

Dental care utilization: a study of 50- to 75-year-olds in Southern Sweden

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Bagewitz IC, Söderfeldt B, Palmqvist S, Nilner K. Dental care utilization: a study of 50- to 75-year-olds in Southern Sweden. *Acta Odontol Scand* 2002;60:20–24. Oslo. ISSN 0001-6357.

This study investigates dental care utilization in an adult population in Southern Sweden in relation to dental and social conditions, attitudes to costs, and perceived need to obtain dental services. The study was based on responses to a questionnaire sent in 1998 to a random sample, 1974 persons, aged 50–75 years. The response rate was 66%. A significantly higher probability of dental care utilization less than once a year was found for men, for those with few remaining teeth, and for those with removable dentures. A higher probability of dental care utilization less than once a year was found for those who stated perceived need to obtain dental care with no possibility because of the cost and for those who stated that the cost had influenced their attendance for dental care. The results showed that there were differences for sex and dental conditions in dental care utilization and that dental care utilization was related to attitudes towards costs of dental care. □ *Attitudes; costs; dental insurance; dentures; edentulism*

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Dental care utilization is a multifactorial phenomenon. It has been shown to depend on dental conditions (1, 2), socioeconomic conditions (2–4), attitudes (3), and reimbursement systems (2). It has also been suggested to be associated with demand changes (5). In economics, attention has been directed to ‘supplier-induced demand’, with suggested correlations between the dentists’ need for income and provided care (6).

The goal of the national Swedish dental insurance scheme, inaugurated in 1974, was to remove socioeconomic obstacles to receiving dental care (7). Several studies before the dental insurance scheme was introduced had shown associations between dental conditions, dental care utilization, and socioeconomic factors. During the first years of operation of the scheme, dental care utilization increased, especially among men, the middle-aged, and the elderly (8, 9).

In a study from the early nineties no socioeconomic differences in dental care utilization were found, although there were such differences in dental conditions (10). During the past decade parts of the patient cost have been subsidized, although with gradual and substantial decreases of the subsidy level over time (11).

According to the Swedish National Board of Health and Welfare, the pattern of dental care utilization changed in 1995. The number of patients demanding dental care decreased, as did the number of patients demanding more comprehensive care (11). It has been suggested that increased costs for the patient partly explain the reduced demand for dental care during the past years (12).

The aim of the present study was to describe dental care utilization among 50- to 75-year-olds and relate this utilization to dental and social conditions, to perceived needs to obtain dental services, and to attitudes towards costs of dental care.

Materials and methods

Study population

A questionnaire was in 1998 sent to a random sample, consisting of 1974 persons aged 50–75 years, in the county of Skåne in southernmost Sweden. The study design has been presented in detail previously (13). The response rate was 66% after two reminders, the last one with a new questionnaire form.

Non-response

The study population consisted of 47% men and 53% women. Non-response could be analyzed with three variables from the sampling frame: sex, age, and place of residence. The non-response rate was 37% for men and 32% for women ($P < 0.05$). A significantly higher proportion ($P < 0.01$) of non-respondents was found in Malmö (the third largest city in Sweden), 41%, than in the rest of the material, 33%. With regard to age there was no difference.

Questionnaire

The questionnaire comprised 63 questions. It was constructed from an analysis of the literature on variables describing oral health (10) and quality of life associated with oral health (14–16). In the present study the following 15 variables were used, most of them presented in a previous study (13):

1. *Dental care utilization* was expressed as number of visits for dental care, to a dentist, a hygienist, or a dental assistant, per year: More than once a year, once a year, and less than once a year.

2. *Sex*, 3. *Age*, and 4. *Place of residence* were given in the sampling frame. Since there is no official classification of

Table 1. Differences in dental care utilization between various sociodemographic groups

| Variable | <Once a year, % | Once a year, % | >Once a year, % | P value |
|---|-----------------|----------------|-----------------|---------|
| Sex (<i>n</i> = 1278) | | | | |
| Men | 15 | 45 | 40 | 0.021 |
| Women | 10 | 46 | 44 | |
| Age (<i>n</i> = 1278) | | | | |
| 50–54 years | 10 | 54 | 36 | <0.001 |
| 55–59 years | 12 | 48 | 40 | |
| 60–64 years | 7 | 45 | 48 | |
| 65–69 years | 15 | 42 | 43 | |
| 70–75 years | 17 | 38 | 45 | |
| Education (<i>n</i> = 1246) | | | | |
| High | 5 | 50 | 45 | <0.001 |
| Medium | 10 | 47 | 43 | |
| Low | 17 | 43 | 40 | |
| Marital status (<i>n</i> = 1251) | | | | |
| Married/cohabitant | 10 | 46 | 44 | <0.001 |
| Unmarried/single | 20 | 43 | 37 | |
| Occupation (<i>n</i> = 1237) | | | | |
| Full-time | 10 | 51 | 39 | <0.001 |
| Part-time | 7 | 47 | 46 | |
| Not working | 14 | 41 | 45 | |
| Residence (<i>n</i> = 1278) | | | | |
| Malmö | 15 | 43 | 42 | 0.174 |
| Malmö suburb | 6 | 43 | 51 | |
| Other city | 13 | 45 | 42 | |
| Smaller other town | 11 | 50 | 39 | |
| Rural area | 11 | 48 | 41 | |
| Ethnic background (<i>n</i> = 1258) | | | | |
| Always lived in Sweden | 11 | 47 | 42 | 0.079 |
| Have not always lived in Sweden | 17 | 41 | 42 | |
| Total | 12 | 46 | 42 | 0.021 |

residence, the postal codes were categorized into five groups, in accordance with the number of inhabitants and common knowledge of the social characteristics of the area as follows: Malmö, Malmö suburb, other city, small other town, and rural area.

5. *Education*: Primary education was designated low education (≤ 9 years, secondary education was designated medium education (10–12 years), and high school, college, or university high education (> 12 years).

6. *Marital status*: Married or cohabitant, and unmarried or living alone.

7. *Occupation*: Full-time (more than 35 h/week), part-time (less than 35 h/week), and not working.

8. *Ethnic background*: Always lived in Sweden, and has not always lived in Sweden.

9. *General health in relation to age peers*: From five response alternatives, three categories were constructed: General health better than age peers, equal to age peers, and worse than age peers.

10. *Number of teeth*: Six self-report response alternatives were collapsed into three categories: None or a few missing teeth, many teeth missing, and few teeth left or edentulous.

11. *Denture prevalence*: Own teeth only, fixed partial denture, and removable denture.

12. *Importance of treatment cost for visit to dental service*: Not so important versus very important.

13. *Attitude towards costs for previous dental visit*: Reasonable price versus too high cost.

14. *Perceived need to obtain dental care with no possibility because of the cost*: No cost barrier versus need care, cost barrier.

15. *Refraining from dental care because of the cost*: Never versus once or more.

Statistical methods

Data were analyzed using frequency distributions and contingency tables. Logistic regression analysis was used with dental care utilization less than once a year versus dental care utilization more than once a year/once a year as the dependent variable. In logistic regression the associations are expressed as odds ratios (OR). Bivariate associations were tested by means of chi-square. A difference was considered statistically significant when $P < 0.05$. When the P value ranged between 0.05 and 0.10, the difference was considered a tendency.

Results

Bivariate results

Twelve percent of the study population utilized dental

Table 2. Differences in dental care utilization between subjects grouped in accordance with general health, various aspects of dental health, and attitudes towards costs of dental care

| Variable | <Once a year, % | Once a year, % | >Once a year, % | P value |
|--|-----------------|----------------|-----------------|---------|
| General health (<i>n</i> = 1249) | | | | |
| Better than age peers | 7 | 52 | 41 | <0.001 |
| Equal to age peers | 13 | 44 | 43 | |
| Poorer than age peers | 19 | 38 | 43 | |
| No. of teeth (<i>n</i> = 1239) | | | | |
| None or a few missing teeth | 5 | 51 | 44 | <0.001 |
| Many teeth missing | 15 | 37 | 48 | |
| Few teeth left or edentulous | 44 | 30 | 26 | |
| Denture prevalence (<i>n</i> = 1276) | | | | |
| Own teeth only | 10 | 50 | 40 | <0.001 |
| Fixed partial denture | 5 | 45 | 50 | |
| Removable denture | 34 | 33 | 33 | |
| Importance of costs for the choice of dental care (<i>n</i> = 1261) | | | | |
| The cost is not so important | 7 | 47 | 46 | <0.001 |
| The cost is very important | 15 | 45 | 40 | |
| Attitude towards costs for last dental visit (<i>n</i> = 1233) | | | | |
| Reasonable price | 11 | 47 | 42 | 0.876 |
| Too expensive | 11 | 46 | 43 | |
| Perceived need to obtain dental care, no possibility because of costs (<i>n</i> = 1247) | | | | |
| No cost barrier | 8 | 47 | 45 | <0.001 |
| Need care; cost barrier | 48 | 31 | 21 | |
| Refraining from dental care because of costs (<i>n</i> = 1259) | | | | |
| Never | 7 | 47 | 46 | <0.001 |
| Once or more | 33 | 40 | 27 | |

care less than once a year. Dental care utilization was less than once a year among men, those 65–75 years old, those with single marital status, persons with low education, and those not working. No significant differences were found for ethnic background or residence (Table 1).

When general health was perceived as poorer than in age peers, dental care utilization was significantly lower than for those who reported equal or better general health than age peers. Among persons with removable dentures and those who had few teeth or were edentulous dental care utilization was less than once a year (Table 2).

The importance and influence of the costs for the choice and utilization of dental care was associated with dental care utilization (Table 2).

Multivariate results

Sex was the only social variable that was associated with the use of dental care in which men had a higher probability of utilizing dental care less than once a year. Persons who had few teeth left or were edentulous had a 16 times higher probability of dental care utilization less than once a year than persons with no or a few missing teeth (Table 3).

There was a sixfold higher probability of dental care utilization less than once a year for persons who stated perceived need to obtain dental care but with a cost

barrier compared with those who reported no cost barrier. Among those who stated that they had refrained from dental care once or more because of the cost, there was a 3.5 times higher probability of dental care utilization less than once a year than for those who had never refrained from dental care because of the cost (Table 3).

Discussion

In the dental literature there are different ways of expressing dental care utilization (1–5, 15–17). Regardless of how dental care is defined, it may be provided by a dentist, a dental hygienist, or a dental assistant. The categories used in this study to assess dental care utilization are comparable to those used in other Swedish studies (18, 19). It should be kept in mind that the frequency of visits does not say whether the patient received full treatment or, for example, only emergency care.

According to a Swedish study comparing self-reported and actual utilization as measured by insurance claims, utilization is overestimated in self-report studies (20). Point estimates may thus be biased in the present study. However, this is less problematic when studying differences and associations; a possible bias in self-reports or in response tendency is probably not structured along the same dimensions as utilization.

Table 3. Logistic regression with dental care utilization less than once a year or not as the dependent variable. Odds ratios (OR) are given together with significance levels and 95% confidence intervals (CI) for the odds ratios

| Independent variables (<i>n</i> = 1125) | OR | 95% CI |
|---|---------|----------|
| Social conditions | | |
| Sex | | |
| Men | 2.5*** | 1.5–4.2 |
| Women (ref. cat.) | – | – |
| Age (in years) | 1.0 | 1.0–1.1 |
| Education | | |
| High | 0.5(*) | 0.3–1.0 |
| Medium | 0.9 | 0.5–1.5 |
| Low (ref. cat.) | – | – |
| Marital status | | |
| Unmarried/single | 1.7 | 1.0–2.9 |
| Married/cohabitant (ref. cat.) | – | – |
| Occupation | | |
| Full-time | 0.9 | 0.4–2.0 |
| Part-time | 1.0 | 0.5–2.0 |
| Not working (ref. cat.) | – | – |
| Residence | | |
| Malmö | 1.9 | 0.4–4.1 |
| Malmö suburb | 0.7 | 0.2–2.4 |
| Other city | 1.8 | 0.9–3.5 |
| Smaller other town | 1.2 | 0.5–2.6 |
| Rural area (ref. cat.) | – | – |
| Ethnic background | | |
| Have not always lived in Sweden | 0.7 | 0.3–1.5 |
| Always lived in Sweden (ref. cat.) | – | – |
| Health and dental condition | | |
| General health | | |
| Better than age peers | 0.5 | 0.4–2.3 |
| Equal to age peers | 1.0 | 0.2–1.5 |
| Poorer than age peers (ref. cat.) | – | – |
| No. of teeth | | |
| Few teeth left or edentulous | 16.2*** | 6.3–41.1 |
| Many teeth missing | 2.6** | 1.3–5.2 |
| None or a few missing teeth (ref. cat.) | – | – |
| Denture prevalence | | |
| Removable denture | 0.4(*) | 0.2–1.1 |
| Fixed partial denture | 0.2*** | 0.4–0.7 |
| Own teeth only (ref. cat.) | – | – |
| Cost attitudes | | |
| Importance of treatment cost for visit to dental service | | |
| The cost is very important | 1.0 | 0.6–1.8 |
| The cost is not so important (ref. cat.) | – | – |
| Attitude towards costs for last dental visit | | |
| Too expensive | 0.4** | 0.2–0.7 |
| Reasonable price (ref. cat.) | – | – |
| Perceived need to obtain dental care, no possibility because of costs | | |
| Need care; cost barrier | 6.1*** | 3.0–12.7 |
| No cost barrier (ref. cat.) | – | – |
| Refraining from dental care because of costs | | |
| Once or more | 3.5*** | 1.8–6.7 |
| Never (ref. cat.) | – | – |

Model chi-square, 242.5; 22 df, $P \leq 0.0001$. Correctly predicted 92.8% of the cases.

(*) = $P < 0.10$, * = $P < 0.05$, ** = $P < 0.01$, *** = $P < 0.001$.

There was a significantly higher proportion of non-respondents in Malmö than in the rest of the material. The complicating factor here is probably the foreign immigration. Of the total population in Malmö, 22% were of foreign birth in 1997 (21). In the present material 19% of the respondents living in Malmö stated that they had not always lived in Sweden, possibly yielding an under-representation of immigrants among the respondents.

A random sample of 112 of the non-respondents was contacted by telephone for questions about their teeth. One fifth had no available telephone number, and 42% did not answer or refused to answer. Altogether 38% accepted contact, and 14% of these were edentulous. Among the respondents 5% were edentulous.

It was concluded that non-response was biased, with overrepresentation of the edentulous. In a logistic regression model with number of teeth as a dependent variable, only sex showed a significant association. It was concluded that, among the non-respondents, women had less teeth than men.

Dental care utilization was found to be less than once a year in 12% of the study population and in 16% of those aged 65–75 years (pensioners). In an earlier Swedish study (8) dental care utilization was found to be less than once a year in 10% for those aged 60, 70, and 80 years. In the present material, in the bivariate analyses, dental care utilization less than once a year was significantly associated with male sex, high age, low education, single marital status, not working, few teeth, presence of a removable denture, and poorer self-estimated general health than age peers. These results are in accordance with several other Swedish studies (1, 9, 10, 18, 19). The results from the bivariate analyses on costs and perceived need to obtain dental care are in agreement with a recent report from the Swedish National Board of Health and Welfare (19).

In a multivariate logistic regression model with dental care utilization less than once a year as the dependent variable, a significantly higher probability of dental care utilization less than once a year was found for men, those with few remaining teeth, and those with removable dentures, independently of each other. These results are in accordance with other Swedish studies (1, 4). In this model a higher probability of dental care utilization less than once a year was also found for those who stated a perceived need to obtain dental care and for those who stated that the cost had influenced their attendance for dental care.

According to the present results, showing a probability for dental care utilization less than once a year, with significance at the 10% level for those with low education, there was only a tendency towards social differences in dental care utilization. Social differences in dental care utilization were recently found in Denmark (22) but not in an earlier Swedish study from 1992 (10). However, that study only comprised 50-year-olds; the age span in the present study was 50–75 years. Moreover, after the study of the 50-year-olds was carried out, there have been

substantial increases in patient fees in the national Swedish dental insurance system (11).

The results show that there are differences as to sex and dental conditions in dental care utilization and that dental care utilization is related to attitudes towards costs of dental care. Considering the subsidy decrease in the national Swedish dental insurance scheme, this relation will probably result in an increasing number of individuals who have a need for dental care that they consider they cannot afford.

Acknowledgements.—This study was supported by the Scania County Council, Public Dental Health Service, and the Faculty of Odontology, Malmö University. A copy of the questionnaire can be obtained from the first author.

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Received for publication 22 March 2001

Accepted 2 July 2001