

Cooperation and competition between dentists and denturists in Finland

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The aim of this study was to investigate cooperation between dentists and denturists in Finland, particularly in relation to perceived competition between the two professions. From a representative sample of 350 private dentists and 253 denturists, 68% returned acceptably filled-in questionnaires dealing with competition and cooperation with other healthcare professionals. Dentists referred their patients significantly ($P < 0.001$) less often to denturists (26.2%) than denturists did to dentists (94.1%). Those who referred their patients to members of the other profession also received patients from the other profession significantly ($P < 0.001$) more often than those who did not (60.7% vs 16.7% among dentists; 90.0% vs 44.4% among denturists). Denturists saw themselves as competing with dentists (56.0%) significantly ($P < 0.001$) more often than dentists did with denturists (29.2%). Dentists practicing in small towns or rural areas cooperated more often with denturists than did those practicing in more urban areas. Among denturists, the likelihood of referring patients to dentists was associated with younger age and fewer clinical working hours. It was concluded that cooperation between dentists and denturists was common. Oral healthcare professionals who referred their patients to the other profession also benefited by receiving more patients on referral from them. Dental services provided by denturists are limited, which may explain their greater willingness to cooperate with dentists. □ *Competition; cooperation; dentists; denturists; economics*

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Increased competition in dentistry with the anticipated consequent reduction in removable denture treatment prices has been cited as a reason why the profession of denturists has become established in many countries (1–4). MacEntee et al. (5) suggested that the presence of denturists in British Columbia limited the increase in denture fees introduced by dentists. Similarly, Rosenstein et al. (6) found that denture care costs did not increase at the same rate as those for other dental services after denturist legislation was passed in Oregon, USA. According to a controversial finding reported by Abrams, no substantial change in the price level of denture services by the 2 professions was observed after the denturist law was passed in Canada (7).

In most of Canada and in New Zealand and Denmark denturists have had the right to supply both complete and partial dentures (4, 8), and for example in some states in the USA, Finland, The Netherlands only complete dentures. In addition, some legislations require a patient to have a statement of oral health from a physician or dentist before a denturist is allowed to make the dentures (9). However, in many countries denturists are free to provide dentures directly to individuals without any supervision or participation by dentists or physicians (8–11).

In Finland, denturists have been licensed for the provision, relining, and repair of complete dentures for persons aged 20 years and over since 1964. However, these patients must have an already edentulous jaw free of pathological or congenital anomalies. The supply of partial dentures is the right of dentists alone. The presence of

denturists in Finland has not improved the availability of denture services in more remote areas (11). In the USA, denturists and dentists have been shown to serve patient groups from similar socio-demographic backgrounds (10), but in Finland denturists have provided complete denture services mainly to older, lower-income urban dwellers (12).

It has been estimated that in the 1970s in British Columbia, Canada denturists were providing 50–60% of the complete denture sets and approximately 30% of single unit complete dentures (5). In a recent study of elderly Finnish men, denturists had provided almost 65% of the complete dentures (13).

Dentists have been willing to reduce competition in dentistry in general (14) and in particular they have suggested a reduced and more controlled role for denturists (15–18). On the other hand, dentists in British Columbia, Canada have broadly supported the education and licencing of denturists (19). Cooperation between individual dentists and denturists has been noted, although its extent remains unknown (4).

Purpose

The aim of this study was to investigate the cooperation between dentists and denturists, particularly in relation to perceived competition between the two professions in Finland. Selected provider and practice characteristics were studied in order to identify factors associated with cooperation.

Table 1. Personal and practice characteristics of the sample dentists ($n = 233$) and denturists ($n = 168$) with complete data on all studied items

	Dentists		Denturists	
	Cooperating with denturists ($n = 61$)	Not cooperating with denturists ($n = 172$)	Cooperating with dentists ($n = 158$)	Not cooperating with dentists ($n = 10$)
Mean				
Age in years	42.8	44.8	51.8	60.0**
Weekly clinical hours in private practice	27.0	27.2	13.9	18.8*
No. of patients per month coming on referral from the other profession	1.3	0.3***	4.0	1.0*
No. of patients per month being referred to the other profession	2.0	0.0	5.5	0.0
Percentage				
Women	61	59	14	10
Working in joint practice with one's own profession	69	73	16	20
Working in joint practice with the other profession	7	2*	9	0
Working in more than one location	18	17	26	10
Practice in small town or rural area	46	28**	53	30

Statistical comparisons between cooperating and non-cooperating providers within the professions using the Fisher exact test, the chi-square test, and Student's t test: * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$, otherwise not significant.

Material and methods

For a pilot study, a random sample of 50 dentists was drawn from 2476 individuals registered as private dental practitioners by the Finnish Dental Association. A questionnaire was distributed in May 1998 together with a paid return envelope. Within a month, 90% of the sampled dentists had returned an acceptably filled-in questionnaire containing 27 questions dealing with personal and practice characteristics, planning and marketing activities, and co-operation with other dentists, physicians, and denturists. Seven-point Likert-type questions were also included that dealt with attitudes toward competition.

The final survey questionnaire, comprising 46 questions, was administered in September–November 1998. For the final survey, a random sample of 305 private dental practitioners was drawn from the same register as was used for the pilot study. The five dentists who had already participated in the pilot study were not sent another questionnaire, but their original data were included in the main study.

The pilot study and main study data were combined for all questions whose wording remained identical, as was the case in all questions included in this particular work. Those who failed to return the questionnaire within a month were reminded by telephone. The reasons for non-participation were recorded. A new questionnaire form and pre-paid return envelope were mailed to non-respondents. Altogether 237 dentists returned an acceptably filled-in questionnaire, and the final participation rate was 67.7%.

The sampling of denturists was based on the membership register of the Association for Special Dental Technicians in Finland. Out of the 312 registered

members 253 were still in active work. After 2 mailings of questionnaire forms with pre-paid return envelopes, 173 questionnaires were returned, with a final participation rate of 68.4%.

Their questionnaire included questions that were similar to those in the dentists' questionnaire form; however, they had been modified to correspond to the work that denturists' do. The questionnaire was finalized in cooperation with the representatives of the Association for Denturists in Finland, and pretesting was not seen as necessary.

Cooperation with the other profession was assessed in the question: 'On average, how many patients do you refer to denturists/dentists per month?' The actual number of referred patients showed the magnitude of cooperation. A dichotomy of cooperation was formed as: 0) not referring any patients to the members of the other profession, 1) referring any patients to the members of the other profession.

An identical question was used to find out how many referred patients each dentist and denturist received monthly from the other profession, and a dichotomy was formed similarly.

The level of competition was based on the question: 'How much competition exists between private dentists and denturists at this moment?' with Likert-type alternatives ranging from 1) Very little, to 7) Very much. Alternative 4 represented a neutral opinion. Alternatives 1, 2, and 3 were later combined as 'little competition', and alternatives 5, 6, and 7 as 'much competition'.

In statistical analysis of the data, the Fisher exact test, the chi-square test, and the trend test were used to evaluate proportions, and Student's t test the means. The level of statistical significance was set at P -values less than 0.05.

Table 2. Percentage distribution of perceived competition at the time of survey between dentists and denturists with and without cooperation with the other profession

	Dentists		Denturists	
	Cooperating with denturists (<i>n</i> = 61)	Not cooperating with denturists (<i>n</i> = 172)	Cooperating with dentists (<i>n</i> = 158)	Not cooperating with dentists (<i>n</i> = 10)
Little competition	44	37	25	30
Neutral opinion	30	33	17	50
Much competition	26	30	58	20

Statistical comparison between cooperating and non-cooperating providers within the professions, using Trend test: among denturists $P < 0.05$, otherwise not significant.

Multiple logistic regression models were fitted to study how the respondents' age, sex, and solicited practice characteristics explained the probability of referring patients to members of the other profession. Age and weekly clinical working hours were used as continuous variables. Sex was dichotomized using female gender as reference group (0). Dichotomies were formed indicating whether the subject was practicing alone (0) or in joint practice with members of one's own profession (1), and if working with members of the other profession (1). Another dichotomous practice characteristic indicated whether the practitioner was working in one location only (0) or offered services in more than one location (1). Location of area served was coded as 0 for 1 of the 10 largest cities in Finland, and 1 for a smaller city or rural area.

The odds ratios and their 95% confidence intervals were calculated from the logistic regression coefficients and their standard errors (20, 21).

Results

Of all participating private dentists, 26.2% referred their patients to denturists. Among participating denturists, patient referral to dentists was significantly ($P < 0.001$) more common (94.1%). Dentists who referred their patients to denturists had significantly higher probability ($P < 0.001$) to receive referrals from denturists (60.7%) than those who did not refer themselves (16.7%). In addition, the referring denturists had significantly

($P < 0.001$) higher probability to receive patients from dentists (90.0%) than did non-referring denturists (44.4%).

When analyzing the magnitude of cooperation, dentists who referred patients to denturists also received a significantly ($P < 0.001$) higher number of referrals from denturists than those who did not refer their own patients to denturists. The referring dentists were also significantly ($P < 0.01$) more often practicing in a small town or in a rural area, and were working in a joint practice with the other profession ($P < 0.05$) (Table 1). Denturists referring their patients to dentists were significantly ($P < 0.01$) younger, worked fewer hours in the clinic per week ($P < 0.05$), and, similarly, received a higher number of patients ($P < 0.05$) on referral from dentists than those who did not refer their own patients (Table 1).

Overall, denturists perceived themselves as being in competition with the dentists significantly ($P < 0.001$) more than dentists with denturists. Referring dentists perceived themselves as competing with denturists only slightly less than did non-referring dentists. On the other hand, denturists who referred patients to dentists perceived themselves as being in competition significantly ($P < 0.01$) more than the few denturists who did not refer patients to dentists (Table 2).

Multivariate analysis revealed that the odds of referring patients to members of the other profession were only slightly dependent on the studied background variables. Among dentists, practicing in a small town or a rural area significantly increased the odds of cooperation also when the effects of other background variables were simulta-

Table 3. Odds ratios with their 95% confidence intervals for the background factors for the probability of cooperating with the other profession (referring any patients), obtained from the logistic regression models

Background factors	Dentists		Denturists	
	Odds ratio	95% confidence intervals	Odds ratio	95% confidence intervals
Age	0.96	0.95–1.01	0.92	0.84–0.99
Working hours in clinic per week	0.98	0.96–1.02	0.92	0.85–0.99
Male sex	0.98	0.49–1.92	1.76	0.16–19.52
Little perceived competition between professions	1.18	0.62–2.23	0.87	0.18–4.29
Joint practice with members of own profession	0.65	0.30–1.38	1.37	0.14–13.42
More than one practice	0.85	0.36–1.98	2.75	0.29–25.47
Practice in small town or rural area	2.19	1.13–4.22	1.76	0.37–8.28
Model chi-square and level of significance	11.62	$P < 0.11$	12.28	$P < 0.09$

neously controlled (Table 3). Logistic regression models among denturists revealed that younger denturists and those working fewer clinical hours had significantly, although weakly, higher odds of referring patients (Table 3). Higher odds ratios in the analyses among denturists had great variations in their confidence intervals, indicating that these factors had poor predictive value.

Discussion

The present study is part of a larger survey in Finland of 9 healthcare professions registered to provide health services directly to the public. The data were based on responses from almost 10% of all 2,476 private dentists nationwide and all denturists involved in clinical work were included in their sample. The age, sex, and geographical distributions of the respondents were practically identical to those of all private dentists and denturists. However, the non-participating dentists and denturists were slightly more often working in solo practice than the participants. It may be that those choosing to work in solo practice are less willing to cooperate with the members of their own and other professions. Overall, the findings can be considered representative of all Finnish private dental practitioners.

The questionnaires for each profession were based on a set of common questions dealing with marketing of services and experiences in competition, plus an additional set of questions of particular interest to each profession only. Structured questionnaires were used for this study in order to enable use of larger sample sizes and to ease comparisons between professions. A more qualitative approach could have provided different views and wider exploration of the questions.

Cooperation between dentists and denturists was common. As approximately half of the almost 5000 dentists in Finland work in the private sector, it should be relatively easy for denturists to find a cooperating dentist. Those denturists who did not cooperate with dentists were significantly older than cooperating denturists, which may indicate that younger denturists are more willing to adopt a co-operative practice format. If this is the case, more cooperation between the two professions may occur in future, which would bring a higher proportion of denturists' patients to check-ups and treatment done by dentists. Currently in Finland a denturist's patient does not need any certificate of oral health, and denturists' cooperation with dentists is based on their own free choice.

Cooperation between the two professions seemed to benefit both, as both cooperating dentists and denturists more often received patients on referral from the members of the other profession than those who did not refer their own patients.

The number of dentists in Finland is currently higher than ever before, and dentists are aware of intense competition among themselves (22). However, denturists perceived even more competition than dentists. The

variety of treatment denturists can provide in Finland is limited to providing, repairing, and relining complete dentures. In an environment of more intense competition, dentists who are able to provide a large range of services have more flexibility to adjust to the new market situation, whereas denturists have practically no possibilities to modify the treatment alternatives offered in their practices.

The few denturists who did not cooperate with dentists perceived less competition than those who did, which may be explained by the fact that the denturists who did not cooperate were older, had practiced denturism for a longer time and probably had a broader patient base. Cooperating denturists may have needed cooperation more in order to get additional business, and it is possible that, at least in some cases, their cooperation was motivated by a need to cooperate instead of willingness to do so.

Dentists operating in smaller cities and in rural areas were twice as likely to cooperate with denturists as those operating in large cities. Even when the effects of all studied background factors were controlled for, the effect of practice location among dentists remained significant. In an earlier study, competition between private dentists was perceived as being significantly less intense outside the metropolitan Helsinki area than in more remote areas (22). Probably dentists in smaller cities and rural areas also perceive competition between themselves and denturists as being less intense than in more urban settings. Dentists who perceive much competition probably consider all those who treat their potential patients as their competitors, whether they be dentists or denturists. It may be that dentists doing more or less prosthodontics perceive competition with denturists differently. However, composition of provided services was not included in the questionnaire.

In Finland, third-party involvement in dental care financing is expanding. Decisions to lower the age limits for eligibility for dental treatment under public health insurance do not include denture services. According to economic theory (23), this development should increase the demand for dental services, thus improving the working conditions for dentists. It remains to be seen whether this increase is large enough to have an effect on dentists' willingness to cooperate with denturists.

Increased cooperation between dentists and denturists would bring removable denture wearers more frequently and regularly to dentist's attention, and oral mucosal inflammations and other disorders would be better detected (4). Furthermore, cooperation could be one possibility by which to try to improve the efficacy of oral health services.

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