Quality evaluation of oral health record-keeping for Finnish young adults

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The objective of this study was to assess the quality of oral health record-keeping in public oral health care in relation to dentists' characteristics. A random computerized selection of 239 subjects, born in 1966–71 and clinically examined during 1994 in an administrative unit of the public oral health service in southern Finland, included 4–5 cases per dentist, the number of dentists being 50. Data concerning actual clinical examinations and treatment courses carried out in public dental clinics came from original oral health records. Criteria for assessment of oral health record entries were based on Finnish health legislation and detailed instructions of health authorities. The results showed that each patient's identity was available in 90% of documents. Recordings concerning continuity of comprehensive care were infrequent; a questionnaire concerning each patient's up-to-date health history was in only 26% of the oral health records. Notes concerning each patient's bite and function of the temporomandibular joint were in 37% of the records, notes about oral soft tissues were in 11%, and the check-up interval was recorded in 21%. Recording of indices on periodontal and dental status varied greatly; the community periodontal index of treatment need was found in 93% and the index of incipient lesions in 16% of the records. Female dentists and dentists younger than 37 years tended to record more information. Dentists should be encouraged to better utilize the options offered by oral health records for individual treatment schemes. □ *Dentist characteristics; patient history; public oral health care; standards*

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A patient record of high quality provides a detailed account of the patient's care, including diagnostic information collected, the resulting diagnosis, the treatment plan selected, and the actual treatment provided (1). The oral health record of a regular patient provides a source for continuous assessment of the outcome of care previously given. It also permits monitoring of his or her oral health, but only if its mapping is properly completed.

Previous studies have identified oral health record-keeping that is insufficient. In Sweden dentists' observance of record-keeping rules, defined as the frequency of correctly entered items among all entries, was 59%, with correct documentation being most frequent (63%) among dentists aged 34–44 years; documentation of patient history was found in 53% of the records (2). In oral health records used in Sweden for forensic identification, information about dental condition, normal findings, and previous restorative treatment was complete in 68% of the documents (3). In the US state of North Carolina, general practitioners had recorded periodontal diagnosis in only 16% of the patient records (4).

If an oral health record form is to contribute to good-quality record-keeping, it should comprise all the relevant components relating to the patient care process and be organized to permit periodic updating, as Jerge & Orlowski (5) have suggested. In Finland health authorities provide the public oral health service with such a structured oral health record form and with detailed instructions on its use.

The aim of this study was to assess quality of oral health record-keeping in Finnish public oral health care in relation to dentists' characteristics.

Materials and methods

Background

The present study was carried out in the town of Vantaa in southern Finland. Of Vantaa's 165,000 inhabitants, 65% were, on the basis of age, entitled to public oral health services. The town's 37 municipal dental clinics are situated evenly throughout its districts. In 1995 a total of 59,000 patients used the services, making 140,000 visits. Patients under the age of 19 years made 63% of the visits, the services being free of charge to them and given on a regular basis according to the Primary Health Act (6). Adults under 40 years of age made 32% of the visits, these services being highly subsidized, with each check-up done on the patient's own initiative after an interval recommended at the completion of a previous treatment course.

Gathering of data

Data on actual clinical examinations carried out in the public dental clinics came from the original oral health records. The basic population comprised all patients ($n = 3248$) born in 1966–71 and clinically examined in

Table 1. Comparisons between basic population, sample, and study population (%)

	Basic population (n = 3248)	Sample (n = 239)	Study population (n = 208)
Sex			
Male	34.9	35.4	34.1
Female	65.1	64.6	65.9
Year of birth*			
1966	20.0	16.7	18.3
1967	20.7	22.5	22.6
1968	17.2	19.2	19.7
1969	15.4	15.8	15.4
1970	13.4	12.1	11.1
1971	13.2	13.8	13.0

* Statistical evaluation of distribution of birth years by chi-square test. Study population vs. basic population, $P = 0.833$; study population vs. sample, $P = 0.998$.

1994, the most recent year during which official statistics on examinations from each clinic were available in a single computerized format. A random computerized selection of 239 subjects included 4–5 cases per dentist to represent everyday record-keeping practice in the public oral health service. Comparisons between the basic population, sample, and study population are presented in Table 1. At the time of the clinical examination, the patients' ages ranged from 22.2 to 30.4 years (mean, 26.6; standard deviation (s) = 2.0; median, 26.8).

The patients' original oral health records were requested from municipal dental clinics, and all notes concerning the most recent clinical examination and treatment course performed between 1994 and 1996 were scrutinized. Data gathered between November 1996 and March 1997 were reviewed according to a written, pretested protocol by one author (S. E. Helminen).

The data collected from the original patient records, which might consist of several documents, were based on the models provided in the standardized oral health record. The authoritative instructions require recording of all the scrutinized entities; thus, any recorded entry was acceptable. To a large degree the assessment followed that suggested by Schoen (7) for process evaluation, though the aim was for the type called procedural audit, as Jerge & Orlowski described it (5). Criteria for assessment of quality were based on the Finnish health legislation and on instructions given by the Ministry of Welfare and Health, the National Board of Health (8), and the local authorities in the public oral health service of Vantaa (9). The following entities, which thus served as quality criteria, were the basis for data collection: ink or pencil for entries (writing should be permanent, except for the patient's address and phone number), corrections (incorrect entry struck through and still legible, or otherwise); patient's identification: name, social security number, occupation, and address; and patient health history questionnaire (whether filled in and updated). Each patient's name and social security number or date of birth were checked in all enclosed documents. Further items checked were date of dental status; the oral status indices: community periodontal index of treatment need (CPITN), number of incipient lesions (I), number of decayed teeth (DT), number of decayed-missing-filled teeth (DMFT), and the World Health Organization's status and intervention index (SI); and notes on the patient's occlusion and soft tissues. Finally came recording of the code of each dentist, of the cost estimate for treatment, and of the individual check-up interval or date of the next check-up.

Background data on the 50 dentists, by their codes, came from the local public oral health authorities. At the time of the examination, the dentists' ages ranged from 30.3 to 62.3 years (mean, 43.0; s = 7.5; median, 40.6). Of the dentists 14% were men, and they performed 17% of the clinical examinations.

Methods of analysis

Recordings were evaluated both for individual variables and for clusters. One cluster, dealing with mapping and monitoring the patient's oral health, included entries on occlusion and soft tissues. The second cluster included entries on periodontal and dental status: CPITN, I, DT, and DMFT. The patient's identity information (name, social security number, occupation, and address) made up the third cluster.

The dentists' ages were defined separately at the time of each clinical examination and categorized by quartiles into three groups: <37 years, 37–50 years, and >50 years.

Statistical significance of differences between the groups was evaluated by means of the chi-square test. A linear regression model was applied to analyze recording activity. Each patient's sex and age at the time of the clinical examination and the dentist's sex and age were included in the models as independent variables.

Results

Record-keeping practice in general

Of the 221 oral health records traced (92% of the original sample), 208 (87%) included notes about a clinical examination performed from 1994 to 1996, with 51% of the most recent clinical examinations being from 1994, 23% from 1995, and 26% from 1996.

In 54% of the oral health records, notes were made in ink in the sections requiring ink; the rest contained both ink and pencil recordings, the latter concerning mainly treatment fees collected. Corrections appeared in 43 oral health records. In 14% of those, corrections were made according to instructions by striking through; in 84% corrections were not according to instructions; and 2% contained both types of corrections. The patient's identification was recorded in the majority of the oral health documents: name (90%), social security number or date of birth (80%), occupation (66%), and address (99%). The date of clinical examination was recorded properly in

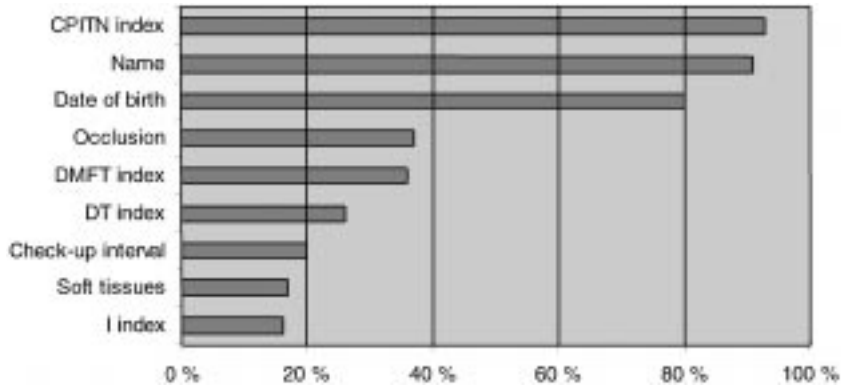

Fig. 1. Frequency (%) of recording oral health record entries.

98% of the oral health records, and the code of the dentist in 98%.

Oral health record entries

A questionnaire concerning each patient's up-to-date health history was in 26% of the oral health records. In 21% it had been filled in during some former treatment course, but 53% lacked such a questionnaire. Most patients with a health history questionnaire were pregnant women or emergency patients.

Recording of indices on periodontal and dental status varied greatly. The CPITN index was found in 93% of the records and the I index in 16%, whereas the SI index appeared in none. Recording of occlusion and soft tissues was in most cases made as notes in some section other than that required by the instructions. No cost estimation for treatment appeared in any of the oral health records scrutinized (Fig. 1).

Statistically significant differences between recording practices for year of clinical examination appeared within the patient history. With lengthening time, more filled-in patient history questionnaires appeared, but fewer were updated.

Recording in relation to dentists' characteristics

Statistically significant differences in recording practice in relation to the age of the dentists occurred within the occlusion and soft tissue cluster and for check-up interval.

Table 2. Distribution of recordings on clinical examination by dentist age at time of clinical examination and by dentist sex*

	Dentist age				Dentist sex		
Recordings made	*P*	<37 years (%)	37–50 years (%)	>50 years (%)	*P*	Male (%)	Female (%)
Patient-identity information	0.346				0.942		
4 recorded		53	62	56		57	56
3 recorded		31	22	28		26	28
0–2 recorded		16	16	16		17	16
Occlusion and soft tissue	0.006				0.004		
2 recorded		20	5	2		3	9
1 recorded		29	30	38		11	36
0 recorded		51	65	60		86	55
Indices	0.481				0.080		
3–4 recorded		33	26	21		31	25
1–2 recorded		63	70	71		57	71
0 recorded		4	4	8		12	4
Patient history	0.834				0.915		
Updated		29	24	25		23	26
Filled-in		22	23	17		23	21
No questionnaire		49	53	58		54	53
No. of examinations		54	101	53		35	173
Check-up interval†	0.006				0.022		
Recorded		29	25	4		6	24
Not recorded		71	75	96		94	76

* Statistical analysis by chi-square test. Difference by age and sex within each cluster.
† From analysis of check-up interval, 17 of 208 cases are missing because treatment courses were not completed.

Table 3. Regression model for recording of patient history ($n = 208$)

Independent variables	Regression coefficient	s	β	t
Patient sex	0.228	0.124	0.128	1.831
Patient age	−0.035	0.030	−0.083	−1.191
Dentist sex	0.020	0.159	0.009	0.127
Dentist age	0.000	0.008	0.001	0.011

Constant = 1.228, $R^2 = 0.0221$; s = standard deviation; β = standardized regression coefficient.

The youngest age group tended to record more information. In relation to the sex of the dentists, significant differences occurred within the occlusion and soft tissue cluster and for check-up interval, with differences in favor of female dentists (Table 2).

Table 3 shows a regression analysis of variables explaining the recording of patient health history. Only 2.2% of the variation in recording was explained by this model. The same independent variables explained 6.0% of the variation in recording of the occlusion and soft tissue cluster, 2.3% for the indices cluster, 3.0% for the patient identity cluster, and 11% for the check-up interval.

Discussion

The quality of record-keeping concerning patient health history and mapping and monitoring of oral health did not meet the 100% level purported by authorities to exist. The criteria for evaluating our dentists' record-keeping were based on Finnish health legislation and on the detailed instructions given by the local health authorities. Therefore, dentists should have had no misapprehension about how to use a patient's oral health record.

This study was confined to young adults below 30 years because a narrow age group can be considered homogeneous in respect to its oral health problems. These data can be considered reliable and valid not only because of restriction to a homogeneous age group but also because they were collected from the original oral health records of a randomly selected sample, and the recordings had been made at actual clinical examinations. Moreover, these dentists were accustomed to treating young adults as a part of their daily routine. Despite the practice of forwarding a patient's oral health record in the case of the patient's moving, the number of oral health records collected for the sample was surprisingly great (92%), guaranteeing these were highly representative of the real-life record-keeping practice.

The rules concerning record-keeping in general were mainly followed, except those on making corrections in official documents and noting the patient's name and social security number in all enclosed documents. These findings are in accordance with those for Swedish dentists (2, 3).

Recordings on patients' oral health, except for the CPITN index, were infrequent, results that are in line with those of previous studies (2, 10). However, in the official statistics used for administrative purposes, these indices and the interval between regular check-ups had been recorded by dentists for almost every patient. This practice underscores the fact that recording for statistics is a necessity, as suggested (11), but it neglects record-keeping for treatment purposes.

The paucity of notes on patients' bite and on temporomandibular joint (TMJ) function and oral soft tissues may result from dentists' custom of recording mainly abnormal findings. That the youngest dentists recorded the status of soft tissues and occlusion more frequently might reflect the shift in emphasis from dental toward oral health in dentist education. In Sweden a dentist's age correlated more strongly with the number of correct entries than did year of licensing (2). However, our regression model with patient age and sex and dentist age and sex as independent variables explained poorly the variation in recordings on TMJ function and soft tissues, as poorly as it did for each examination cluster studied.

The presence of a patient history questionnaire in fewer than half of the oral health records, although particularly frequent in records of pregnant women and emergency patients, reflects a tendency to inquire about the patient's health history in more detail when there is an evident deviation from routine. Still, to avoid possibly harmful procedures or interactions during treatment, dentists should be fully aware of each patient's health status. Furthermore, recording patients' health status is required for a dentist's own legal protection; a health history questionnaire filled in and signed by each patient is recommended as a convenient means to achieve that end (12).

Most quality assessment projects and quality assurance systems measuring professional quality, which are initiated in large numbers nowadays, rely on written documents (13, 14). The basic assumption is that what is documented has also been performed. On the other hand, a dentist may not record certain kinds of observations related to procedures that he or she has performed, as has been found with general medical practitioners (15). This practice might not affect immediate care, but certainly would compromise continuity of comprehensive care.

Because quality is a continuum from perfection to complete failure and dependent on several factors, setting a standard for good quality is difficult. In any human activity the standard can hardly be set at 100% perfection, but those who are involved in achieving standards must also define the acceptable level. The incentive for dentists to maintain high-quality oral health record-keeping practices should not be threats by authorities, but the safety of their patients, their desire to provide comprehensive and continuous oral health care, and, in regard to any unfortunate incident, their own judicial prudence. Of course, dentists' reluctance to record all the required items creates a need for critical evaluation of the criteria and standards for oral health record-keeping. Responsibility

for setting these within the professional community should not be overlooked.

On the basis of our results, it can be concluded that dentists should be encouraged to better utilize the options offered by high-quality oral health records for individual and comprehensive treatment.

References

1. Bailit H, Gotowka T. Guidelines for the development of a quality assurance system for hospital dental programs. Chicago: American Dental Association; 1983.
2. Rasmusson L, René N, Dahlbom U, Borrman H. Quality evaluation of patient records in Swedish dental care. Swed Dent J 1994;18:233–41.
3. Borrman H, Dahlbom U, Loyola E, René N. Quality evaluation of 10 years patient records in forensic odontology. Int J Legal Med 1995;108:100–4.
4. McFall W Jr, Bader J, Rozier R, Ramsey D. Presence of periodontal data in patient records of general practitioners. J Periodontol 1988;59:445–9.
5. Jerge CR, Orlowski RM. Quality assurance and the dental record. Dent Clin North Am 1985;29:483–96.
6. Primary Health Act, No. 66–67 (1972).
7. Schoen MH. A quality assessment system: the search for validity. J Dent Educ 1989;53:658–69.
8. National Board of Health Instructions for systematic dental care to the population born in 1961 or later. Directive 6/85. Helsinki: The Board; 1985.
9. Vantaa City Health and Social Welfare Department Instructions for patient documentation [circular]. Vantaa: The Department; 1991.
10. Vehkalahti M, Rytömaa I, Helminen S. Assessment of quality of public oral health care on the basis of patient records. Community Dent Oral Epidemiol 1992;20:102–5.
11. Mecklenburg R. Documentation and evaluation in oral health services. J Public Health Dent 1990;5:439–46.
12. McCarthy FM. Medical history: the best insurance. J Can Dent Assoc 1983;11:61–4.
13. Lembcke P. Medical auditing by scientific methods. Illustrated by major female pelvic surgery. J Am Med 1956;162:646–55.
14. Øvretveit J. Health service quality. An introduction to quality methods for health services. Cambridge: Blackwell Science; 1992. p. 61–75.
15. Rethans J, Martin E, Metsemakers J. To what extent do clinical notes by general practitioners reflect actual medical performance? A study using simulated patients. Br J Gen Pract 1994; 44:153–6.

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