**Tussentijds Verslag**

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<td>Titel:</td>
<td>Mondzorgverlening in situ in woonzorgcentra met behulp van mobiele tandheelkundige apparatuur: een inschatting van de behandelachterstand (On-site oral health care in LTC with a mobile dental unit: an assessment of the treatment backlog)</td>
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**Uiteenzetting:** (puntgrootte 12, regelafstand 1.5, max 5 blz)
**Introduction**

Due to the tremendous improvements in standards of hygiene and the level of health care, the average life expectancy in Europe has increased by about 10 years in the last 50 years and is higher than in most other regions of the world. Taking the relatively lower birth rate among modern European families into account, it is obvious these countries are facing a rapidly graying population. The same trend is present in Belgium and by 2020 more than 20% of the Belgian population will be 65 years or older and 5.7% will be over 80 years, with the expectation for 2050 to be 27% and 10.6% respectively. Such a demographic shift implies fundamental adjustments to the health care system, since a higher percentage of older people equals higher morbidity and care dependency. Besides, due to the recent advancements, contemporary dentistry has a drastically altered approach than before, putting an extra focus on tooth longevity. Furthermore, dental implants have been successfully implemented in dentistry, showing longevities close to restorations on natural teeth[3]. Consequently, the rate of edentulousness among patients has been highly reduced; which in turn indicates a higher pressure on oral health care resources.

Forasmuch as aging can be accompanied with certain physical and/or mental limitations, maintaining a meticulous oral hygiene and providing them with an efficient oral health care are crucial for the elderly. In spite of that, the significance of oral health among the frail elderly is often overlooked. Numerous studies have pointed out the very poor oral hygiene and limited access to dental care among both housebound and institutionalized elderly living in different countries. According to a cross-sectional study in 2006, there were 62,000 people older than 75 years, residing in retirement houses and nursing homes in Flanders (Dutch speaking part of Belgium), which equaled to 15% of people in the aforementioned age group at the time of the study. Like similar studies, very low levels of oral health were observed among the Flemish study population. Despite the numerosity of such studies, most of them tend to be pure descriptive and there is not much data evaluating a possible correlation between oral health and influencing factors among the target group.
The present study was carried out as a cross-sectional analysis of the oral health of the above-mentioned population to identify the oral health condition and influencing factors of institutionalized elderly.

**Methods and Materials:**

**Population and sample:**
All institutionalized older people who were visited by the Gerodent team of the university hospital of Ghent, Belgium during 10 visits to nursing homes were included in the study. The Gerodent is the name of a project run by university hospital of Ghent that provides the institutionalized elderly in East- and West-Flanders with on-site dental care by means of a mobile dental unit. The inclusion criteria was the presence of at least 2 natural teeth with clinically visible crowns. Data were collected from 143 individuals residing in 13 nursing homes in the Flanders region, Belgium.

**Outcome variables and instrumentation:**
The outcome variables of oral health included dental plaque, periodontal condition, number of carious teeth, number of residual roots and the condition of removable dentures. The mentioned variables were all measured through clinical examination by two pre-trained investigators, one performing periodontal and plaque measurements while the rest of the measurements were carried out by the other examiner. Explanatory variables of each subject were gathered through a questionnaire. The data were subsequently transferred to a digital databank (Baltes®). Dental plaque was assessed using the Silness-Loë plaque index (PI) (score range: 0-3). The DPSI index (Dutch periodontal screening index, score range: 0-4) [25] was used to score the periodontal condition of each sextant (table 1). The highest DPSI score among the sextants of each patient was considered as the patient DPSI score. Caries was detected by an experienced investigator through both tactile and visual evaluations. The number of residual roots was assessed by clinical evaluation by means of direct observation of the root, palpation or clinically related symptoms such as fistula. During the clinical examination, additional data for each patient were registered in the examination form: gender, age, care dependency level (Katz index), number of medications taken, removable dentures (Presence or Absence) and the condition of the dentures.
Including a range of oral health variables, a compound index was created called the “Oral Health Index” (OHI) and calculated for each individual. This was a multi-aspect index to evaluate the condition of natural dentition, periodontium, oral hygiene and removable dentures and to exhibit the eventual need for an intervention. Each parameter was assigned to a score range and the oral health index of the individual was calculated as the sum of these scores, ranging from 0 (very good oral health condition) to 9 (very bad oral health condition). Due to the magnitude of the effects of periodontal status on general health, the periodontal vector was assigned a higher score range, hence a higher weight in calculating the index. An OHI score less than 3 was regarded as an acceptable state of oral health, while a score of 6 or higher pertained to a high need for dental care.

**Results**

One-hundred and forty three individuals were included in the study with a mean age of 82.7 years (SD 7.8, Range: 53-98) with three-quarters (76.2%, n=109) of them being woman and each individual taking an average of 8 (± 4) medications. The majority of the residents suffered from dementia with around 60% of them categorized in care levels “C” and “Cd”.

The mean number of teeth in each individual was 13.6 (± 7.0) with an average of 5.6 (± 4.3) teeth in the maxilla and 8.0 (± 3.8) teeth in the mandible. Furthermore, untreated caries tended to be a frequent finding with an average of 1.4 (± 2.2) carious teeth per patient, which was equivalent to 12% (± 19) of all teeth in each individual.

At subject level, 43% of the individuals had carious lesions. It was also slightly higher in subjects with dementia amounting to 1.58 for the “C,Cd” care level subgroup, while it was 1.28 and 1 for “O,A” and “B” subjects respectively. The average number of residual roots per individual was 1.8 (± 3.1), with upper jaw tending to harbor a higher average number of residual roots than the lower jaw (1.0 (± 2.0) vs. 0.80 (± 1.8)). In addition, patients with a higher level of care dependency tended to have more residual roots, since the groups “O,A”, “B” and “C,Cd” had on average 0.8 (± 1.4), 1.4 (± 2.3) and 2.1 (± 3.6) residual roots respectively. However, this trend was statistically not significant.

The mean number of tooth restorations per individual was 2.3 (± 3.3) with relatively more restorations per female residents than male residents (2.9 (± 3.5) vs. 1.0 (± 2.0)). The dental status of the study population is shown in table 1.
Plaque scores tended to be relatively high, considering the average plaque score being 2.13 on a scale of 3. Buccal sides showed significantly lower plaque scores than the lingual side (p<0.001). Moreover, female individuals manifested slightly less plaque than men. However, the difference was not of statistical significance.

Despite a slight tendency to higher plaque scores in the highly dependent individuals, the inter-group differences were statistically not significant in neither of classifications.

Calculus was found in 81 percent of subjects. Furthermore, more than half of the residents (53.1%) had a DPSI score of 3+ while DPSI scores 2, 4 and 3 came next in the order of frequency with 24.5%, 15.4% and 5.6% respectively. Only 1.4 percent of patients had a DPSI score 1 and there was no patient with DPSI score 0. There was also no significant correlation between different care levels and DPSI scores (p=0.430). Only less than one-third of the study population (28.7%) wore a removable denture. Nevertheless, more than half of them required some sort of intervention.

There was no difference between patients with different care levels in terms of prosthetic treatment need. The Oral Health Index ranged from 1 to 7 with an average of 4.6 (± 1.4). Only 6.3% of the subjects had an OHI score below 3 while 65.1% had a score of 3, 4 or 5. Furthermore, 27.3% of the individuals scored 6 or 7. The most
frequent OHI scores were 5 and 4 with frequency percentages of 25.9% and 25.2% respectively. The score1 had the lowest frequency among the registered values, recorded in only 0.7% of the cases. Figure 1 illustrates the distribution of different OHI scores in the study population.

![Bar chart showing the distribution of different OHI scores](chart.png)

**Figure 4.** The percentage of different OHI scores among the study population.

Among the subjects with care dependency level “O,A”, 5.6% presented an OHI score lower than 3, while this score was observed in 5.3% and 7.1% of “B” and “C,Cd” subjects respectively. Furthermore, 38.9% of the individuals in the “O,A” group had a score equal or higher than 6, while 20.6% of “B” individuals and 27.9% of the “C,Cd” subjects had this score. Despite the mentioned differences, no statistically significant relationship between OHI scores and the care dependency level of the patient could be established. However, the gender was significantly (p=0.009) correlated with OHI, as female individuals exhibited significantly lower OHI scores than male individuals.

Table 10 exhibits the OHI in all individuals and per gender. During the clinical examination, two individuals were diagnosed with mucosal lesions; one being a precancerous mucosal lesion and the other one was a case of bisphosphonate-related osteonecrosis of the jaw (BRONJ). However, due to the low frequencies of such cases, no statistical analysis was performed.