

Discontinued dental attendance among elderly people in Sweden

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Abstract

Aim: Our objective was to study the loss of dental attendance and a possible age trend among patients aged ≥ 65 years in Sweden. Regular dental check-ups are considered to be an important factor in maintaining oral health. Approximately 80% of the adult population in Sweden are enrolled in a regular check-up system; however, dental practitioners often find that older patients attend fewer check-ups. Old people may naturally lose contact with dental services as they move to special housing or die. In this systematic study, these factors were investigated and used as exclusion criteria. **Materials and Methods:** Data were collected for all patients ($n = 4759$) aged 65 or older from the electronic journal system in 3 large public dental clinics in 3 communities. Their dental records for the years 2004–2009 were studied longitudinally by 1 person at each clinic; 1111 patients were excluded (patients died during study period, wanted emergency care only, obtained special dental care allowance, moved from the community or moved to special housing, or left the clinic for another caregiver). The statistical analyses were performed using the Statistical Package for the Social Sciences version 21 (IBM). **Results:** Of the 3648 patients (1690 men and 1958 women) included in the study, 13% lost contact with their dental service over the course of the study (10% of those were aged 65–79 and 21% ≥ 80). The decrease in regular dental contact had a statistically significant association with increasing age ($P < 0.001$). **Conclusion:** A considerable number of older people living independently or with moderate supportive care in their own homes lost contact with dental service despite enrolment in a recall system.

Key words: Dental attendance, dental care for aged, frail elderly, public dental service

INTRODUCTION

As a group, older people are steadily increasing in both numbers and proportions in most countries. Approximately 600 million people worldwide are now aged 60 or older—a number estimated by the World Health Organisation to double by 2025.^[1] This global trend is also seen in Sweden, where the current

population of 1.6 million people aged 65 years or above is projected to increase to 2.2 million by 2025.^[2] The majority of older people in Sweden live independently, however, increasing numbers of those living at home are frail and dependent on daily help from others.^[3–6]

Approximately 80% of the adult population in Sweden are enrolled in a regular dental check-up system, of which

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the Public Dental Service manages 42%.^[7] Treatment is not free of charge, but the national health insurance covers a certain amount of the expenses.^[8] There is also a special dental care allowance for older people receiving substantial supportive care for daily living in their homes or at institutions. Under this special dental care allowance,^[8,9] the maximum fee for the elderly is SEK 1100 per year (€ ≈115). Approximately 6% of the inhabitants aged 65 years and older in the study region are eligible for this special dental care allowance.^[10]

Oral health patterns have changed as increasing numbers of older people retain their own teeth, many of which are heavily restored.^[11,12] Older people have an increased risk of developing oral health-related problems, due to impaired saliva secretion associated with medication, changes in dietary habits, and difficulties in managing at-home dental care. Thus, providing adequate dental care for older people is a considerable challenge for the dental community.^[13] Caring for and helping older people maintain good oral health will require special competence and occupy more of the dental team's time. Regular dental check-ups, preventive measures, home care, and dental care are important to maintaining good oral health.^[14,15] Many dental clinicians report that their older patients lose contact with their dental service, commonly cancelling or failing to appear for scheduled appointments.^[7,16] A study by Strömberg *et al.* concluded that of the several factors associated with the risk of developing caries among homebound elderly people on moderate or substantial supportive care, one of the most important was not having a dentist.^[17] Lack of contact with dental services has also been observed on the admission of older people to nursing homes. A study from France in 2000 reported that over 70% of newly admitted residents had not seen a dentist for over 5 years.^[18,19]

The main aim of this study was to examine to what extent older people enrolled in a regular dental check-up system lose contact with their dental health service. One additional aim was to record dental status and the use of medication in a subsample of the study group to illustrate the oral and physical health of the study group and compare it with the national figures to be able to comment on the representativeness of the sample. Our hypothesis was that contact with dental health services decreases with increasing age.

MATERIALS AND METHODS

Data from electronic dental journals were collected from three public dental clinics in the Region Västra

Götaland, Sweden. Region Västra Götaland, situated on the Swedish west coast and inlands, is the largest county council in Sweden, with a population of 1.6 million, and its mix of urban and rural areas, small communities, and major cities mirrors that of Sweden as a whole. The three selected communities represent both rural and suburban areas. Two of the communities are fairly small, with approximately 10000 inhabitants each, and are situated approximately 200 km from the county's main city, Gothenburg. The third community has 25000 inhabitants and is considered a suburb of Gothenburg. The population of the suburb with 19% aged over 65 years is somewhat younger than that of the two smaller communities, each with approximately 25% of the population aged over 65. Each community has one or more private dental surgeries and one public dental clinic serving the adult population.

Patients included in this study were all enrolled in a dental-recall system at the three selected public dental clinics and were invited for a dental check-up according to their estimated need and individual demand. The study group were aged 65 or older and were living independently or with moderate supportive care for daily living in their own homes. The recall system ensures that patients are scheduled and contacted by the clinic by telephone or post for dental check-ups at least every second year. If the patient declines the invitation or fails to attend the scheduled appointment, it is noted in the record. It is also noted when patients move from the area or choose another dental caregiver. In Sweden, information about whether patients have moved or died is available from the regional population registry that is cross-linked with electronic dental records and is updated on a regular basis. These records are maintained according to the standards of the National Board of Health and Welfare.^[20]

To be included in the main study, patients had to be 65 years or older in 2009. Excluded from the study were those who

- had died during the study period;
- wanted emergency care only;
- obtained or during the study period became eligible for the special dental care allowance subsidized by the county council (because such dental care includes a free annual in-home examination by a dental hygienist);
- lived in or moved to a nursing home during the study period because all residents of nursing homes are entitled to the special dental care allowance;
- had moved from the community and/or left the clinic for another caregiver during the study period.

Individual data from dental records during 2004–2009 for 4759 patients were examined longitudinally by one person at each clinic (two dentists and one dental hygienist). The selected patients were ≥ 65 years old at the beginning of the study in 2009. The three examiners were trained to use the same protocol at each clinic. After application of exclusion, the dental records of 3648 participants (1690 men and 1958 women) were included in the study (small community 1, $n = 912$; small community 2, $n = 754$; suburb, $n = 1982$). Table 1 shows the distribution of age and sex.

The data from the dental records noted in the protocol were age, gender, and active (at least three examinations in the study period) versus nonactive (at least three declined visits) patient status. The five different criteria for exclusion were also noted.

To gain an overview of the sample and its representation of the population, a subsample of 1102 patients was randomly chosen from the different age groups in the main sample of 1982 patients from the largest clinic. Randomization was conducted by selecting every second individual in each age group, other than the oldest group, from a printed list. Because there were fewer participants in the oldest age group, all participants were included. The records from the subgroup were analyzed according to the number of teeth, dentures, implants, medication status, and loss of regular attendance. These data were collected from the last registration in the individual dental records in the study period 2004–2009. In the two small communities these data were not collected.

The Regional Ethical Review Board of Gothenburg approved this study (decision number 402-10).

Data analyses

Data analyses included descriptive statistics and Chi-square linear-by-linear test. The linear-by-linear association test was used to test for trends. $P < 0.05$ was considered

Table 1: Distribution of participants according to age group and sex in the study sample

Age group	Women		Men		Total <i>n</i>
	<i>n</i>	%	<i>n</i>	%	
65-69	633	52.4	575	47.6	1208
70-74	438	51.4	414	48.6	852
75-79	340	51.2	324	48.8	664
80-84	266	54.2	225	45.8	491
85-89	203	64.0	114	36.0	317
≥ 90	78	67.2	38	32.8	116
Total	1958	53.7	1690	46.3	3648

statistically significant. The statistical analyses were performed using the IBM SPSS Statistics for Macintosh, Version 21.0. Armonk, NY: IBM Corp. USA.

RESULTS

A clear association between age and loss of regular dental attendance was found among patients aged 65 years and older ($\chi^2 = 114.0$, $P < 0.001$) [Figure 1]. Between 2004 and 2009, 13% of the participants lost contact with the dental health service (10% in those aged 65–79 and 21% in those ≥ 80).

Table 2 shows dental status, use of medication, and loss of regular dental attendance in the subsample. An average of 17.8 remaining teeth and 3.8 prescribed medicines were found. Seven percent of the participants had implants and 6.4% had a full denture in one or both the jaws. In total, 12% of the subsample had lost contact with dental services during the study period.

DISCUSSION

This study shows that the proportion of older people who lose their regular contact with dental services increases with age. This is in line with both the reported experience of dental staff^[7] and data from other studies.^[17,18] It may seem natural that old people lose contact with dental services as they move to special housing or die. In this systematic study, such factors were treated as exclusion criteria and only those people still living in their own homes, with or without help, were included. To our knowledge, this is the first study to systematically investigate dental attendance in a large sample of older people.

Our finding of a clear relationship between age and an increasing tendency to lose a formerly regular pattern

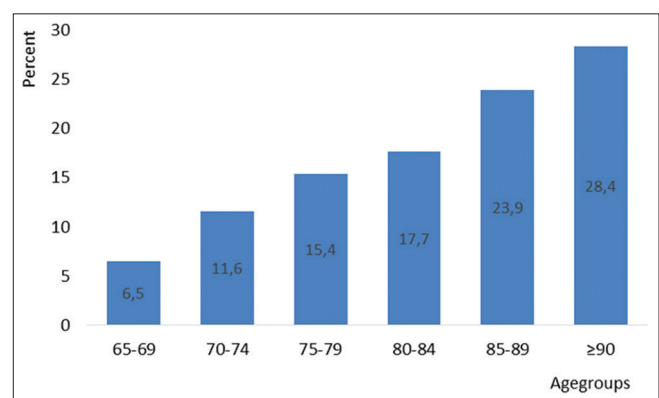


Figure 1: Distribution of participants who had lost contact with the dental health service during the study period according to age group ($n = 3648$)

Table 2: Oral status (teeth, implants, and full dentures), number of medications, and loss of dental attendance in the subsample group from the largest clinic (n=1102). Data obtained from dental records

Age group	Participants <i>n</i>	Teeth		Medicines		Dental implants		Full dentures		Loss of contact	
		Mean	SD	Mean	SD	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
65-69	348	22.6	6.3	2.4	2.7	27	7.8	6	1.7	30	8.6
70-74	268	20.6	6.6	3.0	3.1	25	9.3	7	2.6	31	11.5
75-79	224	19.4	7.1	3.3	2.3	11	4.9	16	7.1	21	9.4
80-84	148	16.0	8.3	4.4	3.2	9	6.1	25	16.9	26	17.6
85-89	94	14.4	7.8	5.0	3.9	9	9.6	16	17.0	26	27.7
≥90	20	14.0	7.0	4.5	2.9	0	-	1	5.0	5	25.0
Total	1102	19.7	7.5	3.3	3.1	81	7.3	71	6.4	139	12.6

Teeth: Remaining teeth in both jaws; medicines: number of medicines taken daily; implants: number of persons with implants in one or both jaws; full dentures: in one or both jaws; loss of contact: number of participants who lost contact with dental services during the study period. SD=Standard deviation

of dental contact is an important observation. However, old age may not be the only reason for the loss of contact with the dental health service. Our results probably reflect a relationship between increasing age and a number of associated factors that reduce the ability of old people to maintain contact with the dental health service. A number of such possibly important factors have been discussed.^[9] It is likely that difficulty in maintaining contact with dental services coincides with various mental and physical health problems such as incipient dementia and multi-disease conditions that often correlate with age and an increasing dependency on others to cope with everyday life in what is sometimes referred to as the “frail” period.^[21] In addition to mental and physical health problems, other factors such as marital status, socioeconomic and sociocultural contexts, oral status, availability of dental service, and the knowledge and attitude of the dental staff may contribute to whether regular dental contact can be maintained.^[9,22-24] There might also be a difference between cohorts. Older adults born before 1940 may not value oral health and dental aesthetics as much as younger generations.^[25]

The study material comes from smaller communities. It is possible that the patterns of dental contact in smaller municipalities are different from those in cities and towns. One factor that may affect the dental contact pattern is accessibility of care.^[16] In urban areas, access to dental care is often better than in small municipalities. However, in the three municipalities studied, dental service was easily available, and in smaller communities, dental professionals may have better knowledge of their older patients and their needs for service.

Social acceptance of oral deficiencies might also be higher in small municipalities, and this may then

affect dental care habits, but we found no scientific data to support this hypothesis. Social relations have, however, been found to be important to oral status or oral health.^[26,27] People who live alone are more likely to have fewer teeth and more anterior tooth spaces. The strength of this study is that earlier in life all the participants had chosen to enrol in a dental care system with regular recall. In Sweden, approximately 80% of the adult population visit the dentist with some regularity.^[10] From this, we can assume that the participants had reasonably regular visits throughout most of their adult lifespan.

A limitation of the method of a retrospective study of patient records is that over time many different people may have been involved in writing the records. Despite guidelines for maintaining consistent records, it is difficult to know how well all contributors conformed to those guidelines. However, prior to the start of the study all three investigators were trained to fill in the protocol based on what was found in the records, so we can expect a consistent interpretation of the records across the three clinics.

The representativeness of the study sample also bears some discussion. The sample was drawn from smaller communities, all located in the same county in western Sweden, but fairly well correlated with the national population distribution. The study group of 65 years and older represented 25% of the population in the two smaller study communities and 19% in the largest. The corresponding figure is 18% for Västra Götaland and 19% for Sweden as a whole.^[2] The proportion of older people is generally slightly lower in larger towns and cities than in smaller municipalities.^[2]

To gain information about representativeness, a subsample of the main sample were randomly selected

and their dental records examined for number of teeth, dentures, implants, medication status, and loss of regular attendance. These data were collected from the last registration in the individual dental records during the study period 2004–2009. Patients in our subsample had an average of 20 teeth. According to the National Board of Health and Welfare, people aged 60–90 in Sweden have an average of 21 remaining teeth.^[28] Seven percent of our subsample had one implant or more, a proportion quite similar to the national figure of 5%.^[29] Thus, the patients in our study correlated quite well with the elderly population of Sweden or parts of Sweden with regard to number of teeth and implants. Six percent of our subsample had a full denture in one or both jaws. In a repeated cross-sectional study of the population in a Swedish county, the proportion of totally edentulous 80-year-old individuals had decreased from 56% in 1983 to 5% in 2003 and even lower in 2013.^[30]

The subsample had an average of 3.3 prescribed medicines. The corresponding figure for Sweden is 5 to 6 medicines for the group 75 years and older.^[31] A recent study^[18] showed that elderly people (75 years and older) dependant on moderate and substantial supportive care used approximately six medicines, but our study group was somewhat younger, and in general probably healthier because substantial supportive care was a criterion for exclusion.

The findings of this study showing a clear relationship between age and an increasing tendency to lose a formerly regular pattern of dental contact support the results of telephone interviews collected by the Living Conditions Survey (SCB Statistics, Sweden), which showed that people aged 16 years and older reported declining regular dental contacts with increasing age.^[32] The ability of old people to maintain contact with their dental health service seems, therefore, often to be reduced. Patient age is therefore an important indicator to consider in the planning of the oral health care system.

Lack of dental contact is likely to escalate the risk of oral health problems, which, in turn, may have negative consequences for patients' quality of life during their later years.^[33,34] The frail period of life probably coincides with the time of not seeing the dentist, developing impaired saliva secretion due to medication, changes in diet, and difficulties in oral hygiene, which can result in the rapid deterioration of their dental status and have a significant impact on their oral health-related quality of life.

CONCLUSION

It is very important for older people, dental services, and society as a whole to preserve the good oral health that has been established through a lifetime of regular dental care. The result of the present study shows, however, that a considerable number of older people living independently or with moderate supportive care in their own homes lose contact with dental service despite enrolment in a recall system. In future studies, it will be important to identify the reasons why older adults lose contact with the dental health service. Knowing these causes may enable us to develop methods to identify individuals at risk of losing contact with the dental health service and develop procedures to ensure regular dental contacts.

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Conflicts of interest

There are no conflicts of interest.

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