Making the Most of a Teachable Moment: A Smokeless-Tobacco Cessation Intervention in the Dental Office

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Abstract

Objectives. Primary care medical clinics are good settings for smoking interventions. This study extends this strategy with a smokeless tobacco intervention delivered by dentists and dental hygienists in the course of routine dental care.

Methods. Male users of moist snuff and chewing tobacco (n = 518) were identified by questionnaire in clinic waiting rooms and then randomly assigned to either usual care or intervention. The intervention included a routine oral examination with special attention to the part of the mouth in which tobacco was kept and an explanation of the health risks of using smokeless tobacco. After receiving unequivocal advice to stop using tobacco, each patient viewed a 9-minute videotape, received a self-help manual, and was briefly counseled by the dental hygienist.

Results. Long-term success was defined as no smokeless tobacco use at both 3- and 12-month follow-ups, with those lost to follow-up counted as smokeless tobacco users. The intervention increased the proportion of patients who quit by about one half (12.5% vs 18.4%, P < .05).

Conclusions. These results demonstrate the efficacy of a brief dental office intervention for the general population of smokeless tobacco users.

Introduction

Although the proportion of the American population that smokes has been steadily declining over the past 25 years, consumption of moist snuff has been increasing dramatically. Research on the health effects of moist snuff and chewing tobacco (also known as smokeless tobacco) is not as extensive as the body of research on smoking, but there is a clear association between smokeless tobacco use and oral cancer as well as cancer of the esophagus, larynx, and stomach. Recent evidence also links smokeless tobacco use with cardiovascular disease.

This body of evidence about the harmful effects of smokeless tobacco has led a number of countries to ban the sale of these products, a recent example being Great Britain.

At present, smokeless tobacco use in the United States is greatest among young males, and there has been some success in implementing school-based prevention programs. However, very little has been done to develop cessation programs for those who have become habitual users.

In examining this problem we felt that the most cost-effective program would be one that reached the majority of users at a time when they would be most receptive to advice to quit. Since over half of the adult population receives dental care annually and the immediate effects of frequent smokeless tobacco use are often evident in an oral examination, the dental office is an ideal setting in which to conduct a smokeless tobacco cessation program.

Building on the success of smoking cessation programs delivered in medical offices and dental offices, we developed a smokeless tobacco cessation program suitable for any dental care setting.

This intervention program was designed to be delivered by dental hygienists and dentists after a single 2-hour training session.

Methods

This project was conducted in the Kaiser Permanente Dental Care Program (KPDCP), a prepaid group practice health maintenance organization (HMO) that currently provides comprehensive dental care to more than 130,000 members in the Pacific Northwest. At the start of the project the receptionists, hygienists, and dentists at eight KPDCP clinics were given a 2-hour training session to orient them to the study and provide training in the recruitment and treatment protocols. Following this initial training session, a project staff member visited each clinic weekly for the duration of the project to monitor progress and provide ongoing training and quality control. Three additional KPDCP clinics were later added to the study to reach recruitment goals.

In a previous survey of 3536 KPDCP patients aged 15 years and older, we found that 4.6% of males used chewing tobacco or snuff regularly but that none of the females reported current use of either form of smokeless tobacco. Therefore, screening for the current study was lim-
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itted to male patients aged 15 years and older who were scheduled for a routine dental hygiene visit. When a patient arrived at the clinic, he was asked to complete a one-page questionnaire on tobacco use. Those who reported current use of smokeless tobacco became participants in the study. Eligibility was assessed by the clinic receptionists, who then determined treatment assignment by checking the last digit of the patient’s KPDCP identification number. Those with an odd number were assigned to the control condition and those with an even number were assigned to the intervention condition.

Patients assigned to the control condition did not receive special attention from dental clinic staff. No mention of their involvement in the study was made in the patients’ dental care charts, and their smokeless tobacco use was not revealed to the hygienists and dentists. Patients in this group (the usual care control group) may or may not have received advice to stop using tobacco, depending on the personal practice habits of their dental care providers. In contrast, when a patient was assigned to the intervention condition, an envelope was put into his dental chart identifying him to the hygienist and dentist as a research participant. This envelope included special data collection forms as well as self-help intervention materials for the patient.

Intervention activities were designed to fit comfortably within the usual routine for a dental hygiene visit. Typically these visits begin with the hygienist conducting a soft-tissue examination and then providing prophylactic treatment (cleaning) and patient education. This routine includes feedback on oral health status and advice on how to improve oral self-care procedures. When seeing an intervention patient, the hygienist recorded plaque and inflammation data on a special research data form and made a thorough examination of soft tissues, looking for keratotic lesions (also known as leukoplakia). Although a soft-tissue examination is routine, we asked hygienists to provide a more detailed report of keratotic lesions and their precise location in the mouth, using a special study form. After completing these assessments, the hygienist asked the patient to show where he kept tobacco in his mouth, and this information was also recorded. Following assessment and dental treatment, the hygienist directly advised the patient to quit using smokeless tobacco and all other tobacco products.

Routine clinic procedures require the dentist to examine patients after they have seen the hygienist. Our research protocol called for the dentists to also point out keratotic lesions, note the harmful effects of smokeless tobacco, and advise the patient to stop using tobacco. The model message for both dentists and hygienists was, “As your dentist (hygienist), I highly recommend that you stop using all tobacco products now.” If a lesion was present, they were instructed to add, “Your use of smokeless tobacco is probably related to this precancerous lesion here in your mouth.” The most important point was that these dental care providers gave an unambiguous message to smokeless tobacco users that all tobacco products are harmful to their health and that they should stop now.

The dentists and hygienists then asked patients to watch a 9-minute videotape produced for this project. The tape begins with a humorous segment designed to reduce patient defensiveness, followed by an interview with a dentist discussing the health consequences of smokeless tobacco use and interviews with former users describing the benefits of quitting and the methods they used to quit. After the patient had watched the video, the hygienist attempted to get the patient to set a specific quit date. At the end of this brief counseling session the patient was given a brief self-help booklet, the phone number of a 24-hour advice line, and a quit kit containing oral substitutes such as chewing gum, toothpicks, a tin of ground mint-leaf nontobacco product, and a set of tip sheets with advice on how to quit.

About a week after the dental clinic visit, each intervention subject was called by a dental hygienist to reinforce the clinic-based intervention and provide support for quitting efforts. Additional support activities included monthly mailings of tip sheets and a newsletter. A more detailed description of the intervention procedures for dental care providers may be found in Little et al.

Halfway through the 18-month clinic intervention phase, three more KPDCP clinics were added to the project. For the first 6 months after these clinics joined the study, smokeless tobacco users were identified by questionnaire in exactly the same manner as in the other clinics except that all patients then received usual care. Intervention training for the dental care providers in these three clinics was delayed so that quit rates in usual care patients seen before and after dentists’ and hygienists’ intervention training could be compared. The patients in these three clinics constituted the preintervention comparison group.

All intervention, control, and preintervention subjects were surveyed approximately 3 and 12 months after being seen at the dental office. Sixty days after entering the study they were mailed a questionnaire about tobacco use since their dental office visit. If they did not return the questionnaire within 14 days they were sent a second copy, and if a questionnaire was not returned after another 14 days they were called and asked to complete the questionnaire in a telephone interview. Those whom we were unable to contact within 120 days after their dental visit were considered lost to follow-up.

The 12-month follow-up consisted of a telephone interview about tobacco use habits followed by a request to schedule an appointment for a free oral examination. At the time of this examination, 5-mL saliva samples were collected for biochemical verification of tobacco use. Those who declined to schedule an oral examination but who had reported abstaining from all forms of tobacco were asked to schedule a visit at our research center, one of the dental clinics, the patient’s home, or any other convenient location to provide a saliva sample for biochemical testing.

Results

A total of 245 intervention, 273 usual care, and 58 preintervention subjects entered this study. As expected, use of smokeless tobacco was highest in the younger age groups; 50% of smokeless tobacco users were younger than 30 and 16% were between 15 and 19. All subjects were using smokeless tobacco at baseline and 30% also reported smoking at least once in the 7 days before their dental clinic visit. An overwhelming majority (96.2%) of the smokeless tobacco users were White, 1.4% were Black, and 2.4% were of other race/ethnicity, a distribution typical of smokeless tobacco users in the Pacific Northwest. Although no attempt was made to exclude members of the same household, none of the subjects shared the same home telephone number.

We had excellent cooperation from the hygienists and dentists in conducting this study. Dentists reported giving advice to quit to 95% of the intervention patients and hygienists reported giving advice to
97%. We suspect compliance on the part of the dental care providers was facilitated by the low time demands and the semiautomated nature of this intervention. Extra time required for the intervention was about 30 seconds per patient for the dentists and 2 to 4 minutes for the hygienists. As in a previous study conducted in dental clinics, we found some difficulty in persuading receptionists to give the screening questionnaire to each arriving patient week after week. Spot checks in the clinics found that more than 90% of the patients who received questionnaires completed them and returned them to the reception desk.

Somewhat to our surprise, we also found that the intervention was acceptable to the vast majority of the patients. Dental care providers reported that 96% of the intervention subjects received the self-help booklet and 68% watched the video. Of those who did not watch the video, we were unable to distinguish between patients who declined and those who did not see the video because of scheduling problems in the clinics. Forty-three percent of the intervention subjects set a specific quit date before leaving the dental clinic.

Of the 245 intervention subjects, 78.6% had observable oral lesions, of which about one third were in the most clinically advanced stage. Of the lesions observed, 85% were in the location the patient identified as his primary area of smokeless tobacco placement. A more detailed description of the lesion data has been presented elsewhere.

Telephone contacts approximately 1 to 2 weeks after intervention were completed for 184 (75%) of the intervention group. Of these subjects, 39% reported not using smokeless tobacco at the time of the call. When asked about the effect of the clinic-based intervention activities (advice, video, and self-help materials), 60% reported that the intervention had helped them to cut down or stop their use of smokeless tobacco. Of those who were still using smokeless tobacco at the time of the call, 71% reported that they were seriously considering quitting in the next 6 months and 42% set a specific quit date at the end of the call.

The questionnaire response rate at 3 months was excellent, with 49% of the questionnaires returned by mail and 40% completed in telephone interviews. Of the remainder, 3% of the subjects declined to complete the interview and 8% were lost to follow-up. At 12 months we were successful in interviewing 74% of the patients, 9% completed the questionnaire by mail, 5% refused, and 12% were lost to follow-up. Most of those who were lost to follow-up had moved out of the area. Since the tobacco use of those who refused or were lost to follow-up could not be assessed, they were considered tobacco users in all analyses.

Saliva samples were collected from 48.1% of the intervention and 46.3% of the control subjects who reported not using tobacco at the 12-month assessment; the difference between the groups was nonsignificant ($\chi^2 = 0.03$, $P > .05$). Of those providing samples, 4 (16%) of the intervention subjects and 2 (8%) of the control subjects had saliva levels indicating tobacco use (cotinine > 25 ng/mL), also a nonsignificant difference ($\chi^2 = 0.76$, $P > .05$). Because of low compliance with the saliva collection procedures, a common problem in field studies with nonselected populations of tobacco users, and considering the lack of difference in refusal rates between the groups and the low rate of disconfirmation for those tested, we chose to use self-report rather than biochemical confirmation as the primary outcome measure of this study.

There was a nonsignificant trend toward higher quit rates in the usual care control group than in the preintervention group. For example, rates of self-reported abstinence from smokeless tobacco (no use in past 7 days) at 3 months were 21.3% for usual care subjects and 19.0% for preintervention subjects ($\chi^2 = 0.15$, $P = .69$) (Table 1). Rates of abstinence from smokeless tobacco at 12 months were 24.5% for the usual care subjects and 20.7% for the preintervention subjects ($\chi^2 = 0.39$, $P = .53$). By the stricter criterion of no smokeless tobacco use and no smoking of cigarettes, pipes, or cigars, rates of abstinence at 3 months were 11.7% for the usual care subjects and 6.9% for the preintervention subjects ($\chi^2 = 1.15$, $P = .28$). A consistent trend toward lower quit rates in the preintervention control group indicates that training for the project may have sensitized dental care providers to smokeless tobacco use among their patients and changed their "usual care" practice habits.


date

The percentage of subjects in each group reporting abstinence at follow-up is shown in Table 1. Compared with the usual care control group, a larger proportion of subjects in the intervention group reported abstinence from smokeless tobacco at the 3-month assessment (32.2% vs 21.3%; $\chi^2 = 8.03$, $P < .01$, one-tailed). Similarly, a larger proportion of intervention subjects reported abstinence at the 12-month assessment (33.5% vs 24.5%; $\chi^2 = 5.56$, $P < .01$, one-tailed) (Table 1). The intervention group also had a significantly higher quit rate when we used the more conservative requirement of abstinence from smokeless tobacco at both 3 and 12 months and considered those lost to follow-up at either assessment as smokeless tobacco users (18.4% vs 12.5%; $\chi^2 = 3.49$, $P = .03$, one-tailed). When we considered no tobacco use (including no smoking) as the outcome measure, the intervention group had significantly higher abstinence rates at 3 months ($\chi^2 = 5.56$, $P < .01$, one-tailed) and a difference of marginal significance when the 3- and 12-month assessments were combined ($\chi^2 = 1.75$, $P = .09$, one-tailed).

The difference in the proportion of patients who reported more than 4 cigarettes per day at the 12-month assessment in the intervention group (18.4%) and in the control group (19.0%) was not statistically significant ($\chi^2 = 0.03$, $P > .05$). At the 3-month assessment, 27 (47%) of the preintervention subjects, 112 (41%) of the usual care subjects, and 136 (56%) of the intervention subjects reported that they had attempted to quit using smokeless tobacco.

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**Table 1—Percentage of Subjects in Each Group Reporting Abstinence at Follow-Up**

<table>
<thead>
<tr>
<th>Follow-Up</th>
<th>Measure</th>
<th>Pre-Intervention (n = 58)</th>
<th>Usual Care (n = 273)</th>
<th>Intervention (n = 245)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 mo</td>
<td>Smokeless only</td>
<td>19.0</td>
<td>21.3</td>
<td>32.2**</td>
</tr>
<tr>
<td></td>
<td>All tobacco</td>
<td>6.9</td>
<td>11.7</td>
<td>19.2**</td>
</tr>
<tr>
<td>12 mo</td>
<td>Smokeless only</td>
<td>20.7</td>
<td>24.5</td>
<td>33.5*</td>
</tr>
<tr>
<td></td>
<td>All tobacco</td>
<td>15.5</td>
<td>17.6</td>
<td>22.0</td>
</tr>
<tr>
<td>3 and 12 mo</td>
<td>Smokeless only</td>
<td>10.3</td>
<td>12.5</td>
<td>18.4*</td>
</tr>
<tr>
<td></td>
<td>All tobacco</td>
<td>3.5</td>
<td>7.0</td>
<td>10.2</td>
</tr>
</tbody>
</table>

Note. Nonresponders were considered tobacco users. *P < .05, one-tailed test comparing usual care controls and the intervention group. **P < .01, one-tailed test comparing usual care controls and the intervention group.
less tobacco since their clinic visits. The techniques used by these subjects in their efforts to quit are shown in Table 2. Although the groups did not differ in their use of simple willpower, subjects in the intervention group were significantly more likely to use active tobacco cessation techniques, including setting a quit date, reading a self-help manual, using gum or another substitute, and increasing exercise (all methods that were emphasized in the video and self-help manual). Very few subjects called tobacco advice lines, attended tobacco cessation groups, used nicotine chewing gum, or used hypnosis or acupuncture. When asked whether their dentists had advised them in the previous 4 months to quit using smokeless tobacco, 38% of the usual care subjects and 80% of the intervention subjects answered yes ($\chi^2 = 81.9, P < .001$). When asked the same question about their hygienists, 45% of the usual care subjects and 83% of the intervention subjects answered yes ($\chi^2 = 65.9, P < .001$). Only the intervention subjects were asked whether the advice received from dental care providers had been a significant influence in their seriously considering quitting smokeless tobacco use: 71% said yes.

To determine the association between cessation techniques reported by subjects at the 3-month follow-up and abstinence from smokeless tobacco at both the 3- and 12-month assessments, we combined the data from all three groups of subjects. The following tobacco cessation techniques were found to be significant predictors of quitting: reading a self-help manual ($P = .002$); using candy, gum, toothpicks, or other substitutes ($P = .001$); exercising ($P = .001$); and using willpower ($P = .001$). None of the other techniques were found to be statistically significant predictors of abstinence at both 3 and 12 months, although setting a quit date did approach significance ($P = .093$).

### Discussion

The experimental design used in this study was conservative in that the intervention condition was compared with usual care received from the same providers. These dentists and hygienists often included advice to quit using tobacco as a part of usual care, as evidenced by reports from more than one third of the subjects in the control condition. This study examined the effectiveness of a single clinic-based contact rather than testing the effectiveness of this intervention as a fully integrated part of routine care in which the patient would receive follow-up interventions at each clinic visit. Even with the limitations of this design, significant differences between the intervention and control conditions were found.

Since this intervention specifically focused on smokeless tobacco use rather than smoking, it is not surprising that the strongest effects were on smokeless tobacco use and the effects on smoking were relatively modest. However, there was no evidence of smokeless tobacco users switching to smoking, and the intervention was marginally effective in reducing use of all tobacco products.

Considerable difficulty in obtaining saliva samples for biochemical testing has been reported by others doing field and population-based research. Unlike the carefully screened participants in multisession treatment programs we have conducted, the subjects in this study were intercepted in the course of routine dental care, and they were not asked to consent to biochemical confirmation when they entered the study. This interception method was used to identify the broadest possible sample of smokeless tobacco users rather than selecting only those who were highly motivated to quit. Many of these patients had little interest in research and did not feel an obligation to comply with our request for a follow-up dental examination and a saliva sample. Since the purpose of the study was to test the effectiveness of this intervention when used with the general population of smokeless tobacco users seen in dental clinics, we were reluctant to exclude half of the subjects because they were unwilling to provide a saliva sample. Of course, when self-reported data are used, there is always the possibility of subjects’ misreporting their tobacco use. However, given the low intensity of the intervention and the fact that equal proportions of subjects provided saliva samples in both groups, we feel that self-reported data are appropriate for this study. A detailed discussion of the appropriateness of self-reported tobacco use in population-based studies is presented in Velicer et al. and the use of self-reported data in interception studies in health care settings is presented in Glasgow et al.

Among the components of this intervention, pointing out smokeless tobacco-related soft-tissue lesions to the patients and then directly advising them to quit using tobacco was expected to have considerable impact. Unlike smokers, most smokeless tobacco users have clinically apparent oral lesions, as did 78.6% of the patients in this study. However, in our study, intervention patients with lesions were less likely to quit using smokeless tobacco than those who did not have clinically detected lesions ($\chi^2 = 6.29, P = .012$). Since the presence of lesions was related to the amount of smokeless tobacco use, heavier users were more likely to have lesions but less likely to quit.

Health care settings have become increasingly attractive as an avenue for promoting smoking cessation. A growing empirical literature has developed on the effect of physicians’ advice to quit smoking. One-year point-prevalence quit rates are typically between 5% and 15%, or about 5 percentage points higher than the quit rates of untreated control sub-
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