Effectiveness of Tobacco Counseling in the Dental Office

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Abstract: This article describes the results of studies among dental care providers regarding tobacco cessation in the past two decades. In the early period, surveys described what dentists were doing in their own practices. The results suggested that they were not adequately communicating to their patients the importance of quitting. There is good evidence that brief interventions from health professionals can increase rates of smoking cessation. The outcome from a number of trials that examined the feasibility of conducting smoking cessation in dental practices is reviewed here. The pivotal role of a team approach is highlighted in many studies. Dentists who implement an effective smoking cessation program can expect to achieve quit rates up to 10-15 percent each year among their patients who smoke or use smokeless tobacco. The challenge is implementing effective treatment in one’s practice or institution while using available primary care resources to provide additional benefit.

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The damaging and harmful effects of tobacco usage on oral health are now well recognized. These include, in particular, a higher prevalence and severity of periodontal diseases among smokers1,2 and the association of tobacco use of any kind with oral malignancies.3,4 Several recent publications have reviewed the scientific evidence relating to the oral disease burden attributable to tobacco use5 and have highlighted the role and the need for the dental profession to get involved with tobacco intervention.6

Surveys on Dentists’ Attitudes and Practice

During the 1990s several studies examined the stated willingness of U.S. and UK dentists to provide smoking cessation advice to their patients. Analyzing the 1992 U.S. National Health Interview Survey data, Tomar’s group reported that in the preceding year 24.1 percent of smokers who visited a dental practice (n=1572) had been advised to quit smoking by their dentists.7 It is worth reviewing the counseling activities of dentists with their patients. These self-reported activities by U.S. dentists collated by various authors were reviewed by Geboy8 in 1989 and are listed in Table 1. Several surveys among U.S. dentists suggested a high proportion had at least raised the issue of smoking cessation with their patients.9,10 In the latest reported U.S. national survey (1,746 dentists completing survey data), 33 percent reported that they asked most or nearly all patients whether they smoke, 66 percent advised smoking patients to quit, and 29 percent provided some tobacco use cessation service.19 Compared with earlier U.S. surveys, this latest study indicated an upward trend of dentists’ involvement in Nicotine Replacement Therapy (NRT) prescriptions (Table 1). In all survey items, periodontists fared better than general dentists and pediatric dentists. Heavy smokers (two or more packs a day) were more likely to have been advised to quit than light smokers (pack or less per day) or occasional smokers.20 In a recent review of dentistry’s role in tobacco control, Tomar21 remarked that more than 40 percent of dentists do not routinely ask about tobacco use, and 60 percent do not routinely advise tobacco users to quit.

A survey of UK dentists (n=2519) in 1991 suggested that half of the responding dentists had asked their clients about their smoking habits, but only about 30 percent of them were providing brief advice to help patients quit tobacco use.22 Other UK and EU studies have reported that most dentists tend not to determine their patient’s tobacco habits and do not provide tobacco cessation counseling.23-26 A survey among Alberta dentists suggested that most dentists limit their counseling efforts to discussing hazards of smoking and benefits of quitting. Very few provided specific strategies to help their patients...
change behavior. Similar conclusions were drawn from a survey of Australian dentists, who were likely to use ineffective advice such as “advice to cut down.” More physicians than dentists advise their patients against tobacco use and provide materials to help them to quit. Most studies that provided baseline data on counseling patients clearly suggested that dentists were not adequately communicating to their patients the importance of quitting smoking.

National Initiatives

Many initiatives have encouraged dentists to get involved in tobacco cessation activities. The First National Dental Symposium on Smoking Cessation was held at the American Dental Association (ADA) headquarters in 1989. The National Cancer Institute’s (NCI) National Dental Tobacco-Free Steering Committee (NDTFSC) in the United States encourages oral health teams and dental organizations to directly, appropriately, and routinely influence patients and the public to avoid and discontinue the use of tobacco. The involvement of U.S. dentists in the NCI’s Community Intervention Trial for Smoking Cessation (COMMIT) is beyond the scope of this review, as all COMMIT activities were at a community level. An overview of dentistry’s involvement in tobacco issues was published by Jones to coincide with the 11th World Conference of Tobacco or Health held in Chicago in 2000. The International Dental Federation (FDI) adopted a position statement on tobacco in 1996 and urges its member associations and oral health professionals to take decisive actions to reduce tobacco use and nicotine addiction among the general public. At the 2000 congress in Paris, the FDI adopted a strategic plan for tobacco intervention that included a member education component.

A substantial number of research reports evaluating programs undertaken by health care workers designed to help their patients quit smoking have been published in the last two decades. The U.S. Department of Health and Human Services published a revised edition of “Clinical Practice Guideline on Treating Tobacco Use and Dependence.” This guideline was based on published data on effective, experimentally validated tobacco dependence treatments and practices along with a statistical analysis including meta-analysis of the available scientific literature. A pivotal question is: Just how successful have the programs been in involving dentists? A meta-analysis of twenty-nine studies suggests that a variety of clinicians, including physicians, nurses, dentists, dental hygienists, psychologists, pharmacists, and health educators, can play an important role in promoting smoking cessation. The number involving dental settings, however, has been meager.

Reported Tobacco Cessation Trials in Dental Settings

A selection of reported smoking cessation programs and trials conducted in dental settings is listed in Table 2. Christen et al. in their pioneering study among volunteers in a university setting introduced the use of nicotine gum (2 mg) for assisting smok-

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Table 1. Self-reported smoking cessation activities by U.S. dentists (%)

<table>
<thead>
<tr>
<th>Activity/Study number</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8a</th>
<th>8b</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Takes a smoking history/records status</td>
<td>-</td>
<td>-</td>
<td>40</td>
<td>84</td>
<td>74</td>
<td>51</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>33</td>
</tr>
<tr>
<td>Provides advice</td>
<td>71</td>
<td>84</td>
<td>65</td>
<td>76</td>
<td>27</td>
<td>52</td>
<td>54</td>
<td>84</td>
<td>65</td>
<td>66</td>
</tr>
<tr>
<td>Provides self-help material</td>
<td>1.4</td>
<td>-</td>
<td>37</td>
<td>11</td>
<td>31</td>
<td>5</td>
<td>13</td>
<td>26</td>
<td>17</td>
<td>32</td>
</tr>
<tr>
<td>Refers to cessation clinics</td>
<td>1.7</td>
<td>-</td>
<td>34</td>
<td>-</td>
<td>33</td>
<td>4</td>
<td>13</td>
<td>-</td>
<td>-</td>
<td>14</td>
</tr>
<tr>
<td>Recommend nicotine aids</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Follows up on subsequent visits</td>
<td>1.1</td>
<td>-</td>
<td>22</td>
<td>-</td>
<td>60</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Includes activities undertaken sometimes or occasionally.
Most studies surveyed General Dentists; a & b represent two categories of dentists IP and HMO.
Study number: Ferguson et al. [1], O'Shea et al. [2], Christen [3], Secker-Walker et al. [4], Gerbert [5], Jones et al. [6], Campbell et al. [7], Severson et al. [8a, b], Dolan et al. [9].
ing cessation by dentists. They reported a quit rate of 12.4 percent in fifteen weeks following initiation of the trial among gum users. Significant differences in quit rates between patients provided with the experimental nicotine-containing gum and the placebo gum were reported (p=0.046). Sixty-five percent of the gum users in this setting reported the gum to be effective in helping them to overcome smoking. In a later U.S. study, the efficacy of prescribing a nicotine gum was confirmed in a population of general dental patients. At twelve months following dentist intervention, patients who received nicotine gum and both nicotine gum and regular reminders to quit fared significantly better compared with those receiving initial counseling only (16.9 percent quit vs 7.7 percent; p=0.012).

In a hospital setting, Cooper and Clayton prescribed nicotine polacrilex gum (2 and 4 mg; nine weeks therapy) to heavy smokers who also received group therapy. A quit rate of 44.4 percent for 4 mg and 12.1 percent for 2 mg users was reported at the end of one year. Half of the 2 mg gum users relapsed within the second year. At twelve months following dentist intervention, patients who received nicotine gum and both nicotine gum and regular reminders to quit fared significantly better compared with those receiving initial counseling only (16.9 percent quit vs 7.7 percent; p=0.012).

Severson et al. reported a pilot study using dental hygienists for smoking cessation. The results were positive. Staff training was by a dossier sent to each dental office for self-study. All smoking patients recruited received brief advice to quit and the provision of nicotine patches was optional. In this study, 154 recruits were followed for nine months, and a quit rate of 11 percent was achieved. The success of this program closely paralleled those reported by physician-involved interventions at the time. The authors, however, reported an inconsistent performance of practicing dentists.

In the first trial conducted in Canada to improve tobacco cessation services offered in dental offices, Alberta dentists demonstrated that their incorporation of advice to quit smoking significantly increased among the intervention group (15.6 percent to 27 percent) compared with the control group (12.2 percent to 15.1 percent, p=0.02). Secker-Walker et al. reported a pilot study using dental hygienists for smoking cessation. The results were positive. Using the visit to a hygienist to deliver smoking cessation was further tested in fee-for-service dental practices in Oregon. This study showed that a program of either minimal or extended

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Country</th>
<th>Setting</th>
<th>n*</th>
<th>Method</th>
<th>Period</th>
<th>Quit rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christen et al.</td>
<td>1984</td>
<td>USA</td>
<td>Univ. clinic</td>
<td>105</td>
<td>2 mg nicotine gum</td>
<td>6 weeks</td>
<td>34.3</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15 weeks</td>
<td>12.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>103</td>
<td>placebo gum</td>
<td>6 weeks</td>
<td>10.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15 weeks</td>
<td>4.8</td>
</tr>
<tr>
<td>Cohen et al.</td>
<td>1989</td>
<td>USA</td>
<td>Private dentists (n=50)</td>
<td>374</td>
<td>brief advice</td>
<td>1 year</td>
<td>7.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>brief advice + reminder</td>
<td>1 year</td>
<td>8.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>brief advice + nicotine gum all measures</td>
<td>1 year</td>
<td>16.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 year</td>
<td>16.9</td>
</tr>
<tr>
<td>Cooper et al.</td>
<td>1989</td>
<td>USA</td>
<td>Hospital clinic</td>
<td>118</td>
<td>gum 4 mg + group sessions</td>
<td>1 year</td>
<td>44.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>gum 2 mg + group sessions</td>
<td>1 year</td>
<td>12.1</td>
</tr>
<tr>
<td>Severson et al.</td>
<td>1998</td>
<td>USA</td>
<td>Dental hygienists (n=75)</td>
<td>1350</td>
<td>usual care</td>
<td>1 year</td>
<td>2.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1305</td>
<td>minimal intervention</td>
<td>1 year</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1374</td>
<td>extended intervention</td>
<td>1 year</td>
<td>2.5</td>
</tr>
<tr>
<td>Severson et al.</td>
<td>1998</td>
<td>USA</td>
<td>Dental hygienists (n=75)</td>
<td>239 ST*</td>
<td>usual care</td>
<td>1 year</td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>394 ST*</td>
<td>extended intervention</td>
<td>1 year</td>
<td>10.2</td>
</tr>
<tr>
<td>Macgregor</td>
<td>1996</td>
<td>UK</td>
<td>Hospital perio</td>
<td>98</td>
<td>DHE + brief advice</td>
<td>3-6 months</td>
<td>13.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38</td>
<td>DHE only</td>
<td>3-6 months</td>
<td>5.4</td>
</tr>
<tr>
<td>Smith et al.</td>
<td>1997</td>
<td>UK</td>
<td>Dental practices (n=54)</td>
<td>154</td>
<td>brief advice + optional NRT</td>
<td>9 months</td>
<td>11</td>
</tr>
</tbody>
</table>

*N=n=number of subjects in each treatment arm of the trial
intervention was not significantly different from the quit rates achieved following provision of usual care by the hygienists. The reported quit rates after smoking cessation by hygienists were consistently lower than those achieved by dentists in other reported trials (Table 2). Extended interventions by the hygienists taking part in the same study, however, were significantly more successful in sustaining smokeless tobacco use compared with usual care (10.2 percent vs. 3.3 percent). The same group had reported earlier that smokeless tobacco intervention by both dentists and hygienists increased the proportion of patients who quit by about one half (12.5 percent vs 18.4 percent; p<0.05).45 The feasibility of using a patient’s regular hygiene visit for the delivery of anti-tobacco interventions by the attending hygienist has now been established by the Oregon group and should be reproducible in most settings.46 Further studies using both dentists and hygienists are desirable to verify what variables in a dental setting, in addition to program orientation, may account for different levels of success.

Validation of Trial Results

Two of the U.S. trials listed in Table 2 were randomized trials that allowed an equal opportunity for subjects to be in either the control or experimental group.36,37 The randomization of the study by Severson et al. was practice-based.44 In the MacGregor study,39 individuals were allocated to the intervention or the control group alternatively; after four months of recruitment, allocation to the intervention and control groups was in the ratio of 2:1.39 In contrast, the study by Cooper et al. did not contain placebo control or a double blind design, but used two dosage regimens for NRT use.38 Smith et al.’s study was implemented in a quasi-research setting, and only one experimental arm was used to test the feasibility of dentists in smoking cessation.40

In smoking cessation trials, it is important to validate the interview-based data on the smoking status of participants. In two of the U.S. studies, carbon monoxide levels were measured using a breath analyzer.36,37 Participants with CO levels <8ppm were considered nonsmokers.36 The success rate (cessation) was chemically verified by Cooper and Clayton, but the method was not described.38 In the UK study involving dental practices, salivary cotinine levels were assayed at base line and at exit.40 The cut-off value for nonsmokers was set at 14.2 ng/ml, and two “deceivers” with salivary cotinine levels of 154.1 and 224.5 ng/ml were exposed at the final dentist interview among those who had claimed to have quit. This confirms the importance of validating self-reported histories.

Effective and convenient methods of testing nicotine metabolites in a patient’s body fluids and in expired air are described elsewhere.47 Routine uses of these tests can be implemented at a low cost.

Effectiveness Following Training

Sixty-two percent of the Minnesota dentists surveyed claimed that they were not well prepared or not at all prepared to assist patients in quitting tobacco use.17 Lack of training for counseling against smokeless tobacco use was estimated at 66 percent.48 More recent studies report that dentists have needs similar to physicians for further tobacco education.31 Most health care providers including dentists only attempt to discuss the negative health effects of smoking and do not know how to use other approaches to assist quitting (Table 1).

Because of gaps in dentists’ knowledge to provide tobacco cessation advice, it is essential to introduce comprehensive and systematic training in dental undergraduate curricula and to provide continuing education to dentists. Less than one-half of dental schools and dental hygiene programs in the United States provide clinical tobacco intervention services.21 The impact of the NCI training of dental teams on tobacco cessation was evaluated on a small group of sixty-nine course participants by pre- and post-testing of various aspects included in the training program.49 A significant increase was found in the number of respondents who reported that, after training, they started to assist patients with stopping tobacco use. The respondents’ confidence in their ability to help patients stop using tobacco also significantly improved after training. Wood et al. described a comprehensive office-based training program in tobacco cessation for dental professionals.50 Fifty-seven dental offices were visited by a trainer who provided a ninety-minute seminar to the dental team at each practice location. Participation in twelve different cessation activities significantly improved following training. However, improvement in some activities were small to moderate, and the mean rank did not reach a level that would suggest any of the
interventions learned were being used frequently or always by the trained dentists or their staff. The time spent on tobacco cessation activities, however, improved between pre-training and their follow-up survey. The material used by the trainers included the U.S. Department of Health and Human Services publication “How to Help Your Patients Stop Using Tobacco” and the NCI’s trainer’s guidebook of the same title.51,52 The core of the NCI-advocated cessation program involves identifying smokers, advising them to quit, providing assistance to patients trying to quit, and following up with patients as a means of enhancing quit rates.53 The five major steps (the 5 As) to intervention in primary care settings are outlined in the PHS Clinical Practice Guideline and are now included in most training manuals. Some booklets have since been specifically prepared for the dental team.54 Several monographs and journal supplements that are useful for trainers on smoking cessation are illustrated in Figure 1.

Improvement in cessation activities one year after training dentists, hygienists, and therapists was measured in New Zealand.55 The importance of skills training was emphasized in a study among Australian dentists, which found that some dentists use ineffective advice such as “recommendations to cut down.”28 Training dental health care workers by workshops has been shown to be more effective than distributing self-help material.6

In a recently published Cochrane Review on the effectiveness of training of health professions in delivery of smoking cessation interventions, only one of the studies in dental settings was selected for review based on methodological quality.56 This was Cohen et al.’s study that used prompts and chart reminders to the dentist to intervene.57,58 The analysis showed that prompted dentists were more likely to advise to quit (29 percent vs. 18 percent) and were more likely to ask patients to set a quit date (14 percent vs. 3 percent). Changing the nature of the practice environment by either flagging charts or providing nicotine replacement therapy changed how clinicians practiced preventive measures.57

Further studies using both dentists and hygienists are desirable to verify whether programs with different levels of training on counseling and orientation show different levels of success.

Constraints Against Counseling in Dental Practice

Various factors are cited by dentists as barriers for counseling in clinical practice.13,22,48 Lack of reimbursement and inadequate counseling training are named as major constraints in most dentists’ surveys.22,48

These survey findings also disclose that at least a quarter (and up to 80 percent in one study) state

Figure 1. Booklets and journal supplements helpful to trainers undertaking teaching to dentists on the topic: helping patients to quit tobacco use
they have no time to provide tobacco counseling in a busy schedule. Cohen et al. estimated time spent by dental staff in cessation activities. While there was a variation among dentists (range 0-8 minutes), the mean chair-time spent was estimated at 1.7 minutes for brief counseling. This increased to 6.7 minutes if gum was prescribed. The Clinical Practice Guidelines by Fiore et al. suggests brief clinical interventions require three minutes or less of direct clinician time. In one study the dentists’ own estimates of the time spent talking to their patients (2.4 ± 2.3 minutes) was well within the prescribed guidelines.

A failed attempt of implementing a smoking cessation program involving dental offices in Ontario, Canada cited lack of time, fear of alienating patients, and a preference for their own protocol. A wide discrepancy between patients’ and dental professionals’ views on tobacco cessation services was reported from Canada. While 58.5 percent of patients expected dentists to provide such a service, 61.5 percent of dentists believed their patients did not expect tobacco intervention. In a U.S. study, more dentists than physicians reported lack of insurance coverage as a barrier to counseling.

It is assumed that dentists have a captive audience to provide advice on smoking during other treatment procedures. However, to enable dentists to work toward a protocol, they need further training on counseling and should be reimbursed for this service.

Use of Pharmacotherapies

Three of the studies reviewed here among trials undertaken by U.S. and UK dentists have used some form of nicotine replacement therapy (NRT) in assisting smoking cessation. NRT is known to double the chances of quitting, and other specific medications such as bupropion may increase the estimated abstinence rate to nearly 30 percent. Brothwell recently examined the cessation products that could be promoted through dental offices. There are no legal contraindications to U.S. dentists prescribing nicotine replacement drugs. There are new initiatives to allow Canadian dentists to prescribe bupropion (Zyban) in consultation with the patient’s physician who is most aware of the patient’s general health status. Bupropion will soon be available through National Health Service prescriptions in the UK for smokers who have expressed a desire to quit smoking.

Smoking Prevention Among Adolescents

While most studies in dental settings have focused on smoking or smokeless tobacco use cessation among U.S. adults, Hovell’s group reported a trial with the aim to prevent initiation of tobacco use by adolescents. Orthodontists (n=154) randomly assigned to the experimental and control groups (seventy-seven in each group) participated in a two-year program (SMILES PLUS) designed to issue eight prescriptions to preteens on various health risk topics/activities including tobacco use. Mean prescription compliance was 64.4 percent. The tobacco use incidence in the control group was 12.6 percent and 12.0 percent in the experimental group. The difference was in the hypothesized direction but was not significant. However, the thirty-day tobacco use incidence and the number of prescriptions issued per subject by the orthodontists in the experimental group were highly significant (OR 0.75 for ≥7 prescriptions received) compared with the control group.

Quit rates among adolescents are known to be less dramatic than in adults. A meta-analysis has suggested that smoking prevention programs directed at adolescents should consider adopting interventions with a social reinforcement, social norms, or developmental orientation.

Dental Team

Most cessation programs conducted in dental offices stress the pivotal role of the team care approach that should involve all members of the dental practice staff. This was first suggested in Christen’s how-to model and was echoed by the dentists who successfully recruited smokers to the UK study. Among five keys to success, team work where all staff are involved and identifying an office champion who has overall responsibility for the program are measures that make a positive difference in the outcomes of trials. As a measure of success, Wood et al. recommend training the entire team at each dental office rather than in a large group in a central location. Based on the educational models (workbook and a video) developed by the Oregon team, a training program for dental health care workers can be disseminated nationally. Other useful resources
for the dental team are the NCI guidelines published for the trainers.67,68

Conclusions and Recommendations

A variety of clinicians in primary care settings including dentists and dental hygienists can play an important role in promoting smoking cessation. Two approaches have strong evidence of efficacy for smoking cessation: counseling and pharmacotherapy. Within the standard treatment times, the dentist and the office team can encourage patients to quit using tobacco by pointing out the damage caused by tobacco to oral tissues and highlighting the general health benefits of quitting. Besides modifying risk behavior, prescribing approved pharmaceutical agents is known to increase the quit rates, and several reported trials have used these agents in various dental settings.

The most significant barrier remains a lack of education of dentists and hygienists on cessation activities during their formative years of training. Effective training modules both at undergraduate and continuing education levels need to be introduced and implemented to allow the dental team to engage in smoking cessation activities at the primary care level. Most trials in dental settings report a quit rate comparable to what has been achieved by physicians. Dentists who implement an effective smoking cessation program in their practices can expect to achieve quit rates up to 10-15 percent each year among their patients who smoke or use smokeless tobacco. These rates will rise further if additional help is harnessed for smoking cessation counseling by referral to smoker’s clinics and by appropriate use of pharmacotherapy. More on-site training, supervision, and larger reimbursement payments proportional to the time spent on counseling may be needed to attain adequate adherence. Optimizing the implementation of routine smoking cessation intervention in general dental practice remains a key aim in the delivery of dental care.

REFERENCES


