COMBINING TELEHEALTH AND E-LEARNING: A CASE STUDY IN SMOKING CESSATION PROGRAMMING

Janice M. Putnam, R.N., Ph.D.

Abstract: This study described the experience college students (age 18 to 24) had using a Web-based smoking cessation program. Data saturation was obtained through open-ended interviews (N=9). Data analysis used Colaizzi's technique and HyperRESEARCH© software. Primary themes identified were (1) helpful education; (2) using telehealth is an enabling experience; (3) mixed social and clinical support experiences; and (4) convenient and familiar format. Other themes involved smoking pattern changes and motivation to quit. The results of this study indicate that using an e-learning delivery format for smoking cessation is an accessible health education and communication option for health education providers.

There is an overwhelming consensus that the high prevalence of tobacco use in college is a major health issue (Chalmers, Seguire & Brown, 2002; DeBernardo & Aldinger, 1999; Emmons, Abraham, Weschler, & Dowdall, 1998; Kelley, Thomas, & Freidmann, 2000; Martinelli, 1999; Rigotti, Regan & Moran, 2003; and Rigotti, Moran & Weschler, 2005). In the United States in 2005, there were 14.5 million students enrolled in 3,800 higher education institutions (National Center for Education Statistics, 2005). The use of tobacco reported by the college population (18- to 24-year-olds) as reported by the National Survey on Drug Use and Health (2004) was 38.5%, higher than the national adult prevalence.

According to Howe and Strauss (2003), millennial generation college students (born between 1982 and 2002) are living in an environment where there is a plurality of face-to-face and online interactions. Computers in college coursework are the norm. Telehealth is the delivery of interventions by healthcare providers on the Internet that may provide assistance in smoking cessation. Escofery and colleagues (2005) report that out of 743 undergraduate students in two colleges, 53% would like to get their health information online, 74% report that they have received health information online, 40% have searched for health information online, and 28% report wanting to attend a health program online. Therefore, in meeting Responsibility VII – C and D of the Responsibilities and Competencies for Health Educators (2007), Internet communication may be a way to vary and foster health communication with this population.

The American Lung Association's Freedom from Smoking Program© is a "gold standard", and appears to be an effective intervention reporting an 85% quit attempt rate, a 29% 3 month point prevalence of abstinence, a 27% 6 month point prevalence, a 25% point prevalence at one year and a one year sustained abstinence of 19% (Lando, McGovern, Barros, & Ettinger, 1990). However meeting face-to-face limits the availability. Responsibility III – A of the Responsibilities and Competencies for Health Educators (2007) speaks to exhibiting competency in planning educational programming. Providing Internet access to this "gold standard" was conceptualized to support flexible attendance. There were no studies identified in the literature review related to the efficacy of Freedom from Smoking© in an online program delivery format.

At the present time, there is enormous popularity in technology as an alternative delivery format for smoking cessation (Escofery, McCormick & Bateman, 2004; Feil, Noell, Litchenstein, Boles & McKay, 2003; Parlove, Cowdery, & Hoerauf, 2004; Stoddard, et al, 2005; Wang & Etter, 2004; ONeil, Gillespie & Slobin, 2000). Bock and associates (2004) performed a study assessing the content, quality and usability of smoking cessation treatment using an Internet delivery format. Of the 202 Internet sites identified, 23% offered treatment options and one in ten provided the interactivity that would classify it as telehealth. No information was provided on the effectiveness of these sites. The

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American Cancer Society is currently providing funding for a clinical trial comparing six different online smoking cessation programs (American Cancer Society, 2005).

Blackboard© is an e-course management system used in more than 2,000 higher education institutions in the United States (Blackboard©, 2003). Blackboard© is a good choice for telehealth program delivery because students are familiar with Blackboard© and it is present in their daily lives. Smoking cessation reminders can be viewed every time a student logs on. Also, students’ freedom to choose access to the course may promote participation, thus increasing the odds of successfully quitting smoking.

**RESEARCH QUESTION**

What was the essence of the lived experience of a young adult college student who used a Blackboard©-supported telehealth course as a method to quit smoking?

**THEORETICAL FRAMEWORK**

The Neuman System Model (Neuman & Fawcett, 2002, Figure 1) states that the client is a system. Clients' consist of basic survival surrounded by lines of defense that protect against stressor invasion. There are developmental stressors that affect Young Adult College (YAC) students (Erickson, 1950). Sub-optimal coping can result from stressor impact and the ensuing manifestation may be smoking. The environment of the YAC student includes and emphasizes technology which may increase accessibility to counseling.

The use of an intervention that supports the process of smoking cessation in college students' online classroom environments was innovative and unexplored. The combination of familiarity, ease of access, educational and problem solving interventions, group counseling and external links made the Blackboard© tool an innovative approach.

**METHOD**

Responsibility VIII – B of the Responsibilities and Competencies for Health Educators (2007) addresses the need to apply appropriate research methods in health education. To explore and describe the lived experience of a Blackboard©-supported health care intervention, the descriptive phenomenologic approach was indicated. This approach supported the philosophy and the exploratory research question and provided a framework to develop insight into each participant’s experience and understanding of their world of daily living, their interactions with technology and their human interaction with both nurses and peers. This population was intelligent, articulate and able to develop an understanding of their experience that only they can share. Thus, this phenomenological approach provided rich data capable of achieving the study aims, contributing to

![Figure 1. Neuman's model applied to smoking in college students](image)

![Figure 2. Interview Guide](image)

"Tell me about your experience in using telehealth as a method to quit smoking?"

Age: ____, Ethnicity: ____, Year in college: ____
Residency: ____ (on campus) ____ (off campus)
Martial status: ____
Years smoking: ____ Cigarettes per day prior to telehealth course: ____
Cigarettes per day after course: ____
Use of other smoking cessation methods during course: ____
Number of previous quit attempts: ____
clinical practice and identifying future research direction.

Data were collected through direct interviews with adult college students using a semi-structured interview tool (see Figure 2). Participants for this study were limited to young adult college students enrolled in a telehealth Internet smoking cessation course. Eligible participants included those between the ages of 18 and 24 who completed the class. Prior to initiation of data collection, two pilot interviews were conducted. This process provided validation of the study questions.

Participants were drawn from four online smoking cessation courses offered at two Midwestern universities. There was a total enrollment of 14 students. Upon completion of the course, the PI sent an electronic message to each participant to schedule an interview. The PI conducted all interviews over a 2 month period; all interviews lasted 20 to 35 minutes and were audiotaped. Semi-structured interview data collected through audiotaping were transcribed verbatim. HyperRESEARCH qualitative software (Hesse-Biber, Kinder, Dupuis, Dupuis, & Tormabene, 1994) and the Colaizzi Technique (Colaizzi, 1978) were used for content analysis. Data were collected from 9 participants with confirmed saturation.

Trustworthiness of this research was established using criteria by Lincoln & Guba (1985). Credibility was strengthened through the use of multiple informants and by validating analysis results with participants. Post analysis, identified themes were e-mailed to obtain member validation. Inter-rater reliability for coding was computed using percent agreement at 85% using the first two interviews between the researchers. Investigator triangulation occurred as the result of these two researchers individually interpreting data. Dependability was strengthened by the inquiry audit functions performed by content experts. Confirmability was addressed through line-by-line analysis and direct quotes from interviews. Clinical experts, content area experts, readers, and an audience all provided further rigor. Transferability was addressed through a thorough description of the research setting and interview process.

RESULTS

Data saturation was obtained through individual interviews with 9 participants. Eight participants self-described themselves as Caucasian (90%) and one participant as African American (10%). There were 6 female participants (67%) and 3 male participants (33%), with a mean age of 24 years. All participants were classified as either juniors or seniors in college. One participant lived on campus and 8 lived off campus. Each participant completed the online smoking cessation course and completed data collection. The majority of participants (89%) reported a quit attempt resulting in smoking cessation or reduction at the time of the interview. Success varied. Of the participants with the longest period of abstinence, the description of the quitting experience included trying a new problem solving approach or attitude change. Of those who were not successful, lack of time, motivation, or self-control were reported issues. Participant smoking status self-disclosure is presented in Table 1.

Data were categorized into four themes (Table 2) including (1) helpful educational information, (2) quitting using telehealth was a difficult but enabling experience, (3) there were mixed social and clinical support experiences, and (4) convenient access and familiar format. These four themes are listed in descending order according to the frequency of the codes.

THEME ONE: HELPFUL EDUCATIONAL INFORMATION

Interview data reflects educational information as a primary theme. Positive statements surrounded
Table 2: Theme identification process: thematic results

<table>
<thead>
<tr>
<th>Codes from Data</th>
<th>Sub-Theme</th>
<th>Theme</th>
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<tbody>
<tr>
<td>Blackboard education</td>
<td>Delivered helpful strategies for quitting smoking</td>
<td>Helpful educational information</td>
</tr>
<tr>
<td>Behavioral modification strategies</td>
<td></td>
<td></td>
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<tr>
<td>Weight management</td>
<td></td>
<td></td>
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<tr>
<td>Alternative behaviors</td>
<td></td>
<td></td>
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<tr>
<td>Helpful information</td>
<td></td>
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<tr>
<td>Brochures good</td>
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<tr>
<td>Power Points good</td>
<td></td>
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<tr>
<td>Knowledge of health consequences</td>
<td>Redundant information</td>
<td></td>
</tr>
<tr>
<td>Cranky</td>
<td>Withdrawal effects - Psychological</td>
<td></td>
</tr>
<tr>
<td>Irritable</td>
<td>Withdrawal effects - physical</td>
<td></td>
</tr>
<tr>
<td>Hungry</td>
<td>Withdrawal effects – social</td>
<td>Quitting using telehealth was a difficult but enabling experience</td>
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<tr>
<td>Nervous</td>
<td></td>
<td></td>
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<tr>
<td>Alcohol related</td>
<td>Concerns about academic performance while quitting</td>
<td></td>
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<tr>
<td>Avoided places</td>
<td></td>
<td></td>
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<tr>
<td>Avoided peers/friends</td>
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<td></td>
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<tr>
<td>Too busy</td>
<td></td>
<td></td>
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<tr>
<td>Planned around exams</td>
<td></td>
<td></td>
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<tr>
<td>Stressed about school</td>
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<tr>
<td>Discussion board use</td>
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<tr>
<td>Interaction</td>
<td></td>
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<tr>
<td>Support</td>
<td></td>
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<tr>
<td>Helpful</td>
<td></td>
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</tr>
<tr>
<td>Set days for access</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of immediate response</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discussion board use</td>
<td>Perceived clinical support</td>
<td></td>
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<tr>
<td>Online support faculty</td>
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<tr>
<td>Online support nursing students</td>
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<td></td>
</tr>
<tr>
<td>Discussion board use</td>
<td>Support from peers</td>
<td>Mixed social and clinical support experiences</td>
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<tr>
<td>Online support peers</td>
<td></td>
<td></td>
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<tr>
<td>Interaction</td>
<td></td>
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<tr>
<td>Privacy</td>
<td></td>
<td></td>
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<tr>
<td>Buddy system</td>
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<tr>
<td>Talking to others</td>
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<tr>
<td>Not alone</td>
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<tr>
<td>Discussion board use</td>
<td>Support for peers</td>
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<tr>
<td>Helping others</td>
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<td></td>
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<tr>
<td>Lack of immediate response</td>
<td>Negative experiences</td>
<td></td>
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<tr>
<td>Mistrust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online versus face-to-face</td>
<td>Access available</td>
<td></td>
</tr>
<tr>
<td>Access locations/type</td>
<td></td>
<td></td>
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<tr>
<td>Scheduling around work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scheduling with other online courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Few technical problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Convenient</td>
<td></td>
<td>Convenient access and familiar format</td>
</tr>
<tr>
<td>Work/school schedule</td>
<td></td>
<td></td>
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<tr>
<td>Where used computer</td>
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<tr>
<td>Online versus face-to-face</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set days for access</td>
<td></td>
<td></td>
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<tr>
<td>How computer was used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Easy to use</td>
<td></td>
<td></td>
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<tr>
<td>Computer system and access</td>
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</tbody>
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-133-
the notion that the course delivered the knowledge necessary to successfully quit smoking. Included in this knowledge were behavioral modification strategies, weight management, alternative behaviors and the healthcare consequences of smoking. One described how the behavioral modification strategy information was organized and delivered.

"I think that the information date corresponds to what you wanted to know. Like the prepare week was giving tips about preparing and how you should do it..."

Another shared her experience with weight management and behavioral modification. "I did the Power Point on weight reduction...I don't need to gain any more weight. I found more of the handout motivational...I like relied more on the tools like the pack track. I did that whole thing where like there are ten reasons that I should like quit smoking. I put it on the refrig and on the bathroom mirror..."

Negative statements surrounded the notion that the course presented some information commonly known through healthcare classes, television or the Internet.

THEME TWO: QUITTING USING TELEHEALTH WAS A DIFFICULT BUT ENABLING EXPERIENCE

Each participant reported having made a quit attempt during the telehealth course. These experiences were described as being similar to previous attempts.

"I wanted a cigarette really, really bad... I don't know I slipped up several times, but it wasn't like it was before. Like, I may take two or three drags and I could talk myself out of it and...put it back out. I think the first video, when it talks about...how long before the nicotine is out of your system...I would go over and over counting the days. I can make a few more days..."

One said he went online twice a week, "...just like my Tuesday-Thursday classes." However, another used it daily.

"I used it on a daily basis... I would check the discussion board... To see if anybody was going through the same thing I was going through...it seemed to be working pretty good at first because people were responding back..."

Concerns of performance in school-related activities such as studying and exams were reported by several participants. For example, "I was so busy getting my (school) work done that I did not make any free time to get online and spend a lot of time doing it."

THEME THREE: MIXED SOCIAL AND CLINICAL SUPPORT EXPERIENCES

Each participant stated an opinion regarding social and clinical support. Examples of positive experiences included privacy and perceived peer support.

"I think being able to talk to other people who were doing the same thing at the same time was really beneficial to me...there was one certain guy in the class too that I think I talked to everyday, cause if I had a bad day then we could kinda relate. That was nice to know that I wasn't doing it by myself." [ie. Positive support through anonymity]

Use of the discussion board in this telehealth program also revealed negative experiences. One commented on the lack of immediate response.

"when you are doing the class you may not get a response for a day or so later... and by then...you are already smoking or you're already so put off by the whole thing that you don't respond to it anyways."

Another expressed mistrust associated with the use of the discussion board.

"another thing was...tell your friends you're not smoking so that they can help you and I am like...the thing is I don't want to tell everybody my business, people be going on there telling a lot of stuff...like I tried this and...I decided that I am not telling anybody my business on Blackboard©. I don't know you all and I am not going to tell you my business...I don't want you to see my name..."

THEME FOUR: CONVENIENT ACCESS AND FAMILIAR FORMAT

Each participant described experiences associated with or related to access to this telehealth intervention. Positively, each was familiar with Blackboard©. One reported all of her courses use Blackboard©. "In fact, it's a rarity if you find one that doesn't, which is great." The participants frequently reported accessing the course at home in the evening.

ANECDOCTAL DATA

Although not the specific aim or research question posed in this study, analysis resulted in three anecdotal themes: (1) change of smoking pattern in college years, (2) multiple previous quit attempts, and (3) similar motivations for quitting smoking.

SMOKING PATTERN CHANGE IN COLLEGE YEARS

All but one participant disclosed experimenting with cigarettes before college. Most believed that they became addicted in college; usage increased due to the stressors and social life associated with college.

MULTIPLE PREVIOUS QUIT ATTEMPTS

Participants reported multiple previous quit attempts. All but one reported trying to quit by "tapering down" and "cold turkey" with various levels of
success. Two had tried nicotine replacement therapy, one reported using an herbal supplement, and one used Vitamin C. Success in quitting smoking was reportedly reversed by high stress events.

SIMILAR SELF-MOTIVATION

Each participant reported self-motivation prior to the class. Motivation came primarily from financial concerns, secondarily from friends and family and lastly as related to health concerns. Financial concerns were mentioned by the majority of the participants.

DISCUSSION

College students in the present study reflect that this telehealth intervention provides education, support, and access needed to be successful to quit smoking. This is important information in planning smoking programs. Each participant identified that the educational component of the course was a facilitator for quitting smoking. Convenience, familiarity with Blackboard®, and proximity to other online courses also were noted as facilitators to successful use of the course. The primary barrier of the program was the lack of immediate response to the group/clinical support discussion board. Participants suggested strengthening the support component through additional technologies or opportunities to meet face-to-face.

Results of this study support the continued use of these educational materials and technologies. Many participants, however, indicated that they had already been exposed to the educational information provided in the course. The availability of smoking cessation and health information is supported by DeBernardo and Aldinger (1999) which reported that the vast majority (98%) considered themselves knowledgeable about the health risks of smoking. In the future, health education specialists may consider tailoring the educational information presented based on knowledge and interest of the college-aged individual. This approach may minimize educational redundancy.

In a study of 159 undergraduate college students, female smokers were more likely than male smokers to report weight management as a reason for smoking (White-Chaleff, 2005). Weight gain is more likely to be an issue in smokers who also are dieters than for smokers who are non-dieters (Jarry, Coombs, Polivy & Herman, 1998). Future site development may include an increase in weight management assistance to help with weight management.

White-Chaleff’s (2005) study also reported that smokers who perceived higher levels of stress were more likely to use avoidance behavior as a coping mechanism. College smokers have significantly higher levels of perceived stress and emotion-orientated coping than non-smokers (Naquin & Gilbert, 1996). These findings suggest the need for additional problem-solving educational interventions that address stress/coping issues in this population.

The results of this study can be used by health education providers to enhance the educational content of future telehealth smoking intervention courses. Suggestions from these participants included adding more stress and weight management information. Expressive writing was suggested by one participant. However, as an intervention for young adults, expressive writing has not been demonstrated to be effective for stress management (Ames, et al.; 2005).

This course used discussion boards and e-mail to promote peer and clinical interventions. Schmidt-Owens (2004) reported that the group component was perceived by participants to be most effective in quitting. However, the participants shared both positive and negative social and clinical experiences related to the use of these features in this study.

Internet chat is the primary mode of communication for online therapy, followed by e-mail (Cook & Doyle, 2002). Since the course in this study only used asynchronous discussion boards, phone line support and chat rooms are future options. Some of the participants suggested adding external links to sites providing 24-hour support. Pod-casting, smoking cessation blogs, instant messaging such as Live Chat and the ability to post photos also might be applicable technologies that could contribute to program objectives and foster therapeutic online relationships (Responsibilities and Competencies for Health Educators, 2007).

Steptoe and associates (2002) reported that, when stressed with exams, there was a 55% increase in smoking behaviors for women with few social supports, but no change in men. Gender specific program interventions may be indicated.

Recommendations can be found in the literature that include the use of technology in smoking cessation programs (Curry, Ludman & McClure, 2003). Varied approaches include treatment matching, stepped care, tailored communications, computer technologies, the Internet and interactive telephone and video (Niaura & Abrams, 2002). Recommendations to facilitate student use of cessation services include offering programs that promote a buddy approach, making enrollment convenient, and to proactively reach out to the students (Mooney, 2001).

It is well documented that college students are citing transitional college stress as a primary reason for smoking (Gaffney, Orn-Anong, & Dawson, 2002; Hendricks & Herbold, 1998; Sciacca & Melby, 1992; Seymour, Hoerr, & Huang, 1997). This study suggests that these findings apply to the
millennial generation. Each participant expressed the belief that they became addicted in college, where usage increased due to the stressors and social life associated with college. College students often begin smoking as a social activity and may find themselves increasing their consumption. This becomes a daily habit by graduation. Consistent with literature, this study suggests that among college students, having friends who smoke, stress, weight management and depression are also reasons for smoking.

Data from this study supports previous literature suggesting high quit attempt rates reported to approach 89% among college students who smoke and the range of students reporting previous quit attempts was 59% to 86% for current smokers (Chalmers, Seguire & Brown, 2002; DeBernardo & Aldinger, 1999; Everett & Husten, 1999). An average of three attempts to quit was reported by Black and colleagues (1993).

Motivation prior to enrolling in the course came primarily from financial concerns which are consistent with those reported in the literature. A significant predictor of quit attempts is the positive financial impact (Ridner & Hahn, 2005). Interventions focusing on the financial aspects of quitting smoking are recommended. College students report that living with roommates and friends that did not smoke was most helpful when quitting smoking (Chalmers, Seguire & Brown, 2002; DeBernardo & Aldinger, 1999; Spencer, 1999). The majority (98%) of college students sampled considered themselves knowledgeable about the health risks of smoking (DeBernardo & Aldinger, 1999). However, the participants in this study do not think that they are vulnerable to the health effects of smoking and that this is not of concern to them. Findings suggest that clinicians focus their counseling on the motivators most important to the student.

Limitations included participant recruitment methodology. Minority individuals were underrepresented. The course was new and enrollment was low, limiting the ability to sample purposively for maximum diversity. Relatively homogeneous student populations limit transferability. Dependability cannot be established because changes in the college population and technology are likely to change future experiences.

IMPLICATIONS

This study provides significant information about this method of delivery for smoking cessation programming. Considering its exploratory nature and the limitations, replication studies are indicated. Replication studies could be designed to include the analysis of the discussion boards, effectiveness rates, or designed to recruit racial minorities or additional geographic sites. Future research should focus on the further development of clinician and social support. Other communication technologies might be useful in impacting the identified barriers and facilitators that influenced smoking cessation efforts. How the client in online support groups is affected by new trends in technology and their interest, familiarity with and willingness to try these trends is a significant consideration.

REFERENCES


Putnam

Schmidt-Owens, M. (2004). Identifying strategies college students perceive to be most effective in a
comprehensive smoking cessation program at the University of Central Florida. *Univ Microfilms International.*


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**RESPONSIBILITIES AND COMPETENCIES OF HEALTH EDUCATION**

Responsibility I - Assessing individual and community needs for health education

- **Competency A:** Obtain health-related data about social and cultural environments, growth and development factors, needs and interests
- **Competency B:** Distinguish between behaviors that foster and those that hinder well-being
- **Competency C:** Infer needs for health education on the basis of obtained data