

# A Pilot Study of the Assessment of Fixed and Removable Oral Prosthetic Needs of Over 55-Year-Olds who Attended the Social Centre for Dentistry in Constanta, Romania, Between January 2009 and January 2010

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## Abstract

**Aims:** The aim of this study was to pilot the assessment of the fixed and removable prosthetic needs and demands of over 55-year-olds in Constanta, Romania. **Methods:** A self-reporting questionnaire was developed and given to a convenience sample of 180 patients aged over 55 years who attended the Social Centre for Dentistry in Constanta for routine care and treatment between January 2009 and January 2010. **Results:** All questionnaires were completed. The mean age of the sample was 69.2 years (range 55-85 years). The majority (110; 61%) were female. One hundred and thirty-two patients (73%) had either fixed or removable prostheses, 96 of whom were unhappy with their current oral prosthesis, in spite of the fact that 120 of these were less than 15 years old. One hundred and sixty-five (92%) reported that they would rely on their dentist to choose the type of prosthesis (fixed or removable) for them. However, 79 (44%) stated that they would prefer a fixed prosthesis and only 20 (11%) that they would prefer a removable prosthesis. **Conclusions:** The use of a convenience sample from one urban centre casts doubt on the representativeness of the sample. However, apart from the sampling technique, the other methodological aspects of the study appeared to work well. The main findings from the pilot may or may not be replicated by a larger study using a random sample.

*Key Words: Prosthetic Needs, Oral Health, Elderly Patients*

## Introduction

There is no doubt that the human population of the world is ageing, not just as individuals or communities but globally. It is expected that by 2030 almost one billion people worldwide will be 65 years and older. Approaches to the ageing process are also changing and no longer involve the idea of physical decline and illness. The rate of disability among older people has declined dramatically during the last 20 years [1], as the global population of elderly people has risen at an unprecedented rate. However, it is predicted that in more than 20 countries there will be a decline in the overall population in the next two decades. One such country is Romania, where it is predicted that the population will decline by 1.5 million by 2030, a decrease of 6.8%. At present, 26.6% of Romanians are aged over 55 years [2].

Poor oral health can lead to major problems in older populations, causing oral and dental conditions that can predispose to nutritional and communication difficulties or oral disease, including oral infections (caries, periodontitis, tooth loss, benign mucosal lesions, and oral cancer). Other common oral conditions found in this age group include xerostomia (dry mouth) and oral candidiasis, which may lead to acute pseudomembranous candidiasis (thrush), erythematous lesions (denture stomatitis), or angular cheilitis [3].

Many agree that about two-thirds of the elderly population have poor oral health but that only about one-third complains of a problem or sees a dentist [4]. There are numerous studies covering the issue of the need for prosthodontic treatment in edentulous elderly populations [5,6]. A Canadian study has identified the discrepancy between the need for prosthodontic treatment and complaints in

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an elderly edentulous population and assessed the factors associated with complaints, needs for treatment, and the use of dentures [7].

The need for an oral prosthesis may be assessed by comparing the need perceived subjectively by a patient (self-perception) with that assessed by an examiner according to the World Health Organization (WHO) diagnostic criteria [8] or through the use of the Geriatric Oral Health Assessment Index (GOHAI) [9].

Most reports that deal with prosthetic need patterns and approaches of dental care specific to older patients consider features such as the use of regular medication, oral problems, cleaning of teeth/removable prostheses, and oral health patterns [10].

It must be stressed that clinicians should pay particular attention to assessment of oral hygiene in relation to both the oral cavity and prostheses, the duration of the prostheses' use, and the appearance of subjective symptoms [11].

### Aims

Against this background, the current study aimed to pilot a methodology to assess the fixed and remov-

able prosthetic needs and demands of over 55-year-olds who attended a clinic in Constanta, Romania.

### Methods

This pilot study employed a questionnaire (*Figure 1*) and involved a convenience sample of 180 persons, aged 55 to 85 years, who attended the Social Centre for Dentistry in Constanta for routine care and treatment during the period between January 2009 and January 2010.

The study was planned as a pilot in order to test the questionnaire, methodology, and logistics prior to a larger study.

The survey was coordinated by one researcher, who trained and calibrated final-year students from the Faculty of Dental Medicine, Ovidius University, Constanta, Romania, to administer the questionnaire to the patients who formed the sample. The students were undertaking the gerodontology module of their course at the time.

The questionnaire included combined questions (both open and closed). It was designed to be self-administered, but the students were available to help participants if they had difficulties in understanding any questions.

Question No.	Question
1	Sex (male/female):
2	Age:
3	What is your level of education?
4.	Why have you come to the Social Centre?
5	Do you wear an oral prosthesis and what type is it?
6	How long have you worn it?
7	Are you content with your oral prosthesis?
8	What factors concern you if your prosthesis needs making or re-making?
9	Do you let your dentist decide with regard to your prosthetic treatment?
10	If you are not satisfied with the treatment option, do you choose another dentist?
11	Do you talk to your family about treatment options?
12	Do you think you are facing serious dental conditions?
13	Do you consider dental treatment is too expensive?
14	What would you choose between fixed and removable prostheses?
15	Do you feel pain when opening your mouth?
16	Do you hear noises when opening your mouth?
17	Do you bite your cheek?
18	Do you face difficulties in widely opening your mouth?
19	Does your mouth block?
20	Do you feel pain in your masticatory muscles when touching them?
21	Do you have pain in the temporomandibular joint amplified by the mandible movements?
22	Do you feel your jaws numb in the morning?
23	Do you feel that your cheeks are fatigued?
24	Has your family doctor recorded that you currently have any specific disease(s)?

*Figure 1. The questionnaire.*

All subjects were attending the clinic for routine appointments and were asked to volunteer to answer the questions in the questionnaire. It was explained that if they agreed to take part, their answers would be kept anonymous and no additional clinical procedures would be performed, over and above those that they would have received anyway. Written consent was obtained from all patients. The protocol for the study was approved by the Dean of the Faculty of Dental Medicine at Constanta. In view of these factors, it was deemed unnecessary to seek formal ethical approval for the pilot study. The responses to question numbers 15-23 will be presented in a second paper.

**Results**

Seventy (39%) patients were male and 110 (61%) were female. All forms were correctly completed; there were no errors, drop-outs, or non-responses. Forty-eight (27%) participants had no fixed or removable prostheses and 132 (73%) had either fixed or removable prostheses. Of those without prostheses, 18 (10%) were male and 30 (16.7%) were female.

The sample was divided into six age subgroups: 19 persons (10.6%) were 55-60 years, 40 (22.2%) were 61-65 years, 54 (29.4%) were 66-70 years, 39 (21.1%) were 71-75 years, 22 (13.3%) were 76-80 years, and five (3.3%) were 81-85 years (Table 1). The mean age of the sample was 69.2 years. The patients' level of education is presented in Table 2.

Those wearing oral prostheses were divided into three categories (Table 3) corresponding to the type of appliance: fixed, removable (dentures), or a

combination of both. There were 44 (24.4%) females and 26 (14.4%) males with fixed prostheses, 27 (15.0%) females and 20 (11.1%) males with removable prostheses (dentures), and 9 (5.0%) females and 6 (3.3%) males with both fixed and removable prostheses. The types of oral prostheses and the age of the wearer are at Figure 2.

*Table 1. Age Distribution of the Patients*

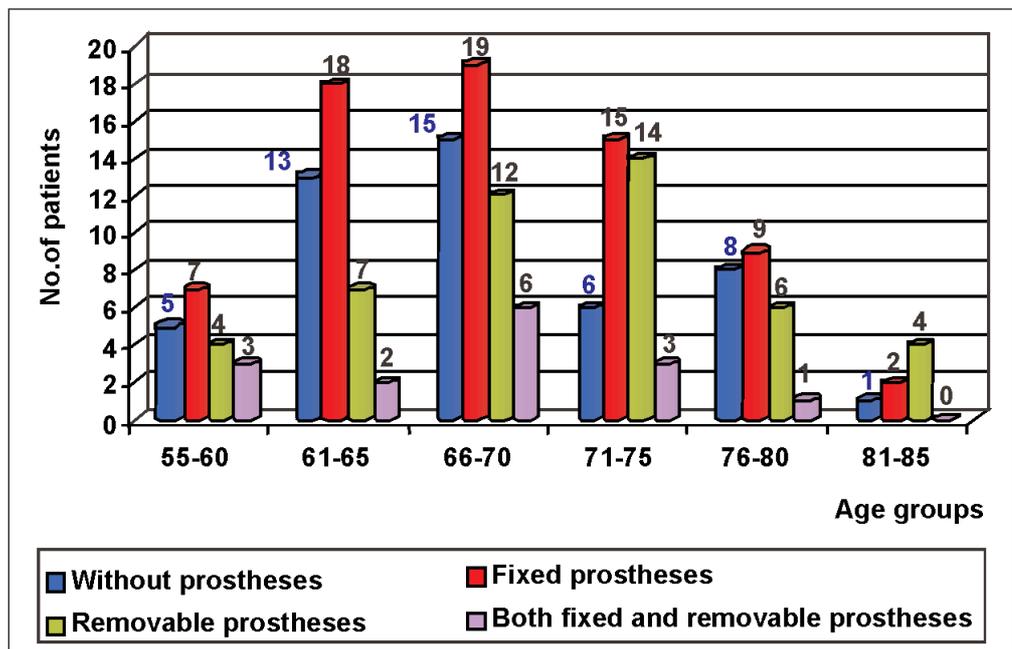
Age group (years)	Subjects n (%)
55-60	19 (10.6)
61-65	40 (22.2)
66-70	53 (29.4)
71-75	38 (21.1)
76-80	24 (13.3)
81-85	6 (3.3)

*Table 2. Patients' Level of Education*

Level of education	Subjects n (%)
Primary	37 (20.6)
Secondary	125 (69.4)
University	18 (10.0)

*Table 3. Type of Oral Prosthesis Worn*

Type of prostheses	Female n (%)	Male n (%)
Fixed	44 (24.4)	26 (14.4)
Removable	27 (15.0)	20 (11.1)
Combination of both	9 (5.0)	6 (3.3)



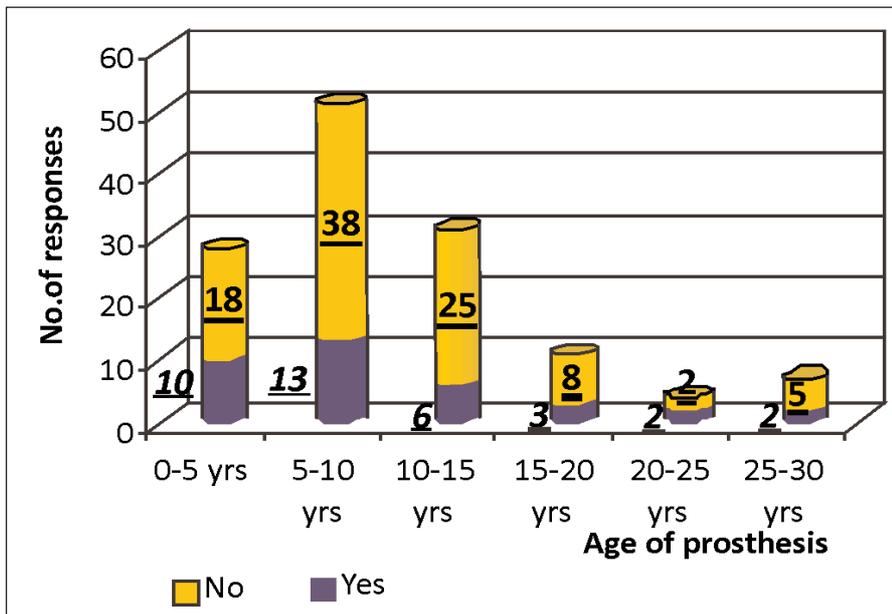
*Figure 2. Types of oral prosthesis worn and age of the patients.*

As far as the age of prosthetic appliances was concerned, the responses were: 29 (22.0%) patients—0-5 years old, 51 (38.6%)—5-10 years old, 30 (22.7%)—10-15 years old, 11 (8.3%)—15-20 years old, 4 (3.0%)—20-25 years old, and 7 (5.3%)—25-30 years old (Table 4). However, these results should be interpreted with caution because some respondents answered in terms of when they first wore an oral prosthesis, whereas others referred only to their present oral prosthesis.

**Table 4. Age of the Oral Prosthesis**

Age of prostheses (years)	Subjects n (%)
0-5	29 (22.0)
5-10	51 (38.6)
10-15	30 (22.7)
15-20	11 (8.3)
20-25	4 (3.0)
25-30	7 (5.3)

The responses to the question on age of the oral prosthesis worn and patients' satisfaction level



**Figure 3. Age of oral prosthesis and patients' satisfaction (yes = satisfied, no = not satisfied).**

**Table 5. Answers to the Six Yes/No Questions in the Questionnaire**

Question	Yes n (%)	No n (%)
Are you still content with your prosthesis?	36 (27.3)	96 (72.7)
Do you let the dentist decide for you as concerns the choice for prosthetic treatment?	165 (91.7)	15 (8.3)
If you are not satisfied with the treatment, do you go to another dentist?	114 (63.3)	66 (36.7)
Do you talk to a family member about treatment options?	111 (61.7)	69 (38.3)
Do you think you have serious dental problems?	122 (67.8)	58 (32.2)
Do you think that dental works are too expensive?	132 (73.3)	48 (26.7)

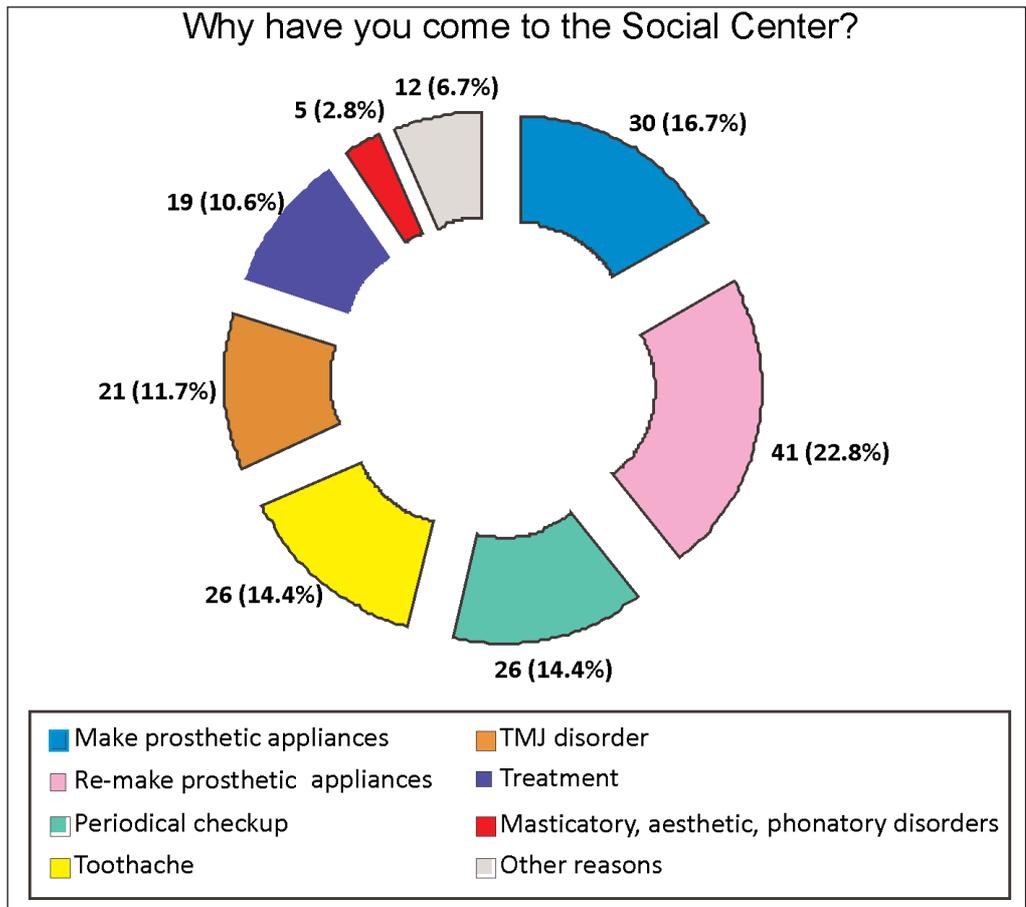
are shown in Figure 3. The results are divided into two categories corresponding to answer “Yes” or “No” to the question, “Are you still content with your denture?”.

The answers to the six closed questions with response options of “Yes” or “No” are shown in Table 5.

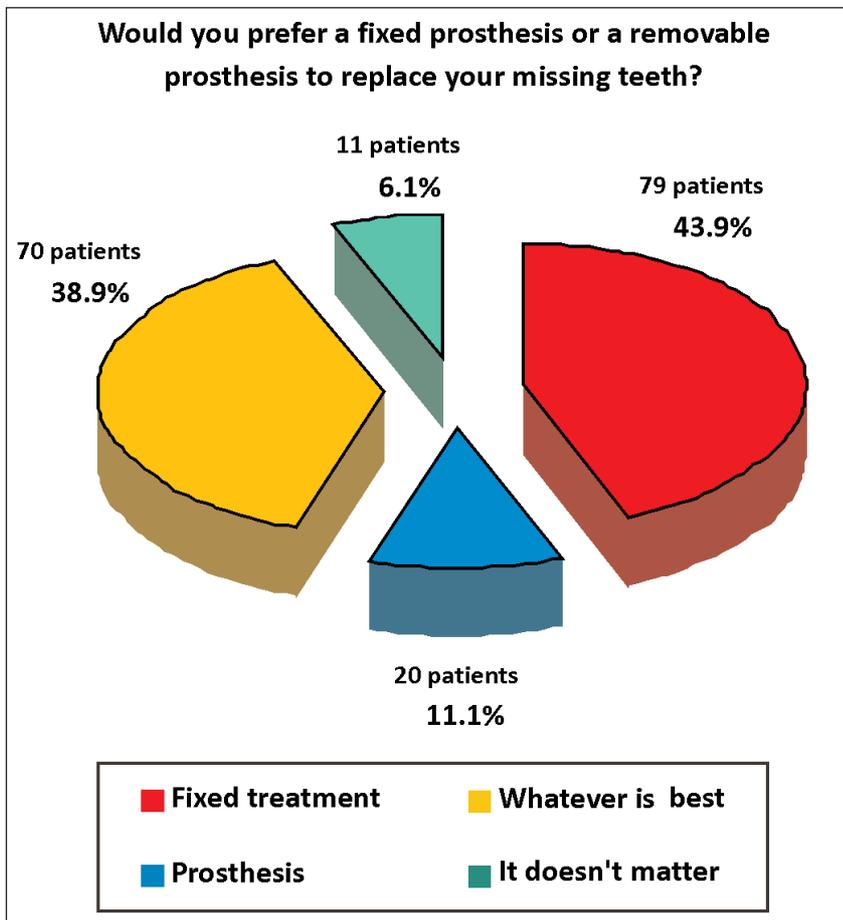
The reasons respondents gave for a visit to the dentist (at the Social Centre) are shown in Figure 4.

As far as attitudes to a new oral prosthesis were concerned, 118 (65.5%) patients responded that for them cost was a key factor, 57 (31.7%) that their oral health was a key factor, and 5 (2.78%) both of these factors.

In answer to the question “Would you prefer a fixed prosthesis (a bridge) or a removable prosthesis (a denture) to replace your missing teeth?”, 79 (43.9%) respondents opted for fixed prostheses and 20 (11.1%) for removable prostheses. However, a high number of 70 (38.9%) patients opted for “Whatever is best”, whereas 11 (6.1%) responded with “It doesn’t matter” (Figure 5).



*Figure 4. Reasons for visiting the dentist at the social centre.*



*Figure 5. Patient responses to the question "Would you prefer a fixed or removable prosthesis to replace your missing teeth?"*

A general question about the patients' health problems was answered as follows: 68 (37.8%) answered "No" when asked whether their family physician was aware that they had any specific current disease. The other 112 (62.2%) answered that they had been advised that they suffered from at least one disease. They reported the following conditions:

- Hypertension: 74 persons (41.1% of the total sample).
- Diabetes: 24 (13.3%).
- Cardiovascular diseases: 21 (11.7%).
- Gastric diseases: 13 (7.2%).
- Rheumatic diseases: 10 (5.6%).
- Hepatitis C: 7 (3.8%).
- Asthma: 2 (1.1%).
- Nerve disorders: 1 (0.6%).

### Discussion

It is planned to perform a large study investigating the oral prosthetic needs and occlusal and temporomandibular joint problems of over 55-year-olds. This pilot study enabled part of the proposed methodology to be tested and also helped to provide final-year dental students with insights into the oral prosthetic needs and expectations of patients aged over 55 years. The reasons for pilot studies have been well documented and include developing and testing adequacy of research instruments, assessing the feasibility of a full-scale study, designing a research protocol, assessing whether the research protocol is realistic and workable, identifying logistical problems that might occur using proposed methods, estimating variability in outcomes to help determine sample size, and training examiners in as many elements of the research process as possible [12].

Convenience sampling was used because it is a simple technique. However, it is recognised that it can lead to bias and an unrepresentative sample. Random sampling is planned for the larger study.

Patient responses to the questionnaire suggested that, in some cases with the help of students, they understood the questions and terminology used and were able to answer them and identify their own problems and needs (as shown in *Figure 1*).

More than a quarter of the respondents in the present study did not wear oral prostheses and felt that they did not want them. However, the majority had either a fixed or removable prosthesis and many considered that lack of money prevented them from visiting the dentist. Frequently, older people experience financial hardship following retirement and the cost, or perceived cost, of dental treatment, together

with poor attitudes to oral health, may mean that they do not visit a dentist. The consequences can be significant and may lead to an inability to chew and smile, and a reduction in the quality of life.

One-sixth of the patients reported that they had been wearing the same removable prostheses for 15 to 30 years. For some patients, the consequence was excessive wear of the occlusal surfaces of the artificial acrylic teeth and loss of face height (vertical dimension), indicating a need for new dentures to restore the vertical dimension. The prosthetic needs of elderly patients are numerous and varied, patients with prostheses being three times more numerous than those without (as shown in *Figure 2*).

Other studies focusing on the same issue of the need for prosthodontic treatment have also assessed theoretical, clinical, and practical factors, as well as various other factors that might help to predict this need. MacEntee and Mojon (1992) showed that about half of the 269 residents of long-term care facilities in Vancouver that they investigated identified a problem, and 83% of the subjects were either using a denture with a major fault or were missing a denture [7]. They suggested that 17% of the sample would not benefit from treatment because of a severely resorbed residual ridge, and that the presence of a complaint combined with a prosthodontic need indicated that about one-third (36%) would seek and benefit from treatment [7].

A study by Catic *et al.* (2000) assessed the number of missing teeth, the state of the existing prosthodontic appliances, and the need for their replacement in a sample of 120 elderly home residents [13]. Prosthodontic appliances were evaluated according to the Karlsson's index (1986) for crowns and bridges [14], and according to the modified Nevalainen *et al.* (1997) index for the evaluation of the complete dentures [15]. It also assessed the need for prosthetic treatment. On average, the crowns were older and in poorer condition than the bridges. More than 82% of the subjects were in need of fixed, removable, or combined prosthodontic treatment [13]. In the current pilot study, no attempt was made to differentiate between the different types of fixed and removable oral prostheses. In the main study, fixed prostheses will be subclassified into crowns and bridges and removable prostheses into complete and partial dentures.

Finally, Colussi *et al.* (2009), assessing the prosthetic need WHO index, concluded that the professional criteria based on WHO guidelines differed from the self-perceived need [8]. Elderly male subjects living in a rural area who did not participate in third age groups and who had not sought dental services for most of their lives were the least likely to per-

ceive the need for prosthetic treatment, thereby underestimating their oral health needs [8]. The sample comprised 270 elderly residents in Brazil. Only five patients identified the need for a prosthesis that had not been identified by the examiner [8]. In the case of 172 elderly subjects, there was agreement between the self-perceived and professionally observed treatment needs. The need for prosthesis was found in 93 elderly subjects who did not perceive any need for prosthetic treatment. The multivariate analysis showed that the variables age, gender, residential area and form of service most sought after during the subjects' lives were significantly associated with a better self-perception of oral health [8].

A further factor that needs to be considered is that the patients of the Social Centre in Constanta come from an urban area and there are major differences between urban and rural areas as concerns the distribution of the older population. Moreover, the older population in rural zones is greater than in urban ones. The ageing population in rural areas is concentrated around certain locations and many younger members of the population have left to find employment. In general, in Romania there are few opportunities for employment and education and the provision of health services is poorer than in urban areas. The elderly in rural zones have lower incomes, rare contact with their children, and poor access to social and health care. Therefore, a large proportion of elderly Romanian people feel that insufficient health care is their most serious problem particularly among rural residents [16].

A specific problem relates to older women who are more numerous and have a longer life expectancy than men. Their health problems illustrate health problems of the elderly in general [17]. The sample in the current study, with over 60% being female, reflected the current gender imbalance in elderly Romanians.

It was interesting to find that in the current study, most patients were aware of their oral health and trusted the dentist to decide on the appropriate prosthetic treatment. Most of them also reported that they talked with members of their family about potential treatment. There was a trend for them to

prefer fixed treatments (44%) rather than removable prostheses (11%), although 39% responded that they would accept whatever the dentist thought was best for them.

The main study that will follow this pilot will also consider the categories of potential patients classified according to their abilities/disabilities, as elderly patients are not always capable of tolerating prostheses, particularly oral ones. This can be for a number of reasons. In the current pilot, 112 (62.2%) patients reported that their family physician had recorded that they had at least one disease or condition, the most frequent being hypertension, cardiovascular and rheumatic diseases. Elderly people have numerous diseases and conditions (poly-pathology), often associated with numerous medications (poly-pharmacotherapy) [18]. Unfortunately, excessive medication can lead to adverse drug reactions (ADR) to medication [19], many of which have oral manifestations such as xerostomia, lichenoid reactions, gingival overgrowth, and taste disturbance [20].

The WHO has drawn attention to the oral health needs of elderly people, pointing out that oral diseases are usually progressive and cumulative [21]. In terms of quality of life (QoL), having fewer teeth, wearing removable prostheses, and an unmet need for dental treatment have been associated with lower QoL. Thus it is important to gain further understanding of the oral problems of the elderly and of their prosthodontic problems.

As stated previously, the larger project that will follow this pilot will consider these problems.

## Conclusions

This pilot study tested a methodology for a future larger study. The use of a convenience sample from one urban centre casts doubt on the representativeness of the sample. However, apart from the sampling technique and the need to subclassify fixed prostheses into crowns and bridges and removable prostheses into complete and partial dentures, the other methodological aspects of the study appeared to work well. The main findings from the pilot may or may not be replicated in a larger study using a random sample.

## References

1. National Institute on Aging/National Institutes of Health/U.S. Department of Health and Human Services. Rising numbers of the oldest old. In: *Why Population Aging Matters: A Global Perspective* (pp. 10-15). Bethesda, MD: NIA/NIH; 2007.
2. Source: U.S. Census Bureau. International Data Base. Accessed (2010 May 15) via: <http://www.census.gov/ipc/www/idb/region.php>
3. Gonsalves WC, Wrightson AS, Henry RG. Common oral conditions in older persons. *American Family Physician* 2008; **78**: 845-852.

4. Bedi R, Gulati N, McGrath C. A study of satisfaction with dental services among adults in the United Kingdom. *British Dental Journal* 2005; **198**: 433-437.
5. Isaksson R, Becktor JP, Brown A, Laurizohn C, Isaksson S. Oral health and oral implant status in edentulous patients with implant-supported dental prostheses who are receiving long-term nursing care. *Gerodontology* 2009; **26**: 245-249.
6. Yoshida M, Kikutani T, Okada G, Kawamura T, Kimura M, Akagawa Y. The effect of tooth loss on body balance con-

trol among community-dwelling elderly persons. *International Journal of Prosthodontics* 2009; **22**: 136-139.

7. MacEntee MI, Mojon P. Discrepancy between need for prosthodontic treatment and complaints in an elderly edentulous population. *Community Dentistry and Oral Epidemiology* 1992; **20**: 48-52.

8. Colussi CF, De Freitas SFT, Calvo MCM. The prosthetic need WHO index: a comparison between self-perception and professional assessment in an elderly population. *Gerodontology* 2009; **26**: 187-192.

9. Murariu A, Hanganu C, Bobu L. Evaluation of the reliability of the Geriatric Oral Health Assessment Index (GOHAI) in institutionalized elderly in Romania. *Oral Health and Dental Management in the Black Sea Countries* 2010; **9**: 11-15.

10. Sugihara N, Tsuchiya K, Hosaka M, Osawa H, Yamane G-Y, Matsukubo T. Dental care utilization patterns and factors associated with regular dental check-ups in elderly. *Bulletin of Tokyo Dental College* 2010; **51**: 15-21.

11. Ault J, Berman SA. *Temporomandibular Disorders*. New York: Medscape. Updated 2010 Oct 11. Accessed (2010 Jan 22) via: <http://emedicine.medscape.com/article/1143410-overview>

12. van Teijlingen ER, Hundley V. The importance of pilot studies. *Social Research Update* 2001; **35**. Accessed (2010 Apr 23) via: <http://sru.soc.surrey.ac.uk/SRU35.html>

13. Catic A, Jerolimov V, Catovic A. Tooth loss and the condition of the prosthodontic appliances in a group of elderly home residents. *Journal of Oral Rehabilitation* 2000; **27**: 199-204.

14. Karlsson S. A clinical evaluation of fixed bridges, 10 years following insertion. *Journal of Oral Rehabilitation* 1986; **13**: 423-432.

15. Nevalainen MJ, Rantanen T, Närhi TO, Ainamo A. Complete dentures in the prosthetic rehabilitation of elderly persons: five different criteria to evaluate the need for replacement. *Journal of Oral Rehabilitation* 1997; **24**: 251-258.

16. Barysenka L. Oral health of the elderly people living under different conditions. *Journal of Oral Health and Dental Management* 2006; **V(2)**: 16-20.

17. Petersen PE, Yamamoto T. Improving the oral health of older people: the approach of the WHO Global Oral Health Programme. *Community Dentistry and Oral Epidemiology* 2005; **33**: 81-92.

18. Ursache M, Gradinaru I, Dascalu C. Aspects of oral health evaluation in elderly. *Journal of Oral Health and Dental Management* 2006; **V(2)**: 8-15.

19. Lawrenson J. A review of drug-induced side-effects in the elderly. London: Medicines Support Unit for Optometrists, City University; 2009. Accessed (2010 Apr 2) via: [www.medsupport.org.uk/IntegratedCRD.nsf/pdf](http://www.medsupport.org.uk/IntegratedCRD.nsf/pdf)

20. Doucet J, Capet C, Jégo A, Trivalle C, Noël D, Chassagne P, *et al.* Drug used in the elderly. Undesirable drug effects in the elderly: epidemiology and prevention. *Presse Medicale* 1999; **28**: 1789-1793.

21. Petersen PE. Priorities for research for oral health in the 21st century—the approach of the WHO Global Oral Health Programme. *Community Dental Health* 2005; **22**: 71-74.