was recorded using a five-point scale and dichotomised in the analyses to at least twice a day and less than twice a day. The data on cariological findings were available for 1944 and brushing habits for 1877 participants. A Chi-squared test was used to examine the association of plaque and enamel caries.

Results: In the population studied, enamel caries (ICDAS1-3) affected practically the entire population (1940, 99%). Brushing at least twice per day was reported by 1217 (65%) of participants. Of those who brushed their teeth at least twice a day, 487 (40%) still had plaque on more than 20% of their teeth. They also had more enamel caries (ICDAS1-3) compared to those who had less plaque on their teeth and brushed as often ($p < 0.001$).

Conclusions: In this adult population, the brushing quality should be evaluated in addition to brushing frequency when assessing caries risk and the need for preventive measures.

4184 CARIES IN PERMANENT FIRST MOLAR: RELATED FACTORS. A RETROSPECTIVE STUDY

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Aim: The permanent first molar (PFM) is the tooth most susceptible to caries (Batchelor et al., 2004). An important objective of paediatric oral health programmes is to prevent caries of the PFM (Tagliaferro et al., 2008). The aim of this study was analyse the factors associated with the appearance of caries in the PFM of 6-year-old children followed- up after 5 years.

Methods: This retrospective cohort study took place over a 6 year period. It was approved by the University of Valencia ethics committee. Children born in 2005, who attended three clinics in Valencia in 2010-2011, before the eruption of their first permanent molars, were followed up 5 years later in 2015- 2016. With the informed consent of their parents, data for 206 children from before eruption of the PFM and after a follow-up period of 5 years after the eruption of their FPM were gathered from their clinical records. Parent's experience of caries, educational level of the mother, dietary habits, brushing frequency, and caries in the temporary deciduous teeth (DT) on the first visit, and presence of molar incisor hypomineralisation (MIH) in PFM, were evaluated. Each risk factor was correlated to the DMFT in PFM using the Mann-Whitney U-test. Related variables were included in a logistic regression analysis. A significance level of 95% was applied in all cases.

Results: The factors significantly associated with caries in PFM were: presence of caries in the parents (1.10±1.40/0.74±1.27), low educational level of the mother (1.21±0.49/0.62±1.17), a cariogenic diet (0.98±1.39/0.18±0.61), tooth brushing frequency (1.31±1.65 / 0.27±1.76), the presence of MIH in PFM (1.39±1.48 / 1.04±1.7) and caries experience in DT (1.90±2.01 / 0.75±1.22). In the multivariate analysis, cariogenic dietary habits, caries in DT and MIH were the variables found to explain caries in PFM (p<0.05).

Conclusions: The frequent intake of sweets and sugary liquids, together with caries in DT and the presence of MIH in PFM, were the factors that explained the presence of caries in a cohort of 6-year-old children followed-up 5 years after their initial oral examination.

4215 PREVALENCE OF MOLAR-INCISOR HYPOMINERALIZATION IN SCHOOL-CHILDREN OF VILADECANS (BARCELONA)

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Aims: Molar-incisor hypomineralization (MIH) is a demineralization of the enamel of systemic origin that affects one to four first permanent molars to different degrees, in combination with or without permanent incisors. The aim of this study was to identify the prevalence of MIH in schoolchildren (7 and 12 years old) from Viladecans (Barcelona-Spain) in 2018 and to determine which teeth were most affected.

Methods: Annual compulsory dental check-ups of schoolchildren from 1st and 6th grades of seven primary schools in Viladecans (Barcelona-Spain) were carried out by a Primary Care Dentist. Their parents gave written consent. The resulting data were recorded in an Excel spreadsheet designed for the study. Study variables were: age, gender, teeth affected from MIH (temporary / permanent dentition).

Results: A total of 590 students (308 boys (52%) and 282 girls (48%)) from 1st and 6th grade of the seven schools were examined. Sixty two (10.5% with 95%-CI=8.0%-13.0%) had MIH. Among the students from 1st grade (6-7 years), 14 (8.7%) of the boys and 11 (8.4%) of the girls had MIH. Among the students of 6th grade (11-12 years old), 20 (11.1%) of the boys and 17 (9.8%) of the girls had MIH. The lower right first molar was the most frequently affected of the first permanent molars and was seen in 28 (45%) of the children with MIH. The upper left central incisor was the incisor most frequently affected by MIH and was seen in 12 (19.3%) of the children. In the temporary dentition, the lower left and right molars were equally affected and MIH was seen in 3 (4.8%) children.

Conclusions: In the population studied the prevalence of MIH was 10.5%.This prevalence can be considered high since previous studies have shown a prevalence of MIH between 3.6% -25%.

4216 A SURVEY OF DENTAL CARIES AND MALOCCLUSION IN SCHOOLCHILDREN FROM VILADECANS (BARCELONA)

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Introduction: Primary care dentists perform annual dental check-ups for the 7 and 12 year-olds who attend schools assigned to the Institut Català de la Salut. Barcelona.

Aims: To assess the prevalence of dental caries and malocclusions in schoolchildren (1st and 6th grade) in Viladecans (a suburb of Barcelona).

Methods: During 2017, annual dental check-ups were carried out on 7 and 12-year-olds from seven schools in Viladecans by a primary care dentist. Their parents consented to the check-ups which were authorised by the school authorities. The age and gender of all the children were recorded, along with dental caries at the D3 level in all deciduous and permanent teeth, malocclusion and type of malocclusion according to the Angle classification.

Results: A total of 590 children, 308 boys (52%) and 282 girls (48%) were examined of whom 148 (25%) presented with caries at the D3 level. Approximately half of whom were girls and the rest boys. The most affected teeth were the second temporary molars (136) and the first permanent molars (75). Malocclusion was observed in: 299 (50.6%) of the children. The most frequent malocclusions were: crowding: 88 (29%) a Class II molar relationship 70(23%) and an overbite of more than 5 mm 63 (21%).

Conclusions: The prevalence of caries and malocclusions in child population studied was high.

4220 CARIES EXPERIENCE AMONG CHILDREN IN THE MOSCOW REGION IN 2018

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Aim: The aim of the study was to assess the caries level among children in the Moscow Region in areas with different fluoride concentration in drinking water.

Methods: In 2018, as part of the 3rd Russian National Oral Health Survey, 1034 children from the key groups of 6-, 12- and 15-year-olds, who lived in seven towns of Moscow region, were randomly selected and examined by calibrated dentists using World Health Organisation (2013) criteria. Fluoride concentration in drinking water was measured in all the towns. Mean DMFT data were compared between towns with different levels of fluoride using Student's t-test. The study was approved by the Ethics Committee of Moscow State University of Medicine and Dentistry.

Results: Fluoride content in drinking water was low (0.23-0.41 mg/l) in four towns, optimal (0.82-0.96 mg/l) in two towns and high (2.64mg/l) in one town. The number of children examined in these towns was 600, 300 and 134 respectively. Mean dmft values among 6-year-olds in the towns with low and optimal F- concentration were 3.11 ± 0.24 and 2.44 ± 0.29 respectively ($p > 0.05$). In the town with high F- concentration mean dmft was significantly lower (1.42 ± 0.28 , $p < 0.001$). Mean DMFT values for 6-, 12- and 15-year-olds in low F-concentration areas were 0.36 ± 0.05 , 3.28 ± 0.23 and 4.34 ± 0.24 respectively. The mean DMFT in different towns varied significantly in all age groups. In towns with optimal and high F-concentration mean DMFT values were significantly lower: 0.20 ± 0.12 ($p < 0.05$) and 0.04 ± 0.04 ($p < 0.001$) - in 6-year-olds, 0.95 ± 0.45 and 1.18 ± 0.28 - in 12-year-olds ($p < 0.001$), 1.65 ± 0.17 and 1.06 ± 0.19 - in 15-year-olds ($p < 0.001$). There were significant differences between DMFT values in 6- and 15-year-olds in optimal and high F- concentration towns ($p < 0.05$).

Conclusions: The results of the study confirmed a significant correlation between fluoride concentration in drinking water and prevalence of caries in children. Concurrently, significant differences between DMFT values in the different towns with low fluoride concentration indicated other factors could be important in caries development.

4221 EPIDEMIOLOGICAL STUDY OF THE ORAL HEALTH OF A VULNERABLE CHILD POPULATION IN MADRID

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Aim(s): It is necessary to know the oral health status of people at risk of social exclusion prior to developing an oral health programme which helps to diminish inequalities and improve their oral health. The propose of this study was to evaluate the oral health status of children living in two communities in Madrid: Cañada Real (sector VI) and El Gallinero, both of which are deprived socio-economic areas.

Methods: An observational cross sectional study was carried out in 2018. Dental caries, periodontal diseases, oral hygiene and access to dental care. were evaluated. From approximately 400 children who participated in activities organised by social support associations, 193 aged from 6 to 16 years were included in the current study. Ethics approval was given by the ethics committee of the Severo Ochoa Hospital in Madrid and written informed consent to take part in the study was obtained from the children's parents. The study followed the methodological recommendations of the World Health Organization as described in the Oral Health Surveys Basic Methods manuals (1997 and 2013). Clinical examinations were performed by one calibrated dentist, who achieved a Kappa score > 0.95 for intra-examiner consistency.

Results: One hundred and seventy six (91%, with 95%-CI=86%-95%) of the children who took part in the survey presented with caries at the D3 level. Only 30 (15.5%) had at least one pit and fissure sealant on a permanent molar. The Restorative Index was 13% for temporary teeth and 48.5% for permanent. Their oral hygiene was poor in that 31/53 (58%) of the children \geq 12 years old reported brushing their teeth once a week or less frequently.

Conclusions: In the population studied levels of oral disease were higher and access to dental care was lower compared to that reported in previous studies which have been carried out in Madrid and Spain.

Session 1c

HEALTH SERVICES RESEARCH (1)

Chairs: Eeva Widström & Lydia Katrova

4070 TREATMENT NEEDS AND TREATMENT PROVIDED FOR CHILDREN IN FIVE FINNISH PDS UNITS IN 2001-2013

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Aim: In Finland, since 1972, the Public Dental Service (PDS) has provided free annual examinations, preventive measures and all necessary care for all children and adolescents (<18 years). Since then children's oral health has improved greatly. This study aimed to survey changes in treatment needs and treatment measures provided for children aged < 18 years by five PDS units between 2001 and 2013.

Methods: Data on patients (<18 years), oral health (CPI > 2, D+d > 0) and treatment between 2001 and 2013 were collected retrospectively from municipal databases in five PDS-units in towns with a total of 320,000 inhabitants. The National Institute for Health and Welfare gave ethics approval. Permission to use local data was received from

the Directors of the PDS units. Treatment measures were listed in 14 categories and patients were grouped by three age categories (0-6 years, 7-13 years and 14-17 years).

Results: About 40,000 children and adolescents visited the PDS each year and 2,488,805 treatment measures were provided for them during the study period. The proportion of those in need of treatment decreased in the youngest age group (0-6 years) by 66% from 11% to 4%, in the middle age group (7-13 years) by 32% from 58% to 46% and in the oldest age group (14-17 years) by 25% from 69% to 54%. The most common treatment categories were examinations (613,753, 24.7%), orthodontics (499,033, 20.1%), preventive measures (372,473, 15.0%) and restorative treatment (355,325, 14.3%) making up 74% of all treatment measures. During the study period the total number of annual treatment measures increased by 16.8%, from 180,967 in 2001 to 211,297 in 2013. Examinations increased from 45,927 to 52,227 (13.7%). Orthodontic treatment measures increased from 42,266 to 43,811 (3.7%), preventive measures increased from 23,683 to 32,329 (36.5%) and restorative treatment halved from 38,697 to 19,192.

Conclusions: Although children's oral health improved and restorative treatment decreased, the total number of treatment measures increased. The biggest increase was in examinations, preventive care and orthodontics.

4071 PUBLIC DENTAL SERVICE (PDS) FACING IMPENDING HEALTH CARE REFORM IN FINLAND

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Aims: An impending health care reform will change the organization, provision and financing of healthcare services in Finland at the same time centralising its administration. The Public Dental Service (PDS) faces a new era of commercialisation and competition with the private sector. Public financing of oral healthcare will be reduced radically. The aim of this study was to find out what the personnel in the PDS thought about their future work opportunities.

Methods: In 2016, an electronic questionnaire was sent to a random sample of 12 health centres in Northern and Southern Finland after ethics approval from the National Institute for Health and Welfare. Altogether 311 PDS employees (121 dentists, 60 dental hygienists and 121 dental assistants (dental nurses) responded; a response rate of 71%. Chi2 test was used in the statistical analyses.

Results: Only 24 (22%) of those working in Southern and 59 (29%) of those in Northern Finland believed that there would not be changes in their work environment after the reform. In contrast, 56 (51%) and 62 persons (31%) respectively ($p < 0.05$) anticipated that their PDS-unit might become a "commercial company" following the municipal enterprise or some other model. In the South, 39 (36%) and in the North 43 (21%) persons ($p < 0.05$) expected changes in the work force, most often "more dental hygienists, fewer dentists". Twenty five (19%) of the dentists 9 (15%) of the dental hygienists and four (3%) the assistants (dental nurses) reported that they could think of moving to the private sector. Most respondents (241, around 80%) suggested that more immediate treatment of dental emergencies, considerably more periodontal treatment and home care instructions for adults and more dental hygienists would increase efficiency. About half of the respondents 58 (53%) in the South and 85 (42%) in the North ($p < 0.05$) thought that greater patient flow would increase income in the PDS.

Conclusions: The dental personnel who responded to the questionnaire expect radical changes in their working conditions especially in Southern Finland where the private sector has a greater market share than in the Northern parts of the country. Dentists and dental hygienists seemed to be more aware of changes than dental assistants.

4076 DENTAL PRACTITIONERS AND THE SCHOOL-BASED ORAL HEALTH CARE AND PREVENTION IN BULGARIA

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Background: A study has indicate that prior to 2000, in Bulgaria, in the state healthcare service, salaried school dentists were willing to take care of children. However, since then, far fewer dentists have worked in the state health-care service. To address this problem, a nationwide oral health programme is currently running with the voluntarily participation of private dental practitioners (DPs).

Aim: The aim of this study was to investigate the interest and motivation of dental practitioners to work with children in school based oral health programmes.

Methods: A convenience sample of 67 (3%) DPs from a total of 2789 members of the list of the Bulgarian Dental Association, who worked in Sofia, completed a questionnaire with 24 questions. The questions were on their readiness to cooperate with parents and teachers to provide prevention of oral diseases, treatment and health education, as well as their opinion on whether dental offices at schools should be reopened.

Results: Fifty (75%) of the respondents were DPs with over 11 years of service, 40 (60%) worked as generalists, 44 (66.2%) worked primarily with adults. Less than half of them showed interest in contacts with school authorities and teachers. Most believed that the role of parents is crucial and schools and the teachers will not contribute significantly to improve the dental health of students without close cooperation, especially during oral health campaigns. Twenty two (30.8%) fully supported reopening school based dental offices/clinics. Sixteen (24.6%) did not think that schools need dental offices. Thirteen (20%) supported the idea in principle, the rest thought that a dental office has to be appropriate to the specific needs of a particular school.

Conclusions: The opinion of the dentists, who responded to this survey, on the topic of reopening dental offices at schools, was mainly influenced by their financial interest and wish to work with children.

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4092 PREVALENCE OF UNMET ORAL HEALTH TREATMENT NEED AMONG FINNISH ADULTS

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Aim: The aim was to analyse the prevalence of unmet oral health treatment need (UTN) among adult Finns.

Methods: The data were collected by interviews as part of the nationally representative Health2000 and Health2011 surveys conducted by The National Institute for Health and Welfare (THL). The Ethics Committees of THL and University Hospital Region of Helsinki gave permission for the surveys. To form a nationally representative data set of adult Finns, the participants were weighted using inverse probability weighting. UTN was defined as experiencing self-assessed treatment need (STN) but not having visited dentist during the past 12 months. Gender-specific prevalence were evaluated with chi squared test according to age separately for both years. Age groups were defined based on birth year on the basis of access to subsidized care.

Results: In 2000, 8,489 participants were interviewed and 5,502 (2,448 males,44% and 3,054 females, 56%) answered the questions on self-assessed treatment need and service use. In 2011, 5,903 participants were interviewed and 5,206 (2,314 males,44% and 2,892 females,56%) answered the questions on self-assessed treatment need and service use. Prevalence was higher among men than among women, among those born in 1956-1970 (33% vs. 24% (p<0.001) in

2000, and 26% vs. 20% ($p=0.009$) in 2011) and among those born in 1946-1955 (30% vs. 24% ($p=0.041$) in 2000, and 22% vs. 17% ($p=0.038$) in 2011), respectively. No differences between men and women were observed among those born in 1971 or after (23% vs. 23% in 2000 and 26% vs. 22% in 2011) or among those born in 1945 or before (22% vs. 22% in 2000, and 20% vs. 18% in 2011), respectively.

Conclusions: In the population studied, UTN was less prevalent in 2011 than in 2000, and seemed to be more prevalent among males than among females.

Acknowledgement: The presenter acknowledges a personal grant, to fund this study, from the Finnish Dental Association Apollonia.

4100 DELIVERY OF DENTAL SERVICES FOR DRUG USERS: ATTITUDES AMONG NORWEGIAN DENTAL PERSONNEL

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Aims: To assess dentists' and dental hygienists' attitudes and practices related to dental treatment of drug users and to describe variation in attitudes in relation to professional category, years of clinical experience and number of drug users treated per month.

Methods: The study population comprised 141 dentists and dental hygienists (response rate 73%) working in the public dental service in three counties in Norway. All the participants completed an electronically distributed questionnaire on existing treatment practices and attitudes to providing dental treatment for drug users under rehabilitation. Individual characteristics of the clinicians (gender, county, graduation place and number of years in clinical practice) were recorded. The study was approved by the Norwegian Centre for Research Data (NSD). The Chi-square test was used for statistical analysis.

Results: One hundred and one (75%) dentists and dental hygienists reported that they took more time for examination and treatment of drug users than for other patients. The majority of dentists and dental hygienists considered drug users as demanding patients, due to missing appointments (121; 91%) and poor compliance to oral hygiene advice (100; 76%). Perception of drug users as dental patients was not significantly associated with respondents' gender, country of graduation, years in clinical practice or number of drug users treated per month ($p>0.05$). Ninety two (70%) considered treatment of drug users as professionally satisfying and felt competent in communication (111; 84%) and treatment (123; 93%) of these patients. However, 106, (80%) of respondents felt they needed more knowledge in providing dental treatment for drug users.

Conclusions: In the group studied, dentists and dental hygienists perceived drug users as demanding patients, who were professionally satisfying to treat.

Acknowledgement: This study was supported with funding from the Norwegian Ministry of Health (Helsedirektoratet).

4115 FISSURE SEALANTS OR FLUORIDE VARNISH? ROUTINES AND ATTITUDES AMONG DENTAL HEALTH PERSONNEL IN NORWAY

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Aim: To investigate routines and attitudes among dentists and dental hygienists concerning use of fissure sealants and fluoride varnish for management of occlusal caries in Norway.

Methods: All dentists and dental hygienists working in child dental care in three counties were asked to complete questionnaires on routines for use of fissure sealants and fluoride varnish. Nine statements regarding attitudes towards use of fissure sealants were scored using a five-point Likert scale. Data collection was performed during autumn 2017. The resulting data were statistically tested using the Chi-square test. The study was approved by the Norwegian Centre for Research Data.

Results: In total 142 of 189 (75%) dentists and dental hygienists answered the questionnaire. The majority of the respondents, 83 (59%), reported that the preventive method they preferred was fissure sealing while fluoride varnish was preferred by 59 (41%). Frequent use of fluoride varnish, several times per week or more, was reported by 105 (74%) and frequent fissure sealing by 58 (41%). Most of the clinicians (106, 75%), used sealants if there were specific

indications, and 91 (63%) opened fissures only when suspecting dentine caries. The preferred method and routines for occlusal caries management differed between counties ($p < 0.05$). The results showed high agreement with the statement that sealants are protective against caries (mean 4.4, SD 0.7), while statements regarding costs, technique sensitivity and children's cooperation revealed some concerns regarding fissure sealing.

Conclusions: In the population studied, fissure sealing was the preferred method for occlusal caries management despite reported challenges with technique sensitivity and patient cooperation. However, a higher proportion of respondents reported more frequent use of fluoride varnish compared to fissure sealants.

4122 DO CHILD CHARACTERISTICS INFLUENCE RECALL INTERVALS FOR NORWEGIAN CHILDREN?

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Background: Children in Norway are offered regular dental services free of charge.

Aim: To explore changes in recall intervals for children aged 5 to 12 years, and study associations with caries experience, parents' national background and education and recall intervals.

Methods: This longitudinal study included 2960 children in one county in Norway monitored from 5 to 12 years of age. Data were collected at clinical examinations, from dental records and by parental questionnaires. Dentists and dental hygienists performed the examinations. Intra- and inter-examiner agreements were tested and calculated using Cohen's kappa showing substantial to almost perfect agreements. Length of recall intervals was dichotomised into short (shorter than 18 months) and long (18 months and longer). Data were analysed using Chi-square statistics and logistic regression (SPSS, version 24). Informed consent was obtained from parents and the study was approved by an ethics committee (REC/2013/1881).

Results: Recall intervals varied from 4 to 24 months, mean 18.2 (SD 4.2) at 5 years of age, and mean 17.2 (SD 3.8) at 12 years of age. Among the 704 children with short recall intervals at 5 years of age half (366) still had short intervals at age 12 years. Among the 2256 children with long recall intervals at age 5 years, the majority (1613) had long intervals at 12 years of age. Multivariate logistic regression analyses controlled for caries experience and characteristics of children showed that the probability of having short interval was higher in children having caries experience than in caries-free children at both 5 years (OR 12.6 CI 9.9-16.0) and 12 years (OR 2.7 CI 2.3-3.1). In addition, at 5 years of age, length of recall intervals was associated with parents' national background (OR 1.8 CI 1.4-2.4) and parents' education (OR 1.3 CI 1.0-1.5).

Conclusions: In the population studied, the majority of children had long recall intervals at both ages. The results indicated that recall intervals were associated with caries prevalence and that family characteristics influenced recall intervals in preschool children more strongly than in older children.

4134 ECONOMIC EVALUATIONS OF PRIMARY CARIES PREVENTION IN 2-5-YEAR-OLDS: A SYSTEMATIC REVIEW

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Background: To date, there have been no assessments of the scope and quality of economic evaluations of caries prevention interventions in pre-schoolers.

Aim: To describe and summarise published economic evaluations of primary caries prevention in 2-5-year-olds and evaluate the reporting quality of these studies.

Methods: MEDLINE, EMBASE and EconLit databases were searched in December 2017 using adapted Canadian Agency for Drugs and Technologies in Health economic evaluation filters. No publication date or language restrictions were applied. Both full and partial economic evaluations of primary caries prevention interventions in 2-5-year-olds were included. The reporting quality of the eligible papers, apart from costing/cost analysis studies, involved assessment, using the Consolidated Health Economic Evaluation Reporting Standards checklist, by two reviewers. Extraction tables included a description of the study population, type of economic evaluation, study design, setting, participant characteristics, intervention(s), comparator(s), methods, outcome measures used, results and conclusions. A narrative synthesis of the findings from the studies will be provided, reflecting the scope and quality of the included papers.

Results: 808 studies were identified, of which 43 (5.3 %) met the inclusion criteria. Of the forty three, 26 papers (60.5%) were published between 2000 and 2017. Twenty-six (60.5%) were partial economic evaluations. Eighteen papers (41.9%) were based on studies conducted in the USA, followed by 10 (23.3%) in the UK, 4 (9.3%) in Canada and 3 (7.0%) in Sweden. The majority investigated multi-component interventions: 17 (39.5%), followed by water fluoridation: 9 (20.9%) and topical fluoride: 5 (11.6%). Costing/cost analysis were the most frequently used types of economic evaluation: 26 (60.5%) followed by cost-effectiveness analysis (CEA): 14 (32.6%).

Conclusions: The majority of papers were published between 2000 and 2017 and originated in the USA. The most common study type was complex multi-component interventions. Costing/cost analysis and CEA were the most frequently used types of economic evaluation. This systematic review is to appraise and summarise all the available evidence of partial and full economic evaluations in the field of primary caries prevention in 2-5-year-olds.

Session 1(d)

HEALTH SERVICES RESEARCH (2)

Chairs: Paula Vassallo & Huda Yusuf

4142 THE ASSOCIATION BETWEEN ETHNICITY, SOCIOECONOMIC STATUS AND CHILD DENTAL HEALTH IN SCOTLAND.

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Aim: While socioeconomic inequalities in child oral health in Scotland remain a challenge, with children from the poorest backgrounds having the greatest disease burden, inequalities in relation to ethnicity are not well understood. Therefore, this study aimed to investigate the relationship of ethnicity and socioeconomic factors to child dental health in Scotland.

Methods: Individual child dental health data were obtained for the school population of 5- and 11-year-olds from the National Dental Inspection Programme. These records were probability-linked in the secure National Safe-Haven to the School Census dataset containing ethnicity data. Records for each annual population-cohort between 2008 and 2015 were linked, providing 381,696 and 362,509 children in the 5 and 11-year-old NDIP cohorts, respectively, with one 5-year-old cohort longitudinally followed to 11-years (n=39,796). Logistic regression analyses assessed associations between ethnicity, area-based / individual-level socioeconomic status (SES), with obvious dental caries experience.

Results: Compared to Scottish white 5-year-olds, Gypsy, Polish, Chinese, Bangladeshi and Pakistani children had significantly higher odds for having dental caries. These associations held even after adjusting for SES, with Gypsy (odd ratio OR 5.5; 95% confidence interval, 95% CI, 4.2-7.1), Polish (OR 2.9; 95% CI 2.7-3.1), and Chinese (OR 2.5; 95% CI 2.3-2.8) having particularly high risk associations. By 11-years these ethnic-related inequalities were no longer significantly different, although 11-year-old Polish (OR 3.3; 95% CI 2.7-4.1) and Gypsy (OR 1.7; 95% CI 1.3-2.3) children still had significantly higher odds for dental caries compared to their Scottish white counterparts. These findings were replicated in the longitudinal cohort, where the risks of 11-year-old children having decay were strongly associated with 5-year-old caries experience (OR, 3.1; 95% CI 3.0-3.3).

Conclusions: In the population studied these results demonstrate clear inequalities in dental caries prevalence among the majority of ethnic groups examined relative to the white population, which were not explained by SES, but which reduced between 5- and 11- years.

4144 PROFILING ORAL HEALTH SYSTEMS ACROSS SIX EU COUNTRIES: A MIXED-METHODS APPROACH

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Aims: Oral health varies around Europe, little is known about impacts of healthcare systems on disease prevention. Information about different healthcare systems is mostly limited to contextual facts with inadequate information about how they facilitate better outcomes. The aim of the Added Value for Oral Care (ADVOCATE), EU Horizon 2020 project, which includes Denmark, Germany, Hungary, Ireland, The Netherlands and the United Kingdom, has been to explore what factors contribute to a safe, effective, patient-centred, prevention-oriented healthcare model. This research also aimed to understand how oral healthcare systems' structure, policy and implementation influence prevention of oral disease in the six ADVOCATE countries.

Methods: A stepwise mixed-methods approach was taken. Data were collected during 2015-2017. In stage1: published literature about each country's demographics and oral healthcare system(s) constructed a contextual template for stakeholders within each system (commissioners/policy makers, dental professionals, patients and insurers) to comment upon during panel discussions. In stage 2: A systematic review of barriers to and facilitators for oral healthcare prevention was undertaken. In stage 3, the results from stages1-2 informed focus groups, in each of the six countries, which explored barriers to and facilitators for oral healthcare prevention as they were perceived by multiple stakeholders (see above). Ethics approval was obtained from the relevant authorities in each country.

Results: Stakeholders contextualised and ratified data extracted from the published literature to explain their country's oral healthcare system and better understand the intrinsic and extrinsic motivational factors which act as drivers for prevention. Data-focused profiles covered: demographics, dental workforce, provision of oral care, oral health status, economics/political aspects. These profiles, combined with information from Stage2, provided the basis for discussions in each country exploring a micro-level of detail previously unavailable. Mixed-method analysis revealed that system characteristics may facilitate a focus on prevention, but alone, do not secure prevention. Influential in the delivery and acceptance of prevention was stakeholders' perceived value and knowledge of it.

Conclusions: In the study, profiling ADVOCATE- country's oral healthcare systems and exploring micro-level (patient/practitioner) and macro-level (political, societal/international level) perspectives have enabled the collection of contextualized data upon which to base future recommendations regarding prevention.

Acknowledgement: The ADVOCATE (added value for oral healthcare) project has received funding from the European Union Horizon 2020 research and innovation programme under the grant agreement no. 635183

4214 IMPACT OF A SUGAR-SWEETENED BEVERAGE TAX ON ORAL HEALTH

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Aim: Due to its high sugar content, excessive intake of sugar-sweetened beverages (SSB) has a negative effect on health, which is why several countries, as a public health measure, have decided to impose tax on these products to reduce their consumption. The aim of this systematic review was to quantify the impact of this tax on SSB consumption and to assess its impact on the improvement of oral health.

Methods: To access the evidence of the impact of a SSB tax, the following databases were used (utilizing keywords and MeSH terms): PubMed (MEDLINE), Cochrane Library, Scopus, Google Scholar, Econlit, National Bureau of Economics Research (NBER) and Research Papers in Economics (RePEc). Literature published between 2008 and 2018, which reported data on the SSB tax and its impact on consumption levels or on oral health, were included.

Results: A total of 187 articles were found, eight of which met the aims of this review and were included in the qualitative analysis. They showed a reduction in the consumption of SSB in all cases (between 4.6% and 22%, depending on price elasticity and the tax applied). Two other studies estimated a reduction in the prevalence of dental caries after the introduction of the tax.

Conclusions: In the literature studied, a tax on sugar sweetened beverages was an effective measure for reducing SSB consumption and it can have positive effects on oral health, especially in high risk groups. However, more studies are needed in order to quantify these effects.

4218 EVALUATION OF ROOT CANAL TREATMENTS IN A FINNISH PUBLIC HEALTHCARE UNIT

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Aim: To assess how root canal treatments (RCTs) performed in the Public Oral Healthcare Services (POHS) of the city of Porvoo (population 50,000) by 24 POHS- dentists followed guidelines for good clinical practice.

Methods: Primary RCTs completed in 2016-2017 were evaluated. The relevant data were collected from electronic patient documents with unified treatment codes, free-format texts and electronic radiographs. The preliminary findings from 117 RCTs reviewed up to 1 August 2018 are presented in this abstract. The Department of Health and Social Services of the city of Porvoo approved the study protocol. Sequential numbers were used for all cases to maintain patient anonymity. The RCTs were assessed against the European Society of Endodontology quality guidelines. Features assessed included preoperative, masterpoint and final root filling radiographs (present/absent); preoperative periapical status as the presence/absence of apical periodontitis (AP); isolation (rubber dam/else/unrecorded), working length of canals (radiographic/electronic/unrecorded); use of irrigation and inter-appointment medication (recorded/unrecorded) separately for sodium hypochlorite (NaOCl), ethylenediaminetetra acetic acid (EDTA), chlorhexidine (CHX), calcium hydroxide (CaOH₂). The treated teeth were categorized as anteriors (incisors/canines) and posteriors (premolars/molars). Patient demographics, which were recorded, included age, gender, systemic health status and smoking. Chi-squared tests were applied to the data with a statistical significance level set at $p < 0.05$.

Results: In total, 117 RCTs were evaluated: 77 (66%) in anterior teeth and 40 (34%) in posterior teeth; preoperative AP had occurred in 29 (25%) of cases. Patients' age ranged from 12 to 80 years, mean age 44 years, 31 (27%) had systemic disease and 16 (14%) were smokers. Isolation with rubber dam was recorded in 36 (31%) cases, other methods of isolation in 20 (17%) cases; 61 (52%) cases had isolation unrecorded. Almost all cases had recordings of the use of NaOCl and CaOH₂. Working length measurement was electronic for 63 (54%) of cases and unrecorded for 24 (21%). Preoperative radiographs were recorded in 95 (81%) cases, radiographs of masterpoints in 28 (24%) and for 111 (95%) completed root fillings. There were no statistically significant differences for all these features between anterior and posterior teeth.

Conclusions: With the exception of recording isolation and working length, in general, the RCTs assessed followed the guidelines reasonably well. Audits of this nature help the clinicians concerned and inform the POHS.

4222 COMPARISON OF ORAL HEALTHCARE SYSTEMS IN 9 EUROPEAN COUNTRIES WITH THE UNITED KINGDOM.

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Background: A series of papers describing the oral healthcare systems in France, Germany, Greece, Ireland, Italy, Poland, Romania, Spain and Sweden have recently been published.

Aim: To summarise and compare the types of oral healthcare system across the nine countries with that of the United Kingdom (UK).

Methods: Using the previous nine papers, as well as information from other sources, a synoptic review was performed in July 2018. It classified the different types of health delivery systems as either Nordic, Bismarckian, Beveridgian,

Southern European, Eastern European or Hybrid and then compared: general health care provision systems, insurance and payment systems, costs of oral healthcare, workforce and access to care, education and epidemiology in the nine countries with those in the UK.

Results: In comparison with some countries, the UK enjoys generous state funded oral healthcare as well as sophisticated oral health prevention and epidemiology programmes. Generally, in the Northern Europe countries, which were reviewed, there was good provision of state funded oral health care and good access to care. In Southern and Eastern Europe, the systems are almost exclusively privately funded with some very basic state support, probably resulting in lower uptake of oral healthcare services. Oral health provision in Greece is in a particularly parlous state given its economic woes. A recent survey found an unmet restorative treatment need of 84.6% in six year old Greek children. There is no overall European oral healthcare workforce plan. Currently Romania and Spain are training a large number of dentists many of whom are unable to find employment in their own countries. Much of the national epidemiological data is of variable quality, which makes inter-country comparison difficult. However, the prevalence of dental caries in children appears to have declined in the Western European countries included in this review but not in Eastern Europe.

Conclusions: In the countries studied, the Northern European oral healthcare systems bore the closest resemblance to the UK. There is no shortage of dentists in the ten countries except in some rural areas. A higher standard of epidemiology and cross border work force planning would benefit all countries.

4223 IS THE USE OF MINIMALLY INVASIVE DENTISTRY IN PUBLIC DENTAL CLINICS JUSTIFIABLE?

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Background: In 2012, the International Dental Federation (FDI) published a document supporting minimally invasive dentistry (MID) as an appropriate method to treat dental caries.

Aim: The aim of the review reported in this abstract was to identify scientific evidence to justify minimally invasive dentistry (MID) as an approach to treat dental caries and to justify its use in public dental clinics.

Methods: A systematic review of literature published between 2008 and 2018 on the topic of MIH, its acceptance by dental professionals and current treatment policies was performed. The inclusion criteria were: written in either English or Spanish, studies in humans, full text, published in the last ten years, population of adults and children. Articles that evaluated oral health programs based on the patient's risks arising from minimally invasive techniques were also taken into account. The PubMed/Medline and CICO databases were searched using the terms: primary dental care, public health dentistry, minimally invasive dentistry and caries risk assessment.

Results: Seventeen publications met the inclusion criteria. They indicated that the majority of dentists were acquainted with MID procedures but, not all of them carried them out. In one of the most surveys (2016) 77% of dentists who were acquainted with MID, accepted that it met the necessary standard of care for the provision of oral healthcare in the adult population. It was also noted that dentists who received training in MID showed significantly better knowledge of and attitude to the adoption of minimally invasive techniques for diagnosis and treatment of dental caries.

Conclusion: In the population studied, it was concluded that the scientific evidence for the use of MID had reached most of the dentists, but it did not benefit all the patients. However, the dentists accepted that it met the necessary standard for the provision of oral healthcare and its acceptance was growing.

4224 EXPLORING DANISH DENTISTS' AND DENTAL HYGIENISTS' VIEWS ON BARRIERS TO AND FACILITATORS FOR PREVENTION

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Aim: To explore the barriers and facilitators to prevention within the Danish oral healthcare system from the perspective of the general public, dental professionals, dental policy makers and insurers. This research is part of a multi- centre Horizon 2020 project: “Added Value for Oral Care” (ADVOCATE).

Methods: Twelve Danish dental professionals (dentists and dental hygienists) participated in a semi- structured focus group which explored their perceived barriers and facilitators to prevention in oral healthcare. The transcripts were translated into English and were analysed using inductive thematic analysis. An ethical waiver was obtained from The National Committee on Health Research Ethics. Data collection took place between June-July 2016 and the qualitative findings from Danish dental professionals are described here.

Results: Seven themes were identified, which acted as both barriers and facilitators to prevention; Knowledge and attitudes, Training and education, Regulation, Incentivisation, Multidisciplinary approach, Access to care, and the dental professional -patient relationship. Those who took part thought that dentistry was tightly regulated which reduced their ownership or control regarding guideline implementation. A greater focus on ways to enhance intrinsic and extrinsic motivation was suggested to enhance a focus on prevention, but ultimately the dental professionals believed there was a lack of political will amongst policy makers to enforce such change. The participating dental professionals possessed varying levels of knowledge and experience regarding prevention, this was also reflected in their motivation to learn more. Positively, the importance of the dental professional -patient relationship was highly valued and tailoring of their preventive message to each patient seen as important. There remained some degree of uncertainty in how to deliver advice and this was expressed through their frustration with patients not changing their behaviour, which in turn caused them to question the value of prevention.

Conclusions: In the population studied the main barrier was a general belief that the system (in terms of regulation and multidisciplinary approach to prevention) does not support the delivery of care at the highest level. However, the main facilitator was dental professionals’ overall belief in the power of prevention within oral healthcare. Awareness of patient behaviour change suggested that more training is required within education and throughout their career on how to elicit and support patient behaviour change.

Session 1e

ORAL HEALTH PROMOTION

Chairs: Jenny Gallagher & Claire Robertson

4062 ASSESSMENT OF A SUPERVISED TOOTH-BRUSHING PROGRAMME AT SPECIAL EDUCATION KINDERGARTENS IN EAST JERUSALEM

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Background: In 2015, the Israeli Ministry of Health expanded dental services to include pre- kindergartens (ages 3-4). The service for this age-group includes tooth-brushing under the teacher’s supervision as part of the daily routine. Implementation of such activity in special- needs kindergartens is complicated. The needs of the children are more complex, their ages are higher, they spend more time in the kindergarten (longer school day, fewer holidays), and they have additional members of staff including therapists (physical, speech, communication, ABA and psychologists).

Aim: To assess the initial outcomes of a supervised tooth-brushing programme for children with autism spectrum disorders (ASD) in special education kindergartens in East Jerusalem.

Methods: An oral hygiene kit for special needs children was developed, adapting existing methods and equipment. Prior to enrolment in the study consent to take part was sought from the children’s parents/guardians. Oral health education and training for kindergarten staff and parents on healthy nutrition and oral hygiene habits was carried out by a dental public health resident and a paediatric dentistry specialist. Daily tooth brushing with fluoride tooth-

paste, supervised by the staff, was then initiated after breakfast in the kindergartens. The target population was 47 children aged 3-6 years, with previously unsuccessful supervised tooth brushing experience, who attended a cluster of 9 kindergartens.

Results: All the teachers (17/17), 18/19 (95%) of the teaching assistants and 12/14 (86%) of the therapists received customised training. Only 12 out of 52 (23%) of the parents invited to the training attended. Forty three (91.4%) of the children brushed their teeth daily, 13 children brushed without any problems or only with verbal encouragement from the staff, 30 children brushed with partial or full physical help from the staff and 4 children refused to brush.

Conclusions: Despite the difficult and complex general and oral condition of the ASD children, finding the appropriate method to help teachers and parents maintaining their children's oral hygiene and teaching them tooth brushing was achieved.

The presenter of this abstract received a Borrow travel award.

4073 ORAL HEALTH RELATED KNOWLEDGE, PRACTICES AND OPINIONS OF CAREGIVERS AT THE BIGGEST CARE HOME FOR THE DISABLED IN TURKEY

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Background: People with a disability have worse oral health than the others. Usually because of their inability to perform good daily oral hygiene, a lack of knowledge of their caregivers and inadequate health policies. There are over 8 million disabled people in Turkey.

Aim: The aim of this study was to evaluate the oral health related knowledge, practices and opinions of a group of caregivers in the largest care home for the disabled in Turkey.

Methods: The study took place in 2017 and was approved by the Ministry of Family and Social Policy. One hundred and seventy caregivers were invited to participate in the study and to complete a structured, pre-tested questionnaire prior to receiving training, which covered the importance of oral health and oral hygiene; tooth brushing and oral care methods.

Results: Out of the 170 caregivers 147, who looked after 322 disabled people, volunteered to take part (response rate 86.5%). Their mean age was 41.4 years (S.D. 7.4). The youngest was 23 and the oldest 58 years old. The majority (98, 66%) were female. Only 11 (7.5%) had received university education and 57 (38.8%) had received only elementary education. Almost half (64, 43.5%) had been working for disabled people for 6-10 years. Among the disabled residents, 255 (79.2%) were mentally disabled and 64 (19.9%) had physical disability. Of the caregivers, 120 (81.6%) reported that they performed oral hygiene procedures for 228 residents (70.8% of 322); 97 (44.1%) reported that they brushed the teeth of residents three times per day. However, 102 caregivers reported that they did not know about the significance of dental plaque and only 47 (32.0%) suggested the frequency of dental visits as two times per year. Nearly two-thirds of the caregivers (95, 64.6%) had not previously received any education regarding oral care and 98 (66.7%) declared that they need training of whom 74 requested that it should be practical.

Conclusions: In the largest care home in Turkey, the caregivers appear to need comprehensive training in oral health so that they can provide adequate oral health care for residents.

4087 PROMOTING ORAL HEALTH IN PRISONS ACROSS ENGLAND, WALES AND NORTHERN IRELAND

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Background: In 2017, a survey of the dental services for prisons in England and Wales and Northern Ireland was carried out.

Aims: To review, collect and present data for dental services in prisons in England, Wales and Northern Ireland. **Methods:** A cross-sectional survey of all adult prisons (18 years and older) was carried out in the three countries between November 2017 to January 2018. An online questionnaire was first piloted then distributed to all 118 prison dentists in the three countries. Themes covered in the questionnaire included dental workforce, patient pathway, safety and security, training and oral health promotion. Ethical approval was not needed as it was deemed to be a service evaluation for Public Health England.

Results: One hundred and two (86%) dentists responded to the survey. 39 (38%) of prisons had one dentist, 37 (36%) two dentists and 16 (10%) four or more dentists but it was unclear whether or not the dentists were all full time. Support staff included dental therapists 40 (39%), dental hygienists (DH) 4 (4%) and oral health promoters 13 (13%). A clinical or non-clinical dental assessment took place in 21 (21%) of prisons carried out by a general nurse or healthcare assistant. Dentists and DH were the main providers of oral health promotion. Advice provided by the dental team included smoking cessation 82 (80%), alcohol misuse 59 (58%) and diet advice 101 (99%). The majority 95 (93%) of prisons had a specialist smoking cessation team in the prison as part of a smoke-free prisons transition programme.

Conclusions: The survey identified that there is a need to monitor workforce training and ensure that all dentists working in prisons receive formal induction and on-going training. The survey also identified that there is a need to ensure that dental health is integrated into other health promoting activities especially for prisoners with complex healthcare needs.

Acknowledgement: The authors would like to thank the dental team delivering services in prisons, NHS England Health and Justice, Her Majesty's Prison and Probation Service (HMPPS), National Association of Prison Dentistry (NAPDUK), Public Health Wales and South Eastern Health and Social Care Trust, Northern Ireland for their help and support in coordinating this survey.

4090 ORAL HEALTH BEHAVIOUR AND BACKGROUND CHARACTERISTICS IN NORWEGIAN 12-YEAR-OLDS

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Background: Children in Norway are offered oral health care free of charge from birth.

Aim: To explore oral health behaviour in 12-year-old children and to study association between oral health behaviour and family characteristics.

Methods: All children (7595) in one Norwegian county were in 2014 invited to participate in the study as part of the routine dental visit at 12 years of age. The included children (4779) completed a questionnaire regarding family characteristics; parental background, parental education, family status and gender. Oral health behaviour included tooth brushing frequency, use of dental floss, use of fluoride supplements and sugar snacking. Data were analysed using Chi square statistics and logistic regression. Informed consent was obtained from parents, and the investigation was approved by an ethics committee (2013/1881/REK sør-øst).

Results: Of the children included in the study, 3867 (81%) brushed twice daily, 1726 (36%) used dental floss once a week or more often, 1842 (39%) used fluoride supplements daily and 2292 (48%) reported consuming sugar between meals once a week or less often. Children who brushed twice daily more often used dental floss regularly, used fluoride supplements daily and consumed sugar between meals less frequently than other children ($p < 0.05$). Girls and children having parents with a high level of education more often had favourable oral health behaviour than other children, brushed more frequently, more often used dental floss and fluoride supplements and sugar snacked less often than boys ($p < 0.05$).

Conclusions: In the population studied, associations between favourable oral health behaviours were found. Oral health behaviour was associated with family characteristics.

4117 DEVELOPING VIGNETTES TO EXPLORE ORAL HEALTH ADVICE DELIVERED BY HEALTH VISITING TEAMS

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Background: Health visitors are registered nurses or midwives, who have additional training in community public health nursing. The health visiting programme in England consists of five visits to nursing mothers after the birth of a child. At the fourth visit, when infants are 9-12 months old, diet and dental health should be discussed. Little is known about their delivery of oral health promotion by health visitors. It is proposed that, by exploring their current behaviour, barriers to delivery of dental preventive advice by the health visitors can be identified. A proposed qualitative methodology to achieve this is the use of vignettes (short standardised scenarios) which are particularly useful in examining health professional's attitudes, perceptions, and beliefs.

Aim: To develop vignettes to investigate oral health promotion by health visiting teams in Ealing (an area displaying the highest levels of decay in five year old children in London).

Methods: The study is taking place over three stages; stage 1 (January to April 2018), when a working group consisting of professionals; with experience in psychological research methods used in health psychology, health visiting, oral health promotion and public health drafted a list of vignettes. Stage 2 (May and August 2018) vignettes presented in focus groups to health visiting teams and their responses audio-recorded. Stage 3 (August and September 2018): analysis of the transcripts from the focus groups and identification of themes. There will be three focus groups each consisting of a convenience sample of up to 10 health visitors. The study has been approved by the Health Research Authority. Resulting themes and vignettes will be presented at the EADPH congress in October 2018.

4118 A COMPARISON OF THE ATTITUDE OF LATVIAN DENTISTS AND DENTAL HYGIENISTS TO GIVING ORAL HYGIENE ADVICE

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Background: The high caries prevalence in Latvian children and adults and increasing dissemination in the mass media of myths about harm from fluoride raises a question: what information is the dental team giving to their patients?

Aim: To determine the dental teams' attitude towards oral hygiene recommendations and what advice they give to their patients.

Methods: In May 2014, after gaining ethics approval from the Ethics Committee of Riga Stradins University, an email with a translated and validated (Cronbach alpha=0.78;Kappa=0.85) questionnaire modified from one validated by Morgan et al., (2013) was sent to all registered dentists (1557) and dental hygienists (259) in Latvia. They were asked to answer 16 questions about oral health recommendations categorizing their answers from 0=no or least important recommendation to 3=most important recommendation. A further six questions about attitudes were categorized on the basis of the Likert scale with scores from 1=least important to 4=most important. Descriptive and analytic (unpaired t- test) statistics were performed.

Results: The response rate was 17.3% for dentists (270) and 43.6% for dental hygienists (113). The majority of all responding dental hygienists (106 - 93.8%) and nearly half (154 - (57.0%) of all responding dentists reported that they always gave oral hygiene recommendations to patients. Most of the dentists (218 - 80.7%) reported spending ≤5minutes, and 65.0 - 57.5% of dental hygienists >10minutes on giving oral health advice. One hundred and eighty three (47.8%) dentists and 43 (38.0%) dental hygienists reported that they do not recommend any specific tooth-brushing technique. Eighty-two (30.4%) of dentists and 62 (54.9%) of dental hygienists reported recommending using toothpaste with 1000 ppm F. On average, dentists gave oral hygiene advice three times less than dental hygienists (mean difference=2.94; 95%CI 2.40- 3.48; p<0.001), but both groups considered oral hygiene advice to be important (mean score for dentists=19.52, dental hygienists=19.56; p=0.828).

Conclusions: In the population studied, both groups consider oral health recommendations equally important, but dental hygienists tended to give more advice than dentists. More dentists than hygienists claimed to give advice that is not evidence-based.

4125 HEALTHY TEETH HARROW: AN INTERVENTION TO ENHANCE THE DENTAL KNOWLEDGE AND SKILLS OF THE PRE-SCHOOL WORKFORCE

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Aim: In Harrow, 34.2% of 5 year old children have decay experience, which is a significant public health problem. There is limited research on maximising the early years workforce to provide oral health promotion. The aim was to develop an intervention to enhance the knowledge, skills and confidence of early years staff to deliver dental advice to families in Harrow, London.

Methods: A focus group was conducted to inform the development of the intervention, followed by a survey questionnaire using Theoretical Domains Framework to assess the knowledge, skills and confidence of early years staff to deliver dental advice. All early years staff were invited to participate in level 1 training. This was supplemented by developing a network of seven oral health champions to ensure sustainability of the intervention. Ethics approval was obtained from Queen Mary College University of London (QMREC2054a).

Results: The 11 focus group participants identified gaps in their knowledge and skills on oral health and were keen to give consistent and evidence-based messages oral health messages. In total, 98/111 staff completed the questionnaire, a response rate of 88.2%. Early years staff's knowledge of dental health varied; 61 (24.2%) of respondents did not know the maximum daily allowance of sugar for four to six year olds and 57 (58.8%) did not know the correct amount of toothpaste for children under three years. Additionally, 64 respondents (66.8%) reported that children should start visiting the dentist from the age of two. Six training sessions and resources were developed and delivered to 111 staff (level 1).

Conclusions: Early years staff, in the population studied, believed that delivering oral health advice was part of their role. However, they have limited knowledge and skills in delivering evidence-based dental advice.

4127 IMPLEMENTING THE HEALTH-EQUILIBRIUM-METHODOLOGY IN ORAL HEALTH PROMOTION IN LOW SOCIO-ECONOMIC AREAS

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Aim: The aim of this project was to implement a method aimed at improving quality of work by assessing both formative and summative results in an oral health promoting setting in low socioeconomic areas. The overall aim was to decrease health inequity.

Methods: During 2017 and 2018, five teams of dental hygienists and dental nurses, who worked in socioeconomic low-status areas, participated in this study. Each team consisted of five dental hygienists and three dental nurses. The teams performed health promoting activities in different settings, for example in family-centres. They were taught how to report health promoting activities according to Health Equilibrium Methodology (HEM), which is based on Social Cognitive Theory. The following questions were put and answered in every report: Which health determinants were targeted? Did any person seem to perceive themselves excluded? Did anything unexpected happen? What to think about in future workshops? Quantitative data were also collected. Almost six-hundred individuals were included in a total of 36 reports. Of these 50% were adults/parents and the rest children, most of them between 1-6 years old. The reports were entered directly into a database after every activity and then processed by a facilitator and later discussed with the teams in workshops every third month. The study was approved by the Västra Götaland as part of operational development not requiring ethics approval.

Results: Analysis of the reports showed that the implementation of health promoting activities according to HEM included the following: -Identification of important health determinants. - Attention on how to get everyone involved and if anything unexpected happened. – Suggestions for possible alterations for future workshops. Throughout the workshops the team- members exchanged experiences.

Conclusions: The HEM-method facilitates depicting and discussing the process of health promotion with focus on health equity. The method has potential to support development of high-quality health-promoting activities in populations with low socioeconomic status. It may also lead to better professional self- confidence.

4139 PUBLIC INFANT DENTAL PREVENTIVE PROGRAMME IN THE PRIMARY DENTAL CARE OF TARAZONA

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Aims: To analyse the evolution of the primary dental care activity carried out within the public programme for children's oral health in Tarazona.

Methods: For this purpose, data recorded by the Oral Health Unit of Tarazona from 2011 to 2017 were analysed. Specifically, four variables for the seven different years: 1) Number of first visits per year, 2) Number of successive visits per year, 3) Number of fissure sealants per year, 4) Number of dental fillings per year.

Results: The primary dental care for the population of children aged from 6 to 13 years is carried out within the framework of the PABIJ -a public programme for children's oral health in the Autonomous Community of Aragón (Spain)-. Annually, the total number of children entitled to use the programme is approximately 1,500 in Tarazona. In the past 7 years the volume of primary dental care delivered in Tarazona within PABIJ has progressively increased. The annual utilisation rate and the number of first visits per year have increased from 404 (30%) in 2011 to 773 (51.5%) in 2017. However, the number of successive visits per year has remained stable. In relation to sealants and fillings, in the last 2 years a greater number of sealants and a smaller number of fillings have been placed.

Conclusions: The results of this study indicate that in the past 7 years, the delivery of primary dental care in the Unit of Tarazona within PABJI has evolved positively. The annual utilisation rate for the programme in Tarazona is higher than the average in Aragón with increasing preventive activity and decreasing numbers of restorations being placed.

4149 EFFECTIVENESS OF SCHOOL BASED DENTAL HEALTH EDUCATION USING A FOLDSCOPE TO IMPROVE CHILDREN'S ORAL HEALTH

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Aim: Schools can provide an important platform for introducing effective health education programmes to control the growing burden of oral diseases and to promote oral health. The aim of this study was to evaluate the effectiveness of school-based educational interventions along with using a foldscope* as a tool to improve oral hygiene status and gingival health.

Methods: A cluster-randomized intervention was performed on a convenience sample of 96 participants aged 12 years, who attended three schools in Imphal and who were categorized into three equal groups of 32 based on the type of intervention. Group 1 no intervention, group 2 education via lecture and group 3 education via lecture along with use of a foldscope. Each school had only one group. The study protocol was approved by the Institutional Review Board of the Regional Institute of Medical Sciences, Imphal and parental consent was obtained for each participant. Plaque index (PI) and gingival index (GI) were assessed at baseline and at a follow-up examination after 3 months. Data were analyzed by analysis of variance (ANOVA), independent and paired t-test.

Results: At baseline, all students had dental plaque, and 98% had gingival bleeding on at least one index tooth. After 3 months the plaque indices and gingival indices of groups 2 and 3 showed a very significant reduction when compared to the baseline values. Mean PI in group 2 decreased from 0.85 to 0.34 and in group 3 from 0.89 to 0.18 ($p<0.001$). Mean GI in group 2 decreased from 1.50 to 1.06 and in group 3 from 1.49 to 0.23. Furthermore a significantly greater decrease in PI and GI scores ($p<0.05$) was observed in the lecture with foldscope use group compared to group 2 (the lecture only group).

Conclusion: Dental health education along with use of foldscope, to demonstrate the presence of the bacteria in plaque, greatly motivated the school children who took part in this study and helped them to improve their oral hygiene.

* A foldscope is an optical microscope that can be assembled from simple components, including a sheet of paper and a lens. It is an inexpensive microscope costing less than \$1(US) to build.

Session 2 a

QUALITY OF LIFE

Chairs: George Tsakos & Alina Puriene

4049 COMPARISON OF SLEEP QUALITY BETWEEN MACEDONIAN DENTAL STUDENTS FROM FIRST AND THIRD YEARS

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Aim: The aim of this study was to compare sleep quality between the first and third year dental students, who were attending the dental school of the University of Saints Cyril and Methodius in 2017/2018, as one of the possible factors for their levels of concentration and ability to master new content while studying.

Methods: All first and third year dental students were invited to take part in the study, which involved completing the Pittsburgh Sleep Quality Index (PSQI) questionnaire. This questionnaire facilitates an assessment of sleep quality and any sleep disorders over a period of one month. It consists of 19 questions, which relate to seven 'components' which are: subjective sleeping quality, latency of sleeping (how long it takes a person to fall asleep), the duration of sleeping, sleeping disorders, use of medicines for sleeping and disabled functioning throughout the day. The summation of the values of the seven components gives a total value. In Macedonia, ethics approval is not required for questionnaire surveys of students with voluntary participation. Statistical analysis of the was performed using SPSS version 16.

Results: Out of a maximum possible number of 143 students, 98 agreed to participate and completed the questionnaire (58 (59% response) from the first year and 40 (75% response) from the third year). There was a statistically significant difference in sleeping quality (Component 1) between the students from first and third years ($M=1.00$, $M=0.52$; $SD=0.86$, $SD=0.75$; $t=2.83(df=96)$; $p<0.05$), for latency of sleeping (Component 2) which consists of answers on the second question ($M=0.89$, $M=0.50$; $SD=0.89$, $SD=0.71$; $t=2.31(df=94)$; $p<0.05$) and for inability to get to sleep in 30 minutes (question 5a) ($M=1.48$, $M=0.92$; $SD=1.11$, $SD=1.02$; $t=2.52(df=96)$; $p<0.05$) and in the total score ($M=14.36$, $M=11.32$; $SD=6.04$, $SD=6.55$); $t=2.36(df=96)$; $p<0.05$). For the other four components, there was no statistically significant difference between the students from the first and third years.

Conclusion: In the students who participated in the study, there were differences in sleep quality between students from the first and third years. Students from the third year reported better sleep quality, but both had relatively good sleep quality as assessed by the PSQI.

The presenter of this abstract received a Colgate travel award

4057 ORAL HEALTH RELATED QUALITY OF LIFE IN CHILDREN WITH MOLAR-INCISOR HYPOMINERALISATION

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Aim: The aim of this study was to evaluate the impact of molar-incisor hypomineralization (MIH) on oral health-related quality of life (OHRQoL) according to the perceptions of children.

Methods: The project was approved by the ethics committee of the University of Marmara. The sample was drawn from 11-14 year-old patients with MIH who attended Marmara University Faculty of Dentistry for dental treatment between July 2016 and February 2018 and who agreed to take part in the study. A total of 89 children (52 girls, 37 boys) completed the self-reported 37 item Turkish version of the Child Perceptions Questionnaire (CPQ11-14). Informed consent forms were completed by the parents. A routine clinical assessment was also performed. The severity of MIH was classified as mild, moderate or severe. OHRQoL was analysed by means of a CPQ11-14 score depending on severity of MIH and gender.

Results: All 89 children participated in the study and answered all questions. The mean age of the children was 11.7 years (SD=0.93). With regard to the severity of MIH, 19 (21.3%) children presented with mild, 25 (28%) moderate and 45 (50.5%) severe MIH. Eighty three (93.3%) had visible dental caries (D3 level). The mean DMFT was 3.8 (SD = 2.24). The overall CPQ11-14 score ranged from 2 to 93 (mean = 34.6 ± 19.57) The highest score for overall CPQ11-14 was 93 points. Girls (35.4±20.38) had higher overall mean CPQ11-14 than boys (33.4± 18.8). But the association between gender and CPQ11-14 scores may be explained by lower concern by the boys. The mean CPQ11-14 score was 40.1±19.61 for children with severe MIH. The highest mean value was 13.2±9.39 for emotional well-being.

Conclusion: In the group studied, children with severe MIH reported a higher associated impact on the oral symptoms and emotional well-being domains of OHRQoL. It is suggested that early detection of MIH could avoid the increased severity of these problems and reduce the impact on OHRQoL in children. Further studies are required to enable a better understanding of the effects of MIH on OHRQoL.

The presenter of this abstract received a Borrow travel award

4059 PREVALENCE OF WORK-RELATED MUSCULOSKELETAL SYMPTOMS AMONG FINAL-YEAR DENTAL STUDENTS USING A STANDARDIZED-NORDIC-QUESTIONNAIRE

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Background: Musculoskeletal problems have become a significant issue for the professions of dentistry and dental hygiene. Studies show that dentists are vulnerable to work-related musculoskeletal disorders (WMSDs) of the neck and upper extremities, but little is known about their epidemiology among dental students. Nordic style questionnaires exploring symptoms in the past year can be considered as useful tools for surveillance of WMSDs, especially if they include numerical scales on symptom severity.

Aim: This study aimed to investigate the prevalence of WMSDs in final-year dental students in Marmara University Dental School.

Methods: A self-administered questionnaire was distributed to final year students between October 2017 and February 2018. The questionnaire requested information on job history, individual characteristics, physical and psychosocial risk factors at work, general health status and the occurrence of musculoskeletal complaints, using a drawing modified from the Standardized Nordic Questionnaire.

Results: A total of 142 questionnaires were distributed to final-year dental students and 100 students (69 females and 31 males) completed the survey. The response rate was 71%. The mean age of the students was 23,1 years (SD=1,59), ranging from 21 to 34 years. Working hours/week mean (SD) was 30,32 hours (10,02). Out of the 100 respondents, 88 reported that they had musculoskeletal problems. The three most common were of the neck seen in 70, the back seen in 69 and waist seen in 65 respondents.

Conclusions: This study has identified an alarmingly high reported prevalence of neck and upper extremity WMSDs among a group of final-year dental students. When investigating the influence of work-related risk factors for musculoskeletal health, dental students should be taken into account. It is suggested that a multidisciplinary approach with primary prevention, early intervention and continuous education about the potential effects of dentistry-related risk factors should be employed.

The presenter of this abstract received a Borrow travel award

4060 QUALITY OF LIFE AMONG FINAL-YEAR DENTAL STUDENTS IN TURKEY: A STUDY USING THE WORLD HEALTH ORGANISATION QUALITY OF LIFE -BREF

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Aim: The aim of this study was to assess the quality of life (QOL) of final year students during their dental education at the Marmara University Dental School and explore the factors that influenced their QOL.

Methods: A cross-sectional study of all (142) final-year Marmara University dental students was carried out in 2017.. Data were collected using a questionnaire based on the WHOQOL-BREF instrument, along with demographic data and occupation information, and self-rated health status and quality of life. The self-administered WHOQOL-BREF is a questionnaire developed by the World Health Organization (WHO) to evaluate the general quality of life. The WHOQOL-BREF scores of overall quality of life range from 0–100 and higher scores indicating better quality of life.

Results: Forty two students did not complete the questionnaire. Data from 100 were analysed. The response rate was 71%. The mean age of the students was 23,1 years (SD + 1,59), ranging from 21 to 34 years. The mean (SD) for the QOL domains were as follows – general health 60,8 (SD + 17,5) physical health 66,5 (SD +12,9), psychological health 62,1 (SD +13,3), social relationships 63,7 (SD +14,58) and environment 60,6 (SD +10,84).

Conclusions: Overall the final year dental students, who took part in this survey, reported a satisfactory level of QOL. The presenter of this abstract received a Borrow travel award.

4068 CO-OCCURRENCE OF BEHAVIOURS WHICH CAN CAUSE ADDICTIONS IN MEDICAL AND DENTAL STUDENTS

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Aim: The aim of the study was to investigate the use of psychoactive substances and behaviours which can lead to addictions amongst dental and medical students of the Medical University of Lublin, Poland.

Methods: The University ethics committee approved the study and consent was obtained from each student, who took part in the study. Data were collected in years 2012-2015 from 100 English language students of dentistry and 1125 students of medicine (65% Polish and 35% English language students) who agreed to take part in survey. Using a one questionnaire, the following assessment scales were used in it: AUDIT, Fagerstrom Test for Nicotine Dependence, M.I.N.I.- module Non-alcohol Psychoactive Substance Use Disorders, 20 Question Gambler Anonymous, Internet Addiction Scale (IAT), Addiction to Mobile Phone Questionnaire (AMPQ). A statistical analysis was conducted using Statistica 10 and the SPSS 21 programme.

Results: 254 (31.4%) of the medical students confirmed that they had used a psychoactive substance (with the exclusion of alcohol and nicotine) at least once during their lifetime. This is a slightly lower percentage than has been reported by previous studies of medical students globally. Among the medical students who reported the usage of psychoactive substances, 13 (5.1%) used non-prescribed benzodiazepines and 9 (3.5%) used benzodiazepines with other psychoactive substances. In the Polish students alcohol-related increased risk behaviour occurred in tandem with a majority of other high-risk addictive behaviours. Internet addiction was reported by 29 (2.9%) of medical students. Furthermore, Internet addiction was reported in tandem with other addictive behaviours, which are often classified as subcategories of Internet addiction as they are available with use of the Internet and include Online game play, and Social Networking Services.

Conclusions: If the results from this study can be extrapolated, it may be that the various addictive behaviours amongst dental and medical students are more homogenous than previously thought. This is confirmed by the co-occurrence of various types of addictive behaviours including both behavioural and substance related addictions.

The presenter of this abstract received a Borrow travel award.

4113 THE IMPACT OF PRACTICE TYPE ON DENTAL HYGIENISTS' HEALTH AND JOB SATISFACTION

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Aim: This study was designed to evaluate the job satisfaction and occupational disorders among Lithuanian dental hygienists and to compare the results according to hygienists' practice type.

Methods: The Lithuanian Bioethics Committee confirmed that their permission for this study was not required. In 2017 all Lithuanian Dental Hygienists Association members (328) were sent an electronic anonymous questionnaire. It comprised a 5-point Likert scale structured set of questions which were developed according to the dentists satisfaction survey. Statistical analysis was performed with SPSS Version 17.0. Comparisons between groups were performed with Independent-Samples T-test and Mann-Whitney U test.

Results: The final response rate was 172 (52.4%). Of those who responded 63 (36,6%) worked only as a dental hygienist, 109 (63,4%) had worked as a dental assistant in the previous 12 months. The level of overall job satisfaction among Lithuanian dental hygienists was 3.86 (95% CI 3.69-4.03) out of 5 on the Likert scale. The least satisfying practice areas were income (3.02, 95% CI 2.87-3.18) and occupational health (3.21, 95% CI 3.07-3.35). The most satisfying areas were relations with colleagues (4.24, 95% CI 4.12-4.36) and dentists (4.07, 95% CI 3.93-4.21). The most frequently reported physical disorders were upper back pain (3.09, 95% CI 2.90-3.27) and shoulder pain (3.21, 95% CI 3.03-3.39). The worst psychological well-being aspects were nervousness (3.48, 95% CI 3.33-3.63) and stress (3.55, 95% CI 3.39-3.71). Hygienists who also work as dental assistants suffered significantly more from ankles/feet ($p<0.01$) and elbows ($p<0.05$) problems. Moreover, they had statistically higher anxiety ($p<0.01$) and insomnia ($p<0.05$) rates. Furthermore, those who worked as dental assistants were significantly less satisfied with their physical and psychological health ($p<0.05$), communication with patients ($p<0,05$), job management and control ($p<0.05$), time spent with their family ($p<0.05$).

Conclusions: A dental hygienist working as a dental assistant reported a negative impact for hygienists' job satisfaction and occupational health. It is important to determine the reasons why dental hygienists work as dental assistants in Lithuania and whether the demand for dental hygienists matches the supply.

4146 THE EFFECT OF COGNITIVE BEHAVIOUR THERAPY ON DENTAL FEAR AMONG ADULTS

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Aim: The aim of this literature review was to assess the efficacy of cognitive behavioural interventions in the treatment of severe dental fear/anxiety in adults.

Methods: The inclusion criteria for papers were that they reported treatment of severe dental anxiety in adults and cognitive behavioural therapy (CBT). The level of dental anxiety of study samples was measured by using validated psychometric scales [the Dental Anxiety Scale (DAS) or the Modified Dental Anxiety Scale (MDAS)] and/or by Americans' DSM-IV or WHO's ICD-10 psychiatric criteria for dental- or needle phobia diagnosis. The primary outcome variables used in this study were level of dental anxiety, acceptance of conventional dental treatment and avoidance behaviour. The inclusion criterion for patients in studies was the need for dental treatment. An electronic literature search was performed of the databases PubMed and PsycINFO at the beginning of 2017. The purpose was to capture the latest study evidence and therefore the review was restricted to studies published since 2000. Twenty publications that fulfilled the criteria were found.

Results: Eleven (55%) of the 20 studies were randomized controlled trials (RCT). Cognitive behavioural therapy resulted in a significance reduction in dental anxiety when compared to waiting-list or no-treatment controls and hypnosis or pharmacological treatment. Fear level was measured by DAS- or MDAS-scales. Furthermore, the results of the studies supported the premise that CBT improves patient's acceptance of conventional dental treatment and transforms avoidance behaviour that does not follow nitro-oxide sedation, hypnosis or pharmacological treatment. These outcomes persisted in follow-ups. Treatment was conducted in multi-professional teams of psychologists/psychotherapists and dental staff.

Conclusions: Studies included in this review revealed that different applications of CBT provide an effective psychological treatment in alleviating severe dental fear and to change dental avoidance behaviour. Multi-professional collaboration with psychologists widen the possibility for dentists to use CBT to treat dental fear.

4152 IMPACT OF ORAL HEALTH STATUS ON DAILY LIVING AMONG LITHUANIAN STUDENTS

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Aim: To assess the impact of oral health status on daily living among Lithuanian university students.

Methods: A questionnaire survey was conducted at the Lithuanian University of Health Sciences (LUHS) among third year dental and veterinary students, in March-April 2018. The impact of oral health status was evaluated by the Lithuanian version of OHIP-14. Data were collected on oral health behaviour, measured by reason for routine visits to a dentist and oral hygiene habits. Statistical analyses were performed using ANOVA and Chi-squared tests. The Centre for Bioethics at LUHS granted its permission to conduct the present study.

Results: A total of 150 (60%) (75 dental and 75 veterinary students) of those invited responded. Mean age of participants was 21.7 (\pm 1.6) years. Visiting a dentist for a check-up was reported by 124 (83%), significantly more by dental than veterinary students (68 (91%) vs. 56 (75%), $p=0.010$). Almost all (139 (93%)) indicated brushing their teeth twice or more times daily with no significant difference between the two groups. Significantly more dental than veterinary students indicated daily inter-dental cleaning using floss (60 (80%) vs. 24 (32%), $p<0.001$), and inter-dental brushing (22 (29%) vs. 6 (8%), $p=0.001$). Only 16 (11%) of students didn't experience any impacts of oral health status on their daily living. The mean sum score of complaints was 6.2 (SD=6.0, median=5.0, range 0-30), with no significant difference between the student groups. Higher mean scores of complaints came from students who reported troublesome dental visits (10.4 vs. 5.3, $p=0.011$). The highest mean sum scores were for psychological discomfort (1.9) and physical pain (1.3) subscales of OHIP-14. Physical pain was experienced more often by those who brush their teeth less frequently – 1.9 vs 1.2, ($p=0.031$).

Conclusions: The impact of oral health status on the daily living of study participants was strongly related to visiting dentist for a check-up and practicing preventive oral hygiene habits.

Session 2 b

ORAL CANCER/GERODONTOLOGY

Chairs: Jacques Vanobbergen & Ruxandra Sava-Rosianu

4048 DENTAL STUDENTS' KNOWLEDGE REGARDING EARLY DIAGNOSIS OF ORAL PRECANCEROUS LESIONS

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Aim: This study aimed to evaluate dental student's ability to diagnose potentially malignant oral lesions early.

Methods: This cross-sectional study took place in 2016 and involved a sample of 70 dental students, representing all students attending courses in the final study year at the University of Medicine and Pharmacy in Timisoara, Romania. After obtaining ethical approval, students received a questionnaire comprising 33 questions (3 identification, 18 closed and 12 open), regarding their knowledge of oral cancer and early diagnosis, preventive oncology control, risk factors for oral cancer, clinical presumptive diagnosis and attitude towards malignant or potentially malignant lesions. Descriptive statistics were used to evaluate the results.

Results: Fifty six students returned the questionnaire, of whom 40 (71.4%) were female and 16 (28.5%) were male aged between 23-36 years (mean age=25.93±2.94). All students agreed that early diagnosis of oral cancer improves the prognosis for the patient, but only 30 (53.6%) reported examining the oral mucosa during a consultation and 28 (50%) said the preventive oncology control should be intensified in patients aged between 40-50 years. Considered risk factors for oral cancer were smoking 49 (87.5%), alcohol consumption 35 (62.5%), and heredity 15 (26.8%). When looking at pictures of oral lesions 28 (50%) didn't recognize leukoplakia and 5 (8.9%) mistook it for candidiasis. Only 2 (3.6%) recognized lichen planus and 11 (19.6%) recognized erythroplakia. One (1.8%) recognized submucous fibrosis and 9 (16.1%) mistook it for an ulcerative lesion. Forty eight (85.7) of students didn't feel they had sufficient knowledge regarding oral cancer. Forty seven (83.9%) reported receiving information during their courses and only 3 (5.3%) reported that they had assisted during a clinical oral cancer diagnosis procedure.

Conclusion: The students who took part in this study didn't feel that they had sufficient knowledge of oral cancer, often misdiagnosed lesions, and didn't have the opportunity to clinically assist during a preventive oncology session or examination of such patients.

The presenter of this abstract received a Colgate travel award.

4089 DETERMINANTS OF ORAL HEALTH IN VULNERABLE OLDER PERSONS: A LITERATURE REVIEW

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Aims: to perform a comprehensive review of the literature on determinants of oral health in vulnerable older persons.

Methods: A structured search was used to access relevant papers, published between 1 January 2000 to 15 March 2017 from Medline, Embase, and Web of Science. This search was complemented by hand-searching reference lists and internal reports. Articles in English and Dutch were included.

Results: 198 studies were included based on the inclusion criteria: a population of (partly) vulnerable elderly (elderly >65 years, in long-term care or living at home) and a description of factors possibly influencing oral health as an outcome. A validation of the included articles is planned. Determinants were structured using the 'Health Field Concept' (Lalonde 1984). The number of publications reporting one or more factors are indicated. Endogenic determinants that were described in the literature were advanced age (18), gender (16), co-morbidity (9) and polypharmacy (dry mouth) (8), cognitive impairment (45), care-dependency and physical limitations (20), frailty (9) and the already acquired oral health status (9). Lifestyle determinants were low daily oral self-care (13), low attitude pertaining oral health (12), low oral health literacy (7), (past) smoking (8), and cariogenic diet (3). Environmental determinants were low socio-economic status (22), small social network (9), residing in a nursing home relative to community dwelling (5) or living alone (3), and a multitude of barriers found within care-organisations (18) and within caregivers (40) such as an inability to cope with care-resistant behaviour (7) and low knowledge, skills and attitude (11). Determinants within the health care system were low accessibility for vulnerable elderly (16), very few or none domiciliary oral health care options (7), and a variety of impediments within dentists (12).

Conclusion: The literature that was reviewed indicated that determinants impede adequate daily oral self-care causing severe oral health issues. This phenomenon could be mediated by caregivers providing daily oral care, although a multitude of barriers within caregivers or care-organisations make this difficult to achieve. For a frail older person, it is a challenge to access conventional dental services due to physical and psycho-social barriers, as well as to barriers related to caregivers and dentists.

4097 ORAL HEALTH CARE OF FRAIL ELDERLY IN BELGIUM AS PERCEIVED BY THEIR DAILY CAREGIVERS

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Aims: (1) to obtain an overview of the needs and barriers in performing oral health perceived by caregivers in care organisations. (2) to assess the differences in these needs and barriers based on explanatory variables between caregivers. (3) to gain insights into these factors to develop new interventions concerning the improvement of oral health in frail elderly people.

Methods: The survey utilised two questionnaires, one for the management of the care organisation concerning the organisations details and the view of the management on oral health (care). The other was completed by caregivers and consisted of three parts which dealt with: demographic characteristics, perceived barriers and needs and current practices concerning oral health care. The survey was sent to all care organisations in Flanders, Belgium with Google Forms in January 2018 and February 2018. Out of the 918 organisations contacted 145 managers and 197 daily caregivers from 138 organisations completed the questionnaire. The study was approved by the ethics committee of the University Hospital of Ghent. The data from the questionnaires were analysed with SPSS V24.0. To evaluate the impact of the explanatory variables, a regression analysis was used to analyse which variables could predict the differences in the outcome variable.

Results: From analysis of the completed questionnaires, it was reported that the care of a dental prosthesis is more regulated by the use of guidelines than the oral care of natural teeth. The best predictor of the use of these guidelines was the presence of an oral health policy. Collaboration with a dentist is associated with a more positive perception of the oral health by caregivers ($p < 0.05$) and by managers ($p < 0.05$). Concerning the perceived barriers, male caregivers reported being more comfortable than female caregivers when providing oral care ($p < 0.001$). More than 20% of the caregivers stated that interdental cleaning was not a part of their job description. The best predictor of a clear point of contact within the organisation was the presence of an oral health policy ($p < 0.001$).

Conclusions: The presence of an oral health policy, and the collaboration with a dentist were important predictors of the outcome variables. Further research is needed to assess the influence of the Gerodent project on the outcome variables. The results suggest that the function of the caregiver is another important predictor, more research is needed to know which functions give the best oral health predictions.

Acknowledgement: The survey was commissioned and funded by the Flemish government as an overall inventory on the practices, barriers and perceived needs of the daily oral health of frail elder by caregivers in Flanders.

4114 TESTING TOOTH AND DENTURE CLEANING ABILITY OF GERIATRIC IN-PATIENTS – CLINICAL STUDY

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Aim: This study aimed to evaluate, if the Timed Test for Money Counting (TTMC), complemented with testing the range of shoulder motion by gripping the back of the neck (NG), predicts the ability of geriatric inpatients to perform independently effective oral hygiene.

Methods: This clinical study was conducted between May 2016 and May at the Geriatric Clinic of Jena University hospital and involved 74 hospitalized geriatric inpatients aged between 66 and 98 years (mean age: 84.1 years). Oral examination included diagnosis of dental caries with the DMFT Index, periodontal health with the Periodontal Screening Index (PSI), dental plaque on natural teeth with the Turesky modified Quigley-Hein Index (TI) and plaque on removable dentures with the Denture Hygiene Index (DHI). Self-perceived oral hygiene was assessed by questionnaire. The TTMC and NG were performed and recorded; as were the completeness of the test procedure and the time needed to complete the test. After autonomous tooth brushing and denture cleaning by the patient, oral hygiene was scored again with the TI and DHI. Data regarding comprehensive geriatric assessment were collected from medical records. Ethics approval was obtained from the Ethics Committee of Jena University Hospital (4590-11/15).

Results: Forty nine (66.2%) geriatric inpatients completed the TTMC&NG successfully. Passing the TTMC&NG was significantly associated with better self-performed oral hygiene. There was a weak correlation between plaque reduction rates and the time needed to complete the test. The sensitivity of the TTMC&NG for above average plaque reduction was 86.4% on teeth and 77.8% on dentures. The test revealed a negative predictive value of 75.0% to detect below average plaque reduction on teeth and 72.7% for dentures.

Conclusions: The TTMC&NG served as a suitable predictor for the ability of geriatric inpatients to perform autonomously effective tooth brushing and denture cleaning. The expenditure of time was only about 5 minutes and might help the medical staff to identify geriatric patients unable to perform effective oral hygiene independently.

4121 COGNITIVE ABILITY, SOCIO-ECONOMIC FACTORS AND MISSING TEETH IN GREEK OLDER ADULTS.

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Aims: Oral health of older people may be affected by their socioeconomic level, and also by limited cognitive ability. The aim of the present epidemiological cross-sectional study was to examine the influence of cognitive ability on missing teeth and the impact of education, occupation, income and dental attendance on the oral health of older adults aged 65 years or above, visiting day centres in two municipalities, Athens and Piraeus (Greece).

Methods: A clinical examination was performed by one calibrated dentist using World Health Organisation (1997) () criteria to assess dental caries and prosthetic status. The sample (N=734) was not representative for the whole population, however, clustering methods were employed according to municipalities, Day Centres and Postal Codes. Estimates for the sample size were based on the results of a pilot study and on a power at least 80%, at the 5% significant level, after adjusting the design factor 1.2 for cluster sampling and 20% over sampling for non-responders. Cognitive ability was measured using the Mini Mental State Examination (MMSE). Response rates were 215 (80%) from the Piraeus Day Centres and 528 (77%) from the Athens area Day Centres. The Ethical Committee of the National and Kapodistrian University of Athens approved the study. All participants volunteered, and informed consent was obtained. Pearson's correlation coefficient, T tests and General Linear Model (GLM) were applied to examine the relationship between missing teeth, cognitive ability gender, personal income, occupation, years of education, reason for dental attendance, tooth brushing frequency and dryness in the mouth. Data were analysed using SPSS software v.23.0.

Results: Pearson r revealed a significant correlation between missing teeth and MMSE score, age and years of education ($p < 0.001$). According to GLM analysis, there was a significant gender effect ($p < 0.001$), with males retaining fewer teeth than females. The number of missing teeth was significantly positively correlated with age ($p < 0.001$), but significantly negatively correlated with the MMSE score ($p < 0.002$) and years of education ($p < 0.001$). Those who brushed their teeth less than once a day, visited the dentist only when in trouble/pain, with lower income and had worked as manual workers had fewer teeth.

Conclusions: In the examined population, those with higher a MMSE score and higher income had fewer missing teeth. To the best of the authors' knowledge, this is the first study to explore and reveal that cognitive ability, missing teeth and socioeconomic inequalities in Greek elders are significantly associated.

4126 IMPROVING THE ORAL HEALTH OF OLDER PEOPLE IN TWO HOSPITALS IN NEW SOUTH WALES, AUSTRALIA

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Aims: The aim of this study was to improve the oral health of older inpatients in two hospitals by determining the effectiveness of a once daily oral hygiene intervention led by an oral health therapist (OHT) compared to the same routine performed by nurses with support from a dentist/OHT

Methods: Between April 2013 and April 2017, a prospective study with three phases: 1. Pre-intervention (PI) which involved nurses usual oral hygiene care practice followed by two interventions; an Oral Health Therapist intervention (OHTI) and a nurse led intervention (NI) with dentist/OHT support. PI conducted at two acute tertiary referral hospitals. OHTI and NI were conducted at one site. Patients admitted via the emergency room and aged > 65 years were recruited. Oral health was assessed on admission (within 24 hours) and at day 7, using the Oral Health Assessment Tool over the three phases. Concord Hospital Ethics Committee approved the study.

Results: A total of 875 patients were assessed on admission of which for a variety of reasons, 118 were excluded between days 1 and 7. Three hundred and fifty-nine patients [PI (n=206); OHTI (n=77); NI (n=76)] were seen at both day 1 and day 7. It was found that patients in both intervention groups had a significant decrease by day 7 in the percentage with 'unhealthy' oral cleanliness, OHTI 66 (85.7%) to 41 (53.2%) $p < 0.001$, NI 61 (80.3%) to 38 (50%) $p < 0.001$ compared to the PI phase 161 (78.2%) to 149 (72.3%) $p > 0.05$. The proportion of patients that moved from 'unhealthy' oral cleanliness at day 1 to 'healthy' at day 7 was significantly higher in the OHTI 27 (35.1%) and NI 28 (37%) phases compared to the PI phase 34 (16.5%) ($p < 0.001$).

Conclusion: In the population studied the oral health of inpatients admitted to geriatric wards was improved through nursing led interventions with support from a dentist/OHT.

4129 STUDYING ORGANISATIONAL RESILIENCE IN ORAL CARE FOR THE DEPENDANT ELDERLY IN SCOTLAND

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Background: There is limited evidence for improved clinical oral health outcomes in Care Home residents through staff education and guidance alone. Care provision remains difficult due to residents' complex needs, and multiple competing tasks and priorities among care home staff.

Aims: The study of Organisational Resilience examines how organisations flexibly adapt to variable conditions to achieve successful outcomes. This study aimed to investigate oral care in 851 Care Homes in Scotland to identify: a) variable conditions, resource challenges, and successful adaptations; and b) opportunities for intervention to improve the oral health of older people.

Methods: Five case study sites were purposively recruited to ensure a range of provision. Ethnographic procedures included: targeted observations; examination of care documents; semi-structured interviews with 20 nurses and care assistants and five focus groups with service providers, regulators and residents. NHS ethical review deemed the project as service evaluation. Data were analysed with QSR NVivo v11.0 using dedicated resilience analysis frameworks.

Results: Oral care is co-ordinated and broadly conceptualised as oral hygiene rather than oral health, the latter viewed as the responsibility of dental services. This means there can be notable omissions, such as formal oral health risk assessments and regular mouth examinations to assess any oral health needs. The core activity across all sites was brushing/cleaning teeth and dentures. The level of support/supervision required varied widely with resident cognitive capacity. There is a tension between demands of person-centred and evidence-based care (e.g. where residents refuse denture care or wish to rinse their mouth out after tooth brushing). Documenting resident information updates and associated actions can be delayed due to time pressures and competing priorities.

Conclusions: In the study sites, oral care was challenging and varied. Clinical guidance might be supported with structured implementation training whereby staff can be supported to address commonly observed challenges and make safe, effective priority decisions.

4136 ASSOCIATION BETWEEN EDENTULOUSNESS AND PHYSICAL FRAILTY: RUSSIAN HAPIEE STUDY

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Aims: There is emerging evidence that poor oral health may increase the risk of frailty (Torres et al., 2015). However, the association is not clear due to the lack of longitudinal studies. The aim of this study was to assess longitudinal association between edentulousness and physical frailty in middle-aged and older Russian adults.

Methods: A random representative sample of Russian Novosibirsk city adults aged 47-75 years at Wave 2 (2006-2008) of the Health, Alcohol and Psychosocial factors In Eastern Europe (HAPIEE) study was used. Baseline socio-demographic (gender, age, marital status, education), general health (smoking, diabetes, cardiovascular disease, medication use, cancer, and asthma) and physical frailty (handgrip strength, physical activity, exhaustion) characteristics were obtained from participants. Self-reported edentulousness (e.g. loss of all natural teeth) measure was obtained through follow-up postal questionnaires in 2012 (response rate: 71.5%). Physical frailty data was collected at re-examination in 2016-2017 and defined using the Fried phenotype. Namely, individuals were considered frail when three or more of (i) low handgrip strength, (ii) slow walking speed, (iii) low physical activity, (iv) unintentional weight loss and (v) self-reported exhaustion were present. A final sample of 1,628 adults aged 57-85 years at re-examination was analysed in multivariable logistic regression models assessing longitudinal association between edentulousness and frailty, adjusting for baseline demographic, general health and frailty characteristics.

Results: Out of 1628 adults, 224 (13.8%) were edentate. 147 (9.0%) individuals were frail in 2016-2017. Edentate participants were 1.7 times more likely to be frail (95% CI 1.1-2.8, p=0.020) compared to dentate adults after adjusting for all the covariates.

Conclusions: Individuals who have lost all of their natural teeth were significantly more likely to develop frailty during follow-up than dentate participants. The findings of this study emphasize that maintaining natural dentition is important in preventing frailty in older adults.

Session 2 c

INFORMATION and COMMUNICATION

Chairs: Huda Yusuf & Desmond Wright

4051 SOURCE OF ORAL HEALTH RELATED INFORMATION FOR ADULTS FROM SWEDEN, ROMANIA AND PORTUGAL

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Aim: The aim of the study was to investigate the source of oral health related information within the adult population in Romania, Sweden and Portugal.

Methods: The survey took place between November 2015 and June 2016 and involved a sample of 1081 randomly selected adults (200 from Portugal, 608 from Romania and 273 from Sweden) as part of the EuHyDens project. A questionnaire, based on the WHO questionnaire for adults (WHO "Oral Health Surveys: basic methods 5th edition, 2013), was developed. It contained questions related to behaviour regarding oral hygiene and the sources of oral health related information. The data were analyzed using descriptive and multidimensional statistics Ethics approval for the study was obtained from the ethics committees of the institutions where the questionnaire was distributed.

Results: The main source of information in Sweden was reported as from dental hygienists by 215 (79%) respondents and dentists by 178 (65.5%) respondents, in Romania it was reported by 392 (64.5%) as from dentists and by family members and friends (in the home environment) by 406 (66.8%). In Portugal it was reported as mainly from dentists by 127 (63.5%), from family members and friends (in the home environment) by 114 (57%) and also from mass-media by 107 (53.5%). There were no significant differences between the three countries, as far as information learned in school was concerned. For the whole sample size, the main source of information was reported as from dentists by 697 (64.6%), followed by family and friends 672 (62.2%), school 461 (42.7%) and dental hygienists 373 (34.6%).

Conclusions: The main source of oral health related information for the whole group of adults was reported as from dentists, followed by family and friends, school and least of all by dental hygienists, which was unsurprising as there are few dental hygienists in Portugal and Romania.

Acknowledgement: This study was funded by a grant: Erasmus+ KA - European Training Platform for Continuing Professional Development of Dental Hygienists - 2015-1-SE01- KA202-012278.

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4052 THE ROLE OF DENTAL STAFF IN INFORMING TEENAGERS FROM ROMANIA, SWEDEN AND PORTUGAL

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Aim: The aim of the study was to investigate the role of dental staff (dentists/dental hygienists) in carrying out preventive measures amongst teenagers from Romania, Sweden and Portugal.

Methods: The study recruited a randomly selected sample of 894 teenagers with a mean age of 14.95 years (SD 1.91) from Romania (n=458), Portugal (n=200) and Sweden (n=236) who completed a questionnaire as part of the EuHyDens project. Different sample sizes resulted from the differences in teenager population between the three countries. The survey took place between November 2015 and June 2016. After obtaining informed consent and the ethical approval from the local ethical committees the questionnaire was developed within the project and was mainly adapted from the WHO questionnaire for adults (WHO “Oral Health Surveys: basic methods 5th edition, 2013), to investigate the role of dental staff in informing teenagers about correct brushing, use of dental floss, gingivitis and caries prevention. The resulting data were analyzed using descriptive and multidimensional statistics.

Results: Six hundred and nine (68%) of the total sample of adolescents reported receiving information regarding correct brushing from dental staff. Most of them (183) came from Sweden and 293 were from Romania. Two hundred and twenty eight (26%) of the total sample reported using dental floss following the advice of dental staff, of whom 70 came from Portugal and 82 from Romania. Information about gingivitis was reported as coming from dental staff by 89 teenagers from Portugal, and 88 from Romania. Receipt of information from dental staff on dental caries was reported by 134 teenagers from Portugal, 208 from Romania, and 89 from Sweden

Conclusions: Amongst the teenagers who took part in the current study, the role of dental staff in providing information to teenagers differed between the three countries. Further studies are needed to investigate if these findings also apply to patients from other age groups.

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4053. AN EVALUATION OF DENTAL UNDERGRADUATE STUDENTS' APPROACHES TO HEALTH PROMOTION

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Aim: Two undergraduate dental students of this institution had established on their own initiatives, their very own non-governmental organisations, “Smile Malaysia” and “Sihat Selalu” (Always Healthy) respectively and since 2016, they have conducted a total of 53 out-reach projects reaching out to 3438 people belonging to all social strata. The aim of this study was to evaluate how these two dental undergraduate students had applied the principles of primary health care and health promotion to reach out to the population.

Methods: The extent of reach in terms of region, subjects screened and involved in oral health education activities, involvement of communities and multi-sectoral agencies, funding and treatment outcomes were assessed. Other activities that were conducted during these visits included basic health screening, distribution of toothbrushes, tooth-brushing drills, blood donation drives, community participation in aerobics and exhibitions on oral and general health. Using SPSS (Version 20) software the difference in the mean attendance of each group was subjected to an independent samples t-test.

Results: Although most of the activities carried out were similar, Smile Malaysia has attempted to make dental treatment affordable and accessible by providing funding for dental care as well as creating awareness through involvement of all Malaysian dental institutions on a national scale that cover six states. Sihat Selalu on the other hand has involved local communities and agencies confining itself to one state. Nevertheless, through 53 programmes, it has reached out to 1980 people (mean 99 per programme) compared to Smile Malaysia which has reached out to 1458 people (mean 61 per programme). This difference was found to be significant ($p < 0.05$).

Conclusions: Notwithstanding the numbers reached, it is heartening to note that the undergraduate dental students have imbibed the principles of primary care and health promotion and continue to improve their organizational and leadership skills which augurs well for the future of the dental profession.

Acknowledgement: To the work of Mr. Jeevarajah, Year 5 BDS student (President, Smile Malaysia) and Mr. Chong Ren Jye (President, Sihat Selalu).

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4079 PATIENT AND CLINICIAN ENGAGEMENT IN THE DEVELOPMENT OF A SPECIALIST DENTAL SERVICE

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Background: Engagement is the practice of interacting with, and influencing all those involved in the development of new services and the successful completion of a project usually depends on how their concerns and expectations are addressed and influence the project.

Aim: To describe a method of patient and clinician engagement in the development of a specialist dental service in London.

Methods: The study took place between December 2017 and February 2018. There were three elements to the methods 1) Scoping – setting up an engagement group, agreeing the groups to be contacted, putting together an engagement strategy 2) Developing - questionnaires and topic guides were developed and piloted 3) Engagement - questionnaires and interviews were administered to patients, specialists and general dentists. Ethical approval was not needed as it was a service review.

Results: Six hundred and eighty three (91%) patients and 100 (10%) general dentists completed the questionnaires. Twenty six specialists (100%) were interviewed. The findings provided reassurance that access and good quality services were being delivered with 588 (98%) patients satisfied with overall treatment and 673 (99%) confirming that they would refer their family and friends to the specialist practice. The key learning points were careful planning, ensuring that the views of those involved are not only included but seen to be included in decision making, diffusion of tension and developing a relationship based on trust and a bottom up approach to the engagement process.

Conclusions: In the population studied, good engagement was important in the development of dental services. Proper planning, and understanding the different layers of engagement can help develop a relationship based on trust.

4198 ASSESSMENT OF PATIENTS' SATISFACTION WITH DENTAL TREATMENT CONDUCTED BY DENTAL STUDENTS AT A POLISH UNIVERSITY

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Aim: To assess factors affecting patients' level of satisfaction regarding dental treatment, conducted by dental students, and their anxiety level prior to its commencement.

Methods: A self-designed questionnaire was given to all patients treated between October 2015 and June 2016, by Polish and English-speaking dental students, in the University Outpatient Clinic of Conservative Dentistry with Endodontics, Krakow. It comprised six questions on epidemiological data, and ten questions which assessed the patients' satisfaction with the treatment on the 5-point Likert scale. Corah's Dental Anxiety Scale was applied to assess the anxiety level. Statistical analyses were performed with the chi-square test, or by the Fisher's exact test. The study protocol was approved by the Jagiellonian University Bioethics Review Committee.

Results: One hundred and twenty two patients completed the questionnaire of whom 86 (70.5%) were very satisfied, and 36 (29.5%) were satisfied with their treatments, with none reporting any dissatisfaction. Their age range was 20 - 81 years, mean age 45 years. Neither age ($p = 0.051$), gender ($p = 0.384$), education ($p = 0.292$), nor patient's place of residence ($p = 0.55$) affected the level of perceived satisfaction, nor their anxiety level. Dental students' seniority ($p = 0.486$), and the language spoken ($p = 0.409$) also did not affect perceived satisfaction or anxiety level. Satisfaction with dental appointments was significantly affected by their frequency ($p = 0.019$). Although, it did not affect their level of perceived anxiety ($p = 0.676$). The most satisfied patients were those in pain, less so those with their appointments scheduled every 3 months. Whilst the least satisfied ones were those attending every 6 or 12 months.

Conclusions: In the group of patients studied, dental treatment as part of the hands-on teaching of dental students was perceived as satisfactory and not associated with a high anxiety level. Neither the cultural differences, nor the language barrier were found to hinder successful completion of dental treatment.

4116 SOCIAL WORKERS' PERCEPTIONS OF THE ORAL HEALTH OF UNDERPRIVILEGED INDIVIDUALS IN BELGIUM.

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Aim: The present survey aimed to gain insights into the perceptions of social workers employed or volunteering in poverty and welfare organisations in Flanders (Belgium) with regard to their clients' oral health status and oral health related needs and barriers.

Methods: The study was a cross-sectional online questionnaire survey undertaken during December 2017, which was sent to all 762 poverty organisations in Flanders. The questionnaire was developed in three consecutive Delphi- rounds with 5 oral health experts, 6 dental professionals and 7 social workers. It comprised 18 items, including information about the responders and their organisation (8 items) and items related to oral health (10 items). Exploratory data analysis was carried out to maximise insight into the dataset and to test underlying assumptions. Differences in proportions between subgroups were analysed using crosstabs and Chi Square statistical tests ($\alpha=0.05$). The survey was approved by the EC University hospital Ghent (B670201733146).

Results: The survey received 363 responses, representing 203 organisations in 129 different municipalities, yielding a response rate of 26.6% from organisations. Most of the responders were female (300 - 82.6%) and professionally active within their organisation (328 -90.4%). Mean age was 39.8 years ($SD=11.1$). Responders reporting sufficient knowledge about their clients' oral health status were more likely to perceive this status as very bad 139 (75.1%) vs 94 (52.8%); $p<0.0001$). Similar differences were found between those playing an active role in helping their clients in their oral health needs and the others 139 (71.6%) 94 (55.6%), $p<0.0001$). According to barriers, 346 (95.2%) reported financial aspects as an important barrier for their clients.

Conclusions: The more social workers are involved in oral health, the more they consider their clients' oral health status as bad or very bad. The financial barrier was perceived as the most important barrier to seeking oral health care.

4128 STRENGTHENING THE COMPETENCE OF DENTAL PERSONNEL IN SUPPORTING HEALTHY EATING-HABITS.

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Background: Globally dietary risk is one of the major driving factors for health inequalities, disability, mortality and dental caries

Aim: The aim of this study was to develop a course for dental personnel to increase their ability to support patients to develop healthy eating-habits and in so doing to contribute to close the gaps in both general and oral health that exist between groups of patients with different levels of socioeconomic status.

Methods: The course was designed to challenge the dental personnel to modify their working methods from simply giving advice to more supportive methods, thus facilitating healthy choices for individuals, especially those of low socioeconomic status. Social Cognitive Theory was the theoretical base for techniques used. The Nordic Nutrition Recommendations were utilised to inform healthy eating guidelines and to reduce the risk of dental caries, both of which were based on best-practice-guidelines. The course included: 1. Two days of lectures (March and April 2018) and exercises with at least a week in between to provide time for reflection according to tasks defined in a personal reflection book. 2. Time to practice newly acquired skills in the clinical setting. 3. Patient-case studies presented in online meetings. The course was evaluated using a questionnaire with a section for free comments from the course participants. It was considered to be staff training and as such ethics approval was not required. Twenty volunteers from the staff of Dental Public Health Västra Götaland attended the course. They were 2 dentists, 7 dental hygienists and 11 dental nurses.

Results: Fourteen (70%) of the 20 dental personnel who undertook the course completed it. The dental personnel that took part reported that they were more confident in helping their patients to acquire more healthy eating habits. The participants gained insights in delivering health promoting advice according to evidence based guidelines and recognised that giving basic information to patients was neither sufficient nor appropriate to change eating-habits.

Conclusions: The first course based on the new techniques resulted in dental personnel developing an enhanced ability to support healthy eating habits. It was also clear that this way of promoting health is often hindered by lack of time and resources, and probably also by the attitudes from both patients and peers.

4141 APPLICATION OF A STRUCTURAL EQUATION MODELLING TECHNIQUE TO ANALYSE PREVENTIVE BEHAVIOUR AMONG ALBANIAN DENTISTS

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Aim: Preventive dentistry is a fundamental aspect of oral health care. However in Albania there is no evidence of preventive behaviour in dental practice. Therefore, the aim of this study was to analyze preventive behaviour, related to advising patients on diet, alcohol, and tobacco consumption, among Albanian dentists and to test the predictive utility of the Theory of Planned Behaviour (TPB) on their behaviour through Structural Equation Modelling (SEM) analyses.

Methods: A cross-sectional study was conducted on a convenience sample of 177 Albanian dentists, using the framework of Fishbein and Ajzen's TPB to assess their attitudes (AT), subjective norms (SN), perceived behavioural control (PBC) and intention to perform preventive behaviour. The questionnaire was given to all dentists attending the 22nd National Dental Conference in Tirana (November 2016) and they were invited to participate in the study. The structural equation modelling (SEM) technique was then employed on the resulting data.

Results: Goodness-of-fit statistics ($\chi^2 = 0.128$, $df = 1$, $p = .721$) related to the TPB model revealed that the hypothesized model fitted the data very well, as evidenced by the Comparative Fit Index (CFI) of 0.997, Tucker-Lewis Index

(TLI) of 0.966 and Root Mean Square Error of Approximation (RMSEA) of 0.044 (90% CI). Internal consistency coefficients (Cronbach's alpha) ranged from 0.60 (for PBC) to 0.85 (for AT), suggesting that the scales were reasonably homogeneous. TPB variables were found to have medium to low associations with both intention and preventive behaviour. Attitudes had the weakest association with intention (AT, $r+ = 0.02$), while perceived behavioural control had the strongest one (PBC, $r+ = 0.50$). The model explained 25% of the variance in intentions and 1% of the variance in behaviour. Perceived behavioural control was only significant in influencing behavioural intentions and behaviours directly. An unobserved, exogenous variable influenced the dentists' attitude in the model.

Conclusions: The study supported the relevance of the TPB framework to predict intentions and preventive behaviour among Albanian dentists, while only PBC could significantly predict their preventive behaviour in relation to asking patients about a healthy diet, alcohol, and tobacco consumption. However, further studies are required to support the validity of the TPB framework in predicting intentions and preventive behaviour of Albanian dentists.

4150 WHO MORALHEALTH TRAINING PROGRAMME TO IMPROVE PREVENTION OF ORAL DISEASES

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Background: The joint initiative between International Telecommunication Union and WHO "Be He@lthy, Be Mobile" was proposed in 2012. It involves the use of mobile technologies to improve prevention and management of Non Communicable Diseases (NCDs). Within this framework the WHO Oral Health Programme aims to develop an ambitious, ready-to-use mOralHealth Programme for Member States to contribute to the reduction of the oral diseases burden. The mOralHealth programme consists of four key components: Literacy; Early Detection; Surveillance; Training. This abstract presents the last component.

Aims: The aims of the mOralHealth Training are to: increase oral health knowledge and skills of frontline health workers and expand awareness of oral health professionals of the national and global oral health agenda.

Methods: SMS, Mobile Apps or web platforms will be used to disseminate information on oral diseases prevention (e.g. noma and oral cancer), oral health promotion and national and global oral health policies. The programme will be nationally led by the Chief Dental Officer or at the Ministry of Health level. The mOralHealth Training programme will be developed in accordance with the national and regional strategies as part of the NCD agenda.

Results: The expected effects of the implementation of the programme are to improve integrated, person centred oral care. More specifically, expected results for frontline health workers are: improvement in management of oral diseases, enhancing prevention of oral diseases and increasing oral health promotion interventions. For oral health professionals, expected results are: an improvement in the diagnosis and treatment of noma and oral cancer; and sharing evidence-based interventions, best practices and key dental public health strategies. Countries interested in this programme may become pilots. These pilot countries will develop and implement their specific programme based on the guidance in the WHO handbook. They will also be in charge of testing, monitoring, and evaluating the programme within their own context.

Conclusion: The mOralHealth Training programme should be integrated to other national initiatives aiming to improve knowledge of professionals to provide effective prevention of oral diseases.

4217 DEVELOPMENT OF DENTAL UNDERGRADUATE TEACHING TO ENHANCE STUDENT BEHAVIOURS IN DELIVERING PREVENTION

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Background: The majority of research on outreach dental education has assessed students' knowledge and skills in diagnosis, treatment planning and provision of treatment. There is limited research in determining students' behaviours in delivering preventive advice in outreach dental clinics.

Aims: To develop and audit a structured student teaching programme to enhance student behaviours in delivering preventive advice in outreach dental clinics at Queen Mary University of London (QMUL).

Methods: A structured student teaching programme was developed and delivered to year three dental undergraduate students including dental care professionals. The programme combined didactic teaching, online training and role play with actors supported by a clinical resource pack. Teaching focused on communication and principles of motivational Interviewing, oral hygiene, diet, tobacco (very brief advice) and Alcohol Identification and Brief Advice (Alcohol IBA). An audit was led by three dental students to determine if patients were being engaged in discussions regarding prevention before and after delivery of the teaching. An audit tool was developed and 50 patient records were assessed at baseline (June 2017), after six months and at one year (June 2018). Ethical approval was not required as this was an evaluation of undergraduate teaching.

Results: The teaching was successfully delivered. There were improvements in delivering preventive advice for all four domains. The proportion of patients who were asked about their diet increased from 40% at baseline to 54% at six months and 100% at one year. Delivering very brief advice on smoking increased from 60% at baseline to 91% at one year. Similarly, the proportion of patients given brief advice on alcohol using the Audit-C tool increased from 0% at baseline to 59% at one year.

Conclusions: The newly introduced teaching programme was successful in improving student behaviours in delivering prevention to their patients in outreach clinics as demonstrated by the two audits. However, there are still inconsistencies around delivering alcohol advice.

Session 2 d

TOOTH SURFACE LOSS and PERIODONTOLOGY

Chairs: Vasileios Margaritis & Melinda Székely

4058 DENTAL EROSION IN FINAL-YEAR DENTAL STUDENTS

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Aim: The aim of this study was to assess the level of dental erosion in final year dental students at the dental school of the University of Marmara.

Methods: There were a total of 142 final year dental students at the Dental School in 2017. All were invited to take part in the study, which involved an oral self-examination and the completion of a questionnaire. A diagnosis of dental erosion of permanent teeth was made according to the Basic Erosive Wear Examination (BEWE) criteria. The questionnaire contained closed-ended questions to investigate the potential factors for dental erosion. The data were recorded on clinical record forms and the questionnaires were entered into a computer.

Results: One hundred final-year dental students (31 males and 69 females), aged 21–34 years, took part in the study; the response rate was 71%. Their mean age was 23.1 (± 1.60) years. The overall mean DMFT score was 4.79 (± 3.8). Thirty (30%) of the students had tooth erosion. Their dental erosion status, expressed as mean BEWE score, was 0.37 (± 1.61). Seven students had a BEWE score of 2 but no one had a BEWE score of 3 or higher. Frequent reported consumption of sports drinks (reported by 24 students) and a high level of tea/coffee consumption (reported by 20 students) were positively associated with tooth erosion.

Conclusions: The results of this study indicated that none of the final year dental students who took part in this study suffered from severe erosion. Although the prevalence of dental erosion was low, the frequency of sport drinks was highly associated with tooth erosion among this group of students.

The presenter of this abstract received a Borrow travel award.

4081 EVALUATION OF THE EFFECTIVENESS OF TWO PRODUCTS TO TREAT DENTINE SENSITIVITY

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Aim: The Aim of this study was to evaluate the effectiveness of two products to treat dentine sensitivity.

Methods: The two products used were a desensitising toothpaste with low Relative Dentine Abrasivity (low RDA), which contained hydroxyapatite and glycerophosphate and 1.1% fluoride varnish. All adult patients (aged 20 - 65 years) who had dentine sensitivity and who attended the Dental Clinic of the Belarussian State Medical University (BMSU) in September and October 2017 were recruited into the study. They were divide at random into two treatment groups. Group 1 used the low RDA toothpaste with a soft toothbrush twice daily for one month. Group 2 received application of 1.1% fluoride varnish, by a dentist, to areas of sensitive dentine at regular intervals five times during the month and brushed their teeth twice daily with a toothpaste free from active desensitising ingredients using a soft toothbrush. Dentine sensitivity was assessed on a scale of 1 to 10 by the application of cold air from a 3 in 1 syringe and by probing.. The study was given ethics approval by the ethics committee of the BMSU.

Results: Eighty nine patients 43 in the low RDA group and 46 in the 1.1% fluoride varnish group attended for reassessment after one month. .At baseline, the pain intensity to cold air was: 7.69 ± 5.56 (0.82) in the low RDA group and 8.06 ± 6.34 (0.96) in the fluoride varnish group and 4.64 ± 4.88 (0.80) and 2.94 ± 3.4 (0.78), respectively in response to probing. After the treatment, the pain intensity to cold air was: 3.82 ± 4.39 (0.71) in the low RDA group, 4.88 ± 5.45 (0.94) in the 1.1% fluoride varnish group and to probing 4.0 ± 4.66 (1.64) and 1.71 ± 1.49 (0.56), respectively.

Conclusions: In the groups studied, the daily use of toothpaste with low RDA containing hydroxyapatite and bio-available calcium glycerophosphate for one month significantly ($p = 0.001$) reduced dentine sensitivity and to the same extent as the repeated applications of 1.1% fluoride varnish. As such it can be seen as an effective initial treatment approach for the patients with dentine sensitivity.

4107 AETIOPATHOGENIC FACTORS ASSOCIATED WITH CLINICAL STATUS OF CHRONIC PERIODONTITIS AND RHEUMATOID ARTHRITIS

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Aims: The main aim of the study was to evaluate possible correlations between 25(OH)D serum levels and clinical status of chronic periodontitis (CP) and rheumatoid arthritis (RA).

Methods: Eighty six patients diagnosed with RA and CP were enrolled in the study at Vilnius University Hospital Santaros and Zalgiris clinics`. Informed consent and bioethics committee permission were obtained before the study. Periodontal status was evaluated by one researcher performing full mouth probing. Periodontitis diagnosis was assessed using "Centre for Disease Control-American Academy of Periodontology" guidelines. Clinical status of RA was assessed using disease activity score (DAS28). Chemiluminescent microplate immunoassay (Architect ci8200, Abbott Laboratories, USA) was used to asses 25(OH)D serum levels. Vitamin D concentration was classified as normal (>75 nmol/l), insufficient (between 50 and 74 nmol/l) or deficient (<50 nmol/l). Statistical analysis was performed using descriptive statistics and non-parametric tests and ANOVA.

Results: The age median of study participants was 55 years (+- 15.75). Seventy eight were female (90.7%) and 8 male (9.3%). Seventeen (19.8%) had severe chronic periodontitis, 46 (53.5%) had moderate periodontitis and 23 (26.7%) had mild periodontal disease. High RA disease activity was observed in 25 (29.1%) patients, moderate in 38 (44.2%) and low in 23 (26.7%). Vitamin D deficiency was diagnosed for 59 (68.6%) patients, insufficiency for 23 (26.7%) patients and 4 (4.7%) patients had normal Vitamin D concentration. Vitamin D deficiency correlated negatively with the activity of RA ($r=-0.34$, $p=0.0009$). Vitamin D serum levels were significantly lower among older age participants with severe periodontal disease ($p=0.008$). Among other age groups, Vitamin D serum levels correlated with the number of missing teeth: among young patients ($r=-0.60$, $p=0.002$) and middle aged patients ($r=-0.37$, $p=0.016$).

Conclusions: This pilot study revealed that Vitamin D deficiency is common among patients suffering from RA and CP. 25(OH)D concentration correlated negatively with clinical status of rheumatoid arthritis and periodontitis activity as well as the number of missing teeth in different age groups.

4124 NANODISPERSED CeO₂ USAGE TO TREAT DESTRUCTIVE FORMS OF BONE LOSS DUE TO APICAL PERIODONTITIS

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Background: Nanodispersed CeO₂ has been used for treatment of destructive forms of apical periodontitis in experimental research. It can potentially restore bone tissue and periodontal destruction can be delayed by up to two to three years. Previously, in experimental studies in vitro, it was shown that CeO₂ improves: cell proliferation, including osteoblasts, matrix mineralization, acts as a nanozyme – antioxidant.

Aim: To explore the nanocrystalline CeO₂ properties in the reparative regeneration of the mandibular defects in rabbits.

Methods: An experiment was carried out with 20 Chinchilla rabbits to estimate regeneration of defects of the cortical plates of the mandible with dimensions of 5.3x3.8 mm (on the right) and 5.4x4.0 mm (on the left). They were treated with a mixture of calcium hydroxide and nanocrystalline CeO₂ on one (test) side and a material containing only calcium hydroxide the opposite control side. The degree of bone regeneration was evaluated using multi-slice computed tomography (MSCT), morphometry after 2 weeks and 1 month. The ethics Committee of the Moscow State University Medical School approved this research.

Results: MSCT indicated that the lower-lateral surfaces of the mandible on both sides were almost entirely covered by conglomerates of osteoplastic material of similar dimensions, (up to 2884 Hounsfield Units - HU). The thickness in the vestibulo-oral direction was up to 2.0 mm. On the 20th day, an incomplete consolidation of the osteoplastic material was noted and linear cortical defects were present. On day 34, complete consolidation of the osteoplastic material was seen on each side. There was a slight decrease in the osteoplastic material density on the control side, measured at 1818 HU with bone callus formation (915 HU), compared to the test side, which did not undergo significant changes (2817 HU). On day 57, the density of the material on the test side decreased to 1910 HU, and the same density was seen on both sides, the excess bone callus on the control side was lysed and did not extend beyond the vestibular cortical plate. Thus during the period between the fourteenth and twenty first day after surgery the differences between the two sides were greatest, as assessed by MSCT. Bone histomorphometry at 2-weeks and 4- weeks, showed differences in percentage of newly-formed bone tissue (Bone Volume/TotalVolume - BV/TV) area on the test and control slides: 15% vs. 2% respectively at 2 weeks, and 26% vs 13% respectively at 4-weeks.

Conclusions: The results of MSCT and histo-morphometry confirmed the possibility of nanodispersed cerium dioxide to promote bone and cortical plate regeneration. If similar results can be obtained in humans, it may be possible to treat teeth with apical periodontitis using nanodispersed CeO₂.

4133 EROSIIVE TOOTH WEAR SURVEY IN ROMANIA AS PART OF A MULTI-CENTRE STUDY

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Background: At the 21st Congress of the European Association of Dental Public Health, as an outcome of the Tooth wear/erosion Special Interest Group (SIG) activity, it was proposed that a multi-centre erosive tooth wear (ETW)

study should be undertaken to develop a questionnaire to be validated and used alongside the Basic Erosive Wear Examination (BEWE).

Aim: This study was aimed to assess the prevalence of dental erosion in young adults living in Romania using a newly developed questionnaire, as part of the multi-centre ETW study.

Methods: The study was approved by the Research Ethics Committee of the University of Medicine and Pharmacy of Tirgu-Mures, Romania. Informed positive consent was obtained from the participants included in this study. The convenience sample consisted of 30 volunteers out of the 87 invited 18 to 21 year old dental students of both genders. A questionnaire designed by the SIG was completed according to participant's responses. The domains of questionnaire were the potential erosive behaviour of patients and it was validated by an international panel of experts in dental erosion. However, this interview-base survey was conducted using the mother-language of the subjects. Unstimulated and also stimulated whole mouth saliva was collected from each subject and saliva flow rate was measured. For the assessment of dental erosion the BEWE score was recorded. All data were introduced in a spreadsheet and data processing is in progress. The questionnaire was piloted in another site where the multi-centre study is taking place.

Results: The response rate was 35%. BEWE scores of 1 and 2 were observed in 4 (13.3%) subjects and 3 (10%) of them presented co-existence with abrasion or attrition, respectively. No association was revealed between reduced salivary flow rate and ETW in the participating young adults.

Conclusions: The results suggested that the prevalence of dental erosion was low in the studied population. The small sample size is a drawback of this study. The data obtained with the newly developed questionnaire will be included for further analysis and validation in the multi-centre study.

4140 EROSIVE TOOTH WEAR AMONG 15-YEAR-OLD ADOLESCENTS IN FINLAND – A PILOT STUDY

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Aims: No data on erosive tooth wear (ETW) status among Finnish adolescents is available so far. Hence, the aim of this study was to investigate the prevalence and severity of ETW among Finnish 15-year-old schoolchildren. This pilot study is a part of the multicenter ETW study initiated by the European Association of Dental Public Health Tooth Surface Loss Special Interest Working Group (SIWG). As a whole, the study aims to develop a validated questionnaire to be used together with clinical Basic Erosive Wear Examination (BEWE).

Methods: All 78 children in the 9th grade of a comprehensive school in the Finnish countryside town, Sievi, were invited to take part in this study, and 66 (85%) agreed to participate. The clinical examination protocol was developed by the Tooth Surface Loss SIWG. Two calibrated and trained examiners (VKA, MLL) performed the clinical examinations together in the school auditorium during two days in October 2017. ETW was assessed using the BEWE index according to the protocol. To decide the BEWE score, the examiners had to agree with each other. Clinical examination was performed using loupes, headlamp, cotton rolls and dental mirror in a supine position. Additionally, all participants were interviewed by a dentist or dental hygienist using the questionnaire developed by tooth surface loss SIWG. This questionnaire is now in the validation phase in different countries. The Ethical Committee of the Northern Ostrobothnia Hospital District approved the study.

Results: Fifty-five (83%) adolescents had ETW of some degree, and 23 (35%) were in need for at least preventative measures (BEWE sum >2). The maximum BEWE sum among the participants was 12 and for 3 (5%) the BEWE sum exceeded 8.

Conclusions: ETW is a common condition among adolescents' living in Sievi. More research is needed to estimate the prevalence and severity of ETW among adolescents in Finland.

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4151 MULTICENTER STUDY TO VALIDATE AN EROSIVE TOOTH WEAR (ETW) SURVEY: PRELIMINARY RESULTS

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Aims: Within the context of the European Association of Dental Public Health (EADPH) Tooth Wear Special Interest Working Group (SIWG) activities, a multicenter Erosive Tooth Wear (ETW) study was started in 2016. The aim of this study was to validate the specificity and sensitivity of an ETW questionnaire to detect the aetiological factors of dental erosion, as reliably as possible. This validated survey will be used in practice beside the Basic Erosive Wear Examination (BEWE). In this presentation, the preliminary results of this study are discussed.

Methods: The study sample consisted of 177 individuals (mean age: 17.5 years, SD: 2.71) from Finland, Greece, Romania, and USA. The detailed clinical examination protocol was developed by EADPH Tooth Wear SIWG. In all countries, trained and calibrated examiners performed the examination between October 2017- May 2018. ETW was assessed using the BEWE index. Also, unstimulated and stimulated whole mouth saliva was collected from each subject, and saliva flow rate was measured, according to the protocol. Additionally, all participants were interviewed using the questionnaire developed collaboratively by the Tooth Wear SIWG. Ethical Committees in all countries approved the study.

Results: Of all those examined, 106 (60%) had ETW of some degree, and 43 (24.3%) were in need of at least preventative measures (BEWE sum score >2). The most often daily consumed potentially erosive foods were fruits, juices, and soft drinks. Further, 31 (21.2 %) and 16 (10.7%) had low secretion of unstimulated and stimulated saliva, respectively.

Conclusions: ETW is a common finding in adolescents and young adults and several factors contribute to this condition. The authors of this abstract are in the process of analysing these data to confirm the validity of the survey, which will be a useful tool for dentists and researchers to detect and differentiate ETW, and to contribute to its secondary prevention, by timely detection of the erosive factors.

4154 EPIDEMIOLOGICAL SURVEY OF THE PREVALENCE OF GINGIVAL RECESSION IN TIRGU-MURES, ROMANIA

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Aim: The aim of the present study was to determine the prevalence of gingival recession in patients who attended a dental practice in Targu Mures and to identify the most commonly associated factors.

Methods: The cross-sectional study involved a randomly selected group of 680 adults who attended the dental practice for diagnosis and treatment and who were aged more than 18 years. All participants were informed of the nature of the study and their informed consent to participate was sought. Clinical examinations were conducted in 2017 by one calibrated examiner, using the P.D. Miller classification of marginal tissue recession. The following clinical parameters were recorded: Silness and Loe plaque index, Loe and Silness gingival index and community periodontal index. Participants also completed a self administered questionnaire which provided detailed information on their oral hygiene habits. Data analysis employed Chi-squared tests to assess associations between gingival recession and its various predisposing factors.

Results: Out of the 680 subjects, 380 (55.88%) exhibited gingival recession. The frequency of gingival recession was not associated with age. A higher prevalence of gingival recession was observed in males (58.5%) compared to females (41.5%). Gingival recession was more prevalent in mandibular incisors (33.0%) and maxillary premolars (23.0%). The prevalence of gingival recession was 44 % among those participants with plaque accumulation compared to 12% among those with no plaque accumulation ($p < 0.0001$).

Conclusions: More than half of the studied sample presented with gingival recession, which seemed to be related to oral hygiene habits.

4188 A PILOT PROJECT TO IMPROVE ORAL HYGIENE IN AKERSHUS NURSING HOMES

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Background: Patients in nursing homes often suffer from physical illness or dementia. Most patients have their own teeth with many restorations and they are often not capable of maintaining adequate oral hygiene. Lack of oral hygiene, dry-mouth syndrome due to medicines and aging cause rapid deterioration of dental restorations, resulting in expense, general deterioration of health, poor nutritional status, pain, discomfort and loss of dignity. Bacteria from the oral cavity may enter lungs and the bloodstream. Improving oral health improves general health and quality of life and may reduce the number of medical consultations and costs for antibiotics in connection with respiratory tract infections

Aims: To ensure that patients living in nursing homes maintain good oral hygiene and experience fewer oral health problems.

Methods: Between October 2017 and June 2018 a pilot quality development project to provide oral education to staff in nursing homes in Akershus took place. It aimed to improve the understanding of the nursing staff of five nursing homes with regard to the importance of good oral health in relation to general health. The study met the ethical and consent requirements of the Norwegian Public Dental Health law. During the project, dentists, dental hygienists and dental nurses from the Public Dental Service visited the nursing homes every month to provide staff training and to give practical advice regarding oral health. The oral health of all residents was assessed following the recommendations of a Revised Oral Assessment Guide (ROAG). Screening of residents will now be carried out once a year when their Mucosal Plaque Score (MPS) will be recorded.

Session 2e

OTHER TOPICS

Chairs: Colwyn Jones & To be nominated

4054 INTRODUCING THE “PUBLIC DENTAL HEALTH” COURSE WITHIN A SUBJECT ORIENTED DENTAL CURRICULUM

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Prior to 1992, before radical social reforms in Bulgaria, dental public health issues used to be a subject of interest only for those trained to work in Health Authorities. Now, they form a substantial part of the undergraduate dental curriculum. The aim of this poster/presentation is to share experience with developing and introducing the dental public health course into the revised, subject oriented, dental curriculum, in the context of the health reforms in Bulgaria and the process of harmonization of dental education in Europe. To achieve the changes in the curriculum, the topics of “social medicine”, “medical ethics”, “dental public health”, “dental practice management”, research methods and others have been introduced and have contributed to the development of the teaching in dental public health and the objective of a harmonized undergraduate dental curriculum. The poster/presentation describes the steps in the implementation and development of the programme, the conceptualization of professionalism and justification of the need for the integration of these disciplines in the overall undergraduate programme. It will also explain the change in the content and length of the courses, the progress made in improving teaching and details of new textbooks, which have been published recently. These developments have occurred almost simultaneously with the restoration of the private oral health sector in Bulgaria. The changes in Bulgaria provide dentists with an opportunity to work in a wider range of social environments than before. It is hoped that the new dental public health course will help dentists to take advantage of these opportunities, to understand and implement a problem-oriented approach to their practice and be open to closer international cooperation.

The presenter of this abstract received a Borrow travel award.

4088 THE NITRITES/NITRATES CONTENT OF SALIVA AND BLOOD AMONG PATIENTS WITH GASTROESOPHAGEAL REFLUX DISEASE

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Background: Globally Gastroesophageal reflux disease (GERD) has a prevalence of 18-46%.The acidic or/ alkaline contents of GER can lead to the demineralisation of teeth and other oral problems.

Aim: To compare the indicators of oral health or disease and the level of nitrites/nitrates (NO_x) in saliva and blood among patients with GERD with different types of refluxant.

Methods: The study was approved by the Ethics Committee of Moscow State Medical and Dental University (MSMDU). It took place between 2014 and 2017 and involved 92 adults aged 22- 70 years (average age 38,5±0,5) The patients were recruited from the Internal Diseases Clinic of the Sechenov Academy. All gave positive consent to take part in the study. They were divided into 4 groups: Group 1-control (n=25); Group 2- patients with GERD with acid refluxant (n=25); Group 3-patients with GERD with a slightly acid refluxant (n=25); Group 4- patients with GERD with a slightly alkaline refluxant (n=17). Blood and saliva samples were taken from each patient. The following parameters of oral health/disease were assessed: pH of saliva, OHI-S, PMA index and the level of NO_x in saliva from the right parotid salivary gland and in blood serum.

Results: OHI-S in Group 4 was significantly higher (2,24±0,95) than in Group 3 (2,15±1,25) and in Group 2 (1,95±0,75) and in Group 1 (1,31±0,63). The PMA index data for Group 1 were 10,34±5,26% vs 29,88±17,29% in Group 2; 46,63±21,17% in Group 3 and 54,73±32,71% in Group 4.

Conclusions: Significant changes in OHI-S and PMA were observed in Group 3 and in Group 4. All patients with GERD had increased levels of NO_x in saliva and blood, which may indicate a regulatory imbalance of NO metabolism in their body.

4096 SOCIAL GRADIENTS IN ORAL AND GENERAL HEALTH AMONG ADOLESCENTS IN NORTHERN NORWAY

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Aim: To explore the social gradients in body mass index (BMI), caries experience (DMFT), self-perceived general and oral health in a Norwegian adolescent population.

Methods: The data were retrieved from a population-based cohort study (Fit Futures), which included all first-year high-school students aged 15-19 years, in two municipalities in Troms County, Northern Norway, in 2010-2011. Over 90 % of the invited adolescents participated. All the data, except BMI, DMFT and 25(OH)D serum, were collected through the questionnaire. The analysed sample consisted of 384 (54%) girls and 324 (46%) boys, participation rate 63%. Multivariable binary logistic regression analysis stratified by gender was used to investigate the association between socioeconomic indicators (mother's education, parents' employment and adolescent's school programme) and outcomes. All models were adjusted for age, country of birth, household with adults, and a combined health variable, which included history of chronic diseases, alcohol consumption, smoking, use of snuff, physical activity, sugar and other unhealthy dietary factors, vitamin D level, oral hygiene, self-esteem, mental health and sleep.

Results: Girls taking part in a vocational school programme (vs programme for specialization in general studies) had a more than two times higher odds ratio for being overweight/obese, having higher than average DMFT, perceiving their general and oral health as less good (OR 2.27, 95%CI 1.05-4.91; OR 2.54, 95%CI 1.30-4.97; OR 2.79, 95%CI 1.27-6.12 and OR 2.54, 95%CI 1.30-4.96, respectively). Boys in the vocational school programme had a more than three times higher odds ratio for perceiving their oral health as less good (OR 3.39, 95%CI 1.54-7.46) and having a mother with a lower level of education (high school or less vs college 4 year or more) increased odds by more than three times to be overweight/obese (OR 3.06, 95% CI 1.05-8.92).

Conclusions: Although almost all adolescents attend the free public health service, a social gradient still exists for both general and oral health in Troms, Northern Norway.

4110 INTELLIGENCE PROFILES OF CHILDREN WITH ORTHODONTIC TREATMENT NEED

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Organization 1: Marmara University, Istanbul, Turkey.

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Background: Intelligence based on its traditional definition have been considered as the major factor of success and academic achievement for a long time. Some studies have suggested that incisor crowding and median diastemas have the greatest negative impact on perceived intelligence.

Aim: The aim of this study was to determine whether there is an association between malocclusion and intelligence quotient (IQ) in a sample representative of the orthodontic patients of 10-15 years of age in Istanbul.

Methods: Ethical approval for the study was obtained from the Ethics Committee of Marmara University Faculty of Dentistry and written consent was obtained from the parents of children with malocclusion who were referred to Marmara University, Department t of Orthodontics. Cognitive function was measured by The Raven's Standard Progressive Matrices (RPM). In a random sample of 150 children seeking the orthodontic treatment. In this test, the number of correct answers from each participant was calculated. Information on malocclusion status was obtained according to the Index of Orthodontic Treatment Need (IOTN). The statistical analyses were performed using SPSS 16.00 software.

Results: A total of 150 children were asked to complete the questionnaire, 126 children aged between 10-15 (49 boys (38,9 %), 77 girls (61,1 %), mean age of 11,80± 1,32) completed all questions and are included in the analysis. According to the Raven score analysis, mean Raven's correct score was 37,03 ± 8,25 and ranged from 12 to 53 for all participants. There were no gender differences (p=0. 603). There was no statistically significant difference between the IQ average score in the patients according to the malocclusion grade (p=0.696).

Conclusion: The results suggest that in the group studied there was no evidence of the association between malocclusion and intelligence quotient.

4143 HEPATITIS B, C AND LEGIONELLA PNEUMOPHILA SERO-PREVALENCE IN DENTAL HEALTH-CARE WORKERS IN AUSTRIA

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Aims: Dental work implies exposure to pathogens in aerosols or blood. The aim of this study conducted in Austrian dental health-care workers (DHCW) was to assess the sero-prevalence of Legionella pneumophila (LP), hepatitis C virus (HCV), hepatitis B virus (HBV), as well as a self-report on immunisation and on the use of barrier techniques to prevent infection.

Methods: At an Austrian dental meeting, 240 volunteers (164 dentists, 54 dental assistants, and 22 accompanying persons) completed questionnaires on their occupation, their health status concerning LP, HBV and HCV, HBV vaccination, and their use of gloves and masks. The 218 DHCW formed the test group and the 22 accompanying persons the control group. Subsequently, blood samples were taken from the test group and control groups and were analysed with SERION ELISA classic® (LP, HBV and HCV). Positive HCV results were confirmed by polymerase chain reaction. Data were statistically analysed with SPSS 21.0. Ethics approval was granted at the Medical University of Graz.

Results: Of the 218 in the test group, 12 (5.5%) were tested positive for anti-LP-IgG compared to 2 (9.1%) in the control group. One dentist and one dental assistant (0.9%) tested positive for anti-HCV IgG. Nine in the test group (4.3%) had experienced an HBV infection in the past. The control group revealed no markers for HBV or HCV. A positive HBV vaccination state was tested in 194 (89%) in the test group but reported by 203 (93.1%). An active immunization against HBV (anti-HBs ≥20 IE) was missing in 17 in the test group (8.1%), another 19 (anti HBs 20-100 IE) required a booster within one year. Those in the control group were statistically significantly less often vaccinated (p=0.002). Overall, 84.4% of the test group reported always wearing gloves while another 11.9% wore them sometimes. Masks were used by 66.5% regularly, by 25.2% sometimes and by 6.4% never. Dentists reported a more frequent use of masks than dental assistants (p<0.001).

Conclusions: With an LP-IgG seroprevalence of 5.5% among dentists and dental assistants a remarkable decrease has been observed since 1984 when 34% were seropositive. No increased risk for HCV and HBV could be shown for DHCW compared to the general population. However, there is still a discrepancy between the self-reported vaccination status and the respective serological findings. To prevent infections, more attention should be given to educating DHCW on immunisation and the effective use of barrier techniques such as gloves and masks. Voluntary screening can serve as a tool to raise awareness of potential hazards in oral health care.

Acknowledgement: This work was funded by the Austrian Dental Association and the Department of Healthcare of the Provincial Government of Styria.

4153 ARTIFICIAL INTELLIGENCE INCORPORATED ANDROID SMARTPHONE SOFTWARE TO DETECT SKELETAL AND DENTAL DEFORMITIES

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Background: Orthodontists have been using cephalometric parameters to detect and classify malocclusions both skeletal and dental and also to decide treatment options.

Aim: the aim of the present study was therefore to investigate the accuracy of the recently developed software 'IMEX CARE' in detecting malocclusions, using soft tissue cephalometric analyses and providing subsequent treatment options, so as to give the general public a tool to raise dental awareness.

Methods: For this purpose a total of 100 patients who were aged between 15 to 40 years were examined of whom 55 were selected randomly in the Department of Orthodontics at SGR Dental College, Bangalore and the other 45 patients in a private clinical practice in Bangalore. Twenty five patients were recruited for each class of malocclusion i.e. I, II & III both dental and skeletal. An additional group of 25 patients aged between 6 to 14 years were also examined. These children had mixed dentitions and were at the stage of developing malocclusions which could, with proper diagnosis be treated with Interceptive orthodontics rather than the 75 adult patients who were to be treated with corrective orthodontics to correct their fully developed malocclusions. The cephalometric parameters were measured and evaluated manually from a cephalogram by one orthodontist and treatment options were considered by the same orthodontist, without using the software. These results were crosschecked with those obtained using the software which is programmed to make calculations and provide treatment options from a single photograph taken on an android phone followed by marking a few soft tissue points by the user, in this case- the orthodontist.

Results: Ninety five percent of the results (cephalometric findings and treatment plans) obtained using the software were the same as those produced by the orthodontist using a manual approach.

Conclusions: The IMEX CARE software could provide a viable and inexpensive way to raise patients' awareness of malocclusions and could also provide general dentists with an indication of the type of extractions that an orthodontist might suggest. Further work is in progress to improve the accuracy of this software and also develop it further to predict growth.

The four GSK/EADPH research prize presentations were followed by a presentation by the winner of the SESPO competition for 2017. The abstract for this presentation is set out below:

SESPO Award 2017

The following abstract, which won the SESPO award for 2017, was presented on the morning of Friday, 19 October 2018, immediately after the presentation of the four abstracts whose presenters competed for the GSK/EADPH 2018 research prize.

DAILY SUPERVISED TOOTH-BRUSHING IN A SCHOOL ATTENDED BY CHILDREN AT HIGH RISK OF CARIES – PRELIMINARY RESULTS.

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Introduction: Daily supervised tooth-brushing in schools of high risk of caries can be an effective method to improve oral health of children and to reduce inequalities in oral health.

Aims: The aim of this study was to implement daily supervised tooth-brushing in a school, whose children were at high risk of caries and to evaluate its effects, feasibility and viability.

Methods: Recruitment of schools with children aged 5 to 7 years at high risk of caries. Randomisation of groups. Implementation of the daily supervised tooth-brushing activity. Oral examination prior to and after the activity. Oral cleanliness was assessed using the Turesky modification of the Quigley and Hein Plaque Index and dental caries using the ICDAS II Caries Index. Analyses of the feasibility and viability included clinical outcomes, invested time, cost, disease incidences and satisfaction of participants.

Results: The preliminary results of the study are presented. The children from one school were recruited and daily supervised tooth-brushing activity was easily and efficiently implemented. Invested time, economic cost and satisfaction of participants were analysed. Differences in Plaque Index were measured.

Conclusions: In the study population, the daily supervised tooth-brushing was established effectively. This preventive activity can be considered a good option to be implemented in other schools whose children are at high risk of caries. A second or additional schools are needed to enlarge the sample.

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