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Tobacco Control Activity of Iowa Dental Hygienists

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**TOBACCO CONTROL ACTIVITY
OF IOWA DENTAL HYGIENISTS**

A Thesis

Presented to the

School of Health, Physical Education and Recreation

and the

Faculty of the Graduate College

University of Nebraska

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

University of Nebraska at Omaha

by Ann Keller Chambers

Spring 1995

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THESIS ACCEPTANCE

Acceptance for the faculty of the Graduate College,
University of Nebraska, in partial fulfillment of the
requirements for the degree, Master of Science, University
of Nebraska at Omaha.

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ACKNOWLEDGMENTS

The author would like to acknowledge the help and support of all those who made this thesis possible. A special note of gratitude goes to Dr. David Corbin, who chaired my thesis committee and provided much needed suggestions and support. I would also like to thank my committee members, Dr. Richard Stacy and Dr. Susan Noble-Walker, for sharing their valuable time and offering advice.

Appreciation is also extended to Dr. Robert Mecklenburg of the National cancer Institute, Dr. Scott Tomar of the Centers for Disease Control & Prevention, Dr. William Maurer of the Iowa Department of Public Health, and a multitude of other people for their special assistance.

A special thanks goes to Frank Hartranft for his expertise in the statistical analysis of this survey and to Pat Dargantes who took a lot of time to teach me how to use the computer.

Finally, the author would like to thank my children, Lani, Paul, & Sarah, and my employer Dr. William Braymen for their patience and support during the completion of this project.

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Abstract

Approximately 419,000 people in the United States die annually from diseases caused by tobacco use (Centers for Disease Control [CDC], 1993). The 1990 Report of the Surgeon General, The Health Benefits of Smoking Cessation, encourages health care professionals to stress repeatedly at every opportunity the value of cessation to the 50 million Americans who continue to smoke. This paper reviews the data gathered from a survey of the tobacco control activities of Iowa dental hygienists.

Dental hygienists who were actively engaged in clinical practice, held a current Iowa dental hygiene license, and had an address in the Midwest were invited to participate in this study. The ages of the respondents ranged from 20 to 62 with the mean being 36.9 years old.

A 37 item questionnaire was mailed to 1056 Iowa dental hygienists. Of the 877 possible subjects, 340 chose to participate by completing and returning the questionnaires for a return rate of 38.6%. The areas examined were Iowa hygienists': (a) intervention behavior; (b) intervention attitude; and (c) knowledge about tobacco. Results of this study indicated that the tobacco control activities of Iowa dental hygienists are minimal. A majority (87%) considered it appropriate to present information about the adverse effects of tobacco during routine dental visits and a majority (84.6%) were willing to learn methods of giving such advice. Practice specialty, training received, education, and familiarity with Healthy People 2000 were significant factors (with $p < .05$) influencing whether or not tobacco cessation services were offered to dental patients who used tobacco. Several barriers to offering cessation services were significantly influenced (with $p < .05$) by smoking status, practice specialty, education, familiarity with Healthy People 2000, and practice type. Only 3.9% of Iowa hygienists were tobacco users at the time of this study.

Chapter 1

INTRODUCTION

Annually approximately 419,000 people in the United States die from diseases caused by tobacco use (Centers for Disease Control [CDC], 1993; American Cancer Society, 1994). According to the 1990 Report of the Surgeon General, The Health Benefits of Smoking Cessation, smoking cessation has profound and immediate health benefits for men and women of all ages. The report also encouraged health care professionals to stress repeatedly at every opportunity the value of cessation to the 50 million Americans who continue to smoke (U.S. Department of Health and Human Services [USDHHS], 1990).

The long-standing evidence that smoking is extremely harmful to health and the mounting evidence that smoking cessation is beneficial to health amplifies the need for developing effective strategies to curtail the use of tobacco (USDHHS, 1990).

In response to this need, thousands of health care professionals collaborated to produce a document that contains strategies designed to significantly improve the health of the nation. Objectives were developed in 1990 aimed at preventing major chronic illnesses, injuries, and the spread of infectious diseases. These objectives were published as Healthy People 2000: National Health Promotion and Disease Prevention Objectives. Objective 3.16 of Healthy People 2000 is to "increase to at least 75 percent the proportion of primary care and oral health care providers who routinely advise cessation and provide assistance and follow-up for all of their tobacco-using patients". The baseline was thirty-five percent of dentists (hygienists were not included) who reported counseling at least 75 percent of their smoking patients about smoking in 1986 (Public Health Service, 1991).

The American Dental Association (ADA) and the American Dental Hygienists Association (ADHA) have passed resolutions advocating tobacco-use prevention and cessation. There are many reasons the dental team should participate in tobacco cessation, including the following:

1. Most of the public can be reached during dental visits. As many as 63% of the adults and 75% of the youth are seen each year in dental offices (Manley and Mecklenberg, 1991).
2. Help is usually one-to-one and very effective because: (a) dental professionals have credibility as health care providers; (b) patients and the public respect the dental profession; (c) dental visits are usually long enough to include the tobacco issue; (d) dental visits are usually at regular intervals; (e) visits are usually prevention and education oriented; and (f) patients can be shown the adverse oral effects of tobacco (Manley and Mecklenberg, 1991).
3. Results are as good as the same services offered by physicians (Mecklenburg, Greenspan, Kleinman, Manley, Niessen, Robertson, and Winn, 1992). In addition to the reduction of heart disease, lung cancer, and respiratory problems there are many oral diseases and conditions caused or aggravated by tobacco use that clearly improve when tobacco use is stopped (Christen, McDonald, & Christen, 1991).

Statement of Problem

The purpose of this study was to determine the existing tobacco control activities provided to dental patients by Iowa dental hygienists. More specifically, the following research questions were asked: (a) What is the extent of tobacco control activities employed by dental hygienists in Iowa? (b) how do they compare with Objective 3.16 of Healthy People 2000? (c) do tobacco control activities differ according to the categorical variables of age, education, practice type, practice

specialty, smoking status, familiarity with Healthy People 2000, or cessation training received? and (d) if tobacco cessation services are not offered to patients who use tobacco, what are the barriers to doing so as perceived by Iowa dental hygienists?

Limitations

A survey was used to determine tobacco control activities of Iowa dental hygienists. Participants in this study included those dental hygienists who: (a) had an active Iowa dental hygiene license; (b) were actively engaged in providing clinical patient care; and (c) had a mailing address in the Midwestern United States (Iowa, North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Missouri, Wisconsin, Illinois, Michigan, Indiana, or Ohio). There were 1056 dental hygienists who held an Iowa dental hygiene license at the time of this study. The size of the group was determined by the Iowa Board of Dental Examiners and the mailing labels were obtained from the Iowa Dental Hygienists' Association.

Limitations of this study included selection bias. It was possible that the hygienists who were most interested and active in tobacco cessation were the ones who replied to the survey. The time of the mailing which was between Thanksgiving and Christmas may have contributed to a low response rate. Limitations also included the self-motivation ability of the respondents. The nature of the survey was also retrospective in nature and required the respondents to recall from memory the information needed to complete the survey. Other limitations included the following: (a) The researcher could not control individual perception and misinterpretation of questions; (b) the survey was printed doubled-sided and used condensed print that could have caused some of the respondents to "skip a page"; (c) some participants did not receive the survey due to incorrect or incomplete mailing addresses; and (d) the

names of those dental hygienists who became licensed or renewed their licenses after the roster was compiled were not included.

Definitions

For clarity, the following terms were defined:

Smokers: Individuals who have used cigarettes, pipes or cigars within the past twelve months.

Smokeless Tobacco (ST) users: Individuals who have used any form of snuff (moist, dry or packaged) or any form of chewing tobacco (loose leaf, plug or twist) within the past twelve months.

Tobacco Cessation Services: Using the Prochaska and DiClementes model, tobacco cessation services are defined as services that assist people to do one or more of the following: (a) contemplate stopping; (b) decide to stop; (c) actually stop; (d) retain their tobacco-free behaviors after having stopped; and (e) attempt to stop again if unsuccessful at previous attempts. These services included asked patients if they used tobacco, advised tobacco using patients to stop, assisted patients who use tobacco to stop, and arranged follow-up for patients who have stopped using tobacco.

Conclusion

Tobacco cessation is a complex behavioral phenomenon consisting of psychological and physiological factors (Henningfield, 1990). It will take all primary health care providers and oral health care providers working together to reach the goals of Healthy People 2000.

Dental hygienists are traditionally the patient educators in dentistry. According to Linda Cato of the American Dental Hygienists' Association, there are a little over 100,000 registered dental hygienists nationwide, with 78,000 actively practicing (personal communication, June 29, 1994). If each hygienist helped one person stop

using tobacco, thousands of individuals and their families could be spared the agony of diseases or deaths caused by using tobacco. The role of the dental hygienist as a tobacco cessation counselor should not be underestimated (Little & Stevens, 1991).

Chapter II

REVIEW OF LITERATURE

The purpose of this chapter was to review the literature on tobacco cessation techniques and attitudes delivered by health care providers. Special attention was given to strategies appropriate for the dental office, especially dental hygienists.

Tobacco Cessation in Medical Offices

A considerable amount of research has been done on smoking intervention delivered in the medical community. Six years after the 1964 Surgeon General's report stated that smoking was hazardous to people's health, United States mail trucks displayed posters proclaiming, "100,000 Doctors Have Quit Smoking Cigarettes. Maybe They Know Something You Don't" (Christens, 1970).

In 1980, the American Medical Association (AMA) Council on Scientific Affairs recommended that physicians should routinely assess the smoking habits of their patients and should encourage them to quit. They should offer them direct assistance or send them to a smoking cessation clinic (Anda, Remington, Sienko & Davis, 1991).

In a 1987 survey of 5875 Michigan adults, 44% of the smokers who had seen a physician during the previous twelve months had been advised to quit by their physician (Anda, et al., 1991). In a survey of San Francisco Bay area internists, 46% of the physicians reported assisting their patients to quit smoking (Cummings, Hansen, Richard, Stein and Coates, 1988). One study found that 75% of smokers believed that physicians' advise would be at least "somewhat" to "very effective" in getting them to reduce or stop smoking. Two-thirds of those questioned stated that they had not been advised to quit by their physician (Cohen, Stookey, Katz, Drook & Christen, 1989). Another study indicated that clinicians were not adequately addressing the needs of

their patients who smoke. Fiore (1991) recommended that Physicians should learn and use a brief intervention message to help their patients quit smoking (Fiore, 1991).

A review of many randomized controlled trials concluded that receiving a recommendation to quit from a health care worker could result in a quit rate ranging from 7% to 14% (Folsom & Grimm, 1987; Janz, Becker, Kirscht, Eraker, Billi, & Woolliscroft, 1987; Little & Stevens, 1991; Russell, Wilson, Taylor & Baker, 1979). This percentage may seem low, but if cessation advice was offered nationally, it could double or triple the spontaneous quit rate of 4% a year (Little & Stevens, 1991; Manley & Mecklenberg, 1991). Cessation results improved as much as 25% if video-tapes or written self-help materials, longer counseling time, and/or follow-up contacts were provided to tobacco using patients (Hollis, 1991; Janz, et al., 1987; Little & Stevens, 1991). The quit rate increased to as much as 51% if the patient had had an illness caused by tobacco. If the patient had been hospitalized for heart disease or was at risk to develop heart disease and received multiple cessation services, the quit rate reached as high as 62% (Little & Stevens, 1991; Pederson, 1990).

A meta-analysis of controlled studies of smoking cessation interventions showed that the greater the number of health care providers giving advice to quit, the greater likelihood that the patient would quit (Kottke, Battista, DeFries, & Brekke, 1988).

Most of the research concurs with Kottke et al. (1988) that "a multifaceted cessation program produces the best results when delivered by physicians and non-physicians on multiple occasions" (Anda, et al., 1991; Cummings, et al., 1988; Fiore, Epps, & Manley, 1994; Hurt, Dale, Fredrickson, Caldwell, Lee, Offered, Lager, Marisa, Knees, & Lindbergh, 1994; Joseph & Bird, 1989; MacKenzie, Bartecchi, & Stirrer, 1994; Sanders, Peeler, Manta, & Fouler, 1993).

Tobacco Cessation in Dental Offices

The 1964 General Convention of the American Dental Association passed a resolution urging its members to educate their patients, especially young people, about the systemic and oral health hazards of using tobacco (ADA, 1964). Despite opposition from some of its members, the ADA was able to pass a resolution in 1978 adding smokeless tobacco to the hazardous substances list. In 1981, the ADA passed a resolution endorsing the National Cancer Institute's program Let's Help Smokers Quit and banned smoking at official functions (Christen, Klein, Christian, McDonald, & Guba, 1990). The ADA Catalog added audiovisual materials, wall plaques, posters, pamphlets, "no smoking" signs, videotapes, and films designed for dental patients who smoke. The ADA Catalog expanded its line of patient education materials to include literature for dental patients who smoke or use smokeless tobacco (ADA, 1994). Nevertheless, it is not widely believed that the oral health team has played an integral role in the prevention and cessation of tobacco use (Brink, Gottlieb, McLeroy, Wisotzky, & Burdine, 1994; Frese & Schierling-Wilkes, 1987; Fried, 1987; Gerbert, Coates, Zahnd, Richard, & Cummings, 1989; Klein, McDonald, & Christen, 1988; Little & Stevens, 1991; O'Shea, & Corah, 1984; Secker-Walker, Hill, Solomon, & Flynn, 1987; Walther, 1990).

"Many dental patients want to quit smoking, but simply do not know how. The dentist can help them if he has studied the scientific evidence of the health consequences of smoking and is himself a nonsmoker" (Christen, 1970). Several studies have shown that most patients would accept help with "kicking the habit" from their oral health professional (Little & Stevens, 1991). A 1990 study done by Little and Stevens concluded that 87% to 97% of the patients who received advice to quit from the dental team thought it was helpful. One survey of private dental patients found that

67% of smokeless tobacco users were open to cessation advice, but only 33% reported having received any advice to quit at the dental office (Little & Stevens, 1991). The main reasons for this disparity is that most dentists surveyed believed that if they routinely gave cessation advice, their patients would feel harassed, embarrassed, or offended enough that they might leave the practice. The list of reasons they did not routinely give cessation advice included lack of time, lack of training and the belief that cessation advice was not effective (Brink, et al., 1994; Ferguson, Logan, & Pomrehn, 1984; Gerbert, et al., 1989; Klein, et al., 1988; Little & Stevens, 1991).

Several surveys revealed that oral health care providers are an undeveloped resource as tobacco cessation counselors, although, they are accustomed to counseling their patients about oral health care. (Geboy, 1989; Gerbert, et al., 1989; Klein, et al., 1988; Schroeder, Soller, & Chen, 1988). By consistently giving all their patients advice to stop using tobacco, dentists and dental hygienists could dramatically lower the nation's smoking rate (Little & Stevens, 1991).

"Should dentists advise smokers to quit?" was the question asked to 391 dentists in Iowa (Ferguson, et al., 1984). Of the 157 dentists who responded, over two-thirds (71%) said, "Yes, they should advise their patients to stop smoking"; however, few of the dentists who responded provided suggestions for stopping, provided a booklet, or scheduled a follow-up session.

Most dentists and hygienists acknowledged that they should help their patients stop using tobacco (Cohen, Christen, Katz, Drook, Davis, Smith, & Stookey, 1987; Fried & Rubinstein, 1990; Little & Stevens, 1991; O'Shea, Sielski, Creola, Geraci, Haberer, & Sowinski, 1987; Secker-Walker, Hill, Solomon, & Flynn, 1987). However, Gerbert et al, (1989) found that the San Francisco Bay area dentists who they surveyed were not generally counseling their patients to stop smoking; even though 97% of the

dentists believed that smoking was "extremely dangerous to health" (Gerbert, et al., 1989). Many other studies confirmed that dentists did not routinely talk with their patients about tobacco use and did not give them direct advice to quit (Christen, 1984; Cohen, et al., 1987; Fried & Rubinstein, 1990; Little & Stevens, 1991; O'Shea & Corah, 1984; O'Shea, et al., 1987; Secker-Walker, et al., 1987).

In an effort to increase dentists' participation in tobacco cessation, The Journal of the American Dental Association dedicated its January 1989 issue to the topic of oral health in relationship to tobacco use. According to Davis (1989) dentists have an important role in controlling tobacco use if the goal of a smoke-free society is to be reached by the year 2000. They are professionals and role models. Dentists should not only discourage their patients from starting the smoking habit, but they should use every available moment to encourage prevention and cessation (Davis, 1989).

The National Cancer Institute (NCI) sponsored a 5 year study evaluating the cessation activities of 92 private practice dentists in Indiana. A brief and effective method of cessation was developed and implemented in the private dental setting. Forty-four private practitioners were randomly assigned to one of four groups. They attended a 1-hour lecture or received personal instruction on the medical consequences of smoking, the benefits of stopping, and the efficacy of nicotine replacement therapy. They also received a four-step protocol for smoking management. The percentage of patients in each group who had quit smoking a year later was 7.7, 16.3, 8.6, and 16.9, respectively (Cohen, et al, 1989). Cohen et al (1989) concluded that dental personnel who were well trained offered cessation advice more often than those who had not received training.

Tobacco Cessation Methods

There are many methods to help patients stop using tobacco. The NCI has How to Help Your Patients Stop Smoking and Ockene & Ockene wrote Nine Ways to Help Your Patients Stop Smoking (as cited in Folsom & Grimm, 1987). Several organizations such as the American Cancer Society, the American Lung Association, and the Seventh-Day Adventists offer effective, free or low cost quit-smoking clinics.

The National Cancer Institute recommends using all of the dental office staff, not just the dentists, in its program. The basic four steps of this program are: (a) ASK your patient about tobacco; (b) ADVISE your patient to stop; (c) ASSIST your patient in stopping; and (d) ARRANGE patient follow-up services. The complete program is in the book How to Help Your Patients Stop Using Tobacco "A National Cancer Institute Manual for the Oral Health Team" (Mecklenburg, Christen, Gerbert, Gift, Glynn, Jones, Lindsay, Manley, & Severson, 1991).

Numerous articles that recommended dental office tobacco cessation presented variations of the NCI program (Brink, et al., 1994; Christen, et al., 1990; Cohen, et al., 1990; King, 1991; Little & Stevens, 1991; Levy, 1990; Stafne, 1993). Cohen et al. (1990) suggested using the Fagerstrom Tolerance Test before beginning counseling. This simple test was developed by Dr. K.O. Fagerstrom. It has eight questions with multiple choice answers. If the score is 0-6, the person taking the test has a low to moderate physical dependence on nicotine. If the score is 7-11, the person is considered highly dependent on nicotine. This test is useful in deciding what type of tobacco cessation program or combination of programs to use. Those patients with high scores may be candidates for nicotine replacement therapy (Cohen, et al., 1990).

Nicotine Replacement Therapy

In the event that a patient is highly dependent on nicotine, it was concluded that nicotine gum was an effective aid to tobacco cessation programs (Christen, McDonald, Olsen, Drook, & Stookey, 1984; Henningfield, 1990; Herod, 1990; Schneider, Jarvik, & Forsythe, 1983). Clinical trials using placebo-controlled, double-blind methods were assessed in the review articles by Fiore, Jorenby, Baker, and Kenford (1992) and Jarvis, Raw, Russell, and Feyerabend (1982). They concluded that nicotine patches were also an effective aid to tobacco cessation programs. Patients who used nicotine replacement therapy with counseling had significantly higher quit rates than those patients who received counseling alone (Fiore, et al., 1992; Jarvis, et al., 1982).

Clinical Studies

Published studies on tobacco-use cessation done in the dental office were few when compared to studies done in the medical community. The majority of the published studies recommended that dentists need to aid their patients to become and remain tobacco free (Brink, et al., 1994; Cohen, et al., 1989; Ferguson, et al., 1984; Little & Stevens, 1991; Secker-Walker, Solomon, & Hill, 1989).

Articles and studies about dental hygienists and tobacco cessation programs were even more scarce. Two published articles specifically about dental hygienists and tobacco cessation were found. They were titled "Smoking cessation advice delivered by the dental hygienist: A pilot study" (Secker-Walker, Solomon, Haugh, Welsh, Tatro, Witham, Hill, & Mercier, 1988) and "Dental hygiene's role in reducing tobacco use" (Little & Stevens, 1991). In the Secker-Walker, et. al. study, hygienists were trained, then instructed to deliver smoking cessation as part of their routine care. The intervention included the hygienist providing brief counseling, self-help materials, and

direct advice to quit. The self-reported quit rate was 14.6% after six months. This is comparable to similar studies done in medical offices. Dental hygienists were at least as effective as physicians or nurses in delivering smoking interventions. The Little and Stevens article was a review of literature (Little & Stevens, 1991).

Patients counseled by health care professionals trained in tobacco cessation methods have a significantly higher quit rate (7% to 14%) than the national average of 4% (Frese & Schierling-Wilkes, 1987; Little & Stevens, 1991; Manley & Mecklenberg, 1991; O'Shea, et al., 1987; Secker-Walker, Solomon, Haugh, et al, 1988; Secker-Walker, et al., 1987).

Summary

The literature showed that many patients were willing to receive assistance in tobacco cessation and they expected advice from health care professionals. According to the National Cancer Institute, smokers who were urged to quit by a health care professional were two to ten times more likely to stop using tobacco than smokers who did not receive advice to quit. Professional advice carried considerable weight with the patients (Manley & Mecklenberg, 1991).

Advice from a dental hygienist, dentist, nurse, or physician was effective in helping patients to stop using tobacco. Studies showed that those health care professionals who were trained in effective cessation methods were inclined to offer cessation advice and services more often than those who had not been trained.

Dental hygienists are traditionally the patient educators in dentistry. They spend a considerable amount of time on direct, one-on-one, patient education. Researchers have concluded that dental hygienists should provide cessation advice to their patients who use tobacco (Little & Stevens, 1991; Mecklenburg, Greenspan, Kleinman,

Manley, Niessen, Robertson, & Winn, 1992; Secker-Walker, et al., 1988; Slater, 1978).

Dental office based cessation programs do not have to be extensive, costly or time consuming for the dentist. The education and counseling can be delegated to the dental hygienist. Dental hygienists were at least as effective as physicians or nurses in delivering smoking interventions (Little & Stevens, 1991). Hygienists are accustomed to talking to their patients about preventive oral health care. By consistently giving all their patients advice to stop using tobacco, dental hygienists could dramatically lower the nation's smoking rate (Little & Stevens, 1991).

Reasons reported by dental hygienists and dentists for not advising their tobacco using patients to stop included lack of confidence and lack of training. This perceived lack of confidence calls for presentation of training programs designed for the dental team. The National Cancer Institute training program teaches simple, brief, and effective methods for helping dental patients quit using tobacco (Ferguson, et al., 1984).

Most of the research reviewed agreed with Kottke, Battista, DeFriese, & Brekke, (1988) that "a multifaceted cessation program produces the best results when delivered by physicians and non-physicians on multiple occasions". The greater the number of health care providers giving advice to quit, the greater the likelihood that the patient will quit (Kottke, et al., 1988; Little & Stevens, 1991).

According to Manley and Mecklenberg (1991), if 75% of the oral health teams routinely helped patients achieve a 10% quit rate, an average of 28 patients per oral health team would succeed. That would result in nearly 3 million tobacco-free patients per year.

Since hygienists have skills and knowledge in patient education, they can undertake the task of delivering and coordinating the majority of tobacco control activities in the dental office. The role of the dental hygienist as a tobacco cessation counselor should not be underestimated (Little & Stevens, 1991).

Chapter III

METHODS

Instrument

In January 1994, a copy of the National Dental Tobacco-Free Steering Committee's Tobacco Control Activity Surveys of Dental Practice was obtained from Dr. Scott Tomar of the Office on Smoking and Health, Centers for Disease Control and Prevention to use in this study. Modifications were made by the author to shorten the survey. The modified survey was piloted to ten colleagues to ensure that the new format was easy to follow.

The 37 items on the survey were assigned to one of four categories: (a) demographics of the respondent; (b) respondent intervention behavior; (c) respondent intervention attitude; and (d) respondent knowledge about tobacco. The survey utilized fill-in-the-blank and multiple choice questions

Procedures

Prior to the beginning of this study, approval was obtained from the Institutional Review Board (IRB) of the University of Nebraska . The survey was conducted with the support of the Iowa Department of Public Health and was endorsed by Linda Rowe, RDH, President of the Iowa Dental Hygienists Association. Partial funding for the survey was obtained from the Iowa Department of Health.

The complete survey consisted of a cover letter, a consent form, a stamped pre-addressed return envelope, and a questionnaire (see Appendix A). One survey was mailed to each of the dental hygienists licensed in Iowa who had an address in the Midwest. Three weeks later, a follow-up postcard was sent to each Iowa hygienist encouraging completion and return of the survey. Each completed survey that was returned to the author before the deadline was given an identification number and the

answers were transferred to a General Purpose National Computer Systems, Inc. answer sheet.

Subject Selection.

Participants in this study included those dental hygienists who: (a) had an active Iowa dental hygiene license; (b) were actively engaged in providing clinical patient care; and (c) had a mailing address in the Midwestern states of Iowa, North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Missouri, Wisconsin, Illinois, Michigan, Indiana, or Ohio. The Iowa Dental Hygienists Association provided the master list of 1056 potential subjects.

Of the 1056 surveys mailed, 41 were returned by the post office and 138 surveys were returned with the consent form stating that they did not meet the criteria. The study population was therefore 877.

Variables

The categorical variables evaluated were age, education, type of dental practice, practice specialty, familiarity with Healthy People 2000, current smoking status, and cessation training received.

Age categories were determined as follows: The year 1964, the Surgeon General's Report about the harm of tobacco use was published, was used as the dividing point. Hygienists born in 1964 were 30 years old at the time of this survey. It was unlikely that they would have received tobacco cessation information before entering school; therefore, five years-the age (when they would have entered school) was added to the base age. One group was 35 years old and younger, and another group was 36 years old and older.

Education levels were categorized as follows: hygienists who held an associate degree (They had attended some college or vocational school) and members who held a bachelors degree or higher (They were 4 year college or graduate school graduates).

The practice type was categorized into: hygienists who were in a solo practice (one dentist) and hygienists who were in a group practice (more than one dentist).

Practice specialty was categorized into: hygienists who were in general practice, hygienists who were in periodontal practice, and hygienists who worked in all other dental specialties such as oral surgery, pathology, endodontics, prosthodontics, periodontics, public health, pedodontics, or orthodontics.

Smoking status was categorized into: hygienists who were current smokers or occasional smokers, hygienists who were former smokers, and hygienists who had never smoked. There were no smokeless tobacco using hygienists in this study.

Respondents were also divided into those who considered themselves to be familiar with Healthy People 2000, and those who considered themselves to be unfamiliar with Healthy People 2000.

Cessation background training was divided into those who had received cessation training (continuing education class, part of school curriculum, organized study club, pharmaceutical program, or other courses) and those who had not received cessation training.

Statistical Analysis

The data were analyzed using non-parametric (descriptive) statistics and the Pearson Chi-squares and t-tests. The alpha level was set at .05.

Chapter IV

RESULTS

Tobacco cessation services or activities were defined as assisting patients to do one or more of the following: (a) contemplate stopping; (b) decide to stop; (c) actually stop; (d) maintain their tobacco-free behaviors after having stopped; and, (e) attempt to stop again if unsuccessful at previous attempts. The purpose of this study was to determine the existing tobacco control activities of Iowa dental hygienists. More specifically, the following research questions were asked: (a) What is the extent of tobacco control activities employed by dental hygienists in Iowa; (b) how do they compare with Objective 3.16 of Healthy People 2000; (c) do tobacco control activities differ according to the categorical variables of age, education, practice type, practice specialty, smoking status, familiarity with Healthy People 2000, or cessation training status; and (d) if tobacco cessation services are not offered to patients who use tobacco, what are the barriers perceived by Iowa dental hygienists.

Results

Three-hundred-forty out of 877 questionnaires were returned for a return rate of 38.8%. The data were analyzed using non-parametric (descriptive) statistics as well as Pearson's Chi-squares and t-tests. The alpha level was set at .05. Selected demographics of the respondents are shown in Table I.

In order to determine the extent of tobacco control activities employed by Iowa dental hygienists and to compare these activities to Healthy People 2000 Objective 3.16 the following questions were asked: (a) Do you personally inquire about tobacco use to determine if the patient smokes or uses smokeless tobacco? (b) how often do you advise your tobacco using patients to stop? (c) do you personally discuss

Table I

Selected Demographics of Iowa Dental Hygienists Responding to the Tobacco Control Activity Survey, 1995

AGE (Mean).....	20-62 (36.9) years
EDUCATION (The highest level attained)	
Some college/vocational education.....	150 (44.4%)
4 year college graduate.....	154 (45.6%)
Graduate school	24 (7.1%)
YEAR GRADUATED FROM HYGIENE SCHOOL (Mode).....	1952-1994 (1987)
DENTAL HYGIENE DEGREE	
Associate Degree in Dental Hygiene.....	196(58.0%)
Bachelors Degree in Dental Hygiene.....	139(41.1%)
Master Degree in Dental Hygiene.....	2(0.6%)
PRACTICE TYPE	
Solo Practice (one dentist).....	219(64.8%)
Group Practice (more than one dentist)	111(32.8%)
PRACTICE SPECIALTY	
General Practice.....	290(85.8%)
Periodontics.....	22(6.5%)
Other.....	26(7.8%)
PRACTICE LOCATION	
Iowa 302 (89.3%)	66 of 100 Iowa counties were represented

strategies or techniques to help them stop using tobacco products? and, (d) does your office provide some type of follow-up (e.g., letter, telephone call, visit) for patients who are trying to stop using tobacco?

Only 4.6% of the respondents "routinely" inquired about tobacco use in their patients, while 25.7% did so "mostly". Thirty two and a half of the hygienists "sometimes" asked about tobacco use. Only .9% of the Iowa hygienists reported that they "never" inquired about their patients' tobacco use and 5.9% reported that they seldom asked their patients if they used tobacco.

In response to the question "How often do you advise your tobacco using patients to stop?", 35% the respondents "routinely" advised their patients who smoked to stop, while 57% of the hygienists "routinely" advised patients who use smokeless tobacco to stop. Approximately 25% of the hygienists advised their patients who smoked to stop "most of the time", while 17% of the hygienists advised their smokeless tobacco using patients to quit "most of the time". Two percent of the respondents "never" advised smokers or smokeless tobacco users to stop

In response to the question "Do you personally discuss with patients strategies or techniques to help them stop using tobacco products?"; 13% of the hygienists answered "routinely" for patients who smoked and 20% of the hygienists answered "routinely" if the patient used smokeless tobacco. Ten percent of the respondents "never" discussed quit strategies with patients who smoked and 10% of the hygienists "never" discussed quit strategies with patients who used smokeless tobacco.

When asked if their office provided some type of follow-up for patients who were trying to stop using tobacco, 82.5% answered "no" if the patient was a smoker while 82.0% answered "no" if the patient used smokeless tobacco. The responses to these questions are shown in Table II.

Table II

The Frequency of Tobacco Control Activities Delivered by Iowa Dental Hygienists, 1995

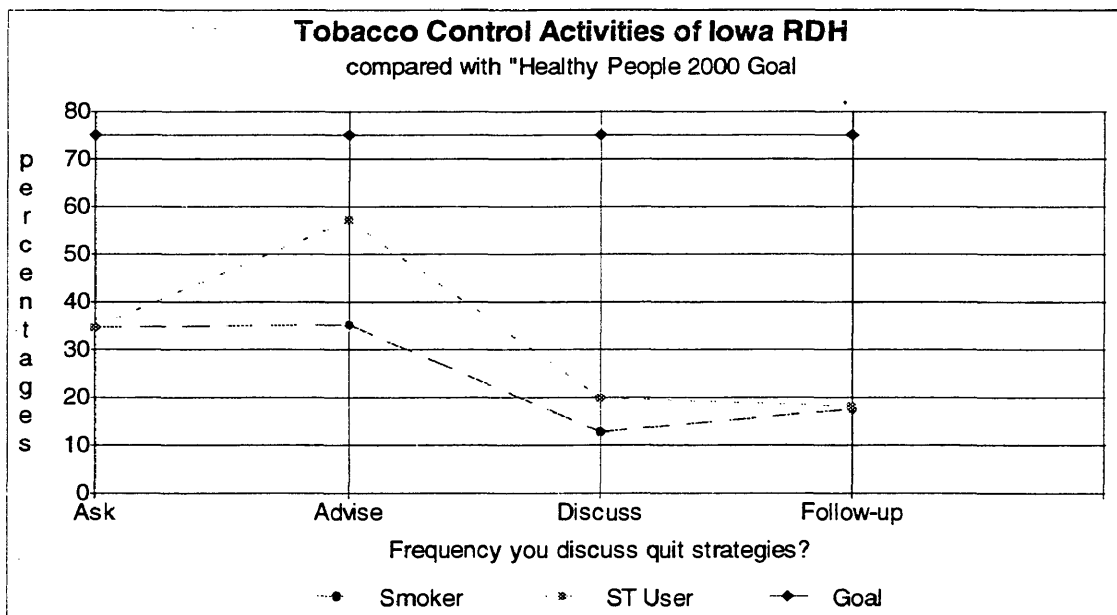
Activity	Frequency (%) *				
	Routinely	Mostly	Sometimes	Seldom	Never
ASK	.....4.6%.....	25.7%.....	32.5%.....	5.9%.....	.....9%
ADVISE					
Smokers...	35.2%.....	24.6%.....	28.4%.....	7.4%.....	.....2.1%
ST User...	57.1%.....	17.2%.....	12.7%.....	3.3%.....	.....2.1%
ASSIST/DISCUSS					
Smokers...	12.7%.....	14.2%.....	39.3%.....	21.3%.....	.....10.4%
ST User....	19.8%.....	14.8%.....	26.9%.....	17.2%.....	.....9.8%
ARRANGE/FOLLOW-UP					
Smokers.....	0.....	0.....	0.....	0.....	.....82.5%
ST User.....	0.....	0.....	0.....	0.....	.....82.0%

*Note: May not add up to 100% because not all respondents provided answers.

The goal of Objective 3.16 of Healthy People 2000 is to "increase to at least 75 percent the proportion of primary care and oral health care providers who routinely advise cessation and provide assistance and follow-up for all of their tobacco-using patients". The baseline was thirty-five percent of dentists and zero percent of dental hygienists who reported counseling at least 75 percent of their smoking patients about

smoking in 1986 (Public Health Service, 1991). The tobacco control activities of Iowa dental hygienists are compared to Healthy People 2000 Objective 3.16 in Figure 1. The tobacco control activities of dental hygienists in Iowa were below the baseline of 35% and well below the goal of 75% established by the Public Health Service. The reason the word "routinely" is so important is because checking for tobacco use is as important as checking for cavities. Dental patients are "routinely" if not always checked for cavities so that a carious lesion is not missed. Subsequently, opportunities to help a tobacco using patient quit can be missed unless the service is provided "routinely".

Figure 1



The hygienists were asked to rank their familiarity with Healthy People 2000 (HP 2000). Only 7.1% considered themselves very familiar with HP 2000 while 2.7% reported that they were familiar with it. The majority (69.2%) of the respondents were

very unfamiliar with HP 2000, 8% were unfamiliar, while 6.8% indicated the middle of the scale.

Approximately 29% of the respondents reported that they had received no training in cessation methods or techniques. Continuing education classes were the source of cessation training for 43.5% of the hygienists while nearly 33% reported receiving cessation training while in hygiene school. Even though the majority of the hygienists have attended cessation classes, 92.3% expressed a need for dental based tobacco cessation education programs. Almost 85% of the hygienists indicated that they were willing to receive cessation training.

The majority (52.4%) of the respondents reported that they had never smoked and 81.7% had never used smokeless tobacco. Almost 7% of the hygienists had personally experimented with smokeless tobacco while 26.3% had experimented with smoking. None of the hygienists reported that they were "current" smokeless tobacco users or were former (regular) users of smokeless tobacco. Almost 15% of the hygienists considered themselves former smokers. Only 3.9% of the respondents reported that they were current or occasional smokers.

The responses to the question "Do you personally inquire about tobacco use by your patients to determine if they smoke or use smokeless tobacco?" revealed no significant differences upon chi-square analysis among any of the categorical variables.

In response to the question "How often do you advise your tobacco using patients to stop?", there were no significant differences in responses by variables if the patient was a smoker. Smokeless tobacco users were advised to quit more often if the hygienist was in general practice versus periodontal practice hygienists, $\chi^2 (12, N = 314) = 67.1, p < .01$. Smokeless tobacco using patients were advised to quit more

often if the respondent was trained in cessation techniques versus being untrained in cessation methods, $\chi^2 (8, N = 331) = 62, p < .00001$.

Dental hygienists in general practice were more likely to assist their patients who smoked to quit than hygienists who were in periodontal practices, $\chi^2 (6, N = 333) = 33.9, p < .02$. Hygienists who had received cessation training were more likely to assist their patients who smoked to quit versus hygienists who had not received training $\chi^2 (8, N = 331) = 39.7, p < .00001$. The respondents who were familiar with Healthy People 2000 were more likely to assist or discuss quit strategies with smoking patients than hygienists who were unfamiliar with Healthy People 2000, $\chi^2 (8, N = 314) = 19.9, p < .01$. Smoking patients were assisted in quitting more often if their hygienist had a bachelors degree or higher rather than an associate degree, $\chi^2 (12, N = 324) = 24.3, p < .02$.

The hygienists who had received cessation training were more likely to assist their smokeless tobacco using patients than hygienists who were untrained in tobacco cessation , $\chi^2 (10, N = 300) = 45.6, p < .00001$.

There were no significant differences among the categorical variables for the responses to the question "Does your office provide some type of follow-up for patients who are trying to quit?". About 82% of the respondents reported that they "never" provided follow-up for patients who were trying to quit, regardless if the patient

smoked or used smokeless tobacco.

The respondents identified many barriers to providing tobacco cessation services into their dental offices. Patient resistance or complaints were perceived as barriers by 32.5% of the respondents. Time was perceived as a barrier by 26.7% of the hygienists responding; while, 27.2% the hygienists indicated that cost was a barrier.

Staff resistance was perceived as a barrier by 18.1% of the Iowa hygienists, and concerns about their own preparedness was a barrier to 29.3% of the respondents. The availability of patient education materials and lack of knowledge of adequate referral sources were considered a barrier by 26.3% and 42.3% of the hygienists respectively. Almost 15% of the respondents listed other barriers, the most common of which was that their employers used tobacco. The perceived barriers to incorporating tobacco services in dental offices are shown in Table III.

There were no significant differences among the categorical variables in the responses to the question identifying patient resistance or complaints as a barrier to offering cessation services; however, the time necessary to provide cessation services was perceived as a barrier by the hygienists who were current smokers versus the hygienists who were former smokers or who had never smoked, $\chi^2(4, N = 329) = 14.6, p < .005$. The respondents in general practice were more likely to perceive lack of reimbursement mechanism (cost) as a barrier than the hygienist in periodontal practice, $\chi^2(8, N = 331) = 20.3, p < .01$. Iowa hygienists who were unfamiliar with Healthy People 2000 also perceived cost as a barrier versus hygienists who were familiar with HP 2000, $\chi^2(8, N = 313) = 20.77, p < .008$. General practice hygienists were more likely to perceive staff resistance as a barrier versus hygienists who were in periodontal practice, $\chi^2(8, N = 329) = 15.1, p < .01$. Hygienists who were current smokers were more likely to perceive staff resistance as a barrier than hygienists who were former smokers or who had never smoked, $\chi^2(4, N = 329) = 11.2, p < .02$.

Associate degree hygienists were more likely to cite lack of their own preparedness as a barrier to offering cessation services to patients who use tobacco than hygienists with a bachelors degree or higher, $\chi^2(12, N = 323) = 21.1, p < .05$. There were no significant differences among categorical variables in the responses to

the question identifying lack of patient education materials as a barrier. Those hygienists who were in a solo dental practice were more likely to perceive lack of adequate referral sources as a barrier versus hygienists who were in group practice, $\chi^2(12, N = 311) = 38.9, p < .04$.

Table III

Perceived Barriers to Incorporating Tobacco Cessation Services in Dental Office Reported by Iowa Dental Hygienists, 1995

Barrier	Barrier Strength		
	Weak	Neutral	Strong
Patient Resistance	34.7%	30.8%	32.5%
Time required	43.8%	26.9%	26.7%
Cost	50.3%	20.4%	27.2%
Staff Resistance	57.1%	22.2%	18.1%
Preparedness	41.7%	26.6%	29.3%
Materials	48.5%	23.4%	26.3%
Referral sources	29.3%	20.4%	42.3%
Other	2.4%	1.5%	14.8 %

In response to the questions about patient education materials, 45.6% of the respondents indicated that patient education materials about tobacco were available in their office. The most commonly reported sources of patient education materials were the American Cancer Society and the American Dental Association. Forty-eight

percent of the respondents reported that they did not have patient education materials concerning tobacco use available in their offices.

The hygienists were also asked if they practiced in a smoke free building. The majority (76.6%) reported that they did work in a smoke free environment, while 14.8% did not.

The hygienists were asked to estimate the time they spent counseling patients about tobacco. About 24% of the respondents reported spending less than one minute per patient on tobacco related counseling, while 37.6% of the hygienists spent one to two minutes on counseling. Approximately 23% of the hygienists counseled their patients about tobacco between three and five minutes and 3.8% of the respondents spent more than 5 minutes on tobacco cessation counseling. The hygienists were also asked to identify all the people responsible for cessation services in their office. Almost 51% of the respondents reported that the dentist was the responsible person followed closely by the hygienists (47.6%).

Approximately 18% of the respondents reported that the dental assistant was responsible for cessation services, while 31.1% of the hygienists considered no one responsible for tobacco cessation services (See Table IV).

The respondents were asked to indicate whether each of the following items were a "regular part" or "sometimes a part" or "not a part" of their existing tobacco cessation services. The items were: (a) "I discuss the health hazards of tobacco use"; (b) "I discuss the benefits of stopping"; (c) "I discuss setting a specific quit date with patients interested in stopping"; (d) "I ask my employer to provide a prescription for nicotine polacrilex(gum) or a prescription for nicotine transdermal patches"; (e) "I refer my patients to a cessation clinic or program"; and (f) "Are the tobacco use cessation

services you personally provide for a patient documented in the patient's chart or record?"

Table IV

Person(s) Responsible for Tobacco Cessation Services in Iowa Dental Offices, 1995

Dentist	175(50.9%)
Dental assistant.....	62(18.3%)
Dental hygienist	161(47.6%)
Office manager.....	20(5.9%)
No one.....	105(31.1%)
Other.....	29(8.6%)

Note: Will equal more than 100% because the respondents were told to indicate ALL the people responsible for tobacco cessation services.

The majority of the respondents (55%) who had an existing tobacco cessation program "sometimes" discussed the hazards of tobacco use with their patients who smoked, while 37% of the hygienists "regularly" discussed tobacco hazards with their patients who smoked. Nearly 7% of the respondents indicated that discussion of tobacco hazards were "never" part of their existing tobacco cessation program for smoking patients.

Approximately 60% of the hygienists "regularly" discussed the hazards of tobacco with their patients who used smokeless tobacco, while 3% "never" discussed the hazards of tobacco with smokeless tobacco using patients as part of an existing cessation program. About 35% of the respondents indicated that they "sometimes" discussed the hazards of tobacco with their patients who used smokeless tobacco.

Nearly 39% of the hygienists "regularly" discussed the benefits of stopping with their patients who smoked, while 51.5% of the hygienists "regularly" discussed the benefits with stopping with smokeless tobacco using patients. Almost 11% of the hygienists "never" discussed the benefits of stopping with their smokeless tobacco using patients and 6.2% of the respondents "never" discussed the benefits of stopping with their patients who smoked.

The majority of the hygienists (68%) "never" set a specific quit date with their patients who smoked. The majority of the hygienists (65.7%) "never" set a specific quit date with their patients who used smokeless tobacco. Almost 29% of the respondents indicated that they "sometimes" set a quit date with their patients who used smokeless tobacco, while 27.5% of the hygienists "sometimes" set a quit date if the patient smoked.

Nearly 2% of the hygienists "regularly" asked their employer for a prescription for nicotine replacement if their patient either smoked or used smokeless tobacco. The majority of the respondents (74.3%) "never" asked their employer for a nicotine replacement prescription for patients who smoked, while 79.3% of the hygienists "never" asked their employer for a prescription for nicotine replacement for smokeless tobacco using patients. Almost 17% of the hygienists indicated that they "sometimes" asked their employer for a nicotine replacement therapy if their patient used smokeless tobacco, while 21.9% of the respondents asked their employer for a prescription for their patients who smoked.

The majority of the hygienists (59.8%) "never" referred their smoking patients to a cessation clinic, while 29.6% of the respondents indicated that they "sometimes" referred their smoking patients to a cessation clinic. Almost 9% of the hygienists "regularly" referred their smoking patients to a cessation clinic.

Table V

The Major Components of Cessation Services Provided by Iowa Hygienists, 1995

Service	Status*	Regularly	Sometimes	Never
Discuss Tobacco Hazards	(S)	125(37%)	186(55%)	23(6.8%)
	(ST)	204(60.4%)	119(35.2%)	10(3.0%)
Discuss benefits of stopping	(S)	131(38.8%)	182(53.8%)	21(6.2%)
	(ST)	174(51.5%)	123(36.4%)	37(10.9%)
Set quit date	(S)	10(3.0%)	93(27.5%)	230(68%)
	(ST)	14(4.1%)	97(28.7%)	22(65.7%)
Ask for Rx	(S)	51(15.5%)	74(21.9%)	251(74.3%)
	(ST)	5(1.5%)	57(16.9%)	268(79.3%)
Refer to cessation clinic	(S)	30(8.9%)	100(29.6%)	202(59.8%)
	(ST)	33(9.8%)	101(29.9%)	191(56.5%)
Services documented in chart	(S)	0	119(35.2%)	175(51.8%)
	(ST)	0	114(33.7%)	178(52.7%)

* S = Patients who Smoked and ST = Patients who used smokeless tobacco

The majority of the hygienists (56.5%) "never" referred their smokeless tobacco using patients to a cessation clinic, while 29.9% of the respondents indicated that they "sometimes" referred their smokeless tobacco using patients to a cessation clinic. Almost 10% of the hygienists "regularly" referred their smokeless tobacco using patients to a cessation clinic.

None of the respondents indicated that they "regularly" documented cessation services in the chart regardless of whether the patient smoked or used smokeless tobacco. However, 35.2% of the hygienists reported that they "sometimes" documented cessation services in the chart if the patient was a smoker; and, 33.7% of the respondents "sometimes" documented cessation services if the patient used smokeless tobacco. The majority of the hygienists (51.8%) "never" document cessation services in the chart if the patient smoked, while 52.7% of the respondents "never" documented cessation services in the chart of smokeless tobacco using patients (See Table V). The statistical results are in Appendix B.

Chapter V

DISCUSSION

This study indicates that there were a substantial number of Iowa dental hygienists who did not offer tobacco cessation services as a regular part of their dental hygiene practices. Only 4.9% of the respondents "routinely" asked if their patients used tobacco; while 25.7% of the hygienists "sometimes" asked their patients if they used tobacco. This could possibly be explained by the fact that the signs of tobacco use were so prominent during the dental examination that asking was unnecessary. It could also be construed that many hygienists associate tobacco cessation with negative behavior modification. Several respondents wrote notes similar to the following statements that were representative of the comments received:

- "This is a very touchy subject...like weight control."
- "My employer considers smoking a personal thing."
- "[It is] none of our business."
- "They know they should quit."
- "We feel that lecturing patients turns them off to any chance of change."
- "I know first hand that nagging or [a] hint of condescending attitudes, however well meaning, only infuriates the smoker."
- "Everybody already knows the risks of tobacco."
- "My patients don't like being hassled."

Approximately 35% of the hygienists were "routinely" advising their smoking patients to stop, while 57.1% of the respondents "routinely" advised their smokeless tobacco using patients to stop. Since most organized tobacco cessation programs traditionally deal with smoking rather than smokeless tobacco, it was expected that smokers would receive more cessation advice than smokeless tobacco users. Possible

explanations for the difference are: (a) The oral signs of smokeless tobacco are more obvious to the hygienist than the oral signs of smoking; (b) the lesions caused by smokeless tobacco are easier to show to patients than the lesions caused by smoking; and (c) the loose pieces of tobacco floating in the oral cavity are usually considered offensive by most hygienists.

The results of this study were compared with the results of earlier studies. Since there were no dental hygiene studies available, the results were compared with studies involving dentists. Iowa dental hygienists in general practice were less likely than dentists to offer advice about smoking to their patients who smoke. They were more likely to provide self-help materials, to take a smoking history, to record smoking status, and to provide some type of follow-up than dentists (Christen, McDonald, & Christen, 1991; Ferguson, et. al., 1984; Secker-Walker, et. al., 1988). This materials approach to tobacco control could be perceived by Iowa hygienists as a less threatening service.

The vast majority of the respondents worked in general dental practices. General practice hygienists were more likely to advise smokeless tobacco users to stop than to advise smokers to stop. This could be due to the fact that smokeless tobacco leaves obvious signs in the mouth that are easier to point out to the patient than dental conditions caused by smoking.

Only 13% of the respondents "routinely" discussed quit strategies with smokers. Nearly 20% of the hygienists indicated that they offered assistance to their smoking patients. Fourteen percent of the hygienists reported that they "sometimes" discussed quit strategies with patients, both smokers and smokeless tobacco users. This could be attributed to the Iowa hygienists' perceived negative image of giving this

type of advice. Many of the written comments by the respondents linked the discussion of tobacco cessation with patients with the words "lecture", "nag", and "preach".

A possible reason that the respondents "never" arranged for cessation services elsewhere or had any follow-up procedures for their tobacco using patients could be because follow-up procedures are time consuming or could possibly be perceived to be of an offensive nature, both to the hygienist and to the patients, as mentioned earlier.

Of those few hygienists who did offer assistance to or discussed quit strategies with their tobacco using patients, those hygienists who worked in a general practice were more likely to assist their smoking patients to quit than hygienists who worked in other specialty practices. This could possibly be due to such factors as: (a) there might be more time to discuss quit strategies while waiting for the dentist to release the patient, (b) smoking cessation training might have been included as part of scheduled staff meetings, and (c) many pharmaceutical companies have targeted general dental offices and have provided a multitude of audio-visual aids to the hygienists.

Time was perceived as a barrier to hygienists who were current or occasional smokers. This could be because any spare time they had might be used as a smoking break. In the present study several hygienists wrote notes to this effect: "Our office staff have enough to do..." which exemplifies that lack of time is perceived as a barrier. Another respondent wrote that tobacco cessation was the responsibility of "an MD or a hospital or clinically supervised" program because "I feel I'm not qualified to counsel patients." One hygienist wrote the following: "I feel like a hypocrite telling my patients to quit when they [the patients] all know that my boss is a smoker".

Cost might be considered a barrier if the hygienist feels that implementing a tobacco cessation program requires expensive materials and literature. Many Iowa hygienists may believe that their employer(s) and/or co-workers would not support

them in a tobacco cessation program for dental patients. Lack of support of employer(s) and/or co-workers was identified as a barrier. Current smokers also perceived staff resistance as a barrier.

Even though most (87%) of the Iowa hygienists believed it was suitable to offer tobacco cessation, the perceived barriers to offering tobacco cessation are comparable to findings in earlier dental studies. These barriers included the belief that if they (dentists) routinely gave cessation advice, their patients would feel harassed, embarrassed, or offended enough that they might leave the practice. Also included on the list of reasons why they did not routinely give cessation advice were lack of time, lack of training and lack of confidence that cessation programs were effective (Brink, et al., 1994; Ferguson, et al., 1984; Gerbert, et al., 1989; Klein, et al., 1988; Little & Stevens, 1991).

Dental hygienists who held an associate degree expressed more of a willingness to receive specific training in cessation methods than hygienists with a bachelors degree or higher. Bachelors degree or higher hygienists set specific quit dates with smokers more often than associate degree hygienists; and, they asked their employer for nicotine replacement therapy for both smokers and smokeless tobacco users more often than associate degree hygienists. This might be explained by the fact that more hygienists with a bachelors degree or higher were more likely to have received training, and were more confident and assertive than the associate degree hygienists.

Hygienists in a group practice were more likely to work in a smoke free building and express a willingness to receive specific training than hygienists who were in a solo practice. The smoking preference of the majority of the practitioners could designate a building as "smoke free" even if one of the dentists was a smoker; whereas, in a solo practice the dentist sets the policy.

If there was a cessation program already in place in their dental office, the hygienists in group practices were more likely to discuss health hazards of tobacco to patients who smoked than hygienists in solo practice. This could possibly be due to time management problems in some group practices. The hygienists might have to wait longer to have the dentist dismiss the patient and therefore they may have used that time to counsel their tobacco using patients.

The respondents who had received cessation training were more active in providing cessation services to their patients who used tobacco than respondents who had not received cessation training which is to be expected.

Hygienists in solo practices provided more cessation services than hygienists in group practices possibly because of the different methods of office management necessary to coordinate multiple schedules. Solo practice hygienists were also more likely to ask their employer for a prescription for nicotine replacement for their patients who use tobacco. This could be because the hygienists in a solo practice might have had a closer working relationship with their employer than the hygienists who divided their time between several dentists in a group practice. It appears that offering a prescription for nicotine gum or patches prompted the solo practice hygienist to then set a specific quit date. This is most likely due to the fact that smoking while using a nicotine patch or gum can have serious adverse effects.

General practice hygienists were more likely to have patient education materials available for patients who use tobacco than hygienists in other specialties. This could be because providing literature to patients is easier and less threatening to the patient than a face-to-face discussion. General practice hygienists were also more willing to receive specific training in cessation methods and techniques than hygienists who were in other specialties. They were also more likely to document services offered to

smokeless tobacco using patients and techniques. This might indicate that the respondents in general practice were willing to offer cessation services but did not feel prepared enough to take the direct approach.

Since periodontal disease and tobacco use are closely linked, it was not surprising that perio hygienists were more likely to discuss health hazards of using tobacco with smokeless tobacco users than hygienists in other specialties. As a practitioner in a specialty practice they would also be predisposed to referring their patients for any treatment other than gum treatments. They were more likely to refer their smokeless tobacco using patients to a cessation clinic than hygienists in other specialties. This might be due to the fact that smokeless tobacco leaves very visible marks on the gum tissue that are easily seen and subsequently shown to the patient as previously mentioned.

Those hygienists who worked in a periodontal practice were also more likely to express a need for continuing education, were more likely to work in a smoke free building, and were more likely to ask for a prescription for patients who smoke than hygienists in other specialties. This could be due to the fact that tobacco induced periodontal disease would be considered important to these hygiene specialists. They might be more aggressive in their tobacco control activities because they are so closely linked to the signs and symptoms of tobacco use.

The supposition that the higher the education level of the hygienists the more active they would be in offering tobacco cessation services to their tobacco using patients was confirmed when the data were analyzed. Hygienists with a bachelors degree or higher were more likely to provide more direct and personal services to their patients than the hygienists with an associate degree. Education appears to have a direct connection with increased tobacco control activity. The assumption drawn was

that "the more they knew, the more they did". There was a link between education and cessation training received upon cross tabulation analysis

The entire dental staff should be actively involved in the cessation procedure. This is illustrated in the following comment from one of the few Iowa hygienists who did provide tobacco cessation services:

"Our office takes the same approach to tobacco cessation as plaque control. It is our responsibility to educate our patients. An educated patient can make good decisions on what they are willing to do and not do."

Many hygienists wrote recommendations that their employers should be actively involved in the continuing education classes. The following comment from one of the respondents summarizes the majority of the notes written on the survey:

"I seem to be telling people to quit and why...but I don't know how."

Chapter VI

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of this study was to determine the existing tobacco control activities of Iowa dental hygienists in relation to the tobacco use by dental patients. More specifically, the following research questions were asked: (a) what is the extent of tobacco control activities employed by dental hygienists in Iowa; (b) how do they compare with Objective 3.16 of Healthy People 2000; (c) do tobacco control activities differ according to the categorical variables among Iowa dental hygienists; and (d) if tobacco cessation services are not offered to patients who use tobacco, what are the barriers perceived by Iowa dental hygienists.

Three-hundred-forty dental hygienists who held an Iowa dental hygiene license, were actively engaged in clinical patient care, and had an address in the Midwest completed and returned mailed questionnaires. Response rates in mail surveys of dental hygienists range from 33% to 92% (Nielsen-Thompson, N. and Boyer, E.M., 1994). The return rate of this survey was 38.8%.

Results of this study indicated that tobacco control efforts employed by Iowa dental hygienists were minimal. Neither the 75% goal nor the 35% baseline for Objective 3.16 of Healthy People 2000 was reached. This study also indicated that a substantial number of Iowa dental hygienists did not "routinely" offer tobacco cessation services as part of their dental practices. There were significant differences between tobacco control activities and the categorical variables of (a) practice specialty, (b) education, (c) familiarity with Healthy People 2000, (d) cessation training received, and (e) current smoking status. Iowa dental hygienists perceived that (a) the

time required, (b) the lack of reimbursement mechanism (cost), (c) staff resistance; (d) lack of preparedness; and (e) lack of knowledge of adequate referral sources the following were barriers to incorporating a cessation program.

Conclusions

Within the limitations of this study, it was concluded that:

1. Most of the dental hygienists in Iowa did not "routinely" offer tobacco cessation education as a regular part of their dental hygiene practices.

2. Most Iowa hygienists did not "routinely" inquire about tobacco use by their patients to determine if they smoke or use smokeless tobacco.

3. The majority of the respondents did not advise their smoking patients to stop; however, those hygienists who were in general practice and/or had received cessation training were more likely to advise their smokeless tobacco using patients to stop versus hygienists who were in periodontal practice or who had not been trained.

4. Iowa hygienists who had received cessation training and/or were in general practice were more likely to discuss quit strategies both their smoking patients and smokeless tobacco using patients than hygienists who had not received cessation training or were in periodontal practice.

5. The majority of hygienists responding to this survey had no follow-up (e.g., letter, telephone call, visit) for patients who are trying to stop using tobacco.

6. There was a considerable difference between tobacco control activities of Iowa dental hygienists and the goal of Healthy People 2000 Objective 3.16. Even the baseline that was established by the Public Health Service in 1986 is higher than the self-reported counseling efforts of Iowa hygienists in 1995.

7. There were significant differences between tobacco control activities and the categorical variables of (a) practice specialty, (b) education, (c) familiarity with Healthy People 2000, (d) cessation training received, and (e) current smoking status.

8. Iowa dental hygienists perceived that (a) the time required, (b) the lack of reimbursement mechanism (cost), (c) staff resistance; (d) lack of preparedness; and (e) lack of knowledge of adequate referral sources were the major barriers to incorporating a cessation program.

Recommendations

More analysis could be done to determine the differences between tobacco control activities of Iowa dental hygienists in regards to where they practice (e.g. urban versus rural). Other studies could be done to determine the effect of personal or family experience(s) with tobacco related diseases and/or death(s) on tobacco control activities. The tobacco use status of the employer might be studied more extensively as a variable in a future study.

There is a need for more information on how to prepare an effective continuing education course that addresses the needs of the dental team. Considering the significance of being familiar with Healthy People 2000 and having received tobacco cessation training, it is recommended that a tobacco cessation course be made available to all dental hygienists in Iowa. According to the data gathered in this study, a tobacco cessation course should address the following:

1. Establish the reasons why it is important to include tobacco intervention services in the dental practice.

2. Teach ways to organize the dental practice to ensure that simple, brief tobacco prevention and cessation services are used routinely, efficiently, and systematically.

3. Teach methods and techniques to help dental patients be tobacco-free by asking questions about tobacco use, advising them of the advantages of being tobacco-free, assisting them in prevention and cessation activities and arranging appropriate follow-ups.

4. Teach methods of following through, such as how to: (a) monitor patients' tobacco use status; (b) help users become nonusers, (c) promote a tobacco-free lifestyle by personal example, and (d) work with the oral health care professionals and community to promote a tobacco-free society.

In the event that a statewide program is not established, there are numerous private and public groups that will offer classes with informative and diverse cessation methods and strategies from which Iowa dental hygienists can choose.

Health and Human Services Secretary Dr. Louis W. Sullivan delivered an inspirational speech to the First International Conference on Smokeless Tobacco, Columbus, Ohio in April of 1991, that concurs with the recommendations of this study:

The disgraceful trade-off in America between [tobacco companies] profits and good health must stop! But it will stop only when our citizens rise up and say, "Enough-no more!" I urge individuals and organizations throughout the Nation and the world to join me in the expression of anger and resolve. Let this be the beginning of an all-out effort. Make no mistake: the continuing battle against tobacco use will be long and difficult. But it is a battle that can be won, must be won, and will be won. Together, we will win it!

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APPENDIX A

University of Nebraska at Omaha

Omaha, Nebraska 68182-0315

October 25, 1994

Dear Dental Hygienist:

You are invited to participate in this thesis research through the University of Nebraska at Omaha. The following information is provided in order to help you to make an informed decision about whether or not to participate. If you have any questions please do not hesitate to ask.

You are eligible to participate because you are a dental hygienist licensed in Iowa. The purpose of this study is to determine the extent of tobacco-use cessation practices of dental hygienist.

The information gained from this study may help to determine the need for continuing education courses in tobacco-use cessation methods.

Participation in this study will require approximately 20 minutes of your time. There are no risks or discomforts associated with this research.

Any information obtained during this study which could identify you will be kept strictly confidential. The information obtained in this study may be published in scientific journals or presented at scientific meetings but your identity will be kept strictly confidential.

For the purpose of this survey the following terms are defined as:

SMOKERS: Individuals who use cigarettes, pipes, or cigars in the past 12 months.

SMOKELESS TOBACCO (ST) USERS; Individuals who use any form of snuff (moist, dry, or that packaged in sachet type tea-bag like pouches) or any form of chewing tobacco during the past 12 months.

TOBACCO-USE CESSATION SERVICES: Assisting people to do one or more of the following:

- (1) contemplate stopping,
- (2) decide to stop,
- (3) actually stop,
- (4) maintain their tobacco-free behaviors after having stopped, and/or
- (5) attempt to stop again if unsuccessful at previous attempts.

Your support of this survey is encouraged by Linda Rowe, R.D.H., President of the Iowa Dental Hygienists' Association.

This study is partially funded by the Iowa Department of public Health, Dental Health Division Bureau.

William Maurer, D.D.S.

YOU ARE VOLUNTARILY MAKING A DECISION WHETHER OR NOT TO PARTICIPATE IN THIS RESEARCH smokeless STUDY. RETURNING THIS SURVEY CERTIFIES THAT YOU HAVE DECIDED TO PARTICIPATE HAVING READ AND UNDERSTOOD THE INFORMATION PRESENTED.

PRINCIPAL INVESTIGATOR : Ann Keller Chambers, B.S., R.D.H.

312 Lafayette Avenue

Council Bluffs, Iowa 51503

Home: (712) 328-1365

UNIVERSITY OF NEBRASKA AT OMAHA CONTACT

David E. Corbin, Ph.D., Professor of Health Education

Office: (402) 554-2620

Are you actively engaged in providing clinical patient care and hold a current license to practice dental hygiene in the state of Iowa?

(a)___YES

Please complete the attached questionnaire and return it as soon as possible.

(b)___NO

Please return the attached questionnaire without answering the remaining questions.

Thank You,

Ann Keller Chambers, B.S., R.D.H.

Tobacco Cessation Practices Survey

INSTRUCTIONS: Please answer all questions by supplying the requested information or by placing an "X" on the appropriate line. Thank you.

1. Your age:....._____

2. Your education: (The highest level attained)

(a)___ Some college/vocational education

(b)___ 4 year college graduate

(c)___ Graduate school

3. The year you graduated from dental hygiene school....._____

Circle Degree: AA, AS, AAS, AAA Cert BS/DHGDH Other

4. Do you work in a solo practice (one dentist) or group practice (more than one dentist) a majority of the time?

(a)___ Solo Practice

(b)___ Group Practice

5. Which one of the following best describes the type of dental practice where you work a majority of the time?

(Please choose only one.)

(a)___ General Practice

(e)___ Periodontics

(b)___ Oral Surgery/Pathology

(f)___ Public Health

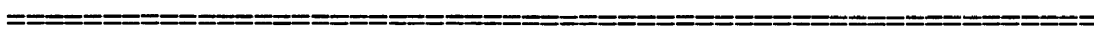
(c)___ Endodontics/Prosthodontics

(g)___ Pedodontics

(d)___ Other _____

(h)___ Orthodontics

6. In which county and state is the dental office located where you work a majority of the time? _____



Since some dental hygienists work in more than one office, PLEASE answer the remaining questions in terms of what you do the majority of the time. Please provide an answer for both parts- Smokers and Smokeless Tobacco Users (abbreviated "ST") when indicated.

7. Do you personally inquire about tobacco use by your patients to determine if they smoke or use ST?

- | | |
|------------------|---------------------|
| (a)___ Routinely | (d)___ Seldom |
| (b)___ Mostly | (e)___ Never |
| (c)___ Sometimes | (f)___ I don't know |

8. Is a patient's tobacco use status documented in the patient's chart?

- | | |
|------------------|---------------------|
| (a)___ Routinely | (d)___ Seldom |
| (b)___ Mostly | (e)___ Never |
| (c)___ Sometimes | (f)___ I don't know |

9. How often do you advise your tobacco-using patients to stop?

- | Smokers | Smokeless Tobacco Users |
|------------------|-------------------------|
| (a)___ Routinely | (f)___ Routinely |
| (b)___ Mostly | (g)___ Mostly |
| (c)___ Sometimes | (h)___ Sometimes |
| (d)___ Seldom | (i)___ Seldom |
| (e)___ Never | (j)___ Never |

10. Do you personally discuss with patients strategies or techniques to help them stop using tobacco products?

Smokers

- (a)___ Routinely
- (b)___ Mostly
- (c)___ Sometimes
- (d)___ Seldom
- (e)___ Never

Smokeless Tobacco Users

- (f)___ Routinely
- (g)___ Mostly
- (h)___ Sometimes
- (i)___ Seldom
- (j)___ Never

11. Does your office provide some type of follow-up? (e.g., letter, telephone call, visit) for patients who are trying to stop using tobacco? (Mark all that apply)

Smokers

- (a)___ Letter/Postcard

Smokeless Tobacco Users

- (f)___

Letter/Postcard

- (b)___ Telephone Call
- (c)___ Office visit
- (d)___ No follow-up
- (e)___ Other_____

- (g)___ Telephone Call
- (h)___ Office visit
- (i)___ No follow-up
- (j)___ Other_____

12. Are patient education materials on tobacco use prevention and/or cessation available in your office?

- (a)___ YES

- (b)___ NO

Please supply a sample or source name: _____

Please indicate whether each of the following items is a regular part/sometimes a part/not a part of your tobacco cessation services.(Each question has two parts.

Please place an "X" in the appropriate box for smokers & ST)

13. I discuss the health hazards of tobacco use.

	regularly	sometimes	never
SMOKER.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ST USER.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. I discuss the benefits of stopping.

	regularly	sometimes	never
SMOKER.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ST USER.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. I discuss setting a specific quit date with patients interested in stopping.

	regularly	sometimes	never
SMOKER.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ST USER.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16. I ask my employer to provide a prescription for nicotine polacrilex (gum) or a prescription for nicotine transdermal patches.

	regularly	sometimes	never
SMOKER.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ST USER.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17. I refer my patients to a cessation clinic or program

	regularly	sometimes	never
SMOKER.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ST USER.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18. Are the tobacco use cessation services you personally provide for a patient documented in the patient's chart or record?

Smokers

Smokeless Tobacco Users

(a)___ YES (How?_____)

(a)___ YES (How?_____)

(b)___ NO

b)___ NO

19. How much time, on the average, do you spend counseling a patient regarding tobacco use cessation.

(a)___ Less than 1 minute

(d)___ More than 5 minutes

(b)___ 1-2 minutes

(e)___ None

(c)___ 3-5 minutes

(f)___ I don't know

20. Who is responsible for tobacco cessation services in your office? (Choose all that apply)

(a)___ Dentist

(d)___ Office manager

(b)___ Dental assistant

(e)___ No one

(c)___ Dental hygienist

(f)___ Other_____

21. Is your office in a smoke-free building?

(a)___ YES

(b)___ NO

To what extent is each of the following reasons a barrier to incorporating tobacco use cessation services into your dental office? (Please circle the number you feel best describes your practice.)

22. Patient resistance/complaints

Not a barrier 1 2 3 4 5 Strong barrier

23. Amount of time required

Not a barrier 1 2 3 4 5 Strong barrier

24. Lack of reimbursement mechanisms (cost)

Not a barrier 1 2 3 4 5 Strong barrier

25. Resistance by staff

Not a barrier 1 2 3 4 5 Strong barrier

26. Concerns about my preparedness

Not a barrier 1 2 3 4 5 Strong barrier

27. Availability of patient education materials

Not a barrier 1 2 3 4 5 Strong barrier

28. Availability of adequate referral sources

Not a barrier 1 2 3 4 5 Strong barrier

29. Other (specify) _____

Not a barrier 1 2 3 4 5 Strong barrier

30. How familiar are you with Healthy People 2000?

Very familiar 1 2 3 4 5 Very unfamiliar

31. From what source(s) have you received tobacco-use cessation training? (Mark all that apply)

- (a)___ Cont. Education
- (b)___ School Curriculum
- (c)___ None
- (d)___ Organized study club
- (e)___ Other: _____
- (f)___ Pharmaceutical program

32. I believe there is a need for continuing education programs regarding tobacco-use cessation and strategies.

- (a)___ YES
- (b)___ NO

33. I would be willing to receive specific training in ways to help my patients stop using tobacco?

(a)___ YES

(b)___ NO

34. How many miles would you travel for a continuing education class on tobacco-use cessation methods?

(a)___ 0-30 miles one way

(c)___ More than 60 miles
one way

(b)___ 31-60 miles one way

(d)___ None

35. I believe that _____ percent of my patients use some form of tobacco?

36. I consider it appropriate to provide information about adverse effects of using tobacco during dental appointments.

(a)___ YES

(b)___ NO

37. Which of the following currently describes you most closely?

(a)___ Current smoker

How much? _____

(b)___ Occasional smoker

How much? _____

(c)___ Former smoker

Quit when? _____

(d)___ Experimented with
smoking

(e)___ Never smoked

(a)___ Current ST User

How much? _____

(b)___ Occasional ST User

How much? _____

(c)___ Former ST User

Quit when? _____

(d)___ Experimented with
ST

(e)___ Never used ST

Thank you very much for your cooperation please return the completed survey in the stamped-self-addressed envelope (attached) to:

Ann Chambers R.D.H.

312 Lafayette Ave.

Council Bluffs, Iowa 51503

THE TOBACCO CONTROL ACTIVITY SURVEY INSTRUMENT THIS SURVEY WAS ADAPTED FROM WAS DEVELOPED BY THE STAFF OF THE MINNESOTA DEPARTMENT OF HEALTH, DENTAL HEALTH PROGRAM REPRESENTING THE ASSOCIATION OF STATE AND TERRITORIAL DENTAL DIRECTORS ON THE NATIONAL DENTAL TOBACCO FREE STEERING COMMITTEE OF THE NATIONAL CANCER INSTITUTE. RICHARD J. HASTREITTER DDS MPH NOVEMBER 1993.

Please write comments or suggestions here:

— — —

APPENDIX B

Summary of Statistical Analysis of the Tobacco Control Activity Survey of Iowa
Dental Hygienists, 1995

Activity	Variable	Statistic	Level of Significance
Ask/Inquire?	Age	t (328, N = 330) = -2.43	.13
	Education	χ^2 (8, N = 336) = 7.96	.44
	Practice Type	χ^2 (8, N = 337) = 6.07	.64
	Prac. Specialty	χ^2 (12, N = 336) = 15.57	.21
	Smoking Status	χ^2 (4, N = 337) = 6.96	.14
	HP 2000	χ^2 (8, N = 318) = 13.46	.1
	Training	χ^2 (8, N = 337) = 12.62	.13
Advise? Smoker	Age	t (323, N = 325) = -1.67	.41
	Education	χ^2 (8, N = 329) = 8.05	.43
	Practice Type	χ^2 (12, N = 330) = 11.97	.45
	Prac. Specialty	χ^2 (8, N = 330) = 5.57	.7
	Smoking Status	χ^2 (4, N = 330) = 2.8	.59
	HP 2000	χ^2 (8, N = 315) = 8.3	.4
	Training	χ^2 (8, N = 330) = 14.13	.08

NOTE: * significant at .05; ** significant at .01; *** significant at .001; **** significant at .0001

Table continues

Table continues Activity		Variable	Statistic	Level of Significance
		Age	t (324, N = 326) = -1.07	.09
		Education	χ^2 (12, N = 313) = 5.75	.93
		Practice Type	χ^2 (18, N = 313) = 12.76	.88
Advise?	ST User	Prac. Specialty	χ^2 (12, N = 331) = 67.13	.00000****
		Smoking Status	χ^2 (6, N = 314) = 2.72	.84
		HP 2000	χ^2 (12, N = 297) = 6.67	.88
		Training	χ^2 (8, N = 331) = 62	.00000****
<hr/>				
		Age	t (324, N = 326) = -1.98	.09
		Education	χ^2 (12, N = 324) = 24.3	.02*
		Practice Type	χ^2 (12, N = 331) = 19.85	.07
Assist/Discuss?	Smoker	Prac. Specialty	χ^2 (6, N = 333) = 33.86	.02*
		Smoking Status	χ^2 (4, N = 331) = 4.30	.37
		HP 2000	χ^2 (8, N = 314) = 19.99	.01**
		Training	χ^2 (8, N = 331) = 39.66	.00000****
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		Age	t (295, N = 297) = -1.64	.39
		Education	χ^2 (10, N = 299) = 14.39	.5
		Practice Type	χ^2 (10, N = 300) = 9.26	.51
Assist/Discuss?	ST User	Prac. Specialty	χ^2 (4, N = 334) = 59.3	.0001****
		Smoking Status	χ^2 (5, N = 300) = 3.11	.68
		HP 2000	χ^2 (10, N = 294) = 9.01	.53
		Training	χ^2 (10, N = 300) = 45.6	.00000****

NOTE: * significant at .05; ** significant at .01; *** significant at .001; **** significant at .0001

Table continues Activity	Variable	Statistic	Level of Significance
	Age	t (273, N = 275) = -1.64	.39
	Education	χ^2 (2, N = 43) = 1.65	.2
	Practice Type	χ^2 (1, N = 21) = 1	.68
Arrange/Follow-up Smoker	Prac. Specialty	χ^2 (3, N = 43) = 5.58	.13
	Smoking Status	χ^2 (1, N = 42) = 1	.48
	HP 2000	χ^2 (1, N = 32) = 1.72	.2
	Training	χ^2 (2, N = 43) = 2.04	.36
	Age	t (38, N = 40) = -2.43	.60
	Education	χ^2 (2, N = 43) = 1.2	.84
	Practice Type	χ^2 (3, N = 42) = 1	.68
Arrange/Follow-up? ST User	Prac. Specialty	χ^2 (2, N = 21) = 1.4	.5
	Smoking Status	χ^2 (1, N = 43) = 1	.43
	HP 2000	χ^2 (1, N = 32) = 1.72	.19
	Training	χ^2 (2, N = 43) = 2.04	.36

NOTE: * significant at .05; ** significant at .01; *** significant at .001; **** significant at .0001

Table continues

Table continues Barrier	Variable	Statistic	Level of Significance
Patient Resistance	Age	t (322, N = 324) = -1.67	.82
	Education	χ^2 (8, N = 330) = 8.45	.43
	Practice Type	χ^2 (12, N = 330) = 12.09	.44
	Prac. Specialty	χ^2 (8, N = 331) = 10.59	.23
	Smoking Status	χ^2 (4, N = 331) = 4.59	.33
	HP 2000	χ^2 (8, N = 312) = 7.7	.46
	Training	χ^2 (8, N = 331) = 9.8	.28
Time required	Age	t (320, N = 322) = -1.07	.189
	Education	χ^2 (12, N = 332) = 9.68	.69
	Practice Type	χ^2 (12, N = 328) = 15.12	.24
	Prac. Specialty	χ^2 (8, N = 329) = 7.68	.47
	Smoking Status	χ^2 (4, N = 329) = 14.62	.005**
	HP 2000	χ^2 (8, N = 311) = 7.03	.53
	Training	χ^2 (8, N = 329) = 5.16	.74
Cost	Age	t (328, N = 330) = 1.64	.79
	Education	χ^2 (8, N = 330) = 6.88	.55
	Practice Type	χ^2 (12, N = 330) = 10.54	.57
	Prac. Specialty	χ^2 (8, N = 331) = 20.27	.009***
	Smoking Status	χ^2 (4, N = 331) = .1	.98
	HP 2000	χ^2 (8, N = 313) = 20.77	.007***
	Training	χ^2 (8, N = 331) = 5.1	.75

NOTE: * significant at .05; ** significant at .01; *** significant at .001; **** significant at .0001

Table continues Barrier	Variable	Statistic	Level of Significance
	Age	t (326, N = 328) = 1	.97
	Education	χ^2 (12, N = 324) = 10.64	.56
	Practice Type	χ^2 (12, N = 328) = 2.64	.96
Staff Resistance	Prac. Specialty	χ^2 (8, N = 329) = 19.81	.01**
	Smoking Status	χ^2 (4, N = 329) = 11.22	.02**
	HP 2000	χ^2 (8, N = 312) = 3.27	.92
	Training	χ^2 (8, N = 329) = 5.34	.72
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	Age	t (327, N = 329) = 1.28	.42
	Education	χ^2 (12, N = 323) = 21.08	.05*
	Practice Type	χ^2 (12, N = 329) = 13.34	.34
Lack of Preparedness	Prac. Specialty	χ^2 (8, N = 330) = 13.7	.09
	Smoking Status	χ^2 (4, N = 330) = 2.62	.62
	HP 2000	χ^2 (8, N = 312) = 12.94	.11
	Training	χ^2 (8, N = 330) = 12.96	.11
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	Age	t (329, N = 331) = .39	.88
	Education	χ^2 (12, N = 325) = 12.1	.36
	Practice Type	χ^2 (12, N = 331) = 12.84	.38
Lack of Education Materials	Prac. Specialty	χ^2 (8, N = 332) = 12.92	.11
	Smoking Status	χ^2 (4, 332) = 7.46	.11
	HP 2000	χ^2 (8, N = 314) = 7.46	.84
	Training	χ^2 (8, N = 332) = 10.13	.26

NOTE: * significant at .05; ** significant at .01; *** significant at .001; **** significant at .0001

Table continues Barrier	Variable	Statistic	Significant
	Age	t (308, N = 310) = .83	.56
	Education	χ^2 (8, N = 310) = 8.5	.39
	Practice Type	χ^2 (12, N = 311) = 22.02	.04*
Lack of Referral Sources	Prac. Specialty	χ^2 (8, N = 311) = 13.17	.11
	Smoking Status	χ^2 (4, N = 311) = 1	.94
	HP 2000	χ^2 (8, N = 304) = 7.41	.5
	Training	χ^2 (8, N = 311) = 7.6	.47

NOTE: * significant at .05; ** significant at .01; *** significant at .001; **** significant at .0001
