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Delivery of mobile dental services to dependent elderly people: results from a pilot study in rural Switzerland

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SUMMARY

The objective of this pilot study was to provide data on the oral health status and oral health behaviour of care-dependent elderly people in the canton of Uri. The study aimed at assessing whether age and duration of living in a nursing home is associated with dental attendance, whether there is a relationship between age and the DMF-T index, and how high the risk was for participants to develop oral health problems.

The study offered mobile dental services to people residing in nursing homes (NHG) and to community dwellers (CDG). Data was collected on demographics, medical history, presence of pain, ability to eat and oral health behaviour by means of a questionnaire. A clinical examination was performed and data on the oral status was collected. Statistical methods were: median tests, linear regressions and descriptive statistics.

Uptake of the programme was low. 56 participants were examined. 47 participants (24 females, 23 males, average age 86.3 ± 7.36 years) resided in nursing home, 9 participants (7 females, 2 males, average age 76 ± 12.8 years) were community dwellers. No significant differences were found between frequency of dental attendance and age ($p = 0.35$) or duration of stay in a nursing home ($p = 0.55$). The number of decayed teeth ($p = 0.005$), missing teeth ($p = 0.01$), and the DMF-T index (average in NHG = 26.5, CDG = 20.2, $p < 0.001$) increased, the number of filled teeth ($p = 0.02$) decreased as age increased. Upon calculation of the Teamwerk index, which takes into account oral health behaviour, dental caries, and periodontal status, the majority of participants had a medium risk of developing oral health problems.

Our pilot study in rural Switzerland provides first results of the oral health status in dependent elderly people. As people age, oral health deteriorates. More attention should be given to oral hygiene maintenance and more regular dental visits, to ensure a better oral health status in dependent elderly people.

Introduction

With the onset of care-dependency, oral health tends to get neglected as priorities shift, with more time being dedicated to care for needs that are considered to be more important (Hoeksema et al. 2017). It is well reported in literature, that dependent elderly people tend to have poor oral health (Chalmers et al. 2002; Matthews et al. 2012; Yoon et al. 2018). Impairments of mobility, manual dexterity and cognitive function, together with barriers related to dental care delivery, all contribute to the oral health problems generally experienced by dependent elders (Wu et al. 2007). The main dental diseases, dental caries and periodontal disease, are behavioural diseases with bacterial involvement, i.e. diseases whose onset and progression can be suppressed by effective oral health care behaviour namely, diet control, regular tooth brushing and denture cleaning, and regular utilisation of dental services (Frencken et al. 2012; Niesten et al. 2017).

In Switzerland, dental health care is not covered by the compulsory health care insurance and dental treatment charges, with exceptions as stated in article 31 in the federal law of health insurance (KVG), are out-of-pocket expenditures (di Bella et al. 2018). Dental care is generally provided in private dental practices. Some dentists and dental hygienists also provide mobile dental services to treat people who, due to physical or cognitive impairments, cannot attend the dental practice. The majority provide these service at less than 20% of their total workload through the use of portable equipment (Borg-Bartolo et al. 2020). Besides portable equipment, other models exist for the delivery of mobile dental care, i.e. mobile dental vehicles, hybrid models (a combination of a mobile dental vehicle together with portable equipment) and the delivery of dental care in-situ, i.e. the setting up of a fully-equipped dental clinic on the premises of either nursing homes or targeted institutions (Association of State and Territorial Dental Directors 2007). For the purpose of this study, the hybrid model and the portable equipment model were used. They were the two models most readily available to conduct the study and were suitable to reach the care-dependent elders residing both in nursing homes or in the community.

The objective of this pilot study was to provide data on the present oral health status and the oral health behaviour of care-dependent elderly people in the rural canton of Uri. The study aimed at assessing whether age and duration of living in a nursing home is associated with dental attendance, whether there is a relationship between age and the DMF-T index, and how high the risk was for participants to develop oral health problems. The null hypotheses for this study were: 1) the frequency of dental attendance is not dependent on a) age b) the duration of living in a nursing home, 2) there is no difference in the DMF-T index as age increases.

Materials and Methods

Ethics approval was obtained in May 2018 (EKNZ ID 2017-07013) prior to the start of the study. The managers of the nursing homes and the local community domiciliary services provided by "Spitex" in the canton of Uri were informed about the study via information leaflets and personal discussions, with the caregivers being responsible for the recruitment of the participants. Informed consent was obtained from the patients or their legal guardians, who signed a consent form after being provided with information regarding the scope of the study and their participation in the study. The inclusion criteria were care-dependent elderly people who resided either in nursing homes or were community dwellers in the canton of Uri. Those who fulfilled the inclusion criteria were examined and none of the participants were excluded retrospectively. The first phase of data collection took place between June 2018 and December 2018 while the second phase took place between October 2019 and January 2020. The dental examinations were carried out by three dentists and one dental hygienist, who conducted dental visits in the participants homes or nursing homes using portable dental equipment or the hybrid model. The dental examinations were offered free of charge. The study protocol was conducted according to the Declaration of Helsinki. The study sample consisted of 56 participants (47 resided in nursing homes, 9 were community dwellers). The nursing home group (NHG) consisted of 24 females and 23 males, aged 86.3 ± 7.36 years. The community dwellers group (CDG) consisted of 7 females and 2 males, aged 76 ± 12.8 years.

Data collection

A questionnaire was completed by the patients themselves or with the help of their caregivers. Data was collected on demographics; age, gender, location, duration in nursing home (if applicable), medical history: heart and circulation, diabetes, cholesterol, anticoagulants, painkillers, respiratory, thyroid, antiepileptics and immunosuppressants, current status; presence of pain, ability to eat, oral health behaviour; daily intake of sugar, daily use of fluoride through toothpaste, mouthwash and/or fluoride tablets, daily oral hygiene, the last visit to the dentist and the last visit to the dental hygienist (appendix 1).

The clinical examination collected data on the oral mucosa (presence and location of oral lesions), oral hygiene status (no plaque or calculus, grade 1 = up to one third of the tooth covered in plaque/calculus, grade 2 = between one and two thirds of tooth surface covered in plaque/calculus, grade 3 = more than two thirds of tooth surface covered in plaque/calculus) (World Health Organization 2013), denture status; status of dental prostheses, denture hygiene status (no plaque/calculus, grade 1 = up to one third of the denture surface covered in plaque/calculus, grade 2 = between one and two thirds of the denture surface covered in plaque/calculus, grade 3 = more than two thirds of the denture surface covered in plaque/calculus), periodontal status; presence of bleeding on probing, presence of at least one tooth with a periodontal pocket which was 4 mm deep or more, and the presence of at least one tooth with furcation involvement, dental status; the Decayed, Missing and Filled teeth index (DMF-T index) was used as a measure of dental caries. Active decay in either crown or root was reported as the D component, missing teeth were reported as the M component and restored teeth due to caries were reported as the F component.

Outcome measures

DMF-T index: The DMF-T index is the summation of the number of decayed (D), missing (M) and filled (F) teeth and was calculated over 32 teeth, i.e. including third molars.

Teamwerk index: The Teamwerk index was used to further describe the oral health status of the patients (Benz & Haffner 2009). The index is the summation of the scores given to each of the following nine parameters: DMF-T index; scores from 0 = low DMF-T (DMF-T index 0–22 for people aged 65 years and over) to 2 = high DMF-T (25 and over for people aged 65 years and over). The grading is according to the Teamwerk index graph which plots age (x-axis) vs DMF-T index (y-axis) in a

normal population. (Benz & Haffner 2009), caries; scores of 0 to 4 depending on the total number of carious teeth present i.e. 0 = no carious teeth, 4 = 4 carious teeth or more, pain; scores of 0 = no pain or 4 = pain present, sugar intake; scores of 0 = sugar intake less than three times daily or 2 = sugar intake three times or more daily, fluoride contact; scores of 0 = fluoride contact more than once daily, 2 = once daily, 4 = less than once daily, oral hygiene; scores of 0 = optimal to 4 = poor, periodontal pocketing; scores of either 0 = no periodontal pockets or pockets < 4 mm in depth or 3 = periodontal pockets ≥ 4 mm, bleeding on probing; scores of 0 = no bleeding on probing or 3 = bleeding on probing present, furcation involvement; scores of 0 = no furcation involvement or 3 = furcation involvement present. In cases where data for a parameter was missing, the highest possible score was given for that missing parameter. For edentulous patients only the parameters DMF-T index, pain and oral/denture hygiene were taken into consideration (Geiger 2011). The final score is divided into three categories: 0 to 8 = low risk, 9 to 14 = medium risk, 15 to 29 = high risk. The risk levels are linked to recommendations for the frequency by which patients should receive dental care, namely: low risk: six-monthly, medium risk: four-monthly and high risk: three-monthly (Geiger 2011).

Data analysis

Descriptive statistics included the total number (n) and percentage (%) for daily sugar intake, daily fluoride contact, frequency of daily brushing, medications, overall dental status, findings of the oral mucosa, presence of dental pain, oral hygiene status, overview of the periodontal status, denture hygiene status. The total number (n) and percentage (%), means and standard deviations (SD), and minimum and maximum values (min-max) were included for decayed, missing and filled teeth, DMF-T index, DMF-T grading and the risk of developing an oral health problem. Median tests were conducted to assess the relationship between age and a) last dental visit as well as b) duration of living in a nursing home, and linear regression models were performed to assess the relationship between age and the number of decayed, missing, filled teeth and DMF-T index. No statistical analyses were carried out for the CDG due to the very small sample size available. Statistical significance was established at p-value < 0.05. Statistical analysis was carried out using StataSE 16.

Results

The number of participants who took part in this pilot study was low. 56 participants were examined in all with 47 participants, 24 females, 23 males, residing in nursing homes while 9 participants, 7 females, 2 males, lived at home. The average age of the participants in the nursing home group (NHG) was 86.3 ± 7.36 years and that of community dwellers group (CDG) was 76 ± 12.8 years (Tab. I). The average stay in a nursing home was 882 days. The most common type of medication being taken by the participants in both groups was for heart and circulatory conditions. A relatively high number of participants in the NHG were on anti-depressants (n = 24, 51%) or painkillers (n = 23, 49%) (Tab. II).

89% of the NHG participants reported brushing their teeth two or three times daily. The majority of the patients living in nursing homes presented with either grade 1 (40%) or grade 2 (40%) oral hygiene levels while the majority of the community dwellers (55%) had a grade 1 level of oral hygiene. 29 (76%) NHG participants and 8 (89%) CDG participants presented with bleeding on probing (Tab. II).

Tab. I Demographics table

Demographics	Nursing homes (n = 47) n (%)	Community dwelling (n = 9) n (%)
Gender		
Female	24 (51%)	7 (78%)
Male	23 (49%)	2 (22%)
Age		
< 65 years	0 (0%)	1 (11%)
65–74 years	4 (9%)	4 (44%)
75–84 years	10 (21%)	1 (11%)
85–94 years	27 (57%)	3 (33%)
> 95 years	6 (13%)	0 (0%)
Location		
Urban area	46 (98%)	4 (44%)
Suburban area	1 (2%)	2 (22%)
Rural area	0 (0%)	3 (33%)
Duration of living in the nursing home[1]		
< 1 year	18 (39%)	
Between 1 and 2 years	8 (17%)	
Between 2 and 3 years	6 (13%)	
Between 3 and 5 years	7 (15%)	
Between 5 and 10 years	5 (11%)	
> 10 years	2 (4%)	

[1] Total numbers may vary due to missing data

Twelve (27%) nursing home participants and six (67%) community dwellers reported that they had never visited a dental hygienist. All participants in both groups had been seen at least once by a dentist. 34 participants from both groups had their last dental visit more than a year prior to the study dental check-up. The median duration of living in a nursing home for those who had their last dental visit in less than one year was 15 months. In contrast, the median was almost double for those who had their last dental visit over a year prior to the performed study dental check-up (Tab. II). No statistically significant differences were reported in the frequency of dental visits as age increased (p = 0.35) or as duration of living in a nursing home increased (p = 0.55).

38 (80%) participants living in nursing homes were dentate while nine (20%) were edentulous. All the patients in the CDG were dentate. There was an increase in the number of decayed teeth (p = 0.005), missing teeth (p = 0.01), and the DMF-T index (p < 0.001) together with a decrease in the number of filled teeth

Tab. II Table of findings

Oral health behaviour	Nursing homes overall (n = 47) n (%)	Nursing homes dentate (n = 38) n (%)	Community dwelling (n = 9) n (%)
Sugar intake[1,2]			
None	5 (14%)	4 (13%)	1 (14%)
Once daily	11 (30%)	8 (26%)	4 (57%)
Twice daily	5 (14%)	4 (13%)	2 (29%)
At least three times daily	16 (22%)	15 (48%)	0 (0%)
Contact with fluoride[1,2]			
Never	2 (6%)	0 (0%)	0 (0%)
Once daily	5 (16%)	3 (12%)	4 (57%)
Twice daily	18 (56%)	15 (60%)	1 (14%)
Three times daily	7 (22%)	7 (28%)	2 (29%)
Frequency of daily brushing[1]			
Never	1 (2%)	1 (3%)	0 (0%)
Once daily	3 (7%)	3 (8%)	4 (57%)
Twice daily	30 (67%)	22 (61%)	1 (14%)
Three times daily	11 (24%)	10 (28%)	2 (29%)
Last visit to the dentist			
< 1 month	1 (2%)	1 (3%)	2 (22%)
Between 6 months and 1 year	17 (38%)	17 (47%)	1 (11%)
Between 1 and 3 years	12 (27%)	9 (25%)	5 (55%)
Between 3 and 5 years	2 (4%)	1 (3%)	0 (0%)
> 5 years	5 (11%)	2 (6%)	1 (11%)
Never visited the dentist	0 (0%)	0 (0%)	0 (0%)
Don't know	8 (18%)	6 (17%)	0 (0%)
Last visit to the dental hygienist			
< 1 month	1 (2%)	1 (3%)	1 (11%)
Between 6 months and 1 year	7 (16%)	7 (20%)	1 (11%)
Between 1 and 3 years	9 (21%)	8 (25%)	1 (11%)
Between 3 and 5 years	1 (2%)	1 (3%)	0 (0%)
> 5 years	3 (7%)	2 (8%)	0 (0%)
Never visits the dental hygienist	12 (27%)	9 (26%)	6 (67%)
Don't know	11 (25%)	7 (20%)	0 (0%)

[1] Total numbers may vary due to missing data
[2] Risk factors for risk calculation: Benz & Haffner 2009
[3] More than one answer per participant was allowed. Total percentage exceeds 100%.
[4] World Health Organization 2013

Tab. II Table of findings continued

Oral health behaviour	Nursing homes overall (n = 47) n (%)	Nursing homes dentate (n = 38) n (%)	Community dwelling (n = 9) n (%)
General health			
Medications most relevant to dental care[1,3]			
Heart and circulation	34 (72%)	25 (66%)	3 (60%)
Anticoagulants	27 (57%)	23 (61%)	2 (40%)
Antidepressants	24 (51%)	19 (50%)	1 (20%)
Painkillers	23 (49%)	18 (47%)	2 (40%)
Other	34 (72%)	28 (74%)	2 (40%)
Intra-oral findings			
Dentate	38 (80%)	38 (100%)	9 (100%)
Fully edentulous	9 (20%)	0 (0%)	0 (0%)
Oral mucosa[1]			
Ulceration	0 (0%)	0 (0%)	1 (20%)
Xerostomia	1 (2%)	1 (3%)	0 (0%)
Leukoplakia	1 (2%)	1 (3%)	0 (0%)
None	34 (83%)	27 (84%)	4 (80%)
Dental pain[1,2]			
Presence of dental pain	2 (4%)	2 (5%)	0 (0%)
Oral hygiene (highest measured value per person)[1,2,4]			
No plaque/calculus	3 (8%)	3 (9%)	1 (11%)
Grade 1: up to 1/3 of tooth surface covered by plaque	15 (40%)	14 (40%)	5 (55%)
Grade 2: between 1/3 and 2/3 of tooth surface covered by plaque	15 (40%)	14 (40%)	1 (11%)
Grade 3: more than 2/3 of tooth surface covered by plaque	5 (13%)	4 (11%)	2 (22%)
Overview of the periodontal status[1,2]			
Bleeding on probing	29 (63%)	29 (76%)	8 (89%)
At least one tooth with a pocket depth ≥ 4mm	9 (20%)	9 (24%)	4 (44%)
At least one tooth with furcation involvement	6 (13%)	6 (16%)	3 (33%)
Hygiene of prostheses (highest measured value per person)[1]			
No plaque	6 (18%)	3 (12%)	1 (25%)
Grade 1: up to 1/3 of denture surface covered by plaque	19 (58%)	17 (68%)	1 (25%)
Grade 2: between 1/3 and 2/3 of denture surface covered by plaque	6 (18%)	3 (12%)	1 (25%)
Grade 3: more than 2/3 of denture surface covered by plaque	2 (6%)	2 (8%)	1 (25%)

[1] Total numbers may vary due to missing data
[2] Risk factors for risk calculation: Benz & Haffner 2009
[3] More than one answer per participant was allowed. Total percentage exceeds 100%.
[4] World Health Organization 2013

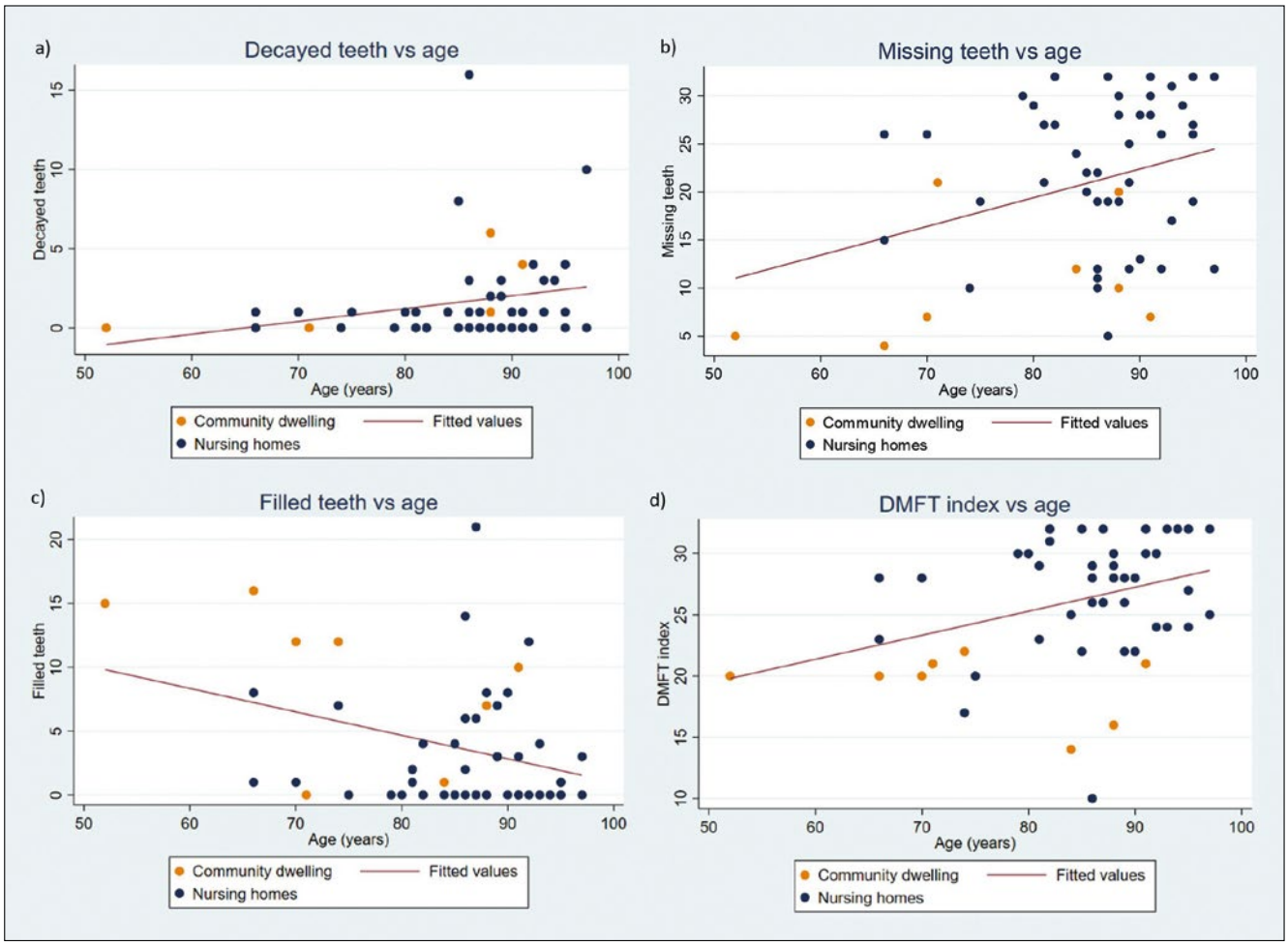

Fig. 1 a) Decayed teeth vs age (p = 0.005); b) Filled teeth vs age (p = 0.02); c) Missing teeth vs age (p = 0.01); d) DMF-T index vs age (p < 0.001)

(p = 0.02) as age increased (Fig. 1a, b, c, d) with these findings being statistically significant. After the calculation of the risk profile using the Teamwerk index 18 (49%) participants in the NHG who were dentate and 6 (67%) participants from the CDG had a medium risk of developing dental problems (Tab. III).

Discussion

The objective of this pilot study was to provide data on the oral health behaviour and the present oral health status of care-dependent elderly people in the rural canton of Uri. We fail to reject the null hypothesis for the first aim, i.e. the frequency of dental attendance is not dependent on a) age b) the duration of living in a nursing home while the second null hypothesis, i.e. that there is no difference in the DMFT-index as age increases, has been rejected. The results of this pilot study give a first insight into the oral health status of care-dependent elderly people in the rural canton of Uri. The sample size was small, especially for the community dwellers, thus making it difficult to generalize the findings to the general population. During the course of the study considerable efforts were made to obtain as many participants as possible. This proved to be very difficult especially among the community dwellers. Studies have reported on the difficulties that are at times encountered when recruiting elderly community dwellers (Wu et al. 2010; Kammerer et al. 2019). Four dental examiners carried out the dental examinations at different times during the study period, making inter-observer variability a limitation of the study, especially in the detection of caries and the grading of oral and denture hygiene. Two indices, the DMF-T and the Teamwerk index were used as outcome measures, adding to the strength of this study. The DMF-T index is a well-established measure of the lifetime accumulation of dental caries experience (Velasco-Ortega et al. 2013). However, it has its limitations as the index gives equal weight to missing, decayed and well-restored teeth and it doesn't take into account teeth lost for reasons other than caries, such as periodontal disease (Lo 2019). The Teamwerk index on the other hand takes into account parameters that cover oral health behaviour, dental caries and periodontal status.

Several studies have reported scenarios of inadequate oral hygiene for patients in nursing homes (Chalmers et al. 2002; Stubbs & Riordan 2002; Brändli-Holzer 2012), with bleeding on probing being a common finding in dependent elderly patients (Geiger 2011; Jordan & Micheelis 2016). Studies have reported ranges of 33% to 75% of patients having at least one periodontal pocket that was 4 mm or deeper (Geiger 2011; Matthews et al. 2012; Jordan & Micheelis 2016). Periodontal disease is a common chronic oral inflammatory disease that is often found in older adults (Boehm & Scannapieco 2007). In the present study, the oral hygiene status does not correspond to the reported frequency of daily tooth brushing. It is not known whether tooth brushing and/or denture cleaning was done solely by the patients, whether they received assistance or whether it was done completely by the caregivers. The findings indicate that more attention needs be given to oral hygiene by either helping the

Tab. III Dental status

DMF–T and risk profile	Nursing homes overall (n = 46)[1]			Nursing homes dentate (n = 37)[1]			Community dwellers (n = 9)		
	n (%)	Mean (SD)	Min–Max	n (%)	Mean (SD)	Min–Max	n (%)	Mean (SD)	Min–Max
Decayed teeth (DT)	24 (52%)	1.6 (3.0)	0–16	24 (65%)	2.0 (3.2)	0–16	5 (56%)	1.4 (2.1)	0–6
– Presence of decay in roots[1]	18 (44%)	1.6 (3.2)	0–16	18 (56%)	2.1 (3.5)	0–16	3 (33%)	0.8 (1.6)	0–5
Missing teeth (MT)	46 (100%)	22.7 (7.5)	5–32	37 (100%)	20.8 (7.0)	5–31	9 (100%)	10.7 (6.1)	4–21
Filled teeth (FT)	26 (57%)	3 (4.4)	0–21	26 (70%)	3.7 (4.6)	0–21	7 (78%)	8.1 (6.4)	0–16
– Presence of fillings in roots[1]	20 (49%)	2.3 (3.7)	0–15	20 (63%)	2.9 (3.9)	0–15	1 (11%)	0.1 (0.3)	0–1
DMF–T (decayed, missing, filled teeth index)		**27.4 (4.6)**	**10–32**		**26.5 (4.6)**	**10–32**		**20.2 (3.9)**	**14–28**
DMF–T grading[2]									
Low (DMF–T 0–22)	6 (13%)			6 (16%)			6 (67%)		
Medium (DMF–T 23–24)	5 (11%)			5 (14%)			1 (11%)		
High (DMF–T ≥ 25)	35 (76%)			26 (70%)			2 (22%)		
Risk of developing a dental problem[1,2]									
Low (score 0–8)	20 (43%)			11 (30%)			2 (22%)		
Medium (score 9–14)	18 (39%)			18 (49%)			6 (67%)		
High (score 15–29)	8 (17%)			8 (22%)			1 (11%)		

[1] Participants with missing data excluded
[2] Risk factors for risk calculation: Benz & Haffner 2009

patients more with their daily brushing and/or to provide more training to the carers.

The Swiss health survey reported a reduction in frequency in dental visits as one gets older (Schneider et al. 2019). A study in Nova Scotia, Canada, reported that almost 75% (n = 313) of the participants residing in nursing homes hadn't had a dental visit in twelve months (Matthews et al. 2012), while another study in France reported that there was a discrepancy between dental visits among community dwellers (n = 9,962) and institutionalized elderly patients (n = 4,167) (Maille et al. 2017). The present study did not report significant differences in dental attendance as age increased or as duration of living in a nursing home increased. Furthermore, it did not draw comparisons between the two groups due to the difference in the sample sizes. The overall sample size of the study (56 participants) was small, thus additional research with higher statistical power is recommended to further analyse the association between the frequency of dental attendance and a) aging as well as b) the duration of living in a nursing home.

The Swiss health survey reported that 6.5% of the people aged 65–74 years were edentulous with the figures increasing to 15% for persons aged 85 years and over (Schneider et al. 2017). The present study reported that 20% of the participants in the NHG were fully edentulous. Studies have reported rates of edentulism among the elderly in nursing homes or geriatric hospitals of 20% (Brändli-Holzer 2012), 41% (Matthews et al. 2012), 52% (Glauser-Popaj 2009; Katsoulis et al. 2012) and 66% (Chalmers et al. 2002). The present study reported that there was an increase in the number of decayed (p = 0.005) and missing teeth (p = 0.01), a decrease in the number of filled teeth

Tab. IV Studies showing the different dental status of dependent elderly people in nursing homes (overall) and nursing homes (dentate)

First author	Year	Country	Region	Sample size	Min Max age (years)	Mean age (years)	DT	MT	FT	DMF-T
a) Nursing home residents overall										
Present study	2020	Switzerland	Uri	46	66–97	86	2	23	3	27.4
Vidzis A.	2011	Latvia	Riga	349	60–72	NA	NA	24	NA	27.6
Petelin M.	2010	Slovenia	nationwide	296	65–99	80	4	25	2	30.8
Laass M.	2010	Switzerland	Zurich	457	29–99	83	NA	17	NA	27.2
b) Nursing home residents dentate										
Present study	2020	Switzerland	Uri	46	66–97	86	2	21	4	26.5
Matthews DC.	2012	Canada	Nova Scotia	198	45–104	80	1	20	5	23.6
Brändli-Holzer B.	2012	Switzerland	Zurich	144	50–105	82	1	17	9	26.8
Glauser-Popaj L.	2009	Switzerland	Zurich	130	45–101	85	3	22	5	29.1
Chalmers JM.	2002	Australia	Adelaide	76	NA	83	1	19	4	23.7

DT, FT, MT, DMF-T represent the mean number of decayed, missing and filled teeth together with the mean DMF-T index.

($p = 0.02$) and an increase in the DMF-T index ($p < 0.001$) as age increased. A high prevalence of dental caries was found in both groups (NHG = 65%, CDG = 55%), with 56% of the NHG participants presenting with root caries (average = 2.1 teeth). Studies of elderly patients in nursing homes have reported the presence of root caries in 37% (Brändli-Holzer 2012) (mean = 2.5 teeth), 44% (mean = 1.3 teeth) (Matthews et al. 2012) and 77% (mean = 1.4 teeth) (Stubbs & Riordan 2002) of the patients examined. Worldwide studies have demonstrated that overall, elderly people who are care-dependent tend to have poor oral health, with reported DMF-T findings ranging from 23.6 to 30.8 (Chalmers et al. 2002; Glauser-Popaj 2009; Vidzis et al. 2011; Brändli-Holzer 2012; Matthews et al. 2012; Petelin et al. 2012) (Tab. IV a, b). Studies in Switzerland have reported average DMF-T findings ranging between 26.8 (Brändli-Holzer 2012) and 29.1 (Glauser-Popaj 2009). The present study reported DMF-T findings that fall within these ranges (Tab. IV a, b).

After taking into account the nine risk parameters as proposed by the Teamwerk index, 22% of the dentate patients in the nursing homes were at a high risk of developing oral health problems while the majority of the patients had a medium risk. On the other hand, most of the community dwellers had a medium risk of developing dental problems even though most of them had a low DMF-T index. Recommendations for the frequency of dental visits were based on the Teamwerk index depending on whether the patient had a high, medium or low risk of developing dental problems, with three-, four- or six-monthly visits being recommended, respectively. The Teamwerk study also noticed that following the initial phase of the project, patients who received four- to six-monthly visits were often found to be worse off than the high-risk patients, thus it was recommended that all patients should be seen every three months (Geiger 2011). The frequency of dental visits should be tailored according to the needs of the patients, with the oral health status monitored at every visit and the frequency of dental visits modified accordingly. Most of the patients in the community were referred for dental treatment by the caregivers of the community domiciliary care services "Spitex", highlighting the key role played by collaboration between the caregivers, both in nursing homes and in the community, in enabling the elderly to receive dental care (Chalmers et al. 2001). Through good organisation between the different stakeholders, dental care to the patients both in nursing homes and the community could be organised through mobile dental services, as demonstrated during the course of this study. The training of the caregivers, both formal and informal, in the oral hygiene maintenance of the care-dependent elderly patients, would also ensure an increase in the number of care providers that will be able to address the basic dental needs of these elderly patients.

Our pilot study in rural Switzerland provides first results of the oral health status in dependent elderly people, even though the sample size was small. As people age, oral health deteriorates. More attention should be given to oral hygiene maintenance and more regular dental visits, to ensure a better oral health status in dependent elderly people.

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Zusammenfassung

Einleitung

Ziel unserer Studie war es, das zahnärztliche Verhalten und den oralen Gesundheitszustand der pflegebedürftigen älteren Menschen im Kanton Uri zu beurteilen. Die Studie wollte bestimmen, ob das Alter und die Dauer im Pflegeheim mit Zahnarztbesuchen zusammenhängt, ob das Alter mit dem DMF-T-Index zusammenhängt, und wie hoch das Risiko für die Entwicklung oraler Gesundheitsprobleme ist.

Material und Methoden

Im Rahmen mobiler zahnärztlicher Dienstleistungen bot die Pilotstudie Pflegeheimbewohner/innen und Senior/innen mit häuslicher Pflege eine zahnmedizinische Beratung und Untersuchung. Informationen zu Geschlecht und Alter, Anamnese, Schmerzen und zahnärztlichem Verhalten wurden mittels eines Fragebogens gesammelt. In einer zahnärztlichen Untersuchung wurden Daten zum oralen Gesundheitszustand erhoben. Als Auswertungsmethoden wurden Mediantests, lineare Regressionen und deskriptive Statistik verwendet.

Resultate

Es fanden sich nur wenige Teilnehmer/innen. Insgesamt wurden 56 Patient/innen untersucht, wovon 47 (24 Frauen, 23 Männer, Durchschnittsalter 86,3 ± 7,36 Jahre) in Pflegeheimen und 9 zu Hause (7 Frauen, 2 Männer, 76 ± 12,8 Jahre) wohnten. Es wurden keine signifikanten Unterschiede zwischen der Häufigkeit von Zahnarztbesuchen und Alter ($p = 0,3$) und der Dauer im Pflegeheim ($p = 0,5$) gefunden. Die Anzahl Zähne mit Karies ($p = 0,005$), fehlende Zähne ($p = 0,01$) und der DMF-T-Index (Durchschnitt im Pflegeheim = 26,5, zu Hause = 20.2, $p < 0,001$) nahm mit dem Alter zu, während die Anzahl Zähne mit Füllungen abnahm ($p = 0,02$). Bei der Berechnung des Teamwerk-Index, der das orale Gesundheitsverhalten, Karies und Parodontalstatus berücksichtigt, hatte die Mehrheit der Patient/innen in beiden Gruppen ein mittleres Risiko, Mundgesundheitsprobleme zu entwickeln.

Diskussion

Unsere Pilotstudie in der ländlichen Schweiz zeigt erste Ergebnisse zum oralen Gesundheitszustand in pflegebedürftigen älteren Menschen, trotz weniger Teilnehmer/innen. Mit dem Alter nimmt die orale Gesundheit ab. Mehr Aufmerksamkeit sollte auf die Mundhygiene und regelmässige Zahnarztbesuche gelegt werden, um den oralen Gesundheitszustand in pflegebedürftigen älteren Menschen zu verbessern.

Résumé

Introduction

L'objectif de notre étude était d'évaluer le comportement dentaire et l'état de santé bucco-dentaire des personnes âgées nécessitant des soins dans le canton d'Uri. L'étude visait à déterminer si l'âge et la durée de séjour dans une maison de retraite sont liés aux visites dentaires, si l'âge est lié à l'indice DMF-T, et quel est le risque de développement de problèmes de santé bucco-dentaire.

Matériel et méthodes

Dans le cadre des services dentaires mobiles, l'étude-pilote a proposé des consultations et des examens dentaires aux résidents des maisons de retraite et aux personnes âgées bénéficiant de soins à domicile. Des informations sur le sexe et l'âge, l'anamnèse, la douleur et le comportement dentaire ont été recueillies au moyen d'un questionnaire. Lors d'un examen dentaire, des données sur l'état de santé bucco-dentaire ont été recueillies. Des régressions linéaires et des statistiques descriptives ont été utilisées comme méthodes d'évaluation.

Résultats

Il n'y avait que quelques participants. Au total, 56 patients ont été examinés, dont 47 (24 femmes, 23 hommes, âge moyen 86,3 ± 7,36 ans) vivaient dans des maisons de repos et 9 à domicile (sept femmes, deux hommes, 76 ± 12,8 ans). Aucune différence significative n'a été constatée entre la fréquence des visites dentaires et l'âge ($p = 0,3$) et la durée dans les maisons de retraite ($p = 0,5$). Le nombre de dents cariées ($p = 0,005$), de dents manquantes ($p = 0,01$) et l'indice DMF-T (moyenne à la maison de retraite = 26,5, à la maison = 20,2, $p < 0,001$) augmentent avec l'âge, tandis que le nombre de dents obturées diminue ($p = 0,02$). Lors du calcul de l'« indice de Teamwerk », qui tient compte du comportement en matière de santé bucco-dentaire, des caries et de l'état parodontal, la majorité des patients des deux groupes présentaient un risque moyen de développer des problèmes de santé bucco-dentaire.

Discussion

Notre étude-pilote dans la Suisse rurale montre les premiers résultats sur l'état de santé bucco-dentaire des personnes âgées nécessitant des soins. La santé bucco-dentaire diminue avec l'âge. Une plus grande attention devrait être accordée à l'hygiène bucco-dentaire et à des visites régulières chez le dentiste afin d'améliorer la santé bucco-dentaire des personnes âgées ayant besoin de soins.

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Appendix I

Labucca

Befundblatt zahnmedizinische Eintrittsuntersuchung

Pat.-Nr.: ……

Untersuchungsdatum: …… Untersucher: ……

Alter…….. Geschlecht M ◯ W ◯

Können Sie Essen/Kauen? ja ◯ nein ◯ **Haben Sie Schmerzen?** ja ◯ nein ◯

1) Orale Schleimhaut (Zustand/Lokalisation)

2) OHI	**Zahnlos**	**OHI**	**Keine Proth.**	**OHI Prothese**
OK	◯	☐	◯	☐
UK	◯	☐	◯	☐

3) Zahnstatus und Behandlung

		18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
OK	Kro	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Wu	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Be	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
UK	Kro	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Wu	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Be	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38

4) Sondierungstiefe (≥5mm) ja ◯ nein ◯

5) Bleeding on Probing ja ◯ nein ◯

6) Furkationsbefall ja ◯ nein ◯

7) Prothesenstatus und Zustand Status **OK** ☐ **UK** ☐ Zustand **OK** ☐ **UK** ☐

8) Weitergehende Anweisungen:

_____

_____

«Logo – Adresse Heimzahnarzt»

Fragen zum allgemeinen Gesundheitszustand

	Ja	Nein
Waren Sie während der letzten Jahre im Spital oder in ärztlicher Behandlung?		
Nahmen Sie in den letzten Wochen regelmässig Medikamente ein?		
War Ihnen je unwohl, nachdem Sie Spritzen erhalten oder Medikamente eingenommen haben?		
Bluten Sie lange bei Verletzungen? Nehmen Sie Blutverdünnungsmittel?		
Hatten Sie jemals…		
…Herz- oder Kreislaufstörungen?		
…Blutkrankheiten, zu hohen oder zu tiefen Blutdruck?		
…Zuckerkrankeit (Diabetes)? Gelbsucht (Hepatitis)?		
…Asthma, Heuschnupfen oder andere Allergien?		
…Schweres Rheuma? Gelenkschwellungen?		
…Hormonelle Störungen? Epilepsie?		
…Verdauungsstörungen, Magenulcus?		
…Eine andere ernsthafte Erkrankung?		

Allgemeine Anamnese

Zucker- Impulse pro Tag (feste Nahrung mit hohem Anteil an Zucker): _____

Fluorid-Kontakte pro Tag (Zahnpasta, Spülung, Fluoridtabletten): _____

Anzahle Mundpflege-Einsätze pro Tag: _____

Sonstiges**:** _____

Wann waren Sie zum letzten Mal beim Zahnarzt?

- o Weniger als 1 Monat
- o Zwischen einem halben und einem ganzen Jahr
- o 1 bis 2 Jahre
- o 2 bis 3 Jahre
- o 3 bis 5 Jahre
- o Mehr als 5 Jahre
- o Ich war noch nie bei einem Zahnarzt
- o Weiss nicht

Wann waren Sie zum letzten mal bei einer Dentalhygienikerin?

- o Weniger als 1 Monat
- o Zwischen einem halben und einem ganzen Jahr
- o 1 bis 2 Jahre
- o 2 bis 3 Jahre
- o 3 bis 5 Jahre
- o Mehr als 5 Jahre
- o Ich war noch nie bei einer Dentalhygienikerin
- o Weiss nicht