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Development and Evaluation of a Tobacco Cessation Motivational Program for Adolescents Based on Physical Attractiveness and Oral Health

Nadine Semer, James Ellison, Chuck Mansell, Lillian Hoika, William MacDougall, Stuart A Gansky and Margaret M Walsh

Nadine Semer, MD, is with the Southern California Permanente Medical Group in Venice; James Ellison, DDS, MPH, is an assistant adjunct professor at the University of California School of Dentistry in San Francisco; Chuck Mansell and Lillian Hoika are with the Lake County Office of Education in Lakeport; William MacDougall, EdD, is principal at Carle High School in Lower Lake; Stuart A. Gansky, DrPH, is an associate professor at the University of California School of Dentistry in San Francisco; and Margaret M. Walsh, RDH, MS, EdD, is a professor at the University of California School of Dentistry in San Francisco; all are in California.

Purpose. Little is known about how to motivate youth to participate in smoking cessation programs. This paper reports an investigation of the feasibility and acceptability of an intervention that used vanity and oral health issues associated with tobacco use to motivate adolescent tobacco users to enter a school-based tobacco cessation program.

Methods and Materials. Sixty-four continuation high school students aged 14 to 19 (31% female) and living in rural California participated in a youth-oriented, vanity and oral health-focused intervention designed to motivate tobacco users to join a six-week tobacco cessation group.

Results. Following the intervention, 21 of 37 (57%) regular smokers signed up for the cessation program. Of these smokers, seven (33%) did not indicate on the baseline questionnaire any desire to quit smoking. Of the 21 smokers who signed up to participate in the cessation program, 16 (76%) actually participated (10 males and six females), eight (50%) completed all treatment sessions, and four (25%) reported that they quit smoking at the end of the program.

Conclusions. Overall program evaluations were very favorable. Findings were interpreted to provide support for the feasibility and acceptability of using physical appearance and oral health-oriented programs to motivate adolescent tobacco users to enter school-based cessation programs. Further study is needed to determine the effectiveness of such programs.

Keywords: Adolescence, smoking cessation, recruitment strategy, adolescent health, addiction

Introduction

Adolescence is the primary time during which cigarette smoking is initiated and during which the transition from experimentation to some level of dependence occurs. It has been estimated that 65% to 70% of adolescents will try smoking before they finish high school, more than a third will become daily smokers, and almost one quarter will become nicotine dependent. It is well documented that the vast majority of adult smokers began smoking by the age of 18. Given the association between smoking in adolescence and resulting health problems in adulthood, initiation and maintenance of

smoking during adolescence represent a genuine public health concern. The need for effective interventions to prevent the transition from youthful smoking to adult smoking was clearly indicated by the 1994 surgeon general's report.³ Sussman and colleagues point out that, among reported cessation and prevention programs, adolescent cessation rates are about twice the rate of naturally occurring quit rates (3% to 8%). More advanced scientific work, however, needs to be undertaken in the area of adolescent tobacco use cessation research because most reported cessation studies used single group designs with no control group.^{1,4}

Among the challenges of tobacco research is that of motivating adolescent tobacco users to quit.⁵ Feedback from focus groups of high school smokers indicates that most are not thinking about quitting, interested in quitting, or planning to quit. These findings suggest that cessation programs need to devote substantial effort to attract adolescent smokers.^{6,7} Appealing and meaningful motivational strategies for adolescents are needed.

Common health concerns reported by adolescents include those related to appearance (height, weight, acne) and dental problems.^{8,9,10,11} Across studies, adolescents consistently rank dental concerns and oral health as being of great importance.^{9,10} ¹² In a seven-year cohort study of 2,406 sixth graders in two communities who were followed annually through the 12th grade, physical appearance was found to be the most valued characteristic and the only one that grew in importance over time.¹³ In addition, four focus groups of high school smokers (aged 14 to 18), with six to 11 participants each, identified aesthetic problems such as bad breath, foul-smelling clothes and hair, yellow fingers, and "it looks gross," as major disadvantages of their smoking.¹⁴ Moreover, in a spit (smokeless) tobacco cessation study of 1,085 male high school baseball athletes, 92% of the subjects in the intervention group rated the showing of slides of graphic facial disfigurement associated with the surgical treatment of oral cancer as a very important component of the intervention.¹⁵ These research findings suggest that addressing tobacco cessation in the context of physical appearance and oral health may motivate adolescents to make an attempt to quit their tobacco use. To gather data on that hypothesis, we developed an intervention to motivate adolescent tobacco users to enter a school-based cessation counseling program and evaluated it for feasibility and acceptability in a sample of high school students. The purpose of this paper is to report the intervention development process and the results of that pilot study.

Methods and Materials

Researchers at the University of California in San Francisco (UCSF) contacted the tobacco use prevention coordinator at the Office of Education in Lake County, California, to inquire about the use of tobacco among high school students in Lake County. The prevention coordinator reported that a 2000 Lake County Office of Education survey of a representative sample of middle school and high school students (N = 924) revealed that 60% of the respondents had tried smoking and 36% were self-reported regular smokers. In addition, 31% of respondents reported having tried spit tobacco (oral snuff and chewing tobacco), and 14% of males reported dipping or chewing within the last 30 days.

To address the need for effective tobacco cessation intervention strategies for adolescents in Lake County, a collaborative research partnership was formed among researchers at UCSF and staff at the Lake County Office of Education, the Lake County Health Services Department of Public Health, and Carle High School in Lake County. In 2001, that partnership received a Community Academic Research Award from the Tobacco-Related Disease Research Program of the State of California. The purpose of that award was to develop and pilot test for feasibility and acceptability an intervention that emphasized the effect of tobacco use on physical attractiveness and oral health. The goal of the intervention was to motivate adolescent tobacco users to enroll in an existing state-funded, school-based tobacco cessation program and to stop their tobacco use. In addition, the intervention would apply a public health perspective to promote behavioral change by bringing the program to all adolescent tobacco users in their school environment, using student peers and the county public health school nurse in its delivery. The school nurse was chosen as an interventionist because, in rural areas of California, school nurses provide all school-based health screenings and coordinate student health care. Once developed, the intervention was to be evaluated among a sample of adolescents attending high school in rural Lake County. Development of the intervention involved the following:

Student Feedback

We contacted three high schools in Lake County, California, and gained permission from the principals to recruit students to complete a questionnaire about tobacco use and to participate in focus groups. The purpose of the questionnaire was to gain insight about adolescent tobacco use by collecting pilot data on reasons for use, experience with withdrawal symptoms, reasons for relapse, and perceptions about factors that would motivate smokers to attempt to quit. The purpose of the focus groups was to gain feedback regarding the feasibility and acceptability of a proposed tobacco cessation recruitment intervention that consisted of the following: 1) digital photography and "special effects" software to simulate facial wrinkling or disfigurement due to smoking and oral cancer, respectively; 2) an analysis of facial skin and fingernail care, advice that smoking causes facial wrinkling and stains fingers and fingernails, and referral to cessation counseling; and 3) an oral cancer screening by a school nurse trained by a dental hygienist to point out tobacco-related dental staining and soft tissue changes in students' mouths, relate tobacco use to halitosis and oral cancer, advise tobacco users to quit, and refer them to a school-based tobacco cessation counseling program.

After receiving positive parental consent, we conducted 20 gender-specific and tobacco use status-specific focus groups with 139 high school adolescents, aged 16 to 19 (69 males and 70 females). The sample included 71 current tobacco users (53 smokers and 18 spit tobacco users), 37 former tobacco users (34 former smokers and three former spit tobacco users), and 30 who had never used tobacco. At the beginning of the focus groups, all students completed the questionnaire on tobacco use.

Questionnaire Assessment

To inform intervention development, the questionnaire assessed tobacco use status, reasons for smoking, sensations experienced when unable to smoke, reasons for relapse after quitting, and factors that might motivate a quit attempt. Current tobacco use was defined as use within the last 30 days. Reasons for smoking were determined by providing a list of possible reasons and asking subjects to indicate how important each was in explaining why they smoked (four possible response options, ranging from "not at all" to "very much so"). Sensations experienced when unable to smoke were assessed by providing a list of possible sensations and asking if each was experienced when unable to smoke due to either restrictions on smoking, or because they were trying to quit (response options were "yes" or "no"). Reasons for relapse were assessed by providing a list of reasons and asking whether or not each was a reason why they started to use tobacco again after making an attempt to quit (response options were "yes" or "no"). Perceived factors that would motivate quit attempts were assessed by providing a list of situations and asking each subject to indicate if any would motivate a quit attempt in the next three weeks (response options were "yes" or "no").

Although all students completed the questionnaire, findings are reported only for smokers because they made up the largest group of tobacco users and those most relevant to intervention development. "Tension reduction" and "cravings" were the main reasons reported for smoking (Table I), and "boredom," "personal problems," "desire for tobacco," and "withdrawal symptoms" were the most common reasons reported for relapse (Table II). Table III shows reported sensations experienced when smokers were unable to smoke. All of these findings suggested that many high school adolescents who smoke are nicotine-dependent, and that discussion of the nature of nicotine addiction and ways to cope with nicotine withdrawal needed to be included in our intervention.

**Table I. Mean scores indicating extent of importance of reasons for smoking
(N = 53 smokers)**

	Smokers' mean score
Tension reduction	2.48
Cravings	1.62
Pleasure/relaxation	1.11
Habit	1.05
Weight concerns	0.94
Social	0.83
Stimulation	0.83
Handling	0.73

Composite scale, range 0 to 3: 0 = "not at all," 1 = "a little," 2 = "quite a bit," 3 = "very much so"

Table II. Percentage of smokers reporting specific reasons for relapse (N = 53)

	Smoker %
Boredom	70
Personal problems	68
Desire for tobacco remained high	66
Withdrawal symptoms	62
Enjoyed tobacco too much and found no good substitute	56
Pressure from friends to start again	48
Concern about gaining weight	22
Actual weight gain	22

Response options were "yes" or "no"

Table III. Percentage of smokers reporting sensations experienced when unable to smoke (N = 53)

	Smokers %
Irritability/frustration/anger	85
Depressed mood	74
Difficulty concentrating	71
Anxiety	69
Restlessness	62
Trouble falling asleep	53
Loneliness	42
A racing heart	40
Headaches	40
Increased appetite/weight gain	37

Response options were "yes" or "no"

With regard to perceived motivational factors related to making a quit attempt, most smokers reported that believing that smoking is related to premature facial wrinkling, sexual impotence, gum disease, facial disfigurement, a funny-sounding voice, and/or cancer would motivate them to try to stop smoking. These findings were consistent with feedback received from focus groups described below. Some smokers also identified tobacco-stained teeth, bad breath, a free quit program, and a special girlfriend or boyfriend asking them to quit as factors that also might motivate them to quit. Very few identified friends in general asking them to quit, or the harmful effect of cigarette smoke on the health of others close to them, as reasons that might motivate them to quit (Table IV).

Table IV. Percentage of smokers reporting factors that would motivate quit attempts (N = 53)

	Smokers %
Facial disfigurement	89
Gum disease	87
Lung or mouth cancer	81
Sexual impotence	79
Stomach ulcers	74
Facial wrinkling	73
Harmful to others	72
Infertility	66
Changes in voice	65
Free quit program	59
Girl/Boyfriend asking to quit	58
Bad breath	55
Stained teeth	53
Coughing	46
Friend asking to quit	17

Response options were "yes" or "no"

Student Focus Groups

Content analyses conducted on the qualitative focus group data identified the following themes related to the proposed intervention components. Most participants believed that a mouth examination was a good way to highlight tobacco-related adverse health and cosmetic effects on teeth, oral tissues, and breath. Most believed it would be a good strategy to motivate tobacco users to make a quit attempt. A large number of smokers, however, reported that loss of confidentiality and the embarrassment of having an oral cancer screening in front of one's peers would be major barriers to participation. To counteract these barriers, participants unanimously recommended that all students, tobacco users and nonusers alike, participate in not only the mouth exam, but also in all components of the recruitment program. Most participants strongly felt that singling out tobacco users would be too uncomfortable and embarrassing for them. Interestingly, the male students were as enthusiastic as the female students about having skin care information offered as part of the recruitment program. All students supported the use of computer simulation to morph digital images of students and recommended that color printouts be given to each student.

With regard to incentives to encourage participation in the recruitment program, students made the following suggestions: Refer to the recruitment program as a "Tobacco and Health Fair," rather than as a tobacco cessation recruitment program; implement the program during school hours; offer credit toward a required class for attendance; use advance, positive advertising to highlight the fun of participation; and offer free toothbrushes, skin care products, and nicotine gum and patches. These findings are consistent with those reported by others and were incorporated into the motivational intervention scheduled for pilot testing.⁷

Nurse Focus Group

Because the infrastructure for school nurse delivery of school-based health screenings and health care is already in place in rural California counties, we contacted the director of the County Nurse Program at the Lake County Department of Health Services to obtain permission to recruit nurse-employees to participate in a focus group to inform our intervention development. The purpose of the focus group was to gain feedback on the feasibility and acceptability of the proposed school-based tobacco cessation recruitment program that would involve county-employed school nurses. As part of the focus group experience, a study investigator who is a dental hygienist explained that a component of the proposed intervention involved school nurses conducting oral cancer screenings of students and educated the nurse participants on the study's oral cancer screening protocol. In addition, the dental hygienist explained that, as part of the oral cancer screening process, the nurses also would be required to ask about tobacco use, point out any tobacco-associated problems in the students' mouths, advise users to quit, and refer them to the schools' tobacco cessation treatment program. Feedback from the six public health nurses who participated in the focus group revealed that the nurses would be willing to implement the oral cancer screening protocol if they received detailed training with continuing education credits at no cost to them. In addition, all participants indicated they would need administrative support, and some stated they would need additional funding for time spent. The nurses identified positive parental consent as a significant barrier to student participation. They recommended the use of a passive parental consent process, given that oral cancer screenings are relatively non-invasive compared to other screening procedures performed by school nurses that required only passive parental consent (e.g., scoliosis examinations). Based on feedback from this focus group, we developed a training manual and videotape for school nurses and trained a school nurse to assist with pilot testing the oral cancer screening component of the proposed tobacco cessation recruitment intervention.

Collaboration with High School Computer Technology Faculty and Students

We collaborated with faculty and students from the Carle High School computer technology educational program in Lake County to develop a "special effects" computer program. The objective of this program was to "morph" digital photographs of students to simulate facial wrinkling associated with smoking and facial disfigurement associated with oral cancer from tobacco use. A study investigator who is a plastic surgeon provided prototype photographs of facial wrinkling, and other UCSF investigators provided prototype photographs of facial disfigurement due to oral cancer. Using these photographs, Carle High School faculty and students using Adobe Photoshop 6.0 (Adobe Systems, Inc., San Jose, CA) created a digital facial wrinkling overlay, or mask, to be placed on digital photographs of students to simulate facial wrinkling (Figure 1). Figure 2 and Figure 3 show the resultant product. An overlay of facial disfigurement due to oral cancer also was created

in a similar fashion. Figure 4 shows the "morphed" photograph when the facial disfigurement overlay is placed on a student photograph, allowing students to see potential effects of tobacco use on their own facial appearances.

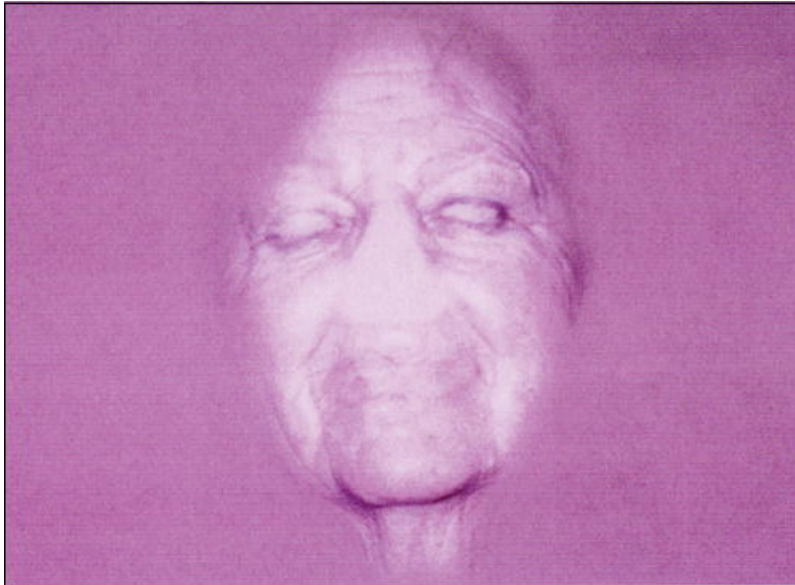


Figure 1. A digital facial wrinkling overlay, or mask, that was placed on digital photographs of students to simulate facial wrinkling.



Figure 2. Photograph of a student prior to placement of the digital overlay to simulate facial wrinkling.



Figure 3. Photograph of student in Figure 2 after placement of the digital overlay to simulate facial wrinkling.



Figure 4. Photograph of a student after placement of the overlay simulating facial disfigurement due to oral cancer.

Collaboration with Clinique Skin Care, Inc., and Local Cosmetology Students

A member of the investigative team contacted staff at Clinique Skin Care, Inc. (New York, NY), to obtain a diagnostic chart for determining skin care products to recommend for use. Clinique, Inc., also donated skin care products, including sunscreen, to pass out as free samples as part of the recruitment program. After developing a training manual for the skin and nail care interventionists, a member of the investigative team from Lake County Office of Education contacted a local cosmetology educational program and recruited three students to participate as skin and nail care interventionists in the planned pilot study of the recruitment program. These cosmetology students were trained in the study protocol by investigators in a one-hour session. The focus of the skin and nail care training was to prepare them to ask about tobacco use, to inform participants that smoking causes premature facial wrinkling and discolored fingernails, to advise users to quit, and to refer them to the school-based group cessation program. In addition, these cosmetology students were trained to ask students specific questions to determine areas of facial skin that were oily or dry and how often sunscreen products were used. Based on responses obtained, the cosmetology students used the Clinique, Inc., diagnostic chart to recommend appropriate products and distribute samples of recommended products.

Pilot Testing for Feasibility and Acceptability

After refining our motivational intervention based on questionnaire and focus group feedback, we contacted the principal of one Lake County High School to gain permission to pilot test our recruitment intervention for feasibility and acceptability at the school. All enrolled students with parental consent were eligible to participate in the "Tobacco and Health Fair" (described below) conducted from 9 a.m. to noon on one school day in an available school classroom. Students moved through the program at their own pace within the allotted time period. All consenting, eligible students were released from class to participate and completed a baseline questionnaire to assess demographics, tobacco use, and interest in quitting. Upon completion of the motivational intervention, an exit questionnaire was administered to each participant to determine acceptability of the program. In addition, any tobacco users interested in participating in the school-based group cessation program wrote their name on a sign-up sheet. One week later, tobacco users who had indicated interest in participating in the group cessation counseling program were contacted and assigned to a cessation group that met for an hour once a week for six weeks. At each session, attendance was taken and group participants reported their tobacco use status to the group leader, who was a trained tobacco cessation counselor.

The Motivational and Recruitment Intervention

The motivational intervention to recruit tobacco users into a school-based cessation counseling program was framed as a tobacco and health fair. The intervention targeted all students-tobacco users and non-users alike and included the following three components:

Computer Simulations. Computer technology was used to simulate facial appearance changes related to tobacco use and oral cancer. A student from Carle High School in Lake County took a digital photograph of each student participating in the "Tobacco and Health Fair" at the pilot high school. Then, within four minutes, he morphed the student's picture to simulate facial wrinkling from smoking, or facial disfigurement from oral cancer (Figure 5, Figure 6). Upon completion of the morphing process, a hard copy of the morphed photograph was printed in color and given to each student.



Figure 5. Student taking a digital photograph of participant at “Tobacco and Health Fair.”



Figure 6. High school student using Adobe Photoshop to morph digital images of students to illustrate premature facial wrinkling and skin aging associated with smoking.

Facial Skin and Fingernail Care Analysis. Three college-age cosmetology students from Lake County performed a simple analysis of facial skin type and fingernail care and provided free samples of suggested appropriate skin care products donated by Clinique, Inc. (Figure 7). In addition, they advised users to quit tobacco use to avoid facial wrinkling, yellowing of fingernails, and staining of fingers.



Figure 7. Cosmetology students counseling pilot high school students.

Oral Cancer Screening. A county school nurse conducted an oral cancer screening on each participant. She pointed out any tobacco-related problems in students' mouths, such as soft tissue changes, tooth discoloration, and halitosis. Non-users of tobacco were encouraged to remain tobacco-free. Tobacco users were advised to stop all forms of tobacco and were referred to the school-based cessation group for assistance with quitting. The nurse explained that nicotine is an addictive drug, and nicotine withdrawal symptoms often make it difficult to quit without help (Figure 8).



Figure 8. Public health school nurse performing oral cancer screening on a pilot high school student prior to giving cessation advice and offering assistance.

The Tobacco Cessation Counseling Program

This program targeted only tobacco users and consisted of a group tobacco cessation program that was conducted one hour per week for six weeks by a local tobacco cessation counselor. Sessions included identifying reasons for quitting, self-monitoring of tobacco use and associated moods and severity of cravings, replacing rewards that students received from nicotine with other pleasant activities, and "talking back" to harmful thoughts.¹⁷ Each session provided tools for

self-monitoring of behaviors to help participants internalize cognitive and behavioral coping strategies taught. Additionally, nicotine addiction was discussed and students were helped to set a quit date and make a plan for quitting (e.g., switching to lower nicotine content brands, cutting back to half the usual amount, practicing going without tobacco at a few favorite times). At each session, those who had stopped tobacco use were praised and reminded of how many days they had been abstinent. Strategies used to cope with nicotine withdrawal and problems experienced were discussed. Those who had slipped were reminded that most people do not always stop on their first attempt, were helped to identify why they slipped and what they could do to avoid slipping in the future, and encouraged to get back on track. If a full relapse occurred, the group facilitator encouraged a new quit date and plan and offered support.

Results

Subject Characteristics

Table V presents the demographics and smoking status of the 64 students who participated in the "Tobacco and Health Fair" to recruit smokers to participate in a tobacco cessation counseling program. The majority were white (77%), followed by American Indian (13%) and Hispanic (6%); about one third were female, and three quarters of the participants had some history of smoking. Overall, the prevalence of current smoking was 58%, with 67% among whites and 27% among ethnic and racial minority groups. A higher percentage of females participating in the study smoked than males (70% vs. 52%) (Table VI).

Table V. Demographic and smoking status characteristics of high school students participating in the pilot test of the intervention (N = 64)

Ethnicity	% (n)
African American	3 (2)
American Indian	13 (8)
Asian American	2 (1)
Hispanic	6 (4)
White	77 (49)
Gender	
Male	69 (44)
Female	31 (20)
Smoking Status	
Current	58 (37)
Former	17 (11)
Never	25 (16)

Table VI. Prevalence of smoking overall and by ethnicity and gender among students completing an exit questionnaire after the intervention pilot test (N = 64)

	% current smokers (n)
Overall	58 (37)
Ethnicity	
African American	0 (0)
American Indian	25 (2)
Asian American	0 (0)
Hispanic	50 (2)
White	67 (33)
Gender	
Female	70 (14)
Male	52 (23)

Acceptability of Program

Table VII shows student evaluation of the usefulness of the various components of the motivational and recruitment intervention. Of the responding 61 students, 48% (n = 29) identified the oral cancer screening as the most useful part of the program; 28% (n = 16) identified the computerized morphing simulations; 20% (n = 12) the skin and nail care analysis; and 5% (n = 3) identified a combination of the components. Interestingly, 26% of males compared to only 6% of females identified the skin care analysis as the most useful component. A slightly higher percentage of females (39%) than males (23%), however, cited the simulated photography as the program's most useful component.

Table VII. Percentage of students evaluating components of the recruitment intervention as "most useful" overall and by gender

	Most useful part of the program			
	Oral cancer screening % (n)	Morphing simulation % (n)	Skin care % (n)	Other* % (n)
Overall (N=61)	48 (29)	28 (17)	20 (12)	5 (3)
Females (N=18)	50 (9)	39 (7)	6 (1)	6 (1)
Males (N=43)	47 (20)	23 (10)	26 (11)	5 (2)

* Combinations of the three other components

Table VIII shows the percentage of students by smoking status who agreed with statements about the recruitment program (five response options ranging from "strongly agree" to "strongly disagree"). More than two thirds of all non-smokers, former smokers, and current smokers agreed that they would recommend this program to other students. More than half of all respondents agreed they were going to tell other smokers about the program, and that they learned about side effects of tobacco use that they previously did not know. Among smokers, 70% indicated that the program made them "start to think about quitting smoking," 49% agreed that they "would like more information about quitting smoking," and 43% indicated they would "like help to quit smoking." Only 7% of all respondents thought "the program was a waste of time," and 14% indicated they learned nothing from the program.

Table VIII. Percentage of students who “strongly agree” or “agree” with statements related to the recruitment program

STATEMENT	Non Smoker N=15 %	Former Smoker N=8 %	Current Smoker N=37 %	All N=60 %
I would recommend this program to other students	87	88	76	80
I am going to tell other smokers about this program	60	88	65	67
I learned about some side effects of tobacco use that I didn't know before	73	63	65	67
I learned useful information from the oral exam portion of the program	80	75	65	70
I learned useful information from the skin care portion of the program	80	88	57	67
I learned useful information from the photography/computer simulation portion of the program	60	75	49	55
I did <u>not</u> learn anything from this program	7	13	14	12
I think this program is a waste of time	7	0	8	7
This program has made me start to think about quitting smoking	n/a	n/a	70	70
I would like more information about quitting smoking	n/a	n/a	49	49
I would like help to quit smoking	n/a	n/a	43	43

Feasibility of the Program

Of the 37 regular smokers attending the recruitment intervention, 21 (57%) signed up to participate in the cessation program and were assigned to one of three cessation groups of seven to eight students that met once a week for six weeks. Included among these students were seven (33%) regular smokers who did not indicate on their baseline questionnaire that they had any desire to quit smoking. Of the smokers who enrolled, 16 (65%) actually participated (10 males, six females) in the cessation program, eight completed all sessions, and five reported that they had quit smoking at the end of the six-week program. Although the group cessation program appeared to be well received by the students and group leader, feedback from students indicated that a three-week cessation program that met twice a week for one hour would be preferable in the future.

Discussion

Results from this developmental study of a youth-oriented tobacco cessation recruitment program support the feasibility and acceptability of using vanity and oral health issues associated with tobacco use to motivate adolescents who smoke to enter cessation treatment. A dental hygienist trained a school nurse on how to conduct an oral cancer screening and how to use that process as a teaching moment to promote tobacco cessation. Dental hygienists are in an ideal position to take a leadership role in this type of motivational intervention, either by directly providing oral cancer screenings or by training other health care providers, such as school nurses, to deliver the oral cancer screening component of the intervention. This latter strategy is consistent with the 2000 surgeon general's report on oral health in America, which emphasizes the lack of access to oral health care for many in the United States and the need to develop practical solutions.¹⁸ The school nurse was selected as an interventionist for this pilot because of the existing county school nurse program in rural areas of

California and the potential for that program to incorporate the proposed motivational intervention on an ongoing basis. Rural school nurse programs established in many rural counties provide an excellent infrastructure for properly trained nurses to sustain ongoing promotion of tobacco cessation in the context of providing oral cancer screenings. Although county school nurses in rural areas may visit high schools on a monthly basis only, many students could be exposed to their cessation assistance over time.

Approximately half of the smokers in this pilot study who attended the health fair signed up for (57%) and attended (43%) the school-based group cessation program. Eighty percent of all participating students and 76% of smokers agreed they would recommend the program to other students. In addition, 93% of participating students agreed that the time spent at the health fair was useful. These results, although preliminary, suggest that using vanity and oral health issues to recruit high school smokers to participate in school-based tobacco cessation programs may be an effective approach. Further strengths of this program are the direct access to the high-risk target population through high schools, the responsiveness of the proposed program to needs expressed in focus groups of tobacco-using adolescents, and public health nurses who serve the school system. Further research to determine the effectiveness of this innovative recruitment strategy for adolescents is warranted.

Cause for concern, however, can be found in the low proportion of users who were actually tobacco free (25%) at the end of the six-week counseling program. In addition, eight students (50%) dropped out as the study progressed. Perhaps it is too much to expect that a strictly behavioral program would result in high quit rates among adolescents, given the experience with withdrawal symptoms reported on our questionnaire by focus group participants. We did not include nicotine replacement therapy due to cost and to published findings suggesting that teens need more behavioral consulting than adults.¹⁹

Another possible explanation for the lack of higher quit rates is that perhaps not all students who enrolled in the program may have been highly committed to quitting. The fact that students were given release time from classes may have enticed some students to enroll in the cessation counseling program who were not really ready to quit. Level of commitment of adolescents to cessation programs entered needs to be further studied. The design of future school-based tobacco cessation interventions for adolescents in general may need to take this lower level of commitment into consideration.

Several limitations of the present study must be considered when interpreting the present data. First, there was no control group; thus, one cannot view the present results as evidence for intervention efficacy. The outcomes reported are encouraging, however, and deserve further investigation. Second, the small sample size dictated limited data analysis and power for detecting significant differences. Nevertheless, the results that did emerge in the present study can serve to guide future research directions. Third, the fact that students were given release time from classes and course credit for program involvement, both for the recruitment program and for the cessation counseling, may have been mediating factors that enticed some students to participate. Our findings may not be transferable to students in high schools unwilling to offer credit toward course requirements and/or to give up class time to implement the programs. According to student feedback in our focus groups, implementing the recruitment and the counseling programs during school hours is important for motivating adolescent students to take advantage of assistance offered. Future studies should compare the effects of our youth-oriented recruitment program on student participation in tobacco cessation counseling programs when offered during and outside of class time and with and without the incentive of course credit.

Finally, another limitation of our findings is that the pilot study was conducted among vocational technical students who are at higher risk for high smoking intensity when compared with same-age students enrolled in academic programs.¹ Thus, our results may not apply to students in mainstream high schools. We chose to work with continuation high school students because a high prevalence of smoking is reported in this population and to maximize exposure of our program to as many tobacco users as possible given limited time and resources.²⁰ The fact that our youth-framed recruitment strategy was well received is promising because motivating tobacco quit attempts in this group of adolescents may be more challenging compared to other groups. Future research is warranted to compare the effect of our recruitment intervention on motivating quit attempts with that of other strategies among mainstream and continuation high school students.

The acceptability of our intervention approach to adolescents is not surprising, as physical appearance and oral health have been reported to be very important values among adolescents.^{8,9,10,11,15, 21} Smokeless (spit) tobacco marketing efforts have gone to great lengths to associate their products with activities and attractive people who embody extraordinary physical

prowess, such as baseball players, rodeo stars, and other athletes. In a study of baseball athletes attending 44 high schools in rural California (N = 1,084), participants were asked to select three items from a list of 11 intervention components that most influenced them to stay tobacco-free or to try to quit their tobacco use during the study period. Ninety-two percent of spit tobacco users (n = 351) cited seeing graphic slides of facial disfigurement from oral cancer, and 81% (n = 330) cited receiving a mouth exam with feedback about spit tobacco-associated oral lesions.²¹ In addition, in a survey of 473 spit tobacco users on football and baseball teams in 16 California colleges, seeing oral lesions in their own mouths and receiving advice to quit from an oral health care professional were highly ranked as factors that might influence them to quit.^{15,22} Similarly, in the current study, the mouth examination was identified by almost half of the participating students as the most useful component of the intervention program.

Other studies also suggest the important value that adolescents place on physical appearance.^{23,24} For example, a study of 15,175 girls and 7,846 boys showed a dose-response relationship between smoking and the belief that "smoking keeps weight down," a factor related to perceived attractiveness in many adolescents.^{23,24}

In addition, in one school-based study on reduction of cigarette smoking and spit tobacco use conducted in 48 junior high schools, two-year follow-up data suggested that a physical consequences curriculum is successful in reducing adolescent spit tobacco use. Additionally, instruction in refusal skills, awareness of social value misconceptions, and physical consequences were necessary to reduce the combined use of spit tobacco and cigarettes.⁴ Sussman and colleagues found that regular smokers report less knowledge of the negative consequences of tobacco use than do same-age nonsmokers.⁴ In another study, nonsmokers from high-risk groups were less likely to be smokers if they placed a high value on health.²⁵ Although long-term serious health risks associated with tobacco use seem to produce little success, in terms of bringing about cessation with adolescents,²⁶ some studies report that tobacco cessation programs that emphasize immediate consequences of use and instruction in coping strategies are relatively successful.³

Although the use of tobacco is decreasing among adults, it remains high among adolescents. Twenty-three percent of high school students in the United States smoke cigarettes on a regular basis.²⁷ There is a paucity of literature on how to recruit adolescents to enter school-based smoking cessation programs, and, to our knowledge, no recruitment strategies that focus on physical attractiveness and oral health have been published. Our findings demonstrate high acceptance of the program by students. Involved faculty also reported that the experience was positive for all concerned.

Conclusion

The design of tobacco cessation interventions for high school tobacco users needs to include recruitment formats that not only educate and inform, but also motivate adolescents to make quit attempts. Although these formats differ from actual treatment programs, they are an important part of developing an effective treatment program. Attracting high school smokers to participate in smoking cessation programs is critical. This study represents an early attempt to develop a motivational program expressly for adolescent tobacco users to recruit them into school-based cessation treatment programs. We hope that it will serve as a guide and model to future developments in this area.

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Notes

Correspondence to: Margaret M. Walsh at emailaddress

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