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Working profiles of dental hygienists in public and private practice in Finland and Norway

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Abstract: *Aim:* The aim was to compare the working profiles of Finnish and Norwegian dental hygienists in public and private practice. To this end, we compared the procedures performed, the type of patients and the time devoted to different tasks. *Subjects and methods:* A questionnaire survey was originally conducted among a representative sample of dental hygienists in Finland (n = 595) and all authorized dental hygienists in Norway (n = 1 138) in 2004. The questionnaires collected data on the dental hygienists' age, gender, year of graduation, working experience, work sector (private or public), working time spent on different activities and patient groups. The questionnaire also assessed how frequently the dental hygienists performed 25 different treatment measures. *Results:* The Norwegian dental hygienists spent 45.4% of their clinical time on check-ups, whereas the Finns spent 49.9% of their time scaling. Dental hygienists in Finland and Norway working in the public sector spent 42.9% and 74.6% of their working time dealing with children and youth respectively. *Conclusions:* The working profiles of dental hygienists in Finland and Norway were quite similar, although differences in distribution by activities, type of patients and treatment measures do exist. The main activity of the dental hygienists was clinical work. The most commonly practised clinical activity among Finnish dental hygienists was scaling, and among Norwegians, check-ups. Public dental hygienists in both countries dealt mainly with children and youths. Oral hygiene instruction was the most commonly reported treatment measure among both Finns and Norwegians.

Key words: dental hygienists; Nordic countries; oral health services; practice

Introduction

The dental hygiene profession emerged when health officials recognized that oral health can be promoted through regular preventive care. The USA worked as a pioneer, establishing the first dental hygiene training course in 1913; today the profession is practiced in more than 30 countries (1). Norway was the second country, and the first in Europe, to initiate its own programme in 1923 using a US educational model (1–3). Of the Nordic countries, Finland was the last to initiate a dental hygiene educational programme, established in 1976 as a continuing education course for dental nurses (4). Later, in 1987, the course evolved into a 3.5-year independent educational programme requiring no previous educational background in dental nursing.

The number of dental hygienists varies greatly worldwide. Studies support the following ratios of dental hygienists to the population: 1:1432 in Japan, 1:1796 in Canada, 1:1822 in the USA 1:821 000 in Germany, 1:96 375 in Italy, 1:84 409 in Portugal and 1:39 670 in Spain (2, 5). In the Nordic countries, the ratio of hygienists to the population (about 1:2000–4500, see Table 1) (1–4, 6–9) is among the highest in Europe. Six member states of the EU (Austria, Belgium, France, Greece, Liechtenstein and Luxembourg) provide no dental hygienist training (5). A comparison of the employment of dental hygienists between European and non-European countries shows that financial incentive seemed not to be a factor to in explaining the disparity (5).

Table 1. **Background information on dental hygienist education and practice in Finland and Norway**

	Finland	Norway
Number of inhabitants	5 238 469*	4 627 926*
Number of dentists	6377†	3733‡
Number of dental hygienists		
Total number	1350§	1050§
Authorized	1246¶	1138**
Dental hygienist:population ratio	1:4333§	1:4476§
Dental hygienist:dentist ratio	1:4§	1:4§
Year of the first training course	1976††	1923††
Year of legalization of dental hygiene profession	1972††	1979††
Educational model	Swedish model††	US model††
Current number of dental hygiene training programmes	5¶ Helsinki Jyväskylä Kuopio Oulu Turku	3†† Oslo Bergen Tromsø
Length of programme	3.5¶	3
Student intake/year	100¶	54§

*World Fact Book.
†Finnish Dental Association.
‡World Health Organization.
§Johnson, 2003.
¶Niiranen & Widström, 2005.
**Wang & Toven, 2006.
††Luciak-Donsberger, 2003.

Since the emergence of the dental hygiene profession, hygienists have contributed considerably to oral health care. Preventive care as a means for oral health improvement has been widely emphasized, especially in the Nordic countries, which share similar social welfare policies and models of oral healthcare provision (10). In these countries, a public sector with salaried personnel takes care of most children, elderly in institutions, special need groups and, variably, adults. Thus, dental services are widely available and, to a great extent, financed through tax revenues. The private sector mainly takes care of working-age adults.

Economic pressures arising from changes in oral health (e.g. adults retaining their own teeth longer and demanding more advanced care and preventive measures) have emphasized the role of an auxiliary work force in oral health care in many western countries to enable dentists to focus on more complicated curative care. Changes in education and legislation as well as in dental healthcare subsidy reforms (11–13) have been made to improve the redistribution of tasks, especially between dentists and dental hygienists, to meet the requirements and demands in the changing healthcare sector.

Although the characteristics of the dental hygiene profession are well established, variations between countries exist in the working profiles of dental hygienists. The aim of this present study was to compare the working profiles of Finnish and Norwegian dental hygienists in public and private practice. To this end, we compared the time dedicated to different tasks, the type of patients and the procedures performed.

Study population and methodology

Pretested questionnaires (3, 4), together with a cover letter explaining the voluntary and confidential nature of this study, were mailed to dental hygienists in Finland and Norway in 2004 to be answered anonymously. In Finland, the questionnaire was sent to 595 hygienists randomly selected from the membership register of the Finnish Association of Dental Hygienists, which has 1246 members (4). In Norway, the questionnaire was sent to all 1138 dental hygienists included in the national register of authorized dental hygienists (3). The initial response rates were 68% and 49% respectively (3, 4). For financial reasons, we sent no reminders.

The questionnaires collected data on the dental hygienists' backgrounds, such as age, gender, year of graduation, working experience (in years) as a dental hygienist, work sector (private or public), size of the community (by number of inhabitants) in which they were working as well as the working time (in percentages) they reported spending on various activities (clinical work, administrative work, assisting a dentist, maintaining instruments and equipment, other duties) and patient groups (children and youths, adults, pensioners, institutional and hospital patients, and the disabled) during a normal working week.

Further, the questionnaire enquired how much time the hygienists spent on clinical activities – grouped into check-ups, preventive work, scaling and other duties – during a normal working week. In addition, the questionnaire assessed how often they performed 25 different treatment measures (see Table 5). Originally, this question was intended to be answered with the following alternatives: 'quite often', 'sometimes' or 'never'. For further analysis, the answers were dichotomized as 'quite often' versus 'sometimes' and 'never' to assess differences between frequencies in the practise of treatment measures by the dental hygienists' work sector or nationality.

Of all respondents, 12% of Finnish and 33% of Norwegian dental hygienists reporting 'not currently in working life' were excluded from the analyses. In addition, 2% of all active hygienists in both countries who reported working in organizations such as hospitals, universities or foundations, as well as 3% of Finnish and 4% of Norwegian dental hygienists who reported working simultaneously in both the public and private sector, were excluded. The final sample consisted of 682 dental hygienists from Finland (n = 341) and Norway (n = 341).

The statistical significance of differences between groups was evaluated with the one-way ANOVA test for mean values and with the chi-square test for frequencies. $P < 0.05$ were considered statistically significant.

Results

The mean age of the Finnish dental hygienists was 44.1 (SD = 8.6), and of the Norwegians, 39.1 (SD = 10.4) years. In all, 99.7% of the Finns and 99.4% of the Norwegians were females. According to years since graduation, 13% of the Finns had graduated more than 24 years ago, 43% from 15 to 24 years ago, 36% between the years 1990 and 1999, and 8% in the year 2000 or later. The corresponding figures for the Norwegians were 18%, 23%, 36% and 22% respectively. The Finnish hygienists had a mean of 14.4 (SD = 7.4) of years working experience, while their Norwegian counterparts had 12.3 (SD = 9.4) years of experience. Of all, 71% of the Finnish hygienists and 53% of the Norwegian hygienists worked in the public sector.

During a normal working week, 79% of the Norwegian dental hygienists' working time was spent on clinical work; the corresponding figure for their Finnish counterparts was 66% ($P < 0.001$) (Table 2). The Finnish dental hygienists spent more time doing administrative work, assisting a dentist, giving health education, maintaining instruments and equipment, and performing other duties than did the Norwegians ($P < 0.001$). In both countries, dental hygienists working in the public sector were more engaged in doing administrative work than did their counterparts in the private sector ($P < 0.05$). Those in private practice spent more time assisting a dentist and maintaining instruments and equipment than did those in the public sector ($P < 0.05$) in both countries (Table 2).

Table 2. **Dental hygienists' reported working time (mean %, SD) spent in different activities during a normal working week**

	Within-country comparisons						Between-country comparisons				
	Finland			Norway			Public*	Private†	All hygienists		
	Public (n = 243)	Private (n = 98)	P-value	Public (n = 182)	Private (n = 159)	P-value	P-value	P-value	Finland (n = 341)	Norway (n = 341)	P-value
Clinical work	70 (21)	59 (28)	**<0.001**	77 (19)	81 (22)	0.132	**<0.001**	**<0.001**	66 (24)	79 (21)	**<0.001**
Health education	11 (9)	5 (4)	0.137	8 (8)	1 (6)	**<0.001**	**0.012**	0.107	10 (9)	5 (8)	**<0.001**
Administrative work	23 (29)	12 (11)	**0.002**	8 (8)	6 (9)	**0.044**	**<0.001**	**<0.001**	21 (26)	8 (8)	**<0.001**
Assisting a dentist	22 (27)	39 (26)	**0.002**	1 (4)	4 (10)	**<0.001**	**<0.001**	**<0.001**	32 (28)	2 (8)	**<0.001**
Maintaining instruments and equipment	8 (5)	11 (6)	**<0.001**	2 (4)	4 (6)	**<0.001**	**<0.001**	**<0.001**	9 (6)	3 (5)	**<0.001**
Other activities	11 (15)	9 (6)	0.582	1 (8)	2 (10)	0.464	**<0.001**	**0.019**	11 (13)	2 (9)	**<0.001**

Comparison of mean values by ANOVA; statistically significant P-values in bold; d.f. = 1 in each case.
*Finnish public hygienists (n = 234) versus. Norwegian public counterparts (n = 182) (see percentages of within-country comparisons).
†Finnish private hygienists (n = 98) versus Norwegian private counterparts (n = 159) (see percentages of within-country comparisons).

Of all clinical working time during a normal working week, both the Norwegian and Finnish dental hygienists in the public sector dedicated more time to check-ups ($P < 0.001$) than did their counterparts in the private practice (Table 3). The most frequently practised clinical activity of the Norwegian dental hygienists during a normal working week was check-ups, to which they dedicated 45% of their working time. The corresponding activity for the Finns was scaling, to which they dedicated 50% of their working time (Table 3).

Among dental hygienists working in the public sector, 43% of the Finnish and 75% of the Norwegian dental hygienists' working time during a normal working week was spent treating children and youths under 18 years of age. The corresponding percentages for their counterparts in the private sector were 14% and 6% respectively (Table 4). Adults and pensioners were the main target groups in the private sector.

Of the 25 given measures, the five most frequently reported treatment measures provided by the Finnish dental hygienists during a normal working week were oral hygiene instruction, scaling, application of fluoride, dietary instruction and periodontal check-ups (Table 5). The respective treatment measures performed by the Norwegians were oral hygiene instruction, taking x-rays, assessing check-up intervals, scaling and assessing caries risk.

Discussion

Dental hygienists' daily activities

More than two-thirds of the dental hygienists' working time in these two Nordic countries was spent on clinical work, which is a common finding worldwide. According to an international comparative study of 19 nations, the scope of dental hygienists' practice was clinical care (2). The time they spent on health education, however, was less than expected in both countries, as traditionally the primary task of the dental hygiene profession is expected to involve more outreach preventive tasks. Dental hygienists in both countries reported spending more working time than expected on administrative work and assisting a dentist, especially in Finland, as well as maintaining instruments and equipment. These tasks should be redistributed to dental nurses in order to provide oral health services more cost-effectively.

Table 3. **Dental hygienists' reported clinical working time (mean %, SD) spent on different activities during a normal working week**

	Within-country comparisons						Between-country comparisons				
	Finland			Norway			Public*	Private†	All		
	Public (n = 243)	Private (n = 98)	P-value	Public (n = 182)	Private (n = 159)	P-value	P-value	P-value	Finland (n = 341)	Norway (n = 341)	P-value
Check-ups	25 (14)	12 (8)	**<0.001**	58 (21)	31 (21)	**<0.001**	**<0.001**	**<0.001**	22 (14)	45 (25)	**<0.001**
Preventive work	27 (14)	24 (14)	**0.043**	25 (17)	22 (19)	0.101	0.135	0.370	26 (14)	23 (18)	**0.030**
Scaling	43 (18)	65 (16)	<**0.001**	14 (12)	44 (24)	**<0.001**	**<0.001**	**<0.001**	50 (20)	28 (24)	**<0.001**
Other activities	17 (17)	14 (18)	0.438	3 (10)	9 (21)	**0.001**	**<0.001**	0.122	16 (17)	6 (16)	**<0.001**

Comparison of mean values by ANOVA; statistically significant P-values in bold; d.f. = 1 in each case.
*Finnish public hygienists (n = 234) versus Norwegian public counterparts (n = 182) (see percentages of within-country comparisons).
†Finnish private hygienists (n = 98) versus Norwegian private counterparts (n = 159) (see percentages of within-country comparisons).

Table 4. **Dental hygienists' reported clinical working time (mean %, SD) spent on different patient groups during a normal working week**

	Within-country comparisons						Between-country comparisons				
	Finland			Norway			Public*	Private†	All		
	Public (n = 243)	Private (n = 98)	P-value	Public (n = 182)	Private (n = 159)	P-value	P-value	P-value	Finland n = 341	Norway n = 341	P-value
Children and youths	43 (20)	14 (22)	**<0.001**	75 (18)	6 (20)	**<0.001**	**<0.001**	**0.047**	39 (23)	43 (39)	0.111
Adults	38 (18)	70 (14)	**<0.001**	9.0 (12)	78 (24)	**<0.001**	**<0.001**	**0.003**	48 (22)	41 (39)	**0.009**
Pensioners	15 (10)	28 (12)	<**0.001**	3 (6)	15 (16)	**<0.001**	**<0.001**	**<0.001**	19 (13)	9 (13)	**<0.001**
Institutional and hospital patients, the disabled	12 (17)	4 (3)	0.072	13 (9)	1 (2)	**<0.001**	0.510	**<0.001**	11 (16)	7.0 (9.0)	**<0.001**

Comparison of mean values by ANOVA test; statistically significant values in bold; d.f. = 1 in each case.
*Finnish public hygienists (n = 234) versus Norwegian public counterparts (n = 182) (see percentages of within-country comparisons).
†Finnish private hygienists (n = 98) versus Norwegian private counterparts (n = 159) (see percentages of within-country comparisons).

Table 5. **Dental hygienists' reporting as practising different treatment procedures (%) 'quite often' during a normal working week**

	Within-country comparisons						Between-country comparisons				
	Finland			Norway			Public*	Private†	All		
	Public (n = 243)	Private (n = 98)	P-value	Public (n = 182)	Private (n = 159)	P-value	P-value	P-value	Finland (n = 341)	Norway (n = 341)	P-value
Caries screening for children	76	2	**<0.001**	97	2	**<0.001**	**<0.001**	0.965	55	55	0.972
Caries screening for adults	30	19	0.069	25	80	**<0.001**	0.295	**<0.001**	27	51	**<0.001**
Taking x-ray pictures	23	32	0.072	98	88	**<0.001**	**<0.001**	**<0.001**	25	93	**<0.001**
Periodontal check-ups	79	75	0.355	18	84	**<0.001**	**<0.001**	0.078	78	49	**<0.001**
Pit and fissure sealant	43	1	**<0.001**	27	1	**<0.001**	**0.001**	0.762	31	15	**<0.001**
Filling with glass-ionomer	1	2	0.617	4	3	0.522	0.086	0.751	2	3	0.126
Filling with composite	0.4	0	0.517	2	3	0.333	0.200	0.066	0.3	3	**0.018**
Taking an impression	41	13	**<0.001**	3	29	**<0.001**	**<0.001**	**0.004**	33	15	**<0.001**
Application of fluoride	87	92	0.177	69	46	**<0.001**	**<0.001**	**<0.001**	88	58	**<0.001**
Application of chlorhexidine	45	46	0.765	–	–	–	–	–	43	–	–
Scaling	94	97	0.322	72	94	**<0.001**	**<0.001**	0.337	95	83	**<0.001**
Oral hygiene instruction	96	96	0.919	96	95	0.790	0.964	0.726	96	95	0.778
Dietary instruction	89	75	**0.001**	92	46	**<0.001**	0.388	**<0.001**	85	70	**<0.001**
Caries risk assessment	68	45	**<0.001**	93	63	**<0.001**	**<0.001**	**0.005**	61	79	**<0.001**
Periodontal risk assessment	66	63	0.605	32	73	**<0.001**	**<0.001**	0.109	65	51	**<0.001**
Temporary crown and bridge	0	2	**0.030**	1	14	**<0.001**	0.107	**0.001**	1	7	**<0.001**
Procedures related to orthodontics	34	4	**<0.001**	31	7	**<0.001**	0.525	0.317	25	20	0.122
Implant maintenance	2	34	**<0.001**	1	2	**<0.001**	0.180	**0.029**	12	10	0.570
Clinical photographing	2	2	0.945	4	16	**<0.001**	0.291	**0.001**	2	9	**<0.001**
Local anaesthesia	7	11	0.188	6	22	**<0.001**	0.583	**0.034**	8	13	**0.041**
Helping in the care of timid patients	15	10	0.285	31	13	**<0.001**	**<0.001**	0.536	13	23	**0.002**
Helping patients to quit smoking	13	8	0.187	13	31	**<0.001**	0.565	**<0.001**	12	2	**0.001**
Check-up interval assignment	50	49	0.866	92	84	0.024	**<0.001**	**<0.001**	50	88	**<0.001**
Tooth blenching	0	16	**<0.001**	2	27	**<0.001**	**0.045**	**0.034**	5	14	**<0.001**
Others	8	13	0.157	36	57	0.106	**<0.001**	**<0.001**	10	48	**<0.001**

Comparison of differences between groups by chi-square test: 'quite often' practising versus sometimes or less, by nationality or working sector. Statistically significant P-values in bold; d.f. = 1 in each case.
*Finnish public hygienists (n = 234) versus Norwegian public counterparts (n = 182) (see percentages of within-country comparisons).
†Finnish private hygienists (n = 98) versus Norwegian private counterparts (n = 159) (see percentages of within-country comparisons).

Dental hygienists' clinical activities and type of patients

Within the clinical activities examined in this present study, scaling was the most common clinical activity for the Finnish dental hygienists, especially for those working in the private sector, which is in accordance with the findings of an international comparative study of 19 nations (2). The corresponding activity for the Norwegian hygienists was performing check-ups, especially for those working in the public sector. In both countries, dental hygienists used less time for preventive activities than was expected. According to the results of our study, the public dental hygienists in Finland and Norway dealt more predominantly with children and youths than did their counterparts in the private sector. This is due to the existing oral healthcare systems and the specific roles of the public and private sectors within care delivery. In the Nordic countries, the public sector provides organized and subsidized oral health services (14), and specifically for all children under 18 years of age, free of charge. Consequently, most children go to public clinics in these countries. The increasing role of dental hygienists in child care has been observed in the Nordic countries (15). In many other European countries, such services provided by the public sector are limited to certain age groups of children or may not exist at all. In turn, the dental hygienists included in this study and working in the private sector in both countries dealt more with adults and pensioners than did their counterparts working in the public sector. However, an increasing proportion of treatment provided for adult patients by public dental hygienists was also reported to meet the increased demands of the adult population after the dental care subsidy reform began in the year 2002 in Finland (11).

Treatment measures

Among the Finnish and Norwegian dental hygienists in this study, oral hygiene instruction and scaling were consistently among the five most frequently reported treatment measures. This was also the case among dental hygienists in the

international comparative study of 19 nations (2). Surprisingly, taking x-rays was the second most commonly practised measure among the Norwegian dental hygienists. However, this was not the case in Finland: a referral by a dentist is required for Finnish dental hygienists to take x-rays, which may explain the low frequency of dental hygienists taking x-rays. In this respect, treatment traditions between countries vary.

Moreover, many countries stress the role of dental hygienists within the dental team of the future. Recent strategic reviews in Scotland and England have recommended increasing the numbers of dental hygienists' training places (16, 17). A Danish report on the future of oral health care reported plans to increase the numbers of dental hygienists in the future, as the number of dentists decreases in order to meet anticipated patterns of treatment needs (18). The role of dental hygienists is increasingly appreciated as an important member of oral health personnel (19). For the development of the work distribution of oral health services among personnel, careful planning of the structure and content of the training programmes of all personnel is a future challenge.

Methodological aspects of the study

Regardless of the differences in historical and educational backgrounds of the Finnish and Norwegian hygienists, the ratios of dental hygienists to the population and to the dentists seem to be similar in these countries. Of the dental hygienists in this sample, the percentages of those working in public and private practice fairly describe the proportions of active dental hygienists in each sector in both countries.

Representative samples of dental hygienists were chosen for this study and more than two-thirds of the Finnish and almost a half of the Norwegian hygienists responded (3, 4). The confidential and anonymous character of this study to a certain extent assured these rates. Unfortunately, because of financial reasons, we could not send reminders, which may have improved the response rate, especially in Norway.

In conclusion, the working profiles of dental hygienists in Finland and Norway were quite similar, although there were differences in distribution by activities, type of patients and treatment measures. In both countries and work sectors, the dental hygienists' main activity was clinical work. The most commonly practised clinical activity among the Finnish dental hygienists was scaling, and among the Norwegians, check-ups. Public dental hygienists in both countries dealt mainly with children and youths. Oral hygiene instruction was the most commonly reported treatment measure among both Finns and Norwegians regardless of their work sector. As the number of dental hygienists in these countries are high, this professional group can make a true contribution to oral healthcare provision.

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