Acceptability and Appeal of a Web-based Smoking Prevention Intervention for Adolescents

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Abstract

English:

Cigarette smoking has been identified as the most important source of preventable morbidity and premature mortality worldwide (American Lung Association, 2002). Statistics show that youth who do smoke report having their first cigarette while in middle school, thus this is a critical opportunity for prevention (Eissenburg & Balster, 2000). This project helps expand current knowledge of adolescent smoking prevention programs by demonstrating an understanding of adolescents' preference for and acceptability of the Internet in the delivery of a smoking prevention intervention. A qualitative usability study was conducted among middle school students using focus groups. Results found that the Internet is a good choice for delivery of a prevention program due to its accessibility, including the availability in most schools. Elements of interactivity and expert-trusted guidance were identified as appealing. In addition, the use of pictures and graphics in conjunction with text, can be useful in reaching students with varied learning styles. By using this non-traditional approach, health education and promotion can work in parallel with the schools, parents, and community in the delivery of effective smoking prevention programs delivered via the Internet.

Spanish:

El fumar cigarillos ha sido identificado como la fuente más importante de enfermedad prevenible y mortalidad premature en todo el mundo (American Lung Association, 2002). Las estadIsticas muestran que los jóvenes que fuman reportan que fumaron su primer cigarillo en la escuela secundaria, lo que constituye una oportunidad muy valiosa para la prevención (Eissenburg & Balster, 2000). Este proyecto ayuda a expandir el conocimiento actual de los programas de prevención de fumar para adolescentes al demostrar un entendimiento de las preferencias de los adolecentes hacia el Internet como medio de distribución de intervenciones para la prevención de fumar. Un estudio cualitativo del uso de estas intervenciones fué desarrollado entre estudiantes de secundaria usando grupos focales. Los resultados revelaron que el Internet es una opción buena para la distribucón de programas de prevención debido a su accesibilidad, incluyendo la disponibilidad en muchos de los colegios. Los elementos de interactividad y la guía de exoertos confiables fueron identificados como atractivos para este grupo. Además, el uso de fotos y gráficos en conjunto con el texto puede ser muy util en llegar a los estudiantes con una variedad de estilos de aprendizaje. Al usar este método no tradicional, la educación en salud y promoción de la salud pueden trabajar paralelamente con los colegios, padres, y comunidad en el desarrollo de programas efectivos de prevención del uso del cigarillo distribuidos a través del Internet.

Keywords: Internet, smoking prevention, adolescent, qualitative, usability.

Introduction

According to the Centers for Disease Control and Prevention (2000), approximately 80% of adult smokers started smoking before the age of 18 and every day, nearly 3,000 young people under the age of 18 become regular smokers. The American Lung Association (2000) reports that approximately one-third of these youth smokers will eventually die of a smoking-related illness. Statistics show that youth who do smoke report having their first cigarette while in middle school (Eissenburg & Balster, 2000). It is therefore imperative that efforts to prevent smoking be targeted to children of middle school age. School-based programs can have a significant impact on smoking behavior among young people and are most effective when part of a comprehensive, community-based effort (Satcher, 2000). It is estimated that the

implementation of effective school-based programs, along with community and media-based activities, can prevent or postpone smoking onset in 20 to 40 percent of U.S. adolescents (Satcher, 2000).

A recent report summarizing data from the 2002 National Youth Tobacco Survey (NYTS) shows that while both tobacco use and cigarette smoking among students in high school decreased by approximately 18% during 2000--2002; there was no decrease among students in middle school. Due to this lack of progress among middle school students, health officials suggest that implementation of proven antismoking strategies should be improved and new strategies to promote continued declines in youth smoking should be developed.(Centers for Disease Control and Prevention, 2003).

In conjunction with over 25 national, federal, and voluntary agencies, the Centers for Disease Control and Prevention (CDC) has developed the *Guidelines for School Health Programs to Prevent Tobacco Use and Addiction* (Centers for Disease Control and Prevention, 1994). Of the key principles outlined, it states that the curriculum should be introduced in elementary school and then intensified in middle/junior high school, which is when students are exposed to older students who use tobacco at higher rates (Centers for Disease Control and Prevention, 1994). Unfortunately, less than 5 percent of schools nationwide have implemented the major components of the CDC's recommended guidelines for school-based programs to prevent tobacco use (Satcher, 2000).

Adolescents are a primary target for health promotion initiatives, but it is often difficult to engage teens in a serious examination of health consequences because they believe that negative consequences are vague and too far in the future to be of any concern (Skinner, Maley, Smith, Chirrey & Morrison, 2001). Results of a meta-analysis of school-based smoking prevention programs (published between 1974 and 1991) suggest that the average program effect was quite limited in magnitude (Rooney & Murray, 1996). Literature even suggests that the "evaluation of program implementation can help illuminate negative results of school-based smoking prevention programs" (Kishchuk, O'Loughlin, Paradis, Masson & Sacks-Silver, 1990, p. 448). No statistically significant impacts of smoking prevention programs on children's knowledge, attitudes, intentions, or behavior were detected in the three quasi-experimental evaluations (Kishchuk et al., 1990).

Two prevention programs that provide skills for resisting social influences (resistance skills) have been shown to be particularly effective (Perry, n.d.). Both the Life Skills Training (LST) program (Botvin,

1986) and the Minnesota Smoking Prevention Program (MSPP) (Murray, Davis-Hearn, Goldman, Pierie & Luepker, 1988) targeted junior high schools and enlisted classroom teachers and older peers to engage the students. Perry (n.d.) suggests that only the social influence approaches have been scientifically demonstrated (through replicated research studies) to reduce or delay adolescent smoking in school-based programs. But, without additional education and community interventions, the effects of these programs have not been sustainable (Perry, n.d.).

Although there are a number of teen smoking prevention interventions, even effective interventions are limited in their impact unless the intervention is readily available and is easy to implement in a target population (Pallonen, 2001). Using computers and the Internet for a smoking prevention intervention allows users the ability to access the program at any time. More than 25 million kids ages 2-17 are online in America and millions more will be coming online from both home and school (Grunwald Associates, 2000). Teenagers report that they are more likely to be on the Internet at school than at home (Grunwald Associates, 2000). By the fall of 2000, 98% of public schools were connected to the Internet as compared to 35% in 1994 (Williams, 2000). Unlike previous years, there were virtually no differences in school access to the Internet by school characteristics (e.g., poverty level and metropolitan status) in 1999 or 2000 (Cattagni & Westat, 2001). Over half of public schools with access to the Internet reported that computers with access to the Internet were available to students outside of regular school hours (Williams, 2000).

As compared to traditional educational tools (i.e. self-help materials, video, instructor, etc.), the Internet provides an advantage by allowing individuals to choose information that he/she thinks is relevant to his/her behavior (Strecher, 2000). The majority of current smoking-related websites provide a plethora of general information, such as smoking statistics, physical impact of smoking, and tips on how to quit smoking. However, the technology is not always utilized to it's potential for providing interactive and appealing techniques for relaying information that go beyond a traditional text book approach.

The Internet holds great potential as a delivery medium for youth-based smoking prevention interventions. The web provides an environment that can be graphically appealing, anonymous, and nonjudgmental, while simultaneously incorporating mutual support and accessibility 24 hours a day (Abate, 1999; Abrams, 1998). Although research has been limited, evidence thus far shows that the

Internet provides "an extremely powerful tool for health education and brief interventions regarding alcohol, drug, and tobacco use" (Skinner et al., 2001, p. 298).

An intervention that is web-based is practical for multiple reasons; it reaches a wide audience, is inexpensive to implement, is easy to update and collect data, and is readily accessible. To date, there are a limited number of web-based health education programs that have been evaluated, and even less research has been done with adolescents to evaluate the acceptability and appeal of such programs.

Because the Internet is such a new option for prevention programs, there is little empirical support for the effectiveness of web-based smoking prevention approaches. Although several recent studies have examined issues surrounding the use of multimedia and the internet in the quality, usability, and effectiveness of smoking cessation interventions, very little data exists regarding web-based prevention programs (Edwards, Elliott, Conway & Woodruff, 2003; Cheh, Ribisl & Woldemuth, 2003; Backinger, et.al., 2003).

One study of 255 participants, randomly assigned to one of three conditions (paper-based, web-based, web-based with interruption), compared web-based assessment techniques with traditional paper-based methods of commonly used alcohol use measures (Miller et al., 2002). Although the results showed no significant differences between assessment techniques, Miller et al. (2002) suggest that "web-based methods are a suitable alternative to more traditional methods because this cost-efficient alternative has the advantage of minimizing data collection and entry errors while increasing survey accessibility" (p. 56).

Purpose

The purpose of this study was to determine the acceptability of the web as a delivery medium for a smoking prevention intervention for middle school students. Secondarily, the study attempted to identify design elements for inclusion in a web-based smoking prevention intervention that are appealing to adolescents.

This project will help expand current knowledge of adolescent smoking prevention programs by gaining a better understanding of the preference of adolescents (acceptability of medium) and the presentation (appeal). The potential success of web-based health education interventions relies on the ability to create new and innovative tools. One of the keys to ensuring that the programs are innovative and appealing to your target audience is to involve them in the creative process.

Methodology

Study Population and Sample

The study population consisted of all students in the sixth, seventh, and eighth grades at three selected middle schools located in predominantly small urban areas of the Midwest. The study sample was 27 students who were divided into three groups based on the school they attended. Group A included eight (8) sixth grade students. Group B included 10 eighth grade students. And Group C included nine (9) eighth grade students. All students attending the selected schools had the opportunity to participate in the focus groups, which were filled on a first come, first serve basis.

Participant Recruitment

A letter was sent to a convenience sample of fourteen area middle school teachers describing the project and the desire to conduct focus groups with his/her class. The middle schools were selected based on response to the letter. A follow-up phone call was made to each teacher and dates were set accordingly. Each middle school teacher informed their students about the opportunity to participate in the focus group and then he/she disseminated consent forms for the students to take home. The students from each class that returned a signed (by parent/legal guardian) informed consent participated. On the day of the focus group, each student participant and one research staff member reviewed and signed the consent form previously signed by his/her parent (or legal guardian). Participation was entirely voluntary. The students were free to drop out of the study at any time with no effect on his/her school program, grade, or other activities.

Confidentiality

All group members were asked to keep the content of all group discussions confidential. The participant needed only to give his/her first name during the group session. Because the student was with a group of other students from his/her school, we couldn't guarantee that a participant's verbal answers during discussion remained confidential among other students. However, students were asked to complete a non-disclosure form on the day of the focus group. All study procedures were reviewed and approved by the University of Michigan Internal Review Board (IRB).

Focus Groups

The location for the focus groups was in a classroom in each selected middle school during school hours. The room set-up was dependent on the ability to adapt the classroom. A round table for open and comfortable conversation as well as ample room for computer set-up was most ideal. The computer and a projector displayed the ASHES program for

participants to easily view.

During each of the 45 minute discussion sessions, focus group participants were asked to describe and explain their views and feelings about preference of delivery medium for smoking information. The students were then asked to discuss how and why they use the Internet and what does and does not appeal to them on the Internet. Questions were developed to elicit information regarding internet use and appeal from the perspective of middle school age children. Students were then given an opportunity to view a sample of an existing web-based smoking prevention intervention (The Adolescent Smoking Health Education Source or ASHES). Students were asked about design elements they would prefer or that would enhance the ASHES intervention.

The ASHES program is a multiple theory-based smoking prevention program developed by researchers at the University of Michigan Health Media Research Laboratory. The program is delivered via the Internet, which gives students access to the program website and survey sections. Students are assessed on smoking status, attitudes about smoking, and perceptions and experiences with smoking (Pallonen, 2001).

Discussion Guidelines and Interviewer/Moderator Guide

The focus group moderator was a health education graduate student who participated in the implementation of this study and who has had prior experience facilitating focus groups with kids on health issues. The moderator's role was to keep the group process and dynamics under control at all times. The moderator asked only six to eight questions to encourage discussion. Questions pertaining to usability issues were based on concepts identified by Nielson (1994,2003) with regards to usability engineering in general and usability of websites for children, specifically. Ground rules were set prior to opening any discussion.

Specific focus group questions and probes are as follows;

1. Where might you access information on smoking? What would you most likely use as support for smoking prevention or cessation information? Why?
2. What would you like to see on a website about smoking prevention for adolescents?
   - Describe the images (pictures, people, video)
   - Describe the layout of the website (color, patterns, font)
   - Describe any sounds or voices
   - What else would you include?
   - What are some things you wouldn't want included?

3. Review ASHES website

Data Collection and Analysis

The focus group discussions were tape-recorded for further review by the researchers. A note-taker was also present. The tape was transcribed and notes were incorporated into the transcription. Students were asked to complete a seven item focus group feedback survey at the end of the session in order to evaluate their experience with the focus group.

Upon completion of the focus groups, but before transcription of the tapes, the research staff met and debriefed on the focus group discussions. Questions included the following:

- What were the important themes or ideas?
- How did these differ from what we expected?
- How did these differ from the other focus groups?
- Were there any unexpected findings?

After the research staff debriefed, and the notes and tapes were transcribed, a narrative report was written to present the focus group results. A narrative report is a traditional focus group report that typically is composed of the key questions or the big ideas that have emerged from the discussion (Krueger, 1998). The descriptive model of the narrative report is a summary paragraph for each question, followed by illustrative quotes (Krueger, 1998).

Results

A total of 27 students participated in the three focus groups. Focus group A included seven White females and one White male. Focus group B included six White females and four White males. Focus group C included four White females and five White males. Each focus group was conducted within a 45 minute session.

Obtaining information about smoking

Regarding delivery medium preference for smoking information, students more often cited people rather than places. Parent, teacher/counselor, or friend seemed to be who the students were most comfortable with in discussing an issue such as smoking. "Who" seemed more important to the participants than the "where". One sixth grade student stated "I would go to my mom because she used to smoke, and she still knows what it feels like to smoke, so she would tell me not to do it." Another eighth grade student mentioned getting the information at school, "… a teacher…like a science teacher or someone you know teaches stuff like that…".

Although several students mentioned obtaining smoking information from the Internet, there was a general distrust of the information as compared to information gathered from teachers and parents. A sixth grade student said "…you could go on the

Internet, like, to places that you know or that somebody told you, or stuff like health issues like you said and to figure out how to stop smoking or to not even smoke." While students in both the eighth grade groups agreed with statements such as

"I disagree with the computer thing, just because there's so much stuff…" and "A lot of the information is false on the Internet, and also, like your friends, because your friends might not know, they probably know as much as you do, and if they know more, it might not be, like, correct, and so you might get the wrong information."

When asked specifically why they might go to the Internet for smoking information, a generally positive discussion surrounded the idea. The consensus was that the Internet was easy to use and had a wealth of information that one could access to learn more about smoking. Ideas like interactive tools that carried an individual through the negative effects of smoking were discussed. Interestingly, several students mentioned the more interpersonal and interactive aspects of the Internet as why they would use it to obtain smoking information. For example, a sixth grade student stated

"You could like, talk to somebody in a chat room or something and they don't have to know who you are", "And they will also tell you not to smoke, or um, what it does to you and how you could die from it and it will hurt your heart and stuff."

Internet use and appeal

Students general use of the Internet tended to center around doing homework, researching for a school assignment or project, e-mailing, shopping, and just for having fun. The students elaborated on this question by talking about some specific sites that they like to visit. Sites where they were able to buy items, create different things, and play games seemed most popular.

The students reported Internet use everyday to weekly. Although an actual count was not collected, the majority of students remarked that they had a family computer at home and all had access to computers at school. Internet use at home and Internet use at school seemed to be equally split. The student's expressed that there were designated times in their library and/or media center that they have access to the Internet during school hours.

When asked what makes websites cool and what makes one go to them, students overwhelmingly identified interactivity as a reoccurring theme. Games, interesting information, kid-voting polls, interesting facts about an idol, movie clips, and e-mailing the "stars" all seemed to entice the students and/or make a website more attractive to them. Other attributes that appealed to the students were music,

graphics and pictures, and bright colors. Several students mentioned the use of graphics or pictures over predominantly text-based sites. Specific comments included "Well, yeah, like if they have more pictures, you get more attracted to them, you want to look at them more because they look interesting" (eighth grade student), and "I really hate reading, but like if you have pictures then you can kind of get a feel for it – or like a video..." (eighth grade student).

When asked what characteristics of websites were not appealing, the students mentioned sites that contained a lot of advertising and that tried to encourage the user to buy something. Also mentioned were sites that forced the user to click (navigate) numerous times to get to the part of the site the user was interested in.

Smoking

When asked what are some images that come to mind when you think about the phrase "teen smoking," students referred to images such as dirty lungs and pictures of smokers missing part of their face. Anti-smoking billboards and television commercials were discussed. The emphasis seemed to turn to the "type of person" that is seen as a smoker. A majority agreed that smokers were seen as "loners" or "bad" kids, skipping school and smoking in the back alley.

When asked to describe what a cool website would look like that talks about anti-smoking, two themes emerged: visual appeal and content appeal. To make the site visually appealing, suggestions were offered such as music, modern look or feel, colorful and flashy design, and possibly some type of cartoon images. The students offered a role model as the host of the site, chat rooms, question and answer section, advice, games, and quizzes as suggestions on what would make the content interesting and inviting. One sixth grade student stated "Like a game where people are asking you to smoke and you try to talk them out of it. And it gets harder and you get more points." Another commented "Maybe like an athlete section? Like to say not to take drugs 'cause if you're an athlete, like if you're a football player, you'd have trouble catching the ball."

Students also felt it was important that the content be realistic and believable and contain a personal element as opposed to a textbook approach. Statements from eighth grade students included:

"Maybe like a real interview with a person who like admitted that they did something wrong and stuff, and like it actually hurt them, instead of just like reading about it, they could like actually hear it or something.",

and

"…it's got to be good writing. I mean you don't

want to have something that's like a textbook or something like this happy-go-lucky don't smoke. Oh cool – kids who don't smoke. It's gotta be realistic and it's gotta be interesting reading to kinda catch your eye."

ASHES review and feedback

After reviewing the ASHES website, feedback and comments across the three groups was very similar. The groups felt that the ASHES website was repetitive and boring and that the following ideas could help enhance the experience: music, noise when you click on an active link, more colors and features, different font, and real pictures. Students also mentioned the use of a host to lead the user through the program.

Focus Group Feedback Survey

A Focus Group Feedback Survey was also conducted at each of the three focus group sites. The purpose of the Focus Group Feedback Survey was to evaluate participant satisfaction with the focus group process. Overall the results of the survey were overwhelmingly positive with all participants agreeing that the focus group was worth their time, that the instructor gave easy to follow directions, and that the instructor was helpful in directing the groups.

When students were asked what they liked most about the focus group experience, comments included: "I liked that we could share our opinions and not be embarrassed." (sixth grader),"I liked talking about what would make the website cool." (sixth grader), "Being able to help others." (eighth grader), "The topic in general. I have friends that smoke." (eighth grader).

When asked what they didn't like about the focus group, participants stated: "I didn't like the website much without color." (sixth grader), "We didn't have enough time." (eighth grader), "I would have liked to look at the site on a separate computer." (eighth grader).

Discussion

This project helps expand current knowledge of adolescent smoking prevention programs by demonstrating an understanding of the preferences of adolescents regarding acceptability of the web as a delivery medium and the appeal of web design elements.

Although many students have access to computers outside of school, schools are a logical location for the integration of prevention programs into the health education curriculum. School-based programs can have a significant impact on smoking behavior among young people and are most effective when part of a comprehensive, community-based effort (Satcher, 2000). It is undeniable that as internet based programs become more available to the schools

their utility as a new an innovative tool for addressing youth smoking will increase. The Internet will continue to be a good choice for delivery of prevention programs due to its accessibility, and affordability and availability in most schools.

Although as was evidenced in this study, middle school age children do not necessarily choose the Internet as their first option for seeking out smoking related information, when presented with an Internet based program they will be engaged and receptive. The results of this study illustrate the need for program developers to involve members of the target audience in program conceptualization, and formative evaluation measures. These results further suggest that the Internet is a viable choice for seeking out smoking information. The focus groups commented on ease of use of the Internet and the ability to access a large amount of information to learn more about smoking prevention. Given the student identified appeal of a human aspect to the Internet (chat rooms, expert guides etc.) suggests that programs aimed toward this age group should contain some type of human interaction, as opposed to creating an environment where students are expected to navigate toward information on their own.

The Internet's availability to students both at home and at school suggests that using the Internet in conjunction with support from a teacher/counselor or parent, would be a convenient, interactive, innovative, and effective way to assist in seeking out smoking related information.

Interactivity was a reoccurring theme with regards to appealing Web design elements. Music videos, desk-top and hand held computer games all use a dynamic approach that appeals to the teen population. By providing a like experience through the Internet, teens will be more drawn to accessing, utilizing, and interacting with smoking prevention interventions.

Visual appeal and content appeal were important characteristics in a smoking prevention website. Attributes such as voting polls, movie clips, games and quizzes, and e-mail attracted students to their favorite websites. Music, graphics and pictures, and bright colors can all be used to create and bring a modern look and feel to the serious and challenging subject of teen smoking.

This study was limited by several factors. The study employed a convenience sample, therefore the findings are not necessarily generalizable to other populations. Additionally, given the student's voluntarily participation, the sample may have been biased toward students who had an existing interest in computers and the Internet. The schools were also all located in areas with an above average socioeconomic status. It is conceivable therefore, that

the sample may have had more access to computers at home and at school. Finally, sixty-three percent of the sample subjects were female, and all subjects were Caucasian. This may have limited the group discussion and the diversity of views represented.

Conclusions

The Internet provides innovative opportunities for reaching the teen population. For this to be an effective medium for the delivery of smoking prevention information, it is imperative that the target population has input into the design and functionality of the program.

The school is a logical location for smoking prevention education delivered via the Internet. Schools facilitate and support education by providing an avenue for the delivery of prevention information to each student. Web-based programs have the ability to draw teens in by the innovative nature of the delivery mechanism while simultaneously providing teens the ability to create an individual experience. Knowing that curriculum at most schools is highly structured both in content and in time allotment, it is suggested that teachers and counselors look for creative ways to incorporate web based programs into their existing curriculum as an innovative way of delivering the information.

Because the Internet is such a new option for prevention programs, the possibilities for future exploration in this area are vast. This study and its results suggest future research in a number of areas including the quantification of various design elements for inclusion in an adolescent smoking prevention website and the examination of differences in efficacy between web-based prevention interventions and traditional programs. In addition, programs need to continue to be developed following sound principles of usability and evaluated accordingly. It has also been suggested that any research which includes health education strategies and computer based interventions include an examination of multimedia and instructional technology learning theories (Soto Mas, Plass, Kane, & Papenfuss, 2003 a,b). By identifying and implementing multiple approaches to smoking prevention, the future of smoking prevention in adolescents remains promising.

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