

Oral health problems and needs in nursing home residents in Northern Italy

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Objective: To describe the oral health status and treatment needs of a sample of elderly people residing in nursing homes in Northern Italy. **Research design:** a sample of 595 elderly residents (mean age 83.2±9.2 yrs), with adequate cognitive skills were examined by six calibrated dentists. **Results:** The sample (82% women) was divided into two groups: edentulous (43%) and dentate. In the edentulous group 58% wore dentures in both jaws, 8% in only one jaw and 34% had no dentures. The main problems were dirty or loose dentures and poor oral hygiene. In the dentate group the mean number of teeth was 8.4±7.4, 53% wore dentures (removable, fixed or a combination). Poor oral hygiene was found in 86%, root caries in 51% and coronal caries in 46%. Their main needs were professional cleaning (72%), oral hygiene instructions (62%) and tooth/root extractions (56%). While normative needs were noted for 82% of the whole sample, oral treatment needs were accurately perceived by only 20% of residents, poorly by 24%, while 46% indicated that they had no oral treatment needs.

Key words: Elderly, nursing home, oral health status, oral needs

Introduction

In most countries, including developing countries, the ageing population is increasing. Chronic diseases especially in older people (cardiovascular disease, hypertension, cancer and diabetes) are more frequent and share common risk factors with most oral diseases (Petersen and Yamamoto, 2005). As oral health and general health are interrelated, a preventive approach, consisting of daily oral hygiene procedures and regular check-ups can stabilize progressive lesions and prevent acute complications, so contributing to a gratifying oral function and a satisfactory quality of life even to the age of ninety years or more (Kiyak, *et al.*, 1993).

While poor oral health is not an inevitable consequence of ageing, extrinsic factors (systemic diseases, medications and lack of access to treatment) can damage oral health status (Papapoulos, *et al.*, 1991). Senior citizens now keep their teeth longer and so have different and more complex dental needs than older adult cohorts (Chalmers 2003, Petersen and Yamamoto 2005). In addition, a steadily increasing group of the oldest, elderly people is homebound, chronically ill, or institutionalised. They have a considerably increased risk of oral problems due to systemic diseases, impaired mobility, dependence on carers and the cost, or perceived cost, of treatment (Pearson and Chalmers 2004). Further there are no specific dental services for elderly people in Italy. In the Veneto Region, nursing home service specifications do not include oral

health care. Public dentistry was excluded at the national level from Primary Health Care in 2002. The oral care services provided by university dental clinics and some district dental clinics concentrate on children and those suffering from systemic diseases. Thus 95% of all dental care is provided by the private sector, which the elderly must also use. Until now, no studies of the oral status and treatment needs of a disadvantaged group of elderly, institutionalised adults, have been undertaken in Italy.

The problem of dental neglect and high levels of unmet dental needs among elderly nursing home residents has been widely documented (Strubig and Depping 1992), but not in Italy. The USA epidemiological studies (Kiyak *et al.*, 1993) demonstrated that between 50 and 70% of older adults have unmet dental needs. This problem is compounded in frail, elderly persons whose chronic diseases and the related prescribed medications, often compromise oral health. Furthermore, many of these patients must rely on others for their oral hygiene. Amongst institutionalized people high rates of caries, total tooth loss, poor oral hygiene, gingivitis, periodontal disease and soft tissue lesions have been documented recently (Ettinger and Mulligan 1999). Such poor oral health status is related to longstanding beliefs that tooth loss and decline of oral functions are age related and because dental care is sought only when there is pain or other acute reasons (Matear and Gudofsky, 1999); failed perception of treatment need in groups with high normative needs is also common in institutionalized people

(Matear and Gudofsky, 1999, Chalmers *et al.*, 2002); the cost of treatment and difficult access to dental offices, often related to low socio-economic status exacerbate the problem (Warren, *et al.*, 1994). Moreover, a chronological definition of the ageing population is not particularly useful in dentistry; rather, a functional definition based on the individual's ability to seek services seems more appropriate. Ettinger and Mulligan (1999) proposed a functional definition categorizing:

1. The functionally independent older adult
2. The frail older adult
3. The functionally dependent older adult

Nursing home residents mostly belong to categories 2 and 3 and have a worse oral health status than non-institutionalised people of the same age (Strubig and Depping, 1992; Australian Institute of Health and Welfare, 1999). Impaired manual dexterity combined with cognitive deterioration make management of daily oral hygiene difficult. Such elderly people must rely on nurse-aids for daily care; these staff are burdened and often uninformed about proper oral hygiene needs and techniques. Dentists do not attend nursing homes regularly to check and treat oral problems. All too often, a dentist is called only to treat acute infections and pain (Knabe and Kram, 1997).

The purpose of the survey was to evaluate the oral health status and treatment need of elderly people residing in institutions in Northern Italy and to investigate their subjective dental treatment demands and personal satisfaction of their oral health.

Methods

Until September 2002 observational studies in Italy did not require approval by an ethics committee for medical research. The directors of 14 medium sized nursing homes were contacted by letter between April and June 2001 with the offer of free dental screening for their residents; each director evaluated the feasibility of the survey and all agreed to participate. The directors were asked to select participants who had adequate cognitive skills to respond to questions about their oral health status and agreed to participate, with the explicit exclusion (to eliminate confounding variables) in case of :

- presence of depression syndromes in patients. In this type of pathology, self-care actions and mode of perception of their own treatment needs are often altered (Kiyak, *et al.*, 1993; Knabe and Kram, 1997; Matear and Gudofsky, 1999). Furthermore, anti-depression drugs may change the incidence of oral pathologies for both hard and soft tissues. For these reasons, patients being treated with anti-depressive drugs were excluded from the survey.
- absence of contact with the outside world that leads to a serious reduction in self-care and request for treatment (Avlund *et al.*, 2003).

From the population of 1,110 older adults in these institutions, 660 (59.4%) were included in this cross sectional study. Six dentists examined the residents. The oral examinations were conducted under artificial light with a mirror and a dental probe; intra-oral radiographs were

not used. A special clinical chart was used to record the status of each person. WHO criteria for caries diagnosis were used (visible cavitation into the dentine).

The following were evaluated for each dentate person (Kijak *et al.*, 1993):

- Dental (coronal and roots decay, retained root tips)
- periodontal : poor oral hygiene (inflammation and redness of gingival tissue, supragingival plaque and/or calculus), sore or bleeding gums, significant tooth mobility, intraoral swelling or suppuration
- prosthetic (removable, fixed or combined appliances),
- soft tissue lesions (candidiasis, ulceration, leucoplakia, lichen planus, oral cancer and for the edentulous ones :
 - wearing denture (on both or only in a jaw) or not
 - oral cleanliness (dirty denture)
 - soft tissue lesions.

Their normative treatment needs were recorded as: caries treatment, tooth/root extraction, fixing dentures, new prosthetic appliance, professional cleaning, OH instructions.

Perceived oral problems and treatment needs and personal satisfaction with their own oral conditions were ascertained using five questions :

1. Can you eat and speak without discomfort?
2. Do you feel any oral pain?
3. Can you swallow comfortably?
4. Do you clean anytime your teeth/appliances/dentures at all?
5. Do you think that you need any oral treatment?

The answers in terms of :

- Satisfaction with his/her own oral situation
- Personal care for oral and/or denture hygiene
- Subjective treatment needs
 - were scored as 0 (none), 1 (poor), 2 (medium), 3 (high), 9 (indeterminate) relating to the ability to eat and/or speak and/or swallow, feeling oral pain, awareness of oral status, requiring oral treatment needs.

The examiners were calibrated before the study at the WHO Collaborating Centre for Oral Epidemiology and Prevention, Dental Faculty, University of Milan, after a training period over two days to ensure uniform diagnosis and recording. A sub-sample of 60 residents was examined twice (with a one-month lapse of time between examinations), by all the dentists to ascertain the inter- and intra-examiner reliability.

Results

Analysis of the calibration examinations gave values of Cohen's K ranging from 0.84 to 0.88 (intra-examiner reliability) and of 0.85 (inter-examiner reliability).

Of the 660 eligible residents (30 died before and 35 denied their consent at the examination date), only 595 received dental screenings during the period between October 2001 and October 2002.

The residents ranged in age from 46 to 103 (mean 83.2 \pm 9.2); 82 % were women (485) with a female-to-male ratio of 4.4:1 (see Table 1); 43% had no natural teeth.

The prevalence of total tooth loss, by gender, was 39% men and 44% women. Fifty-eight percent (146) wore dentures in both jaws, 8% (21) in one jaw only and 34% (87) did not wear any. The two main oral problems were unstable dentures (44.1%) poor oral hygiene and dirty dentures (29.9%). Of this group 7.9% had sore or bleeding gums, 6.7% soft tissues lesions and 6.3% dry mouth. Treatment needs were mainly denture re-lining and oral hygiene instruction.

In this group 57% had some teeth or roots (the mean number of retained teeth was 8.4 ± 7.4) with no differences by gender; the mean number of retained teeth + roots in the overall sample was 9.4 ± 7.4 ranging from 1 to 30 (Table 2). Nearly three-quarters of this group (72.2%) had between 1 and 12 teeth or roots per person; and 27.8% had between 13 and 30. The mean DFT was 5 ± 5.7 ($D=4.5 \pm 5.5$; $F=0.5 \pm 1.7$). Fifty-three percent wore prosthetic appliances, removable (mainly), fixed or a combination; the remaining 47% had natural teeth only. In 85.9% oral hygiene was poor, 51.3% had root caries, 46% coronal caries, 72 % needed oral cleaning, 62 %

oral hygiene instruction and 56 % tooth or root extraction (50% were in urgent need of treatment). Only 3% had no immediate needs.

Nearly 50% were highly or rather satisfied with their own oral conditions, 65% indicated that they practised some form of mouth or denture cleansing. Ten percent (56) did not answer the questions clearly during the interviews and their data were excluded.

Oral treatment needs were poorly perceived by 24% and adequately perceived by 20% of respondents, while 46% (52% edentulous and 42% of the dentate group) did not express any subjective needs (Figure 1). Ten percent of the sample did not clearly answer the related question and their data were not recorded. Despite these figures, 82% of the overall sample was assessed as needing some form of oral health maintenance, in 40% urgently (Figure 2). Figure 3 shows the estimated treatment needs. In the edentulous sub-sample 180 residents (70.9%) needed denture re-lining; in the dentate group, 74.8% needed professional cleaning, 54.5% tooth or root extractions and 33.4% caries restorations.

Table 1. Distribution of subjects by gender and age

	<i>Overall Sample (n=595)</i>	<i>Males (n=110)</i>	<i>Females (n=485)</i>
Mean Age	83,2 ± 9,2	78,2 ± 9,3	84,5 ± 8,8
< 65 years	4%	8%	3%
65 – 74 years	16%	25%	15%
75 – 85 years	35%	43%	32%
>85 years	45%	24%	50%

Table 2. Distribution of dentate persons by number of teeth and/or roots.

<i>Number of teeth and/or roots</i>	<i>Number of subjects</i>	<i>%</i>
1 – 4	110	32.4
5 – 8	82	24.0
9 – 12	54	15.8
13 – 16	29	8.5
17 – 20	24	7.0
21 – 24	25	7.3
25 – 28	16	4.7
30	1	0.3

Table 3. Influence of age.

<i>Results</i>	<i>65-74 years of age (n= 79)</i>	<i>75-85 years of age (n= 213)</i>	<i>> 85 years of age (n= 282)</i>
total tooth loss (%)	34.2	44.6	53.2
total tooth loss without denture (%)	51.9	27.4	30.7
mean retained teeth (SD)	7.5 (8.3)	5.0 (7.1)	3.4 (5.6)
mean retained teeth+roots (SD)	7.9 (8.4)	5.6 (7.4)	4.0 (6.0)
mean sound teeth (SD)	4.4 (6.6)	2.4 (4.9)	1.2 (3.3)
mean DFT index (SD)	3.0 (4.4)	2.5 (4.2)	2.6 (4.6)
mean “D” component (SD)	2.6 (4.3)	2.2 (3.8)	2.5 (4.5)
mean “F” component (SD)	0.4 (1.4)	0.2 (1.5)	0.1 (0.6)

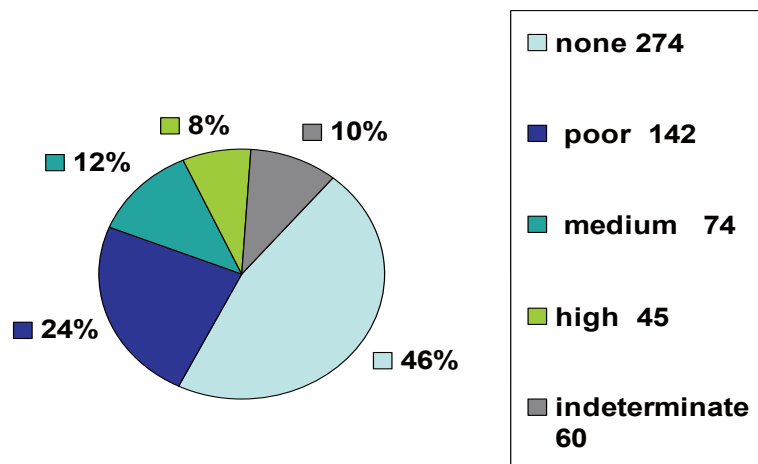


Figure 1. Subjective oral treatment needs (n = 595)

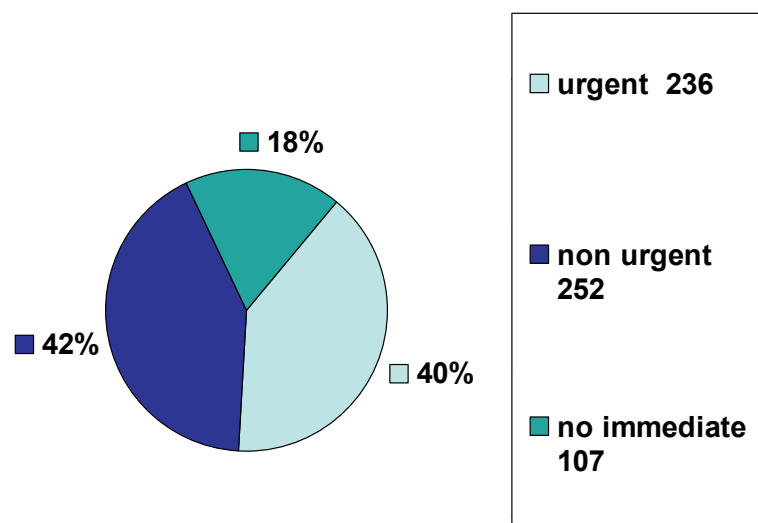


Figure 2. Objective oral treatment needs (n = 595)

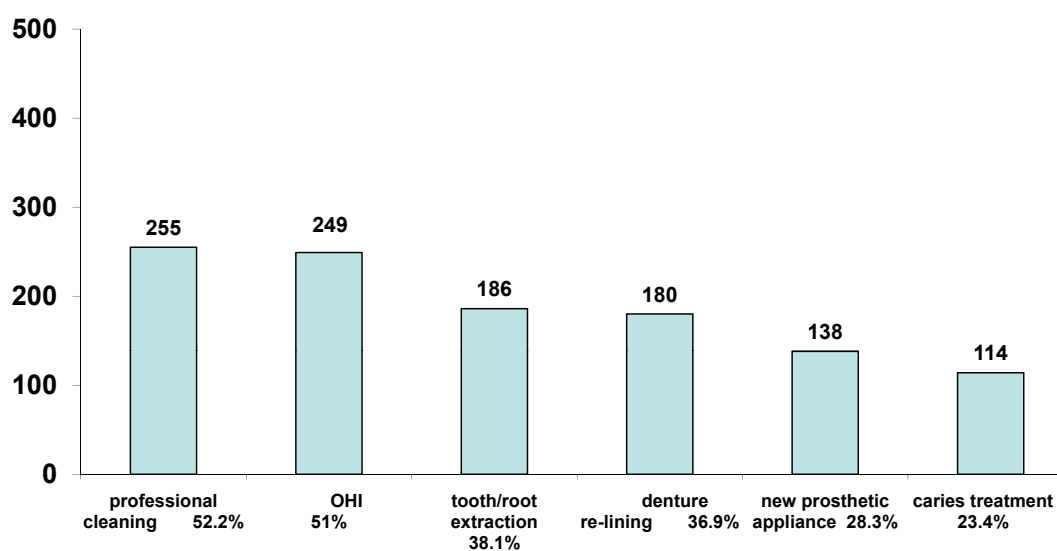


Figure 3. Oral treatment needs (n = 488) (107 subjects (18%) had no immediate needs)

Edentulousness increased by age and the percentage without dentures decreased to around 30%. In the dentate group the mean number of retained teeth/roots decreased, DFT remained stable around 2.9-2.6, the mean number of sound teeth decreased from 4.4 to 1.2 and the mean number of filled teeth remained low (0.4-0.1).

In the three age groups there were no significant differences detected regarding satisfaction with own oral health status, nor personal care for oral or denture hygiene nor in perceived or normative oral treatment needs.

Discussion

As only clinical examinations were carried out, it is probable that the burden of oral diseases was underestimated and, if radiographs had been made, additional carious lesions and periodontal pathology would have been detected. The sample was probably biased toward those at the better end of the oral health spectrum, given that the residents excluded from the oral screening were perhaps those in the greatest need. In the sample 43% were edentulous and 15 % had neither teeth nor dentures. These figures are high compared with data of some other western countries (Bradnock and Pine 1999; Österberg *et al.*, 1995). Lack of Italian data does not allow us to make comparisons at a national level. In Italy oral health is improving, following the same trends as western countries, hence there will probably be a decrease in total edentulousness in the next decade and a parallel rise in dentate elderly people. Root caries was more prevalent than coronal caries. Since the residents are less likely to make a dental visit for asymptomatic reasons, root caries tends to remain untreated. The oral hygiene of the dentate group was poor and they are likely to develop aspiration pneumonia (Sarin *et al.*, 2008), especially those who are bed-ridden and, although as complex periodontal treatment was not required, such conditions could be prevented by improvement in oral hygiene and removal of calculus deposits (Yoneyama *et al.*, 2002; Scannapieco 2006; El-Solh *et al.*, 2003).

The influence of age needs to be further investigated, especially the relationship between time elapsed since admission to an institution and general health status. The results for oral needs and satisfaction of the residents are similar to those found in different studies about satisfaction with oral conditions in Europe (Tsakos *et al.*, 2001). The data from this study were similar to that from countries like Greece. The role of food and the “importance of eating” are very similar in such countries. Despite the world-recognized deeply-rooted Italian gastronomical interest, and the need to provide satisfying meals for the residents, oral health and oral disability in older people are not yet seen as a part of overall health and so are not deemed critical for the quality of life by the central government. This attitude, in part, negatively influences the delivery of oral care.

The discrepancy observed between perceived and normative needs is similar to that reported in many studies (Kiyak *et al.*, 1993; Australian Institute of Health and Welfare, 1999; Chalmers *et al.*, 2002). Preventive dentistry was an unknown science when the subjects of this study were born and these residents perceive their oral health and treatment requirements only when pain

is involved. They consider any other dental care or prevention strategy as useless; the public dental care clinic is often far away from the nursing home and, even if treatment is free of charge, the residents must pay their own travel costs.

There is need for further investigation of the health status of older residents, behavioural and social factors, use of medications, nutritional and financial status, time since admission, previous dental treatment history and to compare oral health status of elderly people dwelling in the community and in institutions

In Italy there is a clear need for more active dental programmes for nursing home residents.. Dental health professionals, both dentists and hygienists, need to become more involved. But, even more important, education and continuing training must ensure suitable motivation and skills of nursing home carers to provide vital daily oral hygiene maintenance care (Wardh, *et al* 2003; Frenkel *et al.*, 2001; Petersen and Yamamoto, 2005)).

Conclusions

Poor oral hygiene and lack of dental care amongst nursing home residents in Northern Italy, especially for those with some remaining natural teeth, was found.

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