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A Stage-matched Smoking Cessation Profram for University of Maine Student Smokers

Su-ching Cheng

A STAGE-MATCHED SMOKING CESSATION PROGRAM FOR UNIVERSITY OF MAINE STUDENT SMOKERS

By

Su-ching Cheng

B.S. University of Maine, 1997

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Advisory Committee:

Mary Ellen Symanski, Associate Professor of Nursing, Advisor

Nancy Fishwick, Associate Professor of Nursing

Mark Jackson, Director of Student Health Services

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Thesis Advisor: Dr. Mary Ellen Symanski

An Abstract of the Thesis Presented
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The objective of this study was to test the hypothesis that a stage-matched intervention will increase student smokers' readiness to quit smoking and progress in stage of behavior change. Forty-one University of Maine students, who were current smokers aged 18-24 years old, were recruited to participate in the study and were systematically divided into the experimental group and the control group. Participants' stage of change in smoking cessation was assessed, and different interventions were used to communicate with participants in the experimental group during the fall semester of 2001.

This study illustrated the dynamics of behavioral change and the challenge of promoting smoking cessations among college students. The study can provide some insights about the potential advantages and drawbacks of a stage-based smoking cessation program on a college campus.

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INTRODUCTION

Cigarette smoking, the signal most preventable cause of morbidity and mortality in the United States, is responsible for a death toll exceeding the combined fatalities from AIDS, alcohol, cocaine, heroin, homicide, suicide, motor vehicle accidents, and fires. Although the number of smokers in U.S has declined in the past three decades, tobacco use among adolescents and young adults continues to increase, especially among women and minority college students (Moskal, Dziuban & West, 1999).

Cigarette smoking is not only serious but also very costly. It was estimated by the Centers for Disease Control and Prevention (CDC) that direct medical costs from smoking were more than $50 billion in 1993. Moskal, Dziuban and West (1999) pointed out that although tobacco companies paid $368.5 billion tobacco settlements nationally, the society as a whole still carries a heavy financial burden to provide healthcare for smokers.

There are more than 8 million college students between the ages of 18 to 24 in the United States. According to the results of National Health Interview survey, smoking among people ages 18 to 24 years old rose after 1991. According to the CDC's 1995 National College Health Risk Behavior Survey 75 percent of the respondents in that age group tried cigarettes. Similar findings were in a study of California college students' health risk behaviors (Patrick, Covin, Fulop, Calfas & Lovato, 1997), in which 71% of

student surveyed indicated that they had tried cigarettes, 19% had been regular smokers at some time, and 20% were current smokers. Comparing patterns of cigarette smoking in 116 nationally representative four-year colleges, another of the 1997 Harvard School of Public Health College Alcohol Study (CAS) found the percentage of college student smokers increased by 27.8% between 1993 and 1997. During this same time frame, the smoking cessation rate had decreased. In 1993, 29.5 percent of the student smokers reported quitting smoking, but in 1997 only 27.8 percent quit (Wechsler, Rigotti, Gledhill-Hoyt & Lee, 1998). However, in the 1999 follow-up study Wechsler and colleagues pointed out that cigarette use rate among college students stabilized between 1997 and 1999 (Rigotti, Lee & Wechsler, 2000).

Background and Literature Review

Smoking cessation can have significant and immediate health benefits for people of all ages with or without existing smoking-related diseases. According to the CDC, as much as 30 percent rate of smoking cessation can be reached with counseling. A report by the U.S. government Agency for Healthcare Policy and Research (1996) also indicated that patients who receive consistent advice and intervention from healthcare providers are more likely to achieve smoking cessation. According to a study to identify effective methods for counseling smokers by Montagna and Hupcey (2000), patients who receive consistent advice and intervention from healthcare providers are more likely to achieve smoking cessation.

Colleges and Universities have a unique opportunity to play a role in promoting smoking cessation and preventing students from starting to smoke. Wechsler et al (1998) noted that college years are a time of transition for young adults in the development or abandonment of smoking behavior. Many college students began smoking in high school years and attempt to quit upon entering college, while others smoked their first cigarette and began smoking regularly during college. DeBernardo, Aldinger, Dawood, Hanson, Lee and Rinaldi (1999) stated that college students are a relatively well definable group of young adults, and that it may be easier to prevent smoking during this period of youth before a prolonged period of addiction to tobacco.

In a study of college students smoking initiation and smoking patterns, Everett and colleagues found that among daily smokers 81% began smoking daily at age 18 or younger, 19% at age 19 or older (Everett, Husten, Kann, Warren, Sharp and Crossett, 1999). Results of a similar survey by Wechsler et al (1998) show 28% of students began smoking daily when they were age 19 years or older. The 1999 Harvard School of Public Health College Alcohol Study Survey results indicate that college is a time when many students experiment with a range of tobacco products. These students may be in danger of developing lifelong nicotine dependence (Rigotti, Lee and Wechsler, 2000). Therefore, during this crucial period, it makes sense for universities to focus on discouraging student initiation of smoking, stopping occasional smokers from becoming regular users, and helping those students who are trying to quit.

Promoting smoking cessation on college campuses however is a difficult task. Young adults tend to be resistant to smoking cessation interventions. At the University of Maine, student participation of smoking cessation program offered by the health center in the past few years had been low. This experience is consistent with other studies examining student attitudes toward smoking cessation programs. According to Wechsler (2001), there is little student demand for existing smoking cessation programs at 393 four-year institutions surveyed: 88% of these schools had no waiting list for smoking cessation program, and 6.2% discontinued smoking cessation programs due to the lack of student interest. In another study of undergraduates' attitudes toward smoking by DeBernardo et al (1999), 89.9% of the survey respondents did not want to receive more information about the adverse health consequences of smoking, and about half of the smokers, 52.2%, did not want any assistance from their college to help them quit.

Psychological Influences on Smoking Cessation and Cessation Behavior

Many factors affect smokers' motivation. DeBernardo and colleagues (1999) identified motivating including factors gender, ethnicity, education, and aspects of psychology, sociology, physiology, and the environment. According to this study women are more likely to have a depressed mood or to have their smoking habits affected by outside influences than male. Peer use of tobacco is the most common reason to start smoking, and presents a challenge to smokers when trying to quit (DeBernardo et al, 1999; Engels et al, 1998; Pletcher and Schwarz, 2000). After addiction, withdrawal symptoms may be a physiological motivation to continue smoking. Psychologically,

smokers may be motivated to smoke because they need stimulation or may need to smoke to relieve tension and stress. Tobacco use could be viewed as part of a college lifestyle that values social life over education achievement (Rigotti et al, 2000).

Smoking is associated with depression and psychological stress. Covey (1999) found evidence that persons vulnerable to depression were more likely to become regular smokers and to become dependent smokers compared with non-depressed individuals. These "depression–prone" smokers experienced difficulties to quit smoking and were at risk of severe symptoms during the nicotine withdrawal period. They might require treatment for depression during the cessation period.

Schuster, Jaycos, Collins, Marshall, Elliott, Zhou, Kanouse, Morrison and Berry (2001) pointed out that people who experience a traumatic event even indirectly might also experience stress reactions. After the September 11 terrorist attacks people across the country had substantial symptoms of stress. Since many people report smoking to relieve stress, one could argue that the September 11 attack may be associated with an increased level of smoking.

Negative mood states have been implicated as a reason for failure at smoking cessation attempts and as the most common antecedent of a smoking relapse. The association of depressed mood with smoking and its effect on the quit rate were demonstrated in the National Health and Nutrition Examination Survey (Covey, 1999).

Understanding the dynamic nature of behavioral change is essential to helping students quit cigarette smoking. There are many stresses associated with college life.

How students cope with the stressors, such as the transition from parents' structured home environment to independent living conditions, interpersonal relationships, public speaking, and examinations, can contribute to bad habits (Grace, 1997). It may be that a theory that recognizes the dynamic nature of behavior change and provides an individualized approach to quitting may work best in the college population. Prochaska and DiClemente developed a stage of change theory in which an individual's behavioral change is not an all-or-nothing phenomenon, and which proposes that different types of intervention should be used according to the individual's stage of change. Relapse is common in behavior change, according to this theory. Also according to this theory the majority of people return to a previous stage of change before eventually succeeding in maintaining a behavior change.

The Transtheoretical Model (TTM)

The transtheretical model (TTM), developed by James O. Prochaska and Carlo C. DiClemente, has been applied to the study of addictive behaviors, such as smoking, alcohol abuse, and drug abuse (Prochaska et al., 1994; Pollark et al., 1998; and Sullum et al., 2000). TTM recognizes that individuals have different attitudes, beliefs and motivations toward a desired new behavior. According to this theory, different treatment approaches and health communication strategies may be necessary for individuals in the different stages of changes.

According to the TTM, individuals progress through five stages of change in adopting a new behavior: precontemplation, contemplation, preparation, action, and

maintenance or relapse. People in the precontemplation stage either do not believe that they should change their behavior or realize that they should change their behavior but have no desire to do it. In the contemplation stage the individual acknowledges the need to change behavior and intends to make a change, but not in the immediate future. People in the preparation stage are ready for action. They intend to make a change in the immediate future and may be taking small steps to modify their behavior. Those in the action stage have made active attempts to change behavior. In the maintenance stage people continue the changed behavior but it requires active or conscious effort to be sustained, and they are still aware of the risk of relapse (Pollak, Carbonari, DiClemente, Niemann, & Mullen, 1998). Relapses to earlier stages are common, resulting in a spiral-like progression. The majority of people relapse and return to the one of previous stages before eventually succeeding in maintaining change. In the TTM, relapse is not unusual but a natural part of the change cycle.

Objective of Study

As mentioned earlier, simply providing information about adverse health consequences of smoking has not resulted in great success on reducing smoking rates among college students (DeBernardo et al, 1999). Student smokers may be in various stages of behavior change and according to the Prochaska model would respond better to interventions tailored to their individual needs. The objective of the study is to implement and evaluate a stage-matched smoking cessation program for University of Maine student smokers based upon Prochaska's Transtheoretical Model.

Chapter 2

METHOD

Design

This study used an experimental design. First the participants' stage of change in smoking status was assessed. Next, intervention were provided to experimental and control group participants. The experimental group participants received individually stage-matched smoking cessation intervention, while the control group participant received an invitation to a smoking cessation group and routine information on request. Finally, stage of change in smoking status was assessed again for each participant.

Based on the transtheoretical model, three stages of change were identified for this study:

(1) Precontemplation stage—not considering quitting smoking in the next three months.

(2) Contemplation stage—planning to quit smoking in the next three months, and

(3) Preparation stage—planning to quit smoking in the next 30 days.

The hypothesis is that participants in an experimental group who receive stage-match interventional would be more likely to move stage in the direction toward quitting, or stop smoking than individuals in a control group.

Measurement

To assess participants' stage of change in terms of intention to quit smoking a questionnaire was developed, which was modified from those developed by Prochaska and Goldstein (1991). Also included in the questionnaire is the respondent's experience of quitting in the past year to determine a relapse. The questionnaire is presented in Figure 1.

Figure 1. First Questionnaire

Age _____. Male _____. Female_____.

1. Are you currently a cigarette smoker?

   If you answer no, how long ago did you quit smoking?

2. If you answered yes, do you intend to quit smoking?

   a. No, I do not plan to quit smoking within the next 3 months.

   b. Yes, I plan to quit smoking in the next 3 months.

   c. Yes, I plan to quit smoking in the next 30 days.

3. Did you try to quit in the past year?

Sample and Group Assignment

Permission to conduct this study on students of the University of Maine was obtained from Office of Institutional Review Board in August, 2001. Men and women students, age 18 to 24 years were recruited. Study participation was voluntary and no cash or any other reward was offered.

Recruitment efforts were made in early September in 2001 when the semester began. A brief advertisement about the study and contact information were placed in the campus newspaper. The same information was also posted on the First Class electronic bulletin board system used on this college campus. Furthermore, students visiting the Cutler Health Center and smokers were presented with written information about the study and the questionnaire.

A total of 44 volunteer students, 25 females and 16 males, filled out the questionnaire and enrolled in the study. Three students were over age of 25 and were excluded from the study. Student volunteers who fit the study criteria were systematically assigned, in alternating order, to either the experimental or control group. Nineteen students were included in the control group and 22 students in the experimental group (Table 1). All volunteers were recruited from students who visited the Health Center; no responses were received from the First-Class announcement or the Maine Campus Newspaper advertisement. Most participants (80 %) had previously tried to quit smoking. Two volunteers in the experimental group dropped out after the first e-mail contact. As seen in Table 1, the control and experimental groups were similar in terms of age and stages of change. More women than men participated in the study.

Table 1. Description of participants by the control and experimental groups

	Control Group	Experimental Group
Previous quit attempt	17	16
Male	5	11
Female	14	11
Average age	19.7	20.7
Stage of Change		
Pre-contemplation	3	4
Contemplation	15	16
Preparation	1	2
Total	19	22

Prochaska and other researchers used a 6 months time frame when measuring changes in stage of behavior change. Prochaska and Goldstein (1991) hypothesized that 6 months is as far in the future as people make plans to change their behavior. In this study a 3-month time frame was used to coincide with a semester schedule. Sullum, Clark and King (2000) also used a time frame within a semester to study college student behavior change on exercise relapse.

Data Collection

Participating students in the experimental group were contacted individually and regularly according to their specific change stage and needs. Students in the control group were only invited to participate in a group smoking cessation program. General

information about smoking cessation was provided to the control group members if requested.

Participants in both groups completed a pretest assessment, a post-test assessment, and were invited to a group cessation program at the student Health Center in November. A written oral inform consent from all volunteers was obtained before the study. Initial surveyed in September 2001 and second survey in December. Telephone calls were made to those students who did not response to the second e-mail survey.

Procedure for Contacting Students and Providing Interventions

Students were contacted by e-mail after signing the verbal consent form. All participants were contacted through e-mail because all of them have the First Class e-mail account provided by the university. Using e-mail in the study was very cost effective and also saved on the delivery and response time. In a study by DeBernardo et al. (1999) it was found that the overall email response rate was greater than 50% and was substantially higher than response rate for the traditional mailed surveys at their college (30%). O'Neill et al. (2000) also stated that computer-administered interventions are attractive to young people and cost-effective. Young adults are familiar with computers, and they see them as an entertaining and non-threatening source of information.

Each participant was contacted individually at least five times. Most e-mails were sent to the participants in the evenings; some responded within a couple of hours. However, the overall response rate was very low, and repeated messages had to be sent to

encourage some students to respond. Seventeen students never responded after they signed onto the study, and their reason for not responding is unknown.

A group smoking cessation session was held in the student health center in November, 2001. Although the session was offered to all university students, it was scheduled in an effort to increase the participation of all students in the study. Participants in both groups were individually notified about and invited to the group session a couple of times. Despite the personal and repeated invitations only 11 students from both groups responded. Among them, 7 confirmed that they were able to come to group session. Disappointingly, none of them attended the group session on smoking cessation.

Case Studies of Experimental Interventions

The focus of experimental intervention was not to convince student smokers to quit but rather to help smokers move along the change process. Zimmerman (2000) suggested that the care provider should view the initial interaction as the opening assessment of patient's behavior change process and not as the intervention. This way a smoker may view the care provider as supportive, rather than critical. Furthermore, Prochaska (1991) pointed out that personalized messages are more likely to move patients closer to action than mini-lectures about the negative health effects of smoking.

There were three participants in the experimental group with whom I have contacted more or less regularly. Two students were in the contemplation stage and one

was in the preparation stage. The following are the stage-based interventions provided to three students who were in the experimental group:

Case one: This 19 year old female student indicated in the questionnaire that she smoked four cigarettes a day and planned to quit in the next three months. Thus she was assessed to be in the contemplation stage. The student also stated that she had tried to quit in the past year and tried several times in the past.

A contemplator is usually seriously thinking about quitting smoking. A couple of times this student pointed out that she really wanted to quit and did not want to be a smoker all her life. Through self-evaluation she identified the following triggers: stress, drinking alcohol, after meals, and when she had trouble sleeping. She stated that "when I am drinking on the weekends, that is when the cigarettes taste the best." She tried to modify behavior by having someone else to hold her cigarettes, or "not buying her own cigarettes".

The primary goal of intervention in this case was to develop and maintain a positive relationship with the student by being empathetic and supportive to her, and by providing information on strategies to overcome barriers, avoid triggers, and handle stressful situations and cravings. Because of her strong resistance to the use of a nicotine patch or gum, and her preference for self-help, no pharmacotherapy information was mentioned. She indicated she was interested in participating in the group session for smoking cessation.

After a number of email contacts with her, I considered that she was in a strong position to move on to the preparation stage. But unfortunately, she stopped responding to my email, and I was unable to contact her by phone for the second survey.

According to Prochaska, Norcross and Diclemente (1994), the contemplators, like this student, rely heavily on consciousness-raising, emotional arousal and self-reevaluation in the change process. Contemplators are eager to talk about themselves and their problem and search for reassurance so that their concerns can be understood and overcome.

Case two: This student was also in the contemplation stage. During the study period she had an acute upper respiratory infection, and I had personal interactions with her when she visited the health center. Contrary to Prochaska's description of a contemplator, this student was not eager to share her experience or needs, and her responses were usually short. My approach was to be empathetic about her acute symptoms and to encourage her to quit or cut down smoking when she had acute symptoms. Prochaska, Norcross and Diclemente (1994) stated that "as people become more aware of their problems, they become more receptive to help" (p. 75). I also shared with her tips for breaking the habit and other strategies for avoiding trigger objects.

This student responded the second survey. In addition she indicated that she had not had a cigarette for about three months and that it was getting easier. Even though she still had a craving for cigarettes in moments of stress but she could no longer stand the smell of cigarette smoke.

Case three: I had several contacts with this student during the study period. She was in the preparation stage. In the first email contact she said: " I have quit about a week and it is pretty hard but I am very excited." In addition to congratulations to her, I also sent her information about possible withdrawal symptoms and tips for coping with cravings to prevent relapse.

I contacted her again a week later continue to give her support and some tips to cope with craving. She responded and said that she was doing well and realized that drinking did not help with her effort to quit smoking. " When I drank this weekend I couldn't stop myself from smoking. I got up feeling an awful pain in my chest and throat; but when I drank I smoked again". I continued contacting her throughout the study period and provided information based on her needs. In the second survey she stated that she had successfully stopped smoking for 3 months.

For students in the preparation stage my intervention shifted from motivating to emphasizing behavior skills such as stimulus control strategies, avoiding trigger situations, coping skills and relaxation exercises.

Reassessment

A post-experiment survey questionnaire, similar to the initial one, was e-mailed to all participants to assess any changes in their intentions to quit cigarette smoking in December (Figure 2). Telephone calls were made to those students who did not response to the second e-mail survey.

Figure 2. Second Questionnaire

Hello,

Welcome back to a new semester! Through this break were you able to change your smoking habits? If you are still interested in getting more information or help to quit smoking, it is still available at the Cutler Health Center. You may also contact me through this email address.

I would like to thank you again for filling out a questionnaire on smoking habits last semester. Please take a few moments now to complete the follow-up survey below and send it back to me. Your response will be of great help in completing this study. Thank you very much for your time and have a wonderful spring semester!

---

1. Are you smoking cigarettes now?
   ____ Yes
   ↓
   _____ No
   → How long have you stopped smoking?
   _____ days or _____ weeks
   1- 7 days more than 7 days
   You are finished. Thank you.

2. How many cigarettes a day do you smoke a day on average? _____
3. Do you intend to quit smoking? (Please check one)
   _____ No, I do not plan to quit smoking within the next 3 months.
   _____ Yes, I plan to quit smoking within the next 3 months.
   _____ No, I do not plan to quit smoking within the next 30 days

   Will you be interested in participating a group smoking cessation session if available in the future?
   _____ Yes _____ No

Thank you.

Chapter 3

RESULTS

Participants in each stage of change at pretest assessment are presented in Table 1 on page 10. The total number of participants recruited to the study was 41. Thirty two of the 41 participants in the study indicated that they had tried to quit smoking in the past year. The result of the final assessment is presented in Table 2. Five students had quit smoking--3 in the experiment group and 2 in the control group. One student in the control group moved from precontemplation to the action stage. Three students in the experimental group and one student in the control group moved from contemplation to action stage. No student reported moving to a lower stage.

Table 2. Post-Experiment Survey

	Pre-Experiment Survey	Post-Experiment Survey		
		No change	Change to a higher stage	Non-response
Experimental Group				
Pre-contemplation	4	1	0	3
Contemplation	16	6	3	7
Preparation	2	2	0	0
Control Group				
Pre-contemplation	3	1	1	1
Contemplation	15	7	1	7
Preparation	1	1	0	0

Chapter 4

DISCUSSION

This study tested a theory-based intervention to enhance the motivation to quit smoking among college students. Even though five out of 41student smokers quit smoking during the study, I was unable to support the hypothesis that the theory-base intervention increased readiness to change smoking behavior in the college population. Since only three students in the experimental group actively participated in communication and receiving interventions, inferential statistical analysis was not appropriate.

Many surveys from literature review indicate that college student smokers demonstrate awareness that smoking is harmful and do not desire more information. For example, DeBernardo et al. (1999) found college students tended to be resistant to smoking cessation interventions. Similar to my study, 89.9% of their survey respondents did not want to receive more information about the adverse health consequences of smoking, and about half of the smokers (52.2%) did not want any assistance from their college to quit smoking. Most of them also are well informed about the public health issues of smoking. Unsuccessful efforts with smoking cessation interventions may be associated to this lack of receptiveness to more information. DeBernardo et al (1999) stated that a combination of resistance to receiving additional information on the adverse

health consequences of smoking and smokers' preferences for unassisted methods for stopping smoking appears to explain why smoking cessation programs experience modest participation by undergraduate smokers.

Socializing with others or relaxing and leisure activities are common situations that pose a challenge to smokers when trying to quit (Engels, Knibbe, Vries & Drop, 1998). Anecdotal input from the students in this study support this premise. During conversations with students by telephone to gather the second survey responses, many students stated that they were not smoking at home with parents but smoked again when they came back to campus with their friends. Everette and colleagues (1999) stated that drinking alcohol and frequent attendance at drinking parties not only might influence smoking behavior, but also serve as a barrier for attempting to quit. One of the students in the study recognized that socially drinking alcohol and planning to quit smoking at the same time was not going to work for her. Risky behaviors among college students such as alcohol or illicit drug use, often accompanies cigarette smoking, and influences the student's life context. Health professionals who plan smoking cessation programs for students should be aware that smoking may be only one of several risk behaviors for some students.

Other survey studies use cash award or course credit to encourage student responding survey (Sullum et al, 2000; Wechsler et al, 1998). This study's participants did not receive any award, and this may be the reason for the low participation rate. Another reason for the low response could have been the timing of this study in the fall

semester of 2001. The September 11 attacks on the U.S. resulted in feeling of panic and stress among students, perhaps making it less likely that they would consider giving up smoking.

The study has several limitations. First, it was not possible to detect between-groups differences in smoking cessation because of the small sample size. Second, there was no objective verification of abstinence. Relying solely on self-report for assessment of smoking status raises the possibility that participants underreport of smoking status. However, Wechstler et al (1998) stated that biochemical measures have established the validity of self-reported smoking status in national surveys, therefore using student's self-report for assessment of smoking status is widely accepted.

In summary, helping student reduction or cessation of cigarette smoking is an important role for student health care providers who work with college students. Studies have shown that many students start smoking after the first or second year in college (DeBernardo et al., 1999; Wechsler et al., 1998). Also, Moskal et al (1999) pointed out that most undergraduates who are smokers bring smoking habits to college. Smoking prevention and cessation programs should start as soon as students enter college. College orientation programs may provide a good opportunity for health care providers approach smoking issues directly with students as well as their parents.

Understanding a student's stage of change and readiness may be helpful in assisting behavior change. However, in order to have a successful promotion program, a specific recruitment plan is needed. Black, Loftus, Chatterjee, Tiffany and Babrow

(1993) stated "if university smokers will not enroll in programs, the purpose of the intervention is compromised and treatment efficacy is jeopardized" (p. 389).

A more individualized approach to helping students quit, meeting students "where they are" may be one solution to help engage young adults in college to participate in breaking the smoking habit. This small pilot study enabled me to experience the process of trying to implement a stage-based smoking cessation program with college students. I learned that motivating students to actively participate and respond to communications is difficult, and while most prefer e-mail, some only answer phone messages. Perhaps students might be more responsive to engaging in a change process if a monetary reward or other incentive were offered. It is my belief that smoking cessation in young adults has great potential rewards in terms of saving lives and preserving quality of life in later years. Therefore, exhaustive efforts should be expended in research and practice to find workable solutions to helping college students quit smoking.

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BIOGRAPHY OF THE AUTHOR

Su-ching Cheng was born in Taipei, Taiwan, Republic of China. She graduated from the Deh Yu Junior College of Nursing in Taiwan with an Associate Degree in Nursing in June1973, and from the University of Maine with a Bachelor of Science in Nursing in May, 1997. Su-ching Cheng has worked in the Cutler Health Center since 1992, first as a Medical Assistant and as a Registered Nurse since 1996. She is certified as a College Health Nurse by the Board on Certification for Community Health Nursing. Su-ching Cheng is a candidate for the Master of Science degree in Nursing from The University of Maine in May, 2002.