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# Disseminating evidence from health technology assessment: The case of tobacco prevention

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**Objectives:** The aims of the present study were to investigate the awareness among dentists and dental hygienists of evidence-based reports and guidelines on tobacco cessation activities and the impact these publications had on clinical practice.

**Methods:** A questionnaire was mailed to dental hygienists and dentists in Stockholm County, Sweden, and the results were compared with a previous investigation.

**Results:** Among the respondents, awareness of a popular science version of a systematic review on smoking and its effect on oral health was reported by 90 percent of the hygienists and 66 percent of the dentists. The information was used in clinical work by 34 percent of the dentists and 54 percent of the hygienists. Reported changes in patterns of practice were more frequent recommendations to use nicotine replacement therapy and a more widespread use of setting quit dates. Approximately one quarter of the dental professionals reported that they had increased tobacco cessation consultation because of the results from the reports.

**Conclusions:** Changes in patterns of practice were observed after dissemination of evidence-based information on tobacco cessation. Methods that were proven to be effective in the evidence-based report such as discussing quit dates and recommending nicotine replacement therapy were more commonly used after the publication of the report. Short, popular versions of extensive systematic reviews seem to be useful for implementing evidence-based knowledge and changing clinical practice.

**Keywords:** Dissemination, Evidence-based information, Tobacco cessation

Smoking and the use of oral tobacco are still widespread habits in Sweden. Although daily smoking has decreased by close to half, from 31 percent in 1980 to 17.5 percent in 2003 (15), tobacco-related diseases are still common. Most tobacco users have occasionally tried to stop smoking or using oral tobacco (1), but relapses are common and most persons who successfully terminate the habit have tried at least twice before (12). There is a continuous demand for ef-

fective methods to help persons cease smoking or using oral tobacco. The Swedish Council on Technology Assessment in Health Care (SBU) has a series of publications in the field of tobacco use. In 1998, a systematic literature review on methods for smoking cessation (6) was published, followed by a guide for smoking cessation aimed at medical practitioners and other medical professionals based on the systematic review (11). In 2002, a report on smoking and oral health that

reviewed the literature concerning the effect of smoking on periodontal health, oral and pharyngeal cancer, and different dental treatments was published. A chapter on methods for cessation of smoking or oral tobacco use that could be used in dental practice was included (2). The chapter was an update of the information that had been presented in the 1998 report. In addition to the 2002 report on smoking and oral health, a guideline for dental professionals—a short and popular scientific version of the actual report—was published (3). All the above reports from SBU are written in Swedish and distributed mainly in Sweden. In short, the reports concluded that clear recommendations to stop smoking, including setting a quit date, and advice on nicotine replacement agents were effective cessation methods.

Over 300 copies of the report on smoking and oral health, aimed particularly at dental professionals, were distributed compared with 4,330 copies of the popular version of the report. The reports and guidelines have also been generously distributed at national and regional meetings concerning tobacco and health; nineteen of these were organized in cooperation with SBU. Since 2002, these publications have been mentioned or referred to more than 70 times in articles in newspapers or other nonscientific journals and on radio or television. The reports were sold for a low price, approximately 15 EUR each, whereas the guidelines (the popular version of the report) were distributed free of charge.

A special effort was made to disseminate the results from the report on smoking and oral health in the short popular version. The guidelines were published in the form of a booklet, with an appealing design and many pictures. All clinically active dental hygienists and all dental clinics received copies as did the dental and hygienist schools.

In 2001, before the dissemination of the report and guidelines on smoking and oral health, a survey study was conducted addressing barriers, knowledge, and activity in matters of smoking or oral tobacco cessation among dental professionals (9). The results from this study showed that few were engaged in cessation support. Main barriers for not engaging in tobacco cessation were lack of experts to refer a patient to, lack of reimbursement, lack of knowledge, time constraints, and a feeling of inadequacy. Also, one of two dentists and three of ten hygienists did not see it as part of their job to help patients stop smoking. At that time, one systematic review on tobacco cessation methods was available in Swedish (6). Although that report was not specifically aimed at dentistry, approximately 10 percent of the dentists and dental hygienists reported to make use of the report in their clinical work (9).

Evidence-based guidelines for tobacco cessation treatment are available in several countries (13). However, information on how they are received and used in clinical practice is scarce. One study on the implementation of a nonsmoking policy in the United States found no conclusive effect of such reports on changes in behavior (4), but interventions aimed at clinic leadership in medical settings seemed, according to an-

other study, to be more effective than information to all staff physicians (10). Few comparable data have been reported from the dental field, where the dentist or dental hygienist often work autonomously and the reimbursement system often differs from that of the medical profession. A training program on the health hazards of smoking and tobacco cessation methods increased the number of tobacco cessation activities among the participants—dentists and dental hygienists in a study from New Zealand (14). However, the impact of such programs on actual cessation rates has not been studied. The aim of the present study was to investigate the impact among dentists and dental hygienists in Stockholm County, Sweden, of the SBU reports and accompanying guidelines on smoking and oral health.

## STUDY POPULATION AND METHODS

A questionnaire was distributed to 376 dental hygienists and 576 dentists in Stockholm County. This sample comprised all dental hygienists and a random selection of one third of all dentists working in the county at the time. The addresses of the recipients were obtained from the Registry of the Swedish Dental Hygienist Association and the Swedish Dental Association. This population was much the same as in the previous study (9), although there was a new random selection of the dentists.

The prospective participants received an anonymous questionnaire by mail, together with a letter of introduction, explaining the purpose of the study. Two reminder letters were sent out after 3 and 5 weeks to all participants. Because the questionnaire was anonymous, telephone follow-up calls to enhance the response rate were not possible. Data were collected between December 2003 and March 2004.

The present questionnaire was developed from the previous one, used in the baseline investigation (9). Additional questions assessed the knowledge and use of the SBU systematic reviews on methods for tobacco cessation and the effect of tobacco on oral health. Questions on how these reviews had influenced the dental professionals in their work with tobacco cessation counseling were asked, as were questions concerning career experience, tobacco cessation consultation activities and experience, and potential barriers for this work. The questionnaire comprised 23 questions in total.

The responders' knowledge of the three reports from SBU was investigated by asking to what extent they had acquainted themselves with the reports, with multiple choice answers ranging from "I do not know about the report" to "I have read the report thoroughly." The influence from the reports on the responders' clinical work was also assessed in two separate questions. One question asked if they used the information in their clinical work at all, the other to what extent, if any, they had an impression that the number of patients receiving cessation consultation because of the results of the reports had increased.

**Table 1.** Some Characteristics of the Study Population<sup>a</sup>

	Dentists		Dental hygienists	
	2001	2003	2001	2003
Number of questionnaires	582	576	353	376
Number sent back because "Not clinically active"	<sup>b</sup>	57	<sup>b</sup>	37
Number in the study population	<sup>b</sup>	519	<sup>b</sup>	339
Response rate – % (no./total no.)	61(357/582)	57(297/519)	67(238/353)	66(225/339)
Private practice – % (no./total no.)	60(215/357)	57(168/297)	60(143/238)	61(138/225)
Public Dental Health Service – % (no./total no.)	40(142/357)	43(129/297)	40(95/238)	39(87/225)

<sup>a</sup> Denominators vary because of nonresponse.

<sup>b</sup> No data available.

The participants were asked what proportion of patients, if any, they offered different kinds of tobacco cessation support. Additional questions assessed the time spent on tobacco cessation activity and the number of patients receiving any kind of tobacco cessation assistance during the previous month.

## Statistics

To test for statistical significance when comparing data from this investigation with data from the baseline study or when comparing the answers of dentists and dental hygienists, a two-tailed Chi-squared test was performed and the *p* value was calculated. All statistical analyses were carried out using the SPSS statistical program.

## RESULTS

Of the 858 questionnaires that were distributed, 522 (61 percent) were returned. The response rate was somewhat higher in the dental hygienist group. Sixty-one percent of the hygienists and 57 percent of the dentists were working in private practice. Data on the study population are presented in Table 1, together with corresponding data from the baseline investigation in 2001.

Perceived barriers to providing tobacco cessation support had not changed substantially since before the infor-

mation was distributed. Dental hygienists appear to perceive fewer obstacles to this work than the dentists.

The participants' knowledge of the first report on tobacco from SBU (1998) was 22 and 30 percent for dentists and dental hygienists, respectively, and had not changed since the previous investigation. Awareness of the two more recent reports (2002), varied (Table 2). The popular science version of the systematic review on smoking and its effect on oral and pharyngeal cancer and periodontitis, and the outcome of different dental treatments were known to 90 percent of the hygienists and 66 percent of the dentists 1 year after publication. Forty-seven percent of the dentists claimed they had read this version "partly or thoroughly" compared with 79 percent of the hygienists. The systematic review itself was known and read to a lesser extent; 14 percent of the dentists and 23 percent of the dental hygienists, respectively, had read it "partly or thoroughly." The dental hygienists were significantly more aware of both reports than the dentists. The information from the reports was used in the clinical work by 34 percent of the dentists and 54 percent of the hygienists.

Of the 83 percent in each group that gave an answer, 17 percent of the hygienists and 10 percent of the dentists reported that more patients were receiving cessation consultation because of the results from the reports. The average increase in number of patients was 28 percent for hygienists and 26 percent for dentists (Table 3). However, no change was noted between the two studies concerning the total

**Table 2.** Distribution of Positive Answers to the Questions Concerning Knowledge of the SBU Reports

Questions	Dentists		Dental hygienists		<i>p</i> value
	(%)	(no./total no.)	(%)	(no./total no.)	
Knowledge of "Methods for smoking cessation"	22	49/223	30	49/159	
Knowledge of "Smoking and oral health"	25	57/232	25	40/155	
Knowledge of popular version of "Smoking and oral health"	66	186/280	90	191/213	<sup>a</sup>
Read "Methods for smoking cessation" partly or thoroughly	12	28/227	26	41/159	<sup>a</sup>
Read "Smoking and oral health" partly or thoroughly	14	34/235	23	37/159	<sup>b</sup>
Read "Popular version of "Smoking and oral health" at least partly	47	131/281	79	171/217	<sup>a</sup>
Use information from the reports in clinical work	34	96/278	54	114/213	

<sup>a</sup> *p* < .001.

<sup>b</sup> *p* < .05.

**Table 3.** Mean Number of Patients and Mean Time Spent on Smoking Cessation Activities during the Previous Month at Baseline (2001) and in the Present Investigation after Dissemination of Information (2003)

	2001		2003	
	Mean	SD	Mean	SD
<i>Dentists</i>				
Smoking routinely recorded in patient records – % (no./total no.)	82 (289/351)		91 (262/289)	
Use of smokeless tobacco routinely recorded in patient records – % (no./total no.)	71 (249/350)		78 (182/234)	
Mean number of patients in any kind of tobacco cessation support during the previous month.	7.80	16.18	9.98	20.11
Mean time (hours) used for any kind of tobacco cessation support during the previous month.	1.42	4.57	.92	1.85
Mean increase in patients receiving tobacco cessation activities due to knowledge from the reports (based on 30 positive answers)			26%	
<i>Dental hygienists</i>				
Smoking routinely recorded in patient records – % (no./total no.)	88 (208/237)		95 (210/222)	
Use of smokeless tobacco routinely recorded in patient records – % (no./total no.)	78 (182/234)		84 (183/219)	
Mean number of patients in any kind of tobacco cessation support during the previous month.	13.73	22.68	12.39	17.45
Mean time (hours) used for any kind of tobacco cessation support during the previous month.	2.87	6.90	2.74	6.86
Mean increase in patients receiving tobacco cessation activities due to knowledge from the reports (based on 39 positive answers)			28%	

number of patients receiving cessation support and the mean time for these activities (Table 3).

For dentists and hygienists engaged in tobacco cessation support for smokers, the most common intervention was advice on nicotine replacement therapy (Table 4). There

was no change in the frequency of this intervention in comparison with the previous investigation. Dentists and dental hygienists, however, were significantly more active in providing self-help material for smokers. Dental hygienists more often discussed a quit date with patients who smoked than

**Table 4.** Percentage (and Proportion) of Dentists and Dental Hygienists Who Reported That They Engaged in the Following Tobacco Cessation Activities with 70% or More of the Patients Who Wanted to Quit at Baseline (2001) and in the Present Investigation after Dissemination of Information (2003)

Cessation activities	2001		2003		<i>p</i> value
	Dentists (%) (no./total no.)	Dental hygienists (%) (no./total no.)	Dentists (%) (no./total no.)	Dental Hygienists (%) (no./total no.)	
<i>Smokers who want to quit:</i>					
Provide self-help material	6 22/357	17 40/238	14 34/241 <sup>d</sup>	25 45/179	a,b,c,d
Offer individual follow-up at the clinic	4 13/357	12 28/238	5 12/235	13 22/172	
Offer smoking cessation groups at the clinic	5 19/357	8 19/238	6 15/237	6 10/168	
Discuss a quit date with the patient	7 24/357	9 22/238	11 26/242	22 42/186	a,c,e
Advise NRT	28 99/357	43 103/238	33 82/251	48 97/202	
<i>Smokeless tobacco users who want to quit:</i>					
Provide self-help material	5 16/357	17 40/238	12 28/236 <sup>e</sup>	19 33/175	
Offer individual follow-up at the clinic	6 22/357	13 30/238	7 16/231	10 16/166	
Offer smoking cessation groups at the clinic	4 13/357	10 23/238	5 11/229	5 8/165	
Discuss a quit date with the patient	5 17/357	4 10/238	7 17/235	17 31/179	a,e
Advise NRT	6 22/357	9 21/238	23 56/244 <sup>e</sup>	40 77/193	c,e

<sup>a</sup> In comparison with baseline.

<sup>b</sup> *p* < .05.

<sup>c</sup> In comparison with dentists 2003.

<sup>d</sup> *p* < .01.

<sup>e</sup> *p* < .001.

NRT, nicotine replacement therapy.

in the previous study, although there was no change for this intervention among the dentists. Overall, dental hygienists were significantly more active in tobacco cessation support than dentists, especially concerning patients using smokeless tobacco. For those patients, the most common cessation activity among the dentists was to advise nicotine replacement therapy. This activity had increased from 6 to 23 percent between the studies (Table 4). Also the provision of self-help material was increased. As many as 40 percent of the dental hygienists advised nicotine replacement therapy for smokeless tobacco cessation in the present study compared with only 9 percent in the previous study (Table 4). Also, discussing a quit date with the patient was more frequent among the hygienists than before, 17 percent compared with 4 percent, whereas the provision of self-help material remained the same (Table 4). A new question in the present investigation concerned referral to external cessation therapy for patients using smokeless tobacco. A total of 7 and 10 percent of the dentists and hygienists, respectively, used that alternative.

A recommendation to change tobacco smoking to smokeless tobacco was given routinely by 4 percent of the dentists (11 of 244) and 2 percent of the dental hygienists (4 of 180). However, 20 percent of the dentists had at some time or other recommended smokeless tobacco as a support for smokers who wanted to quit. The corresponding figure for dental hygienists was 16 percent.

## DISCUSSION

The popular version of the systematic literature review on tobacco cessation and oral health was widely known and used by both dentists and dental hygienists. Current evidence on implementation shows that no single approach is superior in all situations of change (7). Nevertheless, evidence-based statements have better chances to be followed when they are easily accessible and understandable as well as translated into practical, attractive tools (5). The short, popular version on tobacco cessation with answers to questions encountered in daily practice, thus, can be a contribution to improve practice. The results of this study, however, must be interpreted with caution. This study was based on anonymous, self-reported data, and no objective validation of the answers was performed. It is also possible that the SBU reports may have changed the responders' definition of cessation support since the previous investigation. This is not surprising, because it was the aim of the reports to change awareness of what constitutes effective cessation support. This hypothesis is supported by the finding that cessation activities as well as registration of tobacco use had increased in the 2 years between the studies. Part of the positive outcome may be contributed to the reports, but other influences may also have been significant in the changes of clinical outcomes. However, the changes are not in conflict with the results from the SBU reports.

Because the survey comprised all dental hygienists in the area and every third dentist, the population of hygienists in the present survey was much the same as in the baseline investigation, whereas the present group of dentists would partly be the same third as before. The overall response rate was 61 percent, after two reminders. This rate was lower than in the previous investigation and may reflect unwillingness on the part of several of the respondents to answer another, rather extensive questionnaire shortly after the first one. The share of the responding dentists and hygienists working in private practice reflects the conditions in Sweden, and no evidence was found that the conditions of tenure influenced the response rate.

A new question in the present study addressed whether dental professionals recommended the use of smokeless tobacco as a method for smoking cessation. Although few did this routinely, one in five had on occasion recommended smokeless tobacco as a support for smokers who wanted to quit. As of today, we do not know if this is a growing trend or a one-time phenomenon. The question could be a focus for future research. In a study of Swedish general practitioners (8), 20 percent of those who answered a questionnaire stated that they had at some time in the previous month recommended smokeless tobacco as a method for smoking cessation. One explanation for this non-evidence-based behavior may be the ongoing debate on "harm reduction" in Sweden and the belief that smokeless tobacco may be a more effective smoking cessation method than nicotine replacement therapy or other pharmaceuticals.

One problem for the present study is the selected time window of 2 years. It may be argued that a longer time is needed to inseminate "best practice" reports. However, selecting a longer time window increases the probability that factors other than the reports may affect tobacco cessation work in the investigated population.

In conclusion, the popular science version of evidence-based information on tobacco and oral health with advice on how to help patients stop using tobacco that was distributed broadly to the dental profession was known to the majority of the recipients. Approximately one in four had also implemented the results from the report in their clinical work. An evidence-based method such as recommending nicotine replacement therapy for smokeless tobacco users was more commonly used than in the previous investigation.

## POLICY IMPLICATIONS

Short, popular versions of extensive systematic reviews seem to be useful for implementing evidence-based knowledge and may contribute to changing clinical practice.

## CONTACT INFORMATION

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