Dental Health Differences by Social Class in Home-Dwelling Seniors of Barcelona, Spain

Vladimir Pizarro, DDS, MPH; Montserrat Ferrer, MD, PhD; Antonia Domingo-Salvany, MD, PhD; Joan Benach, MD, PhD, MD, PhD; Carme Borrell, MD, PhD; Josep Puigvert, BSc; Jordi Alonso, MD, PhD

Abstract

Background: The aim of this study was to assess dental health differences by social class in home-dwelling seniors in Spain. **Methods:** A cross-sectional house-hold survey of a cohort of senior residents in Barcelona (Spain) was undertaken. Of 891 survivors (72 years or older), 561 (62.9%) oral examinations were completed according to the DMF Index (Decayed, Missing and Filled teeth). **Results:** 42% of participants were edentate. The individuals of social class IV-V were more likely to be edentate, and to have fewer than 15 teeth compared to those in social class I-II. The DMF Index in dentate individuals (Adjusted mean=16.4) also showed significantly worse dental health for lower social classes (p = 0.001). **Conclusions:** The results of this study indicate a different level of utilization of dental health services and dental health by social class in home-dwelling seniors. Further research is needed to understand the barriers of access and social inequality.

Key Words: DMF Index; edentulism; aged; socio-economic factors; oral health.

Introduction

Studies conducted in many locations have shown that the elderly suffer from poor dental condition. In developed countries, the proportion of edentulism amongst people aged 65-74 ranged from 65% in the Netherlands (1) to less than 30% in Sweden (2) and the US (3). In addition to these major problems, socio-economic differences in dental health status and/ or dental service use are evident worldwide (3,4, 1,5).

The study of socio-economic differences in dental health status is of particular importance to countries like Spain, which has a National Health System (NHS) that provides universal and free health coverage to all ages including seniors. However, it did not cover any adult dental treatment, apart from extractions (6). The Span-

ish NHS was established in 1986, but the previous General Health Service also had a high coverage rate (84% in 1973), resulting in a low percentage of uninsured individuals. Part of the population has private insurances purchased by individuals to provide services beyond those offered by the NHS. Again, this situation differs for dental care services, where the fee-forservice is the almost dominant method of payment (6). In fact, the most recent Barcelona Health Survey from the year 2000 showed that of individuals who visited a dentist during the previous two weeks, 69% reported direct fee-for-service payment (7). The aim of this study is to assess dental health differences by social class in homedwelling seniors of the city of Barcelona, Spain.

Methods

A cohort of home-dwelling residents aged 65 and older from the 1986 Barcelona Health Interview Survey was studied (8). The data presented here is based on the final evaluation conducted in 1994, the only wave in which a dental examination was included. From 891 survivors, 69 could not be contacted, 68 refused, and 754 were home-interviewed. Dental examination data were missing for 193 of the interviewees, and the final sample size was 561 (62.9% of the survivors).

Survey interviewers, especially trained by the University of Barcelona Dentistry School, performed the dental examination according to the DMF (Decayed, Missing and Filled teeth) Index. The information on dental health service utilization was measured with the question: "When did you last visit a dentist? Less than 6 months ago, 6 months to 3 years ago, more than 3 years ago, never." Social class was obtained from the head of the household's occupation, using a widely-used Spanish adaptation of the British Registrar's General classification (9): classes I-II comprise senior managers or independent professionals associated with University degrees (i.e. lawyers, doctors or nurses), artists and athletes; class III includes junior managers, administrators and employees, emergency

Send correspondence and reprint requests to: Dr. Montserrat Ferrer, Health Services Research Unit, Institut Municipal d'Investigació Mèdica (IMIM-IMAS), c/ Doctor Aiguader 80, 08003 Barcelona, Spain. Phone: (+34) 93 225 7553; Fax: (+34) 93 221 4002. E-mail: mferrer@imim.es. Drs. Pizarro, Ferrer, Domingo-Salvany and Alonso and Mr. Puigvert are affiliated with the Health Services Research Unit. Institut Municipal d'Investigació Mèdica (IMIM-IMAS), Spain. Dr. Benacht is affiliated with the Occupational Health Research Unit, Universitat Pompeu Fabra, Spain. Dr. Borrell is affiliated with the Agència de Salut Pública de Barcelona, Spain. Dr. Alonso is also affiliated with the Universitat Autònoma de Barcelona, Spain. Sources of Support: This study was supported in part by funds from the Fondo de Investigación Sanitaria (91/0629), Instituto de Salud Carlos III (RCESP network of excellence C03/09), and DURSI Government of Catalonia (2001 SGR 00405). Vladimir Pizarro was supported by a grant from Fundación BBVA-Fundación Carolina (Public health program). Manuscript received 1/06/06; accepted for publication 8/06/06.

and public safety workers; and classes IV-V are manual workers. Health-care coverage was grouped into: Private health insurance, Public health insurance only, and Uninsured. Only a proportion of individuals with private health insurance in Spain have a coverage which includes dental treatments (6) but no information on specific dental coverage was registered. According to the data from the Barcelona Health Survey of the year 2000, only 16% of the individuals who visited a dentist during the previous two weeks had the dental services covered by private insurance(7).

The x² and Kruskal Wallis tests were used, as appropriate, to compare social classes. Also a 3-category multinomial regression models were constructed to calculate Age and Gender Adjusted OR for Social Class, using the class I-II as the reference. To evaluate the association of the DMF Index with social class, among dentate individuals, multivariate log-linear Poisson models were constructed to avoid problems stemming from their skewed distribution. Edentate participants were excluded from this analysis since the objective was to focus on the health status of the remaining teeth. This study received approval from the ethics committee of the sponsoring institution. All subjects provided consent before participation.

Results

The mean age of the 561 participants with oral examination was 79 years, 65.6% were female, and 58.3% had some teeth preserved (Table 1). Bivariate analysis showed statistically significant differences between social classes for number of teeth, health care coverage, time from last dental visit, age, and gender, and also for all DMF sub-indices (except D).

The age and gender adjusted ORs show that those individuals belonging to the social class IV-V were significantly more likely to have 1-14 teeth or to be edentate when compared to the social class I-II (OR= 1.9 and 2.4, respectively). The last dental visit being more than 3 years ago was more likely among participants from lower social classes (OR= 2.1 for social class III, and 2.8 for social class IV-V). Regarding DMF Index, the M sub-index is the biggest component for all social classes: from a mean of 17.6 (SD = 10.1) in social classes I-II to 20.2 (SD = 9.3) in social classes IV-V.

The log-linear Poisson multivariate models with the DMF Index and sub-indices as dependent variables amongst the dentate individuals (n=327) are shown in Table 2. Seniors and individuals of lower social class had more decayed and lost teeth, and fewer filled teeth (p<0.001). Addition-

Table 1
Characteristics of the Sample. Age and Gender Adjusted OR for Social class
(Reference category: Social class I – II)

			Adjusted OR (C.I. 95%) using Class I-II as reference				
	All participants (n=561)	Social Classes I-II (n=116)	Social Class III (n=134)	Social Classes IV-V (n=311)	p-value	Social Class III	Social Classes IV-V
Number of teeth							
≥ 15 teeth	20.7	38.8	36.6	24.4	0.01		
1 – 14 teeth	23.9	25.9	22.4	31.2		1.0 (0.5 – 1.9)	1.9 (1.1 – 3.4)
Edentate (0 teeth)	55.4	35.3	41.0	44.4		1.5 (0.8 – 2.8)	2.4 (1.4 – 4.1)
Health care coverage							
Private insurance	34.8	49.1	47.0	24.1	< 0.001		
Public insurance only	62.9	43.1	52.2	74.9		1.2 (0.7 – 2.0)	3.6 (2.2 – 5.7)
Uninsured	2.3	7.8	0.7	1.0		0.1 (0.1 – 0.9)	0.3 (0.1 – 1.01)
Last dental visit							
< 6 months ago	15.0	22.4	15.7	11.9	0.04		
6 months - 3 years	30.3	33.6	29.1	29.6		1.3 (0.6 – 2.7)	1.8 (0.9 – 3.3)
>3 years	54.7	44.0	55.2	58.5		2.1 (1.03 – 4.1)	2.8 (1.5 – 5.2)
Age							
72-74	30.7	19.8	38.8	31.2	0.03		
75-84	57.9	67.2	51.5	57.2			
85 and over	11.4	12.9	9.7	11.6			
Gender							
Female	65.6	59.5	58.2	71.1	0.01		
Male	34.4	40.5	41.8	28.9			
		mean (SD) p-va					
DMF Index	21.3 (8.3)	19.6 (8.8)	20.8 (8.4)	22.1 (8.0)	0.01		
Decayed teeth	1.3 (3.1)	1.1 (2.9)	1.4 (3.1)	1.3 (4.5)	0.24		
Missing teeth	19.3 (9.7)	17.6 (10.1)	18.6 (9.9)	20.2 (9.3)	0.04		
Filled teeth	0.7 (2.4)	0.9 (2.3)	0.9 (2.9)	0.5 (2.2)	0.01		

*p values were calculated by using Kruskall-Wallis test

ally, the date of the last dental visit consistently appeared to be significantly associated with the DMF subindices. Those dentate participants reporting more than 3 years from last dental visit presented more decayed and less filled teeth than those who visited the dentist in the previous 6 months (p<0.001). Health-care coverage was significantly associated with the F sub-Index, with uninsured individuals having fewer filled teeth (p=0.01). However, no differences were found between health care coverage groups (private, public insurance or uninsured) for the sub-indices D and M.

Discussion

Elderly home-dwelling subjects from Barcelona (aged 72 and over) have accumulated many dental health problems, particularly a high rate of edentulism (41.7%). Amongst dentate individuals, the low number of remaining teeth, together with the unmet needs detected (from a mean of 14.9 remaining teeth, an average of 2.2 decayed which need to be filled and only 1.2 filled teeth) indicates that extraction has been the main dental treatment. In addition, significant and consistent differences were shown by social class indicating that dental health problems are higher and visits to the dentist are less frequent for lower social classes. On the other hand, the association between social class and use of dental services is partially explained by the prevalence of edentulism. While the 20% of dentate individuals reported having visited a dentist in the past 6 months, among edentate subjects this proportion is only 7.7%; and 67% of the edentulous reported to have seen the dentist over 3 years ago. This result may indicate that edentate seniors perceive no need to see a dentist.

No differences on missing and decayed teeth between dentate participants with public and private insurance were detected. This finding appears to support the notion that only very small fraction of private insurance schemes provide substantial dental care services beyond the basic services already offered by the NHS. Table 2Adjusted mean scores in the DMF Index (obtained with the Log-linear
Poisson Model) for Dentate Individuals (n=327)

_	D		М		F		DMF	
	Adjuste	ed 1	Adjustee	d A	djusted	d A	Adjusted	1
	Mean	p value	Mean	pvalue	Mean	p value	Mean	p value
Age						a		<u> </u>
72-74	1.3		11.1		1.1		12.6	
75-84	1.2	0.52	12.2	0.01	1.4	0.01	14.7	0.01
85 and over	2.9	< 0.001	16.9	< 0.001	0.1	0.01	20.5	0.001
Gender								
Female	1.3		11.1		1.1		12.6	
Male	2.1	< 0.001	10.1	< 0.001	1.0	0.26	13.6	0.50
Social class								
Class I-II	1.3		11.1		1.1		12.6	
Class III	1.6	0.06	11.2	0.55	1.1	0.45	14.2	0.13
Class IV-V	1.6	< 0.001	13.2	< 0.001	0.7	< 0.001	15.5	< 0.001
Health care covera	ge							
Private insuran	ce 1.3		11.1		1.1		12.6	
Public insurance	e 1.1	0.55	10.7	1.00	1.3	0.08	13.1	0.42
Uninsured	1.5	0.13	11.1	0.44	0.1	0.01	12.8	0.40
Last dental visit								
<6 mo ago	1.3		11.1		1.1		12.6	
6 mos - 3 yrs ag	o 1.3	0.94	9.9	0.01	1.0	0.45	12.2	0.6
>3 yrs ago	1.9	< 0.001	10.7	0.60	0.5	< 0.001	13.2	0.01

Only uninsured participants presented a significantly lower number of filled teeth that could not be explained by having fewer remaining teeth. In fact, missing teeth adjusted means of dentate participants were very similar in each health care coverage group (11.1, 10.7, and 11.1 in individuals with private, public insurance, and uninsured, respectively). However, results of the uninsured group should be interpreted with caution since it had a small sample size, only 13 individuals from those participants with oral examination had no public or private insurance (2.3%)

Due to recognized differences in the health care systems, it is generally accepted that there are less health differences by social class in Europe than in the US. Particularly, the health insurance plan for older adults in US (Medicare) has little coverage for dental services. However, while more than 73.4% of older dentate adults visited a dentist within the previous year in Iowa (10), in this study only 20% of dentate individuals reported having visited a dentist in the past 6 months. This lower level of utilization among Spanish older adults may be due to a lack of perceived need, a shortage of professionals or both. The number of dentists in Spain was extremely low in the late 20th century (1/10,000 inhabitants in 1980), with an exponential increase that led to a ratio of 1/ 3,000 in 1995 (6). Since it is expected that this change will have important effects on Spanish older adult cohorts in the future, information on the initial situation will facilitate the analysis of evolution and its related factors.

Limitations of this study on dental diagnosis should be considered. However, examiner training and methods used were comparable with epidemiological studies (4,10). Secondly, dental examination was only performed on 561 individuals (62.9% of the total alive participants). Regarding its representativeness, it is important to remark that 193 additional interviewees who did not receive dental examination were similar to those who did (data not shown).

In summary, the high number of missing teeth together with the low proportion of dentate and edentate individuals who visited the dentist in the previous 3 years, suggest a problem of use of dental services in Spain, and may reflect the historic pattern of low dentist to population ratio. This is the first study to demonstrate social class differences in the dental health of seniors from the general population in Spain.

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