Social, Demographic, Clinical and Lifestyle Determinants of Dental Care Visits in an Urban Sample of Portuguese Adults

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Purpose: To describe the use of dental care services in an urban sample of adults from Porto, and to quantify the association between dentist visits and social, demographic, clinical and lifestyle factors.

Materials and Methods: Participants were selected by random digit dialling, and interviewed with a structured questionnaire to obtain information on socio-demographic, clinical and lifestyle variables. Crude, and age- and education-adjusted Odds Ratios (OR_{adj}) were computed by unconditional logistic and multinomial logistic regression to quantify the association between the use of dental care and each exposure.

Results: In the year preceding the interview, 51.1% of the subjects visited a dentist at least once. Dental visits were less frequent in subjects aged ≥ 70 years compared to those aged 18–29 years (OR_{adj} = 0.66, 95% Confidence Interval [CI]: 0.45–0.98), and increased with education (from 23.8% in subjects with 0–3 school years to 67.9% in those with > 12 years of education, $p < 0.001$ for trend). The use of dental care services at least once in the previous year was more frequent in white-collar workers (OR_{adj} = 0.69, 95% CI: 0.52–0.91), when a private doctor was the usual source of medical care (OR_{adj} = 1.38, 95% CI: 1.06–1.79) and in those who visited a medical doctor in the previous year (OR_{adj} = 1.96, 95% CI: 1.57–2.45). Diabetics were less likely to seek dental care (OR_{adj} = 0.67; 95% CI: 0.48–0.93).

Conclusion: Nearly half the adults from Porto had not visited a dentist in the previous year. Education was the factor most strongly associated with dentist attendance. No differences were observed regarding the determinants of one or two or more dental visits in the previous year.

Key words: dental care, epidemiology, oral health, Portugal

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Oral health refers specifically to the existence of good teeth and the absence of soft tissues lesions, chronic orofacial pain, oral cancer, congenital malformations and other diseases of craniofacial complex (World Health Organization, 1999; Petersen, 2003). Dental caries and periodontal diseases are the most prevalent oral health problems (Petersen, 2003) and are considered major public health issues by the World Health Organization (WHO) (Petersen, 2003). However, these can be largely prevented through the adoption of adequate dental hygiene practices and a non-cariogenic diet (Marshall et al, 2003; Touger-Decker and van Loveren, 2003), avoidance of tobacco smoking (Amarasena et al, 2002; Boutigny et al, 2005; Beaglehole and Benzian, 2005) and alcohol consumption (Altieri et al, 2004; Figuero Ruiz et al, 2004), and the regular use of dental care services (Holst, 1979; Matos et al, 2001; Mumcu et al, 2004). The International Dental Federation (Cohen, 1987) considers that the frequency of dental care visits is influ-

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enced by factors such as fewer human resources in the public health system, lack of public support for oral health in prevention and promotion programmes, and factors related to the perception of need, treatment, anxiety and fear.

Specifically in Portugal, the low individual income and the organisation of oral health care services (Direcção-Geral de Saúde, 2005), including asymmetries in the geographical and institutional distribution of dentists and the lack of dental care services in the public sector of health, are major obstacles to dental care utilisation. Such barriers compromise the timely and quantitatively adequate use of these specific health services, and may contribute to the ranking of Portuguese oral health indicators below that observed in many other European countries (WHO Oral Health Country/Area Profile Programme, 2007). In the late 1990s, Portugal presented an index of Decayed, Missing and Filled teeth (DMFT) at 12 years of 2.95 (Direcção-Geral de Saúde, 2000), higher than the European average.

The present study aimed to describe the use of dental care in a random sample of urban adults and to quantify its association with social, demographic, clinical and lifestyle factors, in a country where dental care is delivered mainly by the private health sector.

PARTICIPANTS AND METHODS

The present study was based on a health and nutrition survey performed in an urban sample of Portuguese adults, aged 18 to 92 years, living in Porto, that has been described before (Santos and Barros, 2003, 2004). Briefly, 2488 individuals were selected by random digit dialling, having households as the sampling unit. When a household was selected, all residents were identified by age and gender, and one resident (aged 18 or more years) was randomly selected as the respondent, without replacement if there was a refusal. The participation rate was 70% (Ramos et al, 2004). A visit to the Department of Hygiene and Epidemiology of the Porto Medical School was scheduled by telephone according to the participant's convenience. A personal interview was then performed by trained interviewers at the offices of the Department of Hygiene and Epidemiology, using a structured questionnaire comprising data on socio-demographic factors (age, gender, marital status, education and occupation), clinical aspects (visits to the dentist, visits to the doctor, usual source of medical care, diabetes, and use of psycholeptic and psychoanaleptic drugs) and lifestyles (smoking, alcohol consumption and dietary habits).

The use of dental care services, evaluated through the number of visits to the dentist in the previous year, was analysed as a dichotomic (zero visits, or one or more visits) or a three-group variable (zero, one, or two or more visits). After excluding the subjects who did not provide information on the number of visits to the dentist in the previous year, 2407 subjects (913 males, mean age 54 years, standard deviation (SD) 15 years; 1494 females, mean age 53 years, SD 15 years) were included in the analyses.

Education was recorded as the number of complete years of formal education and analysed in five categories: 0–3, 4, 5–9, 10–12 and more than 12 years of education. Two categories were considered for marital status; married and not married (including single, widowed and divorced/separated). Occupation was classified according to the Portuguese Classification of Occupations (Instituto do Emprego e Formação Profissional, 2007) and grouped in white-collar (comprising the non-manual occupations), blue-collar (comprising the manual occupations) and a third category including unemployed, housewives and retired people, defined as no paid job.

The number of visits to a medical doctor in the preceding 12 months was recorded, and for analysis it was treated as a dichotomic variable (no visits or at least one visit). The usual source of medical care was considered in three categories (public health centre, private care and hospital care). Information on the history of diabetes was obtained by asking the participants if a doctor had ever diagnosed the disease.

Regarding smoking habits, subjects were classified as smoker (one or more cigarettes per day, on average), occasional smoker (less than one cigarette per day, on average), ex-smoker (for more than 6 months) or never-smoker, according to WHO categories (WHO, 1997). However, for analysis, three categories were used: smokers (current or occasional), ex-smokers and non-smokers. Four categories were considered in the analysis of alcohol intake: non-drinker, ex-drinker (for more than 6 months), occasional drinker (consumption of less than a drink per week, on average) and usual drinker (consumption of at least one drink per week, on average).

The dietary habits in the 12 months preceding the interview were evaluated using a semi-quantitative food frequency questionnaire (FFQ) comprising 82 food and beverage items or groups. It was designed according to Willet (Willet, 1998), and was adapted by inclusion of a variety of typical Portuguese food items. The FFQ was validated with a 7-day food record in 75 female and 71 male community participants and, re-

garding the fatty acid composition, with the composition of subcutaneous adipose tissue in 64 female and 52 male subjects (Lopes, 2000). For each FFQ item, subjects were asked the average frequency of consumption (nine possible responses ranging from never to six or more times per day) and the portion size usually consumed (based on a photograph manual with small, medium and large portion sizes). The information obtained was used to estimate the average daily intake of each item by multiplying the usual frequency of intake per day by the average portion size of the corresponding item.

For the current analysis, food/beverage items or groups of foods or beverages with the highest sugar contents were considered, among those evaluated by the FFQ: biscuits (all type of biscuits or cookies) and pastry, soft drinks (including coke and all other types of soft drinks), ice cream and dairy desserts, chocolate, jam/marmalade (all types of jam and marmalade), and sugar added to other food or drinks (e.g. coffee, tea, milk, yoghurt and fruit). For each item, subjects were classified as non-consumers (0 g/day), consumers of less than one average portion size per day or consumers of at least one average portion size per day.

Chronic medication in the previous year was recorded, and every drug coded to the corresponding level of WHO Anatomic Therapeutic Chemical (ATC) classification (World Health Organization, 1990). The use of drugs responsible for a decreased salivary flow, such as psycholeptics (N05) (including antipsychotics [N05a], anxiolytics [N05b], hypnotics and sedatives [N05c]) or psychoanaleptics (N06), (including antidepressants [N06a] and psycholeptics in combination with psychoanaleptics [N06c]), was considered for the present analyses.

Data were analysed using STATA®, version 9.2. The use of dental care services in the previous year is presented as proportions and respective 95% Confidence Intervals (95% CI). The results were analysed as crude and age-standardised by the direct method (European Reference Population [United Nations, 1990]). The association between dentist consultations in the previous year and socio-demographic, clinical and lifestyle variables was quantified through the calculation of crude, age- and education-adjusted odds ratios (OR), and respective 95% CI using unconditional logistic regression (one or more dental visits in the previous year vs. no dental visits) and multinomial logistic regression (one dental visit in the previous year vs. no dental visits, and at least two dental visits in the previous year vs. no dental visits). The results were considered statistically significant when $p < 0.05$.

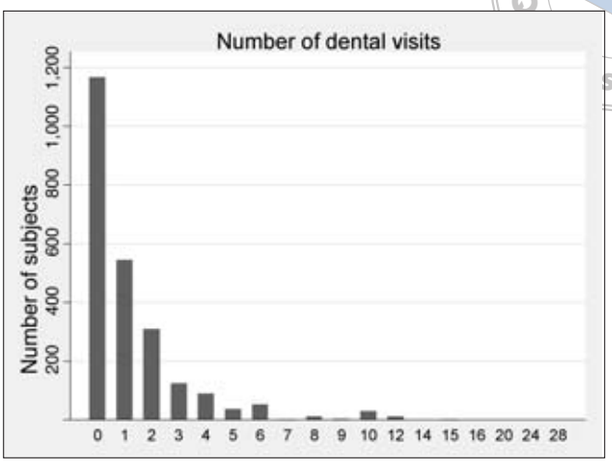

Fig 1 Number of dental visits in the year preceding the survey (1999–2003) in adults from Porto (n = 2407).

The present study was approved by a local Ethics Committee, and all participants gave written informed consent.

RESULTS

In the present representative sample of an urban population, 51.5% (95% CI: 49.0–53.0) of the subjects visited a dentist at least once, 28.8% (95% CI: 27.0–30.6) visited the dentist at least twice, and 15.9% (95% CI: 14.4–17.4) three or more times, during the year preceding the survey. The corresponding age-standardised prevalence figures are 54.5% (95% CI: 52.1–56.8) for one or more, 31.0% (95% CI: 28.8–33.2) for two or more and 17.3% (95% CI: 15.4–19.1) for three or more visits. The distribution of dental visits is presented in Figure 1.

After adjustment for education, no statistically significant association was observed between age and the use of dental care services, except for ages above 69 years (OR = 0.66, 95% CI: 0.45–0.98), but the age-adjusted OR for education increased with the number of school years ($p < 0.001$ for trend) (Table 1). For the remaining variables (Tables 1 to 3), the associations tended to approach unity when age and education adjustment was performed.

Regarding the socio-demographic factors (Table 1), significant differences were observed for occupation (blue-collar vs. white-collar: OR = 0.69, 95% CI: 0.52–0.91), and marital status (not married vs. married: OR = 0.81, 95% CI: 0.67–0.99).

Table 1 Association between socio-demographic characteristics and the use of dental care services in the previous year

		Visits to the dentist in the previous year						
	All subjects	At least one	One	At least two	At least one vs. none		One vs. none	At least two vs. none
	n	n (%)	n (%)	n (%)	OR (95% CI)	OR (95% CI) [a]	OR (95% CI) [a]	OR (95% CI) [a]
Age (years)								
18–29	194	125 (64.4)	55 (28.4)	70 (36.1)	1 [b]	1 [b]	1 [b]	1 [b]
30–39	241	140 (58.1)	54 (22.4)	86 (35.7)	0.76 (0.52–1.13)	0.87 (0.58–1.29)	0.74 (0.45–1.20)	0.98 (0.62–1.53)
40–49	526	300 (57.0)	137(26.0)	163 (31.0)	0.73 (0.52–1.03)	1.06 (0.74–1.51)	1.02 (0.67–1.57)	1.08 (0.72–1.62)
50–59	563	301 (53.5)	125 (22.0)	176 (31.3)	0.63 (0.45–0.89)	1.09 (0.76–1.56)	0.93 (0.60–1.44)	1.23 (0.82–1.85)
60–69	484	232 (47.9)	104 (21.5)	128 (26.4)	0.51 (0.36–0.72)	1.09 (0.74–1.58)	0.97 (0.61–1.54)	1.19 (0.77–1.83)
≥ 70	399	141 (35.3)	71 (17.8)	70 (17.5)	0.30 (0.21–0.43) [c]	0.66 (0.45–0.98)	0.67 (0.42–1.08)	0.64 (0.41–1.02)
Gender								
Female	1494	767 (51.3)	332 (22.2)	435 (29.1)	1 [b]	1 [b]	1 [b]	1 [b]
Male	913	472 (51.7)	214 (23.4)	258 (28.3)	1.01 (0.86–1.19)	0.88 (0.74–1.05)	0.92 (0.74–1.15)	0.85 (0.69–1.05)
Marital Status								
Married	1642	866 (52.7)	382 (23.3)	484 (29.5)	1 [b]	1 [b]	1 [b]	1 [b]
Not married [f]	764	372 (48.7)	164 (21.5)	208 (27.2)	0.85 (0.72–1.01)	0.81 (0.67–0.99)	0.81 (0.64–1.04)	0.81 (0.65–1.02)
Education (years)								
0–3	240	57 (23.8)	27 (11.2)	30 (12.5)	1 [b]	1 [b]	1 [b]	1 [b]
4	722	306 (42.4)	149 (20.6)	157 (21.8)	2.36 (1.69–3.29)	2.11 (1.50–2.96)	2.21 (1.41–3.49)	2.02 (1.31–3.12)
5–9	533	269 (50.5)	119 (22.3)	150 (28.1)	3.27 (2.32–4.61)	2.96 (2.07–4.22)	2.80 (1.74–4.48)	3.10 (1.97–4.86)
10–12	299	191 (63.9)	93 (31.1)	98 (32.8)	5.68 (3.88–8.29)	5.16 (3.47–7.65)	5.38 (3.24–8.93)	4.96 (3.03–8.10)
> 12	613	416 (67.9)	158 (25.8)	258 (42.1)	6.78 (4.81–9.55)[e]	6.08 (4.198.81)[de]	4.90 (3.00–7.99) [de]	7.12 (4.49–11.27) [de]
Occupation								
White-collar	886	564 (63.7)	232 (26.2)	332 (37.5)	1 [b]	1 [b]	1 [b]	1 [b]
Blue-collar	375	153 (40.8)	61 (16.3)	92 (24.5)	0.39 (0.31–0.50)	0.69 (0.52–0.91)	0.58 (0.40–0.85)	0.78 (0.56–1.08)
No paid job [g]	1146	522 (45.6)	253 (22.1)	269 (23.5)	0.48 (0.40–0.57)	0.87 (0.68–1.10)	0.97 (0.72–1.30)	0.79 (0.60–1.05)

OR, Odds Ratio; 95% CI, 95% Confidence Interval; a, adjusted for age (18–29; 30–39; 40–49; 50–59; 60–69; ≥ 70 years) and education (0–3; 4; 5–9; 10–12; > 12 years), except when otherwise specified; b, reference class; c, education-adjusted; d, age-adjusted; e, $p < 0.001$ for trend; f, the total number of subjects is less than 2407 due to missing information; g, no paid job includes retired, housewives and unemployed.

Table 2 Association between clinical factors and the use of dental care services in the previous year

		Visits to the dentist in the previous year						
	All subjects	At least one	One	At least two	At least one vs. none		One vs. none	At least two vs. none
	n	n (%)	n (%)	n (%)	OR (95% CI)	OR (95% CI) [a]	OR (95% CI) [a]	OR (95% CI) [a]
Visits to medical doctor								
No	431	182 (42.2)	91 (21.1)	91 (21.1)	1 [b]	1 [b]	1 [b]	1 [b]
Yes	1974 [c]	1057 (53.6)	455 (23.0)	602 (30.5)	1.58 (1.28–1.95)	1.96 (1.57–2.45)	1.65 (1.26–2.18)	2.27 (1.73–2.99)
Usual source of care								
Health centre	1477	672 (45.5)	316 (21.4)	356 (24.1)	1 [b]	1 [b]	1 [b]	1 [b]
Private care	385	255 (66.2)	99 (25.7)	156 (40.5)	2.35 (1.86–2.97)	1.38 (1.06–1.79)	1.26 (0.91–1.73)	1.47 (1.09–1.97)
Hospital care	124 [c]	70 (56.4)	33 (26.6)	37 (29.8)	1.55 (1.07–2.25)	1.29 (0.88–1.89)	1.35 (0.85–2.14)	1.24 (0.79–1.96)
Diabetes								
No	2225	1175 (52.8)	517 (23.2)	658 (29.6)	1 [b]	1 [b]	1 [b]	1 [b]
Yes	182	64 (35.2)	29 (15.9)	35 (19.2)	0.48 (0.35–0.66)	0.67 (0.48–0.93)	0.65 (0.42–1.00)	0.68 (0.45–1.02)
Use psycholeptic drug								
No	1899	1007 (53.0)	438 (23.1)	569 (30.0)	1 [b]	1 [b]	1 [b]	1 [b]
Yes	508 [c]	232 (45.7)	108 (21.3)	124 (24.4)	0.74 (0.61–0.91)	0.91 (0.73–1.12)	0.95 (0.73–1.24)	0.87 (0.67–1.11)
Use psychoanaleptic drug								
No	2238	1150 (51.4)	510 (22.8)	640 (28.6)	1 [b]	1 [b]	1 [b]	1 [b]
Yes	168 [c]	89 (53.0)	36 (21.4)	53 (31.6)	1.06 (0.78–1.46)	1.13 (0.81–1.57)	1.03 (0.68–1.57)	1.20 (0.82–1.76)

OR, Odds Ratio; 95% CI, 95% Confidence Interval; a, adjusted for age (18–29; 30–39; 40–49; 50–59; 60–69; ≥ 70 years) and education (0–3; 4; 5–9; 10–12; > 12 years); b, reference class; c, the total number of subjects is less than 2407 due to missing information.

The use of other sources of medical care (private care vs. public health centre: OR = 1.38, 95% CI: 1.06–1.79) and visits to the medical doctor in the same period (OR = 1.96, 95%CI: 1.57–2.45) was associated with a higher frequency of dentist visits. History of diabetes (OR = 0.67, 95% CI: 0.48–0.93) was associated with a less frequent utilisation of dental care services. No statistically significant associations were observed between the use of psycholeptic or psychoanaleptic drugs and the use of dental care (Table 2).

Adding sugar to foods and drinks (more than 16 g/day vs. no consumption: OR = 0.79, 95% CI: 0.64–0.98) was associated with fewer dentist visits, and consumers of less than one average portion size per day of biscuits (0.1 to 17.9 g/day vs. no consumption: OR = 1.25, 95% CI: 1.01–1.53) were more likely to have appointments in the previous year (Table 3).

Models including an interaction term between each of the evaluated socio-demographic, clinical and behavioural factors and age (< 65 years vs. ≥ 65 years) were fitted. No statistically significant differences were observed between the risk estimates for subjects aged below 65 and those aged 65 and over (data not shown).

When dental care use was defined as no dental visits in the previous year, one visit, or two or more visits, the magnitude of the association with the considered variables was similar to that observed when dental care utilisation was defined as at least one visit in the previous year or no visits in the previous year. The magnitude of the OR for one dental visit and for two or more visits were similar (Tables 1 to 3), and no statistically significant differences were observed between the OR, except for the consumption of biscuits (Table 3) (more than one average serving vs. no consumption: OR = 0.85 for one dental visit and OR = 1.64 for two or more visits).

DISCUSSION

Nearly half the adults from Porto had no dentist appointments in the previous year and 15.9% had three or more visits. Socio-demographic, clinical and lifestyle factors were associated with access to dental care, independently from age and education, and across different definitions of dental care utilisation.

The results from the present study regarding the prevalence of at least one visit to the dentist in the previous year confirm the poor utilisation of dental care in Portugal, when compared to the UNISaúde (UNIS) survey (de Almeida et al, 2000) performed between 1996 and 1999 (prevalence of 61.3% in subjects aged from 18 to 29 years), even though the prevalence observed in the present investigation is higher than that reported in the 1998–1999 National Health Survey (prevalence varying from 28.7% to 6.9% in age groups from 55–64 to ≥ 85 years) (Ministério da Saúde, 2001).

Although the comparison with observations performed in other countries is limited by the use of different methodologies, populations or definition of dental care attendance, the prevalence appears to be higher than in developing regions (e.g. 20% in China in 2001 [Lo et al, 2001], 40.4% in Turkey in 2003 [Mumcu et al, 2004]) but lower than in other European regions (e.g. 58% in Norway in 1973 [Heloe and Tronstad, 1975], 80% in Sweden and Denmark in 1999 [Kronstrom et al, 2002] and 59% in the United Kingdom in 1998 [Nuttall et al, 2001]). In the United States, the prevalence of one dental visit was 69.7% in 1994 (Lo et al, 2001). However, the prevalence in United States is reported as one dental visit in a 5-year period, which is a value considerably lower than the one obtained in the present study.

The results from the present study, as those from other studies (Manski and Magder, 1998; Gibson et al, 2000; Scott et al, 2002), overestimate the attendance to routine dentist appointments since no information was available on the reason for each visit, the type of treatment or individual oral health indicators, such as the number of teeth or the presence of dentures. This limitation of the present investigation, which was not specifically designed to characterise the utilisation of dental care services in depth, also applies to the study of other factors associated with dental care utilisation. When evaluating the determinants of one or more dentist appointments in the previous year, with no further specification, the dentist visits related to check-up appointments, emergency needs or long treatments were considered together, despite that each of these subgroups may be differentially associated with socio-demographic, clinical and behavioural factors.

There is no consensus regarding the adequate interval between routine appointments, which may range from one (Matos et al, 2001; Bader, 2005) to two (Bader, 2005) per year, depending on age (MacEntee et al, 1988), general (Woolfolk et al, 1999; Sandberg et al, 2001; Bagewitz et al, 2002) and oral health condition (Holst, 1979; MacEntee et al, 1988; Woolfolk et al, 1999), and local policy/guidelines (Bader, 2005). In the present study, no differences were observed regarding the determinants of one or two or more dentist appointments in the previous year, except for the consumption of biscuits.

Table 3 Association between lifestyle exposures and the use of dental care services in the previous year

		Visits to the dentist in the previous year						
	All subjects	At least one	One	At least two	At least one vs. none		One vs. none	One vs. none
	n	n (%)	n (%)	n (%)	OR (95% CI)	OR (95% CI) [a]	OR (95% CI) [a]	OR (95% CI) [a]
Smoking habits								
No smokers	1303	650 (49.9)	293 (22.5)	357 (27.4)	1 [b]	1 [b]	1 [b]	1 [b]
Ex-smokers	464	248 (53.4)	106 (22.8)	142 (30.6)	1.15 (0.93–1.43)	0.91 (0.73–1.14)	0.87 (0.66–1.16)	0.87 (0.66–1.16)
Smokers	581 [e]	325 (55.9)	137 (23.6)	188 (32.4)	1.28 (1.04–1.55)	0.88 (0.71–1.09)	0.85 (0.65–1.12)	0.85 (0.65–1.12)
Alcohol consumption								
No drinkers	421	240 (57.0)	104 (24.7)	136 (32.3)	1 [b]	1 [b]	1 [b]	1 [b]
Ex-drinkers	167	78 (46.7)	37 (22.2)	41 (24.6)	0.66 (0.46–0.95)	1.03 (0.70–1.52)	1.08 (0.67–1.74)	1.08 (0.67–1.74)
Occasional drinkers	370	219 (59.2)	85 (23.0)	134 (36.2)	1.09 (0.82–1.45)	1.07 (0.79–1.44)	0.96 (0.66–1.39)	0.96 (0.66–1.39)
Regular drinkers	1391 [e]	686 (49.3)	310 (22.3)	376 (27.0)	0.73 (0.59–0.91)	0.79 (0.63–1.00)	0.81 (0.61–1.08)	0.81 (0.61–1.08)
Sugar added to food/ drinks (g/day)								
0	573	331 (57.8)	137 (23.9)	194 (33.9)	1 [b]	1 [b]	1 [b]	1 [b]
0.1–15.9	608	322 (53.0)	149 (24.5)	173 (28.4)	0.82 (0.65–1.04)	0.88 (0.69–1.12)	0.96 (0.71–1.28)	0.96 (0.71–1.28)
≥ 16	1157 [e]	566 (48.9)	247 (21.4)	319 (27.6)	0.70 (0.57–0.86) [c]	0.79 (0.64–0.98) [d]	0.80 (0.62–1.05)	0.80 (0.62–1.05)
Biscuits (g/day)								
0	612	287 (46.9)	152 (24.8)	135 (22.1)	1 [b]	1 [b]	1 [b]	1 [b]
0.1–17.9	1051	565 (53.8)	246 (23.4)	319 (30.4)	1.32 (1.08–1.61)	1.25 (1.01–1.53)	1.03 (0.80–1.33)	1.03 (0.80–1.33)
≥ 18	675 [e]	367 (54.4)	135 (20.0)	232 (34.4)	1.35 (1.08–1.68)	1.21 (0.96–1.52)	0.85 (0.64–1.13)	0.85 (0.64–1.13)
Pastry (g/day)								
0	821	389 (47.4)	170 (20.7)	219 (26.7)	1 [b]	1 [b]	1 [b]	1 [b]
0.1–59.9	1323	720 (54.4)	321 (24.3)	399 (30.2)	1.33 (1.11–1.58)	1.17 (0.98–1.41)	1.22 (0.96–1.53)	1.22 (0.96–1.53)
≥ 60	194 [e]	110 (56.7)	42 (21.6)	68 (35.0)	1.45 (1.06–1.99) [d]	1.11 (0.79–1.55)	0.99 (0.64–1.52)	0.99 (0.64–1.52)
Soft drinks (ml/day)								
0	1305	660 (50.6)	302 (23.1)	358 (27.4)	1 [b]	1 [b]	1 [b]	1 [b]
0.1–199.9	785	430 (54.8)	176 (22.4)	254 (32.4)	1.18 (0.99–1.41)	0.96 (0.79–1.17)	0.88 (0.69–1.12)	0.88 (0.69–1.12)
≥ 200	248 [e]	129 (52.0)	55 (22.2)	74 (29.8)	1.06 (0.81–1.39)	0.86 (0.64–1.16)	0.80 (0.55–1.17)	0.80 (0.55–1.17)
Jam/marmalade (g/day)								
0	999	474 (47.4)	217 (21.7)	257 (25.7)	1 [b]	1 [b]	1 [b]	1 [b]
0.1–9.9	1070	590 (55.1)	253 (23.6)	337 (31.5)	1.36 (1.15–1.62)	1.18 (0.98–1.41)	1.13 (0.90–1.41)	1.13 (0.90–1.41)
≥ 10	269 [e]	155 (57.6)	63 (23.4)	92 (34.2)	1.51 (1.15–1.98) [c]	1.32 (0.99–1.76)	1.21 (0.84–1.72)	1.21 (0.84–1.72)
Ice cream and dairy desserts (g/day)								
0	1225	598 (48.8)	265 (21.6)	333 (27.2)	1 [b]	1 [b]	1 [b]	1 [b]
0.1–29.9	1040	580 (55.8)	251 (24.1)	329 (31.6)	1.32 (1.12–1.56)	1.07 (0.89–1.28)	1.07 (0.85–1.34)	1.07 (0.85–1.34)
≥ 30	73 [e]	41 (56.2)	17 (23.3)	24 (32.9)	1.34 (0.83–2.16) [d]	1.01 (0.62–1.66)	0.99 (0.53–1.85)	0.99 (0.53–1.85)
Chocolate (g/day)								
0	1206	584 (48.4)	273 (22.6)	311 (25.8)	1 [b]	1 [b]	1 [b]	1 [b]
0.1–9.9	893	497 (55.7)	204 (22.8)	293 (32.8)	1.34 (1.12–1.59)	1.10 (0.92–1.32)	0.98 (0.78–1.24)	0.98 (0.78–1.24)
≥ 10	239 [e]	138 (57.7)	56 (23.4)	82 (34.3)	1.46 (1.10–1.93) [d]	0.96 (0.71–1.29)	0.85 (0.58–1.23)	1.05 (0.74–1.48)

OR, Odds Ratio; 95% CI, 95% Confidence Interval; a, adjusted for age (18–29; 30–39; 40–49; 50–59; 60–69; ≥ 70 years) and education (0–3; 4; 5–9; 10–12; > 12 years); b, reference class; c, $p < 0.01$ for trend; d, $p < 0.05$ for trend; e, the total number of subjects is less than 2407 due to missing information.

In most previous surveys (Heloe and Tronstad, 1975; Manski and Magder, 1998; Scheutz and Heidmann, 2001; Bagewitz et al, 2002), women tended to attend the dentist more frequently, but that was not observed in the present study, although the visits to any other doctor were more frequent in females (males vs. females: OR = 0.55; 95% CI: 0.44–0.68). Also, when comparing dental to medical visits, the latter were considerably more frequent (prevalence of at least one appointment in the previous year: 55.1% vs. 82.1%), suggesting that a greater importance is given to general health or that economic factors contribute to level the gender differences because dental care is provided mainly in the private sector.

As in other studies (Manski and Magder, 1998; Woolfolk et al, 1999; Lo et al, 2001; Matos et al, 2001; Bagewitz et al, 2002; Stewart et al, 2002; Mumcu et al, 2004), the frequency of dental appointments increased with education, probably reflecting the acquisition of specific knowledge towards a healthier behaviour and also the fact that education is directly associated with income. The higher prevalence of visits to the dentist among subjects with white-collar jobs or having a private doctor as usual source of medical care may be related with better income. The participants who went to a medical doctor at least once in the previous year were more likely to have dentist appointments. This is probably attributable to referral to the dentist, since none of the general health conditions that could be associated with oral health problems resulted in a more frequent use of dental care services. Furthermore, it is worrisome that patients with chronic diseases with oral manifestations, such as diabetes, were less likely to have a dentist appointment than the counterparts without such conditions.

Analysing the relationship between number of dental visits and lifestyles, the consumption of highly cariogenic (Newburn, 1989) 'sticky' foods was associated with a higher use of dental care services, probably due to its relationship with a poorer oral health status. Nevertheless, the cross-sectional nature of the present investigation and the absence of information on the individual oral hygiene practices make the interpretation of the effect of these behavioural factors more difficult.

By evaluating a representative sample of the Portuguese population, the present investigation showed that the dental care services are used less frequently than in other European countries, and provides an important contribution to understanding the factors associated with poor access to this specific type of health care. Education was the factor most strongly associated with dentist attendance, with more educated subjects visiting the dentist more often. No differences were observed regarding the determinants of one or two or more dentist appointments in the previous year.

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