 © 2003 Springer Publishing Company

A Web-Based Bilingual Teen Health Intervention: Lessons Learned

Cathy Strachan Lindenberg
Susan Hunter Yates
Meg Strawbridge
Angela Chen
Aubrey Hale
Meaghan C. McElroy
University of Washington, Seattle

Rosa Maria Solorzano
Kathy Pittman
Georgia State University, Atlanta

Six common risk behaviors contribute to 75% of morbidity and mortality in the United States. These behaviors are: tobacco use, alcohol and drug use, risky sexual behaviors, lack of physical exercise, poor nutritional habits, and intentional and unintentional injuries. These behaviors are often clustered together or are interrelated resulting in poor health and social outcomes. By and large, these behaviors are established during adolescence, persist into adulthood, and are preventable. While these behaviors are widespread among adolescents, they are particularly problematic within the disadvantaged Latino and other minority youth populations; they are aggravated by issues of poverty, low levels of education, pressures to acculturate, and limited access to health information, insurance, and services. This article describes a pilot demonstration study designed to educate youth about healthy behaviors and life decision making. The article describes the feasibility and acceptability of delivering an empirically based, bilingual, interactive intervention, TeenSmart: Informa-T/Ayuda-T (Inform Yourself/Help Yourself), via the Internet among 30 predominantly Latino adolescent youth in a school setting. Lessons learned are provided, but quantitative research and analysis of the program outcomes have not yet been conducted.

Seis comportamientos arriesgados y comunes contribuyen al 75% de la morbosidad y de la mortalidad en Estados Unidos. Estos comportamientos son: uso de tabaco, uso de alcohol y de drogas, comportamientos sexuales arriesgados (RSB), falta de ejercicio físico, pobres hábitos alimenticios, y lesiones intencionales, y accidentales. Además, estos comportamientos frecuentemente se agrupan o están correlacionados, conduciendo así a consecuencias negativas sociales y de salud. Generalmente, estas prácticas se establecen durante la adolescencia, persisten en la edad adulta y son evitables. Aunque comunes entre adolescentes, estos comportamientos son particularmente problemáticos para jóvenes Latinos igual que para otros jóvenes que pertenecen a minorías étnicas, puesto que los agravan problemas como la pobreza, un bajo nivel de educación, la presión hacia la asimilación y el acceso limitado a información, servicios y seguro de salud. Este trabajo describe un proyecto preliminar diseñado para educar a jóvenes sobre comportamientos sanos y de cómo tomar buenas decisiones con respecto a sus vidas. El artículo describe la viabilidad y la aceptabilidad de hacer una intervención, bilingüe, interactiva y basada en resultados empíricos, conocida como TeenSmart: Informa-T/Ayuda-T. La intervención tomó lugar a través del Internet y fue dirigida a un grupo de 30 adolescentes, en su mayoría Latinos, en un ambiente escolar. Se incluyen las lecciones aprendidas, aunque todavía no se han hecho una investigación y un análisis cuantitativo de los resultados del programa.

Six common risk behaviors contribute to 75% of morbidity and mortality in the United States. These behaviors are: tobacco use, alcohol and drug use, risky sexual behaviors (RSB), lack of physical exercise, poor nutritional habits, and intentional and unintentional injuries (Centers for Disease Control, 2000). These behaviors are often clustered together or are interrelated resulting in poor health and social outcomes. By and large, these risky behaviors are established during adolescence, persist into adulthood, and are preventable. While these behaviors are widespread among adolescents, they are particularly problematic within the disadvantaged Latino and other minority youth populations; and they are aggravated by issues of poverty, low levels of education, pressures to acculturate, and limited access to health information, insurance, and services (Lillie-Blanton, Parsons, Gayle, & Dievler, 1996).

Latinos are the fastest growing minority in the United States. Currently, they represent almost 12% of the population and are expected to represent 15% by the year 2015 (United States Department of Commerce and News, Economics and Statistics, 1997). The Latino population is youthful, with about 30% under the age of 15 years, compared with only 20% among the non-Hispanic White population. Finding ways to empower Latino adolescents about their health, their life decision making, and their families is of utmost importance.

Simultaneously, use of the Internet is widespread and growing. Web-based information is becoming increasingly accessible and affordable, and potentially may be an effective resource for providing individuals, families, and organizations with education, counseling, and referral. While it is estimated that approximately 41% of White households own a computer, among Latino populations, it is estimated that only 19% own a computer. Unfortunately, this gap in ownership is greater than it was 3 years ago (National Telecommunications and Information Administration, 1998).

Despite this growing inequality in access, the use of web-based technology may still be a valuable avenue to track and understand factors that influence health behaviors and health outcomes, especially among adolescents. A Kaiser Family Foundation study (Rideout, 2001) found that 75% of 15- to 24-year-olds on-line have used the Internet to search for health information. More importantly, youth are looking up information about specific health issues: pregnancy, birth control, HIV/AIDS and other STDs, weight issues or nutrition, mental health, drugs and alcohol, and violence (Rideout, 2001).

Given youth's interest in the Internet as a tool for educating and empowering themselves about health, and given the existing technology gap between Latinos and other minority groups and their more connected White counterparts, we have designed a program to bridge these trends and to increase opportunities to individualize health in a more accessible, confidential, and sensitive manner for Latino youth. Community-based organizations, such as schools, may be optimal institutions for bridging this technological, educational, and health status gap, so our pilot was conducted among 30 predominantly Latino adolescent youth in a school setting. This article describes our pilot demonstration project and considers the feasibility and acceptability of implementing an empirically based, bilingual intervention in the form of a health education and decision-making, empowerment curriculum and self-help resources titled TeenSmart: Informa-T/Ayuda-T (Inform Yourself/Help Yourself) delivered via the Internet.

Conceptual Framework for TeenSmart: Informa-T/Ayuda-T Pilot Project

The conceptual framework chosen to guide the design of the curriculum and its evaluation measures was the Social Stress Model for Substance Abuse and Other Risk Behavior Prevention (SSM) (Rhodes & Jason, 1988). This model posits that risky behaviors are influenced by multiple and dynamic individual, family, and environmental factors. The model takes into account demographic and social background risk factors, such as age, gender, ethnicity, and socioeconomics, and the stresses that arise from acculturation and immigration. In the model, protective factors (i.e., family support, communication and cohesiveness, peer and environmental social influence, and individual personal competencies) help diminish the impact that social, demographic, and antecedent factors and lifetime stressors have on the initiation and continuation of alcohol, tobacco, and other drug (ATOD) use and other risky behaviors. Our curriculum and our evaluation measures were tailored to address the unique risk and protective factors in an adolescent's life.

Culturally sensitive bilingual content and methods for this educational intervention program were developed through a series of evidenced-based research studies, and work with teenagers and young adults in community and school settings (Lindenberg, Gendrop, Nencioli, & Adames, 1994; Lindenberg, Solorzano, Kelly et al., 1998; Lindenberg, Solorzano, Krantz et al., 1998; Lindenberg et al., 1999; Lindenberg, Solorzano, Munet-Vilaro, & Westbook, 2001; Lindenberg et al., 2002). The studies were funded by numerous intramural and extramural federal and private sector grants, including National Institutes of Health, National Institute for Nursing Research, and National Institute for Drug Abuse. A multicultural, interdisciplinary team of educators, researchers, and clinicians collaborated to produce literature reviews and ethnographic studies, which led to the development of measurement tools for intervention strategies. Studies included reviews of the literature focused on methodological studies to develop valid and reliable evaluation measures, and design of intervention materials consistent with the theoretical model and intended outcomes. Latino and other ethnically diverse teenagers collaborated in

the development of the problem-based case studies and curriculum content materials. Intervention field pilots were done to test the acceptability of the content and teaching methods (Lindenberg et al., 1993, 1994; Lindenberg, Solorzano, Kelley et al., 1998; Lindenberg, Solorzano, Krantz et al., 1998; Lindenberg et al., 1999, 2002).

In addition, high school teens and college nursing students worked collaboratively during two spring quarters (see also Huyhn et al., 2001; and Ahl et al., 2002) with support of school administration and teachers to create new features for the intervention and to adapt the educational materials for use on the Internet. A number of the website features were developed based on a needs assessment conducted with and for the high school students. Other features were incorporated from previously successful materials developed by the author and colleagues.

Program Design and Structure of TeenSmart: Informa-T/Ayuda-T Intervention

The bilingual (Spanish/English) TeenSmart website is comprised of two major sections: a series of assessment tools used for teens and program staff, *How Healthy Are You?* and an intervention for teens, *Educate and Empower Yourself.* The first section promotes self-assessment. Information is collected from program participants in a database that accommodates tracking of responses over time. This section is divided into two surveys: (a) *How Healthy Are You?* a 40-item questionnaire that assesses the teen's health behavior patterns and provides the teen with immediate written feedback about his/her lifestyle behaviors, and (b) *The Youth Multiscale Profile* (YMSP), a research-based questionnaire that evaluates the risk and protective factors posited in the SSM. The YMSP is used by the program director for research on teen behaviors and evaluation of program impact.

The second section of the website, *Educate and Empower Yourself,* is the main intervention of the program and it promotes self-management and self-care among teens. It has five features: (a) "the 12-lesson TeenSmart Curriculum" that focuses on the six risky health behaviors and life skills that may reduce these; (b) "health topics," which provides facts to teens about a wide variety of health topics; (c) "Internet links" to other carefully selected adolescent health promotion sites; (d) "resources in your community," which provides a list of current addresses and telephone numbers of local, regional, and national health and social services for teens; and (e) "Get Advice," an interactive nursing consultation and referral email service.

The Intervention Curriculum: TeenSmart: Informa-T/Ayuda-T

The intervention curriculum seeks to help teens understand their health behaviors and develop strategies to make wise choices to help them live fully and productively. Specifically, the curriculum is intended to enhance the knowledge, skills, and attitudes of adolescents, with an emphasis on ATOD, RSB, and violence. The curriculum engages teens in personal and interactive problem-based exercises that focus on clarifying values, setting personal goals, and building self-esteem and self-efficacy specifically related to ATOD, RSB, and violence. Additionally, the curriculum aims to enhance social support (i.e., family communication and cohesion) and positive social influences (improving selection of peers with reduced levels of risk behaviors).

The curriculum is provided through a website and offers a personal and confidential computer course notebook. The curriculum consists of 12 lessons facilitated by a TeenSmart teacher. Each lesson has boxes where the teen can type his or her answers to questions and/or exercises. The teen is the only one who can access the notebook, except for an anonymous TeenSmart teacher who provides feedback and encouragement and responds to teens' questions and concerns. The feedback provided is based upon motivational written principles (Miller & Rollnick, 1991): (a) the application of teen-centered counseling responses; (b) the importance of perceiving the world from the teen's viewpoint; (c) "rolling with resistance" in an accepting and supportive relationship free of confrontation or prescriptive responses; and (d) promoting teen self-control, problem solving, and decision making. All teen responses are private and are never shared with parents, schoolteachers, friends, or anyone else, unless the teen reveals that he or she wants to do harm to him/herself or another human being. In this situation, breaking the confidentiality is legally necessary. Each module of the curriculum takes less than an hour to complete. A summary course matrix provides the teen with feedback regarding what lessons and what sections have been completed, and incentive points are earned for lessons completed. In this pilot demonstration project, the participants received a financial incentive for each module completed. The participant could print out a copy of their course notebook, if desired.

Each lesson is comprised of four sections, each one about two pages in length:

- Risk. This section promotes knowledge by providing current information on topics such as alcohol, cigarettes, abstinence, safe sex, teen pregnancy, violence prevention, and stress management. It also offers other links such as "Health Topics," "Internet Links," and "Resources in Your Area" so that teens can continue learning.
- Resilience. This section emphasizes skill building, increasing motivation, and self-management habits of effective living. *The Seven Habits of Highly Effective People,* a foundational set of principles for daily living, provides the framework and content for building these competencies (Covey, 1989). *The Seven Habits* has three major foci that are congruent with building protective factors posited in the SSM. The first three habits help

build personal competence: (a) Be proactive: Take responsibility for your life; (b) Begin with the end in mind: Define your mission and goals in life; (c) Put first things first: Prioritize and do the most important things first. The second three habits are: (a) Think win-win: Have an everyone can "win" attitude; (b) Seek first to understand, then to be understood: Listen to people sincerely; and (c) Synergize: Work together to achieve more. These work toward the development of effective interpersonal and social skills.

- Reflection. This section encourages the teen to apply concepts presented in the risk and resilience sections by providing problem-based cases and written exercises. The reflection section presents short stories with questions to follow about scenarios that teens face. The questions analyze these situations, promote application of the concepts learned, and explore the possible consequences of choices, as well as alternative solutions. The teen is given time to think and write about his/her own life today and in the future.
- Response. This section asks the teen to share what he/she is learning with someone important (i.e., a parent, adult, or peer); to practice some of the ideas discussed to see how they work; and to find ways to make them work more effectively. Teens are encouraged to write back about their experiences.

In summary, each lesson builds upon the previous lesson to form a curriculum that promotes understanding and practice of knowledge, skill, and motivation for effective and healthy living.

Evaluation Design of the Pilot Demonstration

The purpose of the pilot demonstration project was to assess the feasibility and acceptability of conducting an Internet, health-promotion curriculum and resource that may promote positive, healthy choices and behaviors among teens. This article offers a narrative of lessons learned from the program so far. This article does not provide a scientifically based evaluation of the intervention program behavioral outcomes.

Informants for this evaluation included school administrators, teachers, staff, students, the webmaster, data programmer, data analyst, and TeenSmart teacher. Data collection methods included focus groups, informal interviews, research team journal entries, observations, and web-based evaluation survey instruments. Feasibility focused on the organizational, human, physical, and technological capabilities and assets required to deliver the intervention via the Internet. Measurement criteria for assessing feasibility included: organizational infrastructure, computer requirements, computer expertise, and TeenSmart teacher/moderator skills. Criteria to assess acceptability focused on the conditions necessary to assure that the content and methods of the intervention satisfied and engaged teens. Measurement criteria for assessing acceptability included: contextual and developmental relevance, confidentiality, recruitment and retention, cultural sensitivity, language appropriateness, interactive responsiveness, curriculum layout, and flexibility of the methods and materials.

Setting and Sample for Evaluation of Feasibility & Acceptability. A voluntary sample of 30 predominantly Latino adolescent boys and girls were recruited via flyers, letters of invitation, and personal contact during the lunch hours at an inner-city, public high school in the Pacific Northwest. Both teens and parents provided written informed consent to participate. The school was comprised of 750 ninth to twelfth graders from mainly economically disadvantaged populations (43% Asian, 38% African American, 10% European Caucasian, and 10% Latino). The average age of the participants was 17 years. Fifty-seven percent (n = 17) of the participating teens were female. Average family income was less than $20,000 per year. Sixty percent (n = 18) of the teens were Latino, 17% (n = 5) African American, and the remaining participants were Somalian, Asian, and Pacific Islanders.

Enrolled students were oriented to the web-based program in one of the school computer laboratories. After the initial instructions, they created PIN identification numbers and conducted the two baseline surveys: *How Healthy Are You?* and the YMSP. These surveys required approximately 90 minutes for completion. Following the baseline enrollment, students continued to complete the 12-lesson TeenSmart curriculum at their own pace. Twenty-one students or approximately 70% completed the TeenSmart 12-module interactive curriculum. The pilot project was conducted over a 6-month period of time (summer through fall 2001). The following section of this article presents some lessons learned from this pilot demonstration.

Lessons Learned about TeenSmart Demonstration Pilot Study

Feasibility

Feasibility was defined as the organizational, human, physical, and technical capabilities and assets required to deliver the intervention via the Internet.

A Supportive Organizational Base and Environment. While Internet and computer technology are growing tools for education, their effectiveness strongly depends upon the context in which they are used. There were a number of organizational factors that facilitated the successful implementation of this pilot project. Some of these included: conducting the intervention in a youth development/education setting where large numbers of teens congregate; the involvement and support of students, staff, and teachers; expertise of web designers, data programmers, and data managers; access to state of the

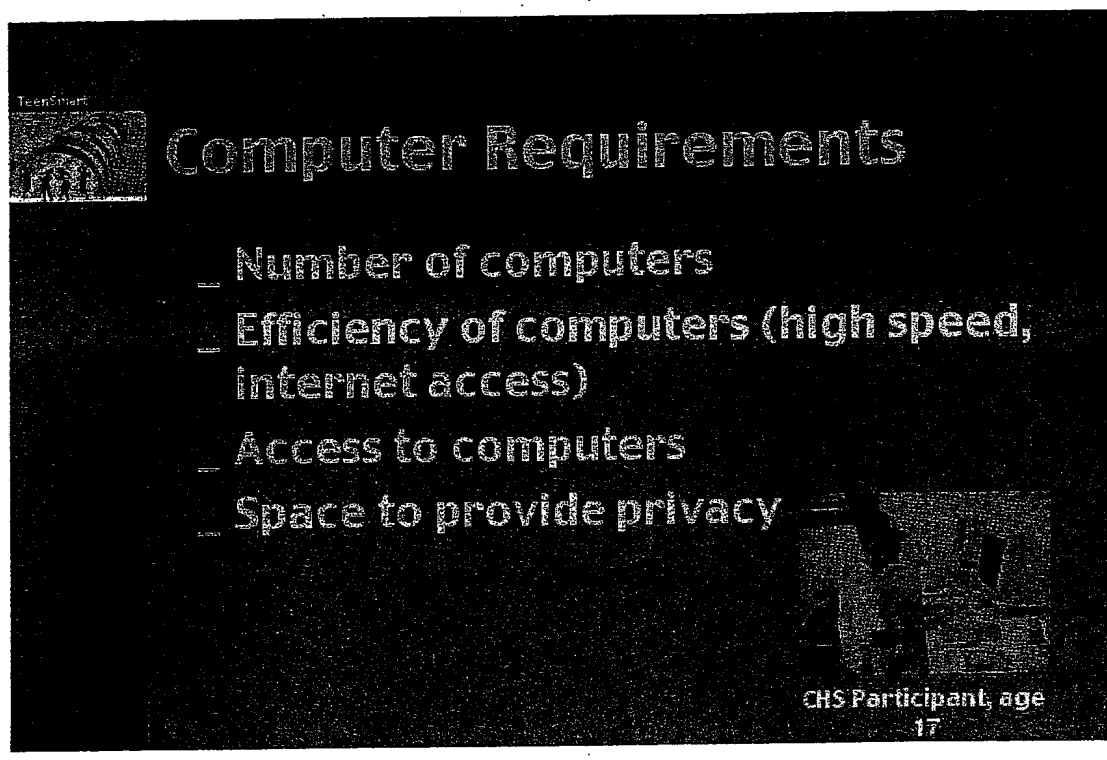

Figure 1. Computer requirements.

art computers with sufficient RAM and memory to support the various features of the interactive website; youth incentives for participation; and peer influence and excitement about computers (See Figure 1).

This web-based intervention was developed as an innovative tool to enhance the services of existing youth development organizations. We did not intend it to be a "solo intervention." We selected a setting in which the mission and values of the organization focused on youth development, education, and preventive health care. The inner-city high school selected for the pilot study not only serves an urban and Latino population, but it has some of the highest risky behavior statistics in the state of Washington. Because of this, the school requires that students take a health education course for graduation. The school also provides a teen health clinic, school nurse services, and counseling. It was a setting that provided ready access to teens needing preventive health education, and it welcomed our innovative approach.

A second ingredient of success was the strategic and collaborative development of the web-based intervention. School administration, faculty, staff, and students were involved over a period of 2 years in the design and implementation of the project prior to launching it. This involvement was key to its feasibility. Students helped determine topics for the website and curriculum by contributing their life experiences for case studies and by offering suggestions for the numerous features of the website. Senior nursing students at the University of Washington worked collaboratively with the teens to elicit their participation. An advisory committee of teens, parents, faculty, and staff also provided initial and ongoing suggestions and support.

Computer Requirements. We learned that the successful implementation of a web-based intervention is enhanced by the availability of computers with high-speed Internet access in private, accessible spaces. We undertook initial, informal, school-wide surveys of computer needs and computer literacy in order to understand the school resources and to assure that the environment could support our project. Initially, there were very few computers, and many were not Internet linked and had too little memory and RAM to support our program. Over time, the high school's computer hardware and software capacity grew, providing over 120 Internet-linked computers, distributed in classrooms and libraries. Despite improvements in the school, students were unable to access the computers during summer months and had to resort to local libraries and community centers. Only 4 of 30 teens had access to the Internet in their homes. Students with computers connected to the Internet completed the TeenSmart course most readily, while students who depended on public computers were less likely to complete the program. More teens participated during the school calendar months than during summer months. Access to a computer was essential.

Computer Technological Expertise and Support. We learned that a competent and experienced webmaster, computer programmer, and data analyst are essential to the effective delivery of a web-based interactive intervention. These experts must communicate and coordinate their efforts carefully. A webmaster must continually update graphics, design, and functionality. A data programmer must assure that links, database retrieval, and functionality are effective. A data analyst must readily

analyze incoming data and provide aggregate findings, as well as individual findings. The three must work closely to ensure accuracy of data and timely responsiveness to the teens. Beta testing of all the site features is important prior to launching any pilot.

Protecting against the loss of confidentiality was an important programming consideration. First, subjects were assured the freedom to refrain from answering any questions they did not wish to answer on the *How Healthy Are You?* and the YMSP. Secondly, all data obtained from the web-based survey questionnaires were identified by a PIN, which was generated for evaluation purposes. PINs and participants' names never appeared on the Internet website simultaneously, so Internet data could not be linked to any individual. Thirdly, data were collected using a secure server supporting 128-bit encryption to protect against hackers, computer compromises, and so forth.

The website contains many complex features, such as narrative and quantitative databases, interactive asynchronous communication, bilingual features, and incremental tracking formats. Initially, it was difficult to find and hire persons with sophisticated web-based design and computer programming skills required to develop and maintain the website. Expertise with HTML, ASP, VBScript, SQL, Windows 2000 Server, Discussion Board software, Access 2000, SQL Server, and Photoshop are required, not only for the design, but to sustain the Internet site. Initial design and programming efforts were inadequate and frustrating. We had many persons working on different aspects of the website, with little coordination and communication. The project constantly evolved, and we kept attempting to do something new. We did not have a technical project manager to organize the development phases, product specifications, functionality, and features. Thus, parts of the website worked, while others did not.

Other problems were related to participants' errors, such as forgetfulness. Students often forgot their PINs and passwords or used capital letters instead of lower case on their logins. Creating a laminated card with those details for each student to carry was a very important facilitating factor.

Acceptability

Acceptability was defined as those conditions necessary to assure that the content and methods of the intervention are satisfying and engaging to teens. There were many sources of information used to assess acceptability of the website. These included a web-based feedback survey attached to each curriculum module, and a summary web-based evaluation at the end of the 12-module curriculum. Focus groups were held with parents, girls, and boys in their respective groups. We learned that there were seven conditions that were key to acceptability of the website intervention: relevance, confidentiality, access and time, interactive motivational responses, cultural and bilingual sensitivity, curriculum layout, and flexibility.

Relevance and Interest. There was a high level of interest among those students who began the pilot program. Peer influence was important to initial marketing. Groups of friends tended to participate together. The opportunity was spread through word-of-mouth and students continued to ask about the course, even after enrollment had terminated for this pilot study. Students were intrigued by use of computer technology, variety of assignments, and formats of information. This was especially true for young men. It was considered "cool" to take a course on the computer. Teens said working on the computer enhanced their reading, writing, and typing skills.

The relevance of the materials to teens' lives was key to sustaining their interest. The materials focused on problems relevant to their adolescent development, and afforded them the opportunity to pick and choose information, as they desired. Teens were drawn to the topics, especially those related to drugs, sex, and communicating with parents.

They appreciated the factual information found in the "Risk" sections of each lesson and in the links to other sources of information. Some expressed prior knowledge of this information, but appreciated the opportunity to reinforce this knowledge. The "Resilience" section provided the students with a framework for problem solving and decision making. Students appreciated having a structure to guide their thinking about choices and behaviors. They enjoyed clarifying their own values, writing their mission statements and objectives for their lives. Some students understood the principles readily, while others did not. Some wanted more in-depth information. The "Reflection" section of each lesson was the most popular. Students felt the short, problem-based stories mirrored their own life situations and risk-taking opportunities. They appreciated the opportunity to reflect upon these stories and to relate them to their own lives, and then to have the opportunity to write about their thoughts. One teenager stated, "I have never done anything before like writing down my goals and values. . . . It gave me time to reflect and think about my future."

Confidentiality. We wanted to create an environment where teenagers could feel comfortable sharing intimate aspects of their lives and discussing sensitive topics. Personal interaction with the TeenSmart teacher and the confidential program format proved to be a significant draw. Participants expressed gratitude for having an adult they trust listen to them. Being able to ask questions, share thoughts/feelings, and explore options in a private manner were appealing. As one teen summed it up, "It's cool to go on the net with problems and have someone else give advice. When you can't tell your friends or parents, then you can get on the Internet."

However, the sensitive nature of the content of the website was controversial. The survey questionnaires included some sensitive questions about family history of alcohol and drugs, child abuse and neglect, delinquency, and so forth. Although teens could skip questions that

made them uncomfortable, one parent expressed concern that the questions invaded family privacy; she had her teen removed from the pilot program. Another student wrote about her feelings of being suicidal. By law, we were required to report any communication related to child abuse and/or suicide to the school counselor, who then followed up with the teenager.

Retention and Attrition. Research demonstrates that interventions are most effective if participants perceive a need to change and are ready for change (Spoth, Redmond, Hockaday, & You, 1996). We found that recruitment and retention are possible, but ultimately they depend upon the motivation of the teen and accessibility of the intervention. This program was available to the participants via the Internet 24 hours a day and feedback was generally provided within 24 hours to 48 hours. Teens had access to the TeenSmart teacher via email and telephone.

While access to computers, computer glitches, remembering the URL, one's PIN, and password, and the lack of a structured time and place were some of the barriers to participation, individual intrinsic motivation and a felt need (by the teen) were, perhaps, the two most important factors in completion of the TeenSmart Course. All the teens were given a monetary incentive after completion of the curriculum. The website was programmed to provide a quick summary of the sections completed. Initially, the monetary incentive seemed an extrinsic motivator for many, but, over time, money did not appear to be an important factor in continuation. Some teens were motivated by their own personal responsibility and commitment to complete the course. Others were motivated because the website addressed some of their personal needs. However, others withdrew or completed only a few of the lessons. As one teenage boy stated, "I am not excited about how other people think and I don't like to go deep into things. Besides I don't have enough time.... girls take away much of it." This participant dropped out after completing only a couple of the lessons.

Interactive Components. We learned that success with the interactive portions depended upon the ability of the TeenSmart teacher to read and respond empathetically to teens. Other key ingredients were affirmation and encouragement. This was accomplished by validating the positive qualities and behaviors the teen shared about himself or herself. Empowerment was another important focus. The problem-based cases encouraged teens to analyze and explore options and consequences of certain risky situations. The TeenSmart teacher encouraged critical thinking and problem solving. The TeenSmart teacher encouraged the teens to find the answers within themselves. The TeenSmart teacher did not argue or confront a teen, but, instead, often asked questions and encouraged discussion in an honest and candid manner, treating the teen as an adult. One teen expressed her satisfaction with these interactive responses, "The person that was writing to me was very cool. She said I had a lot of good qualities. It made me feel better about myself, instead of someone always coming down on me and saying that I am nothing. I felt it was authentic. It sounded like it was just another teenager writing back saying, 'I understand you.'"

Cultural Sensitivity and Bilingual Component. Understanding the cultural beliefs and practices of different ethnic groups participating in the intervention and providing opportunities for these to be examined are important to the acceptability and effectiveness of the program. Many immigrant populations approach discipline, child performance expectations, gender roles and responsibilities, and extended families in ways that differ from those accepted in mainstream America. We believed that an intervention that promotes valuing and exploring these differences to enrich problem solving and behavior modification would aid in the success of the program. TeenSmart has been carefully developed to consider the needs and perspectives of multiethnic and socioeconomically disadvantaged families and teens. One student mirrored her satisfaction, "I liked the stories where they talk about the topic and then there is a story about a girl who has had the same problems. It shows that other people go through the same thing, not only you. This helped me clarify my own thinking."

One important technical feature of the website is the ability to switch between viewing the material in English or in Spanish. Approximately 60% of the participants were second-generation Latinos who spoke English fluently. However, four of the students were recent immigrants from Mexico and Central America who responded in both English and Spanish. The website provided an avenue for enhancing reading and writing skills in English.

Not only did the program reach the teens with limited English, but the "Risk" and "Resilience" sections of each website lesson were mailed to parents in the language of their choice—the majority of Latino parents requested the lessons in Spanish—to enhance parental involvement and adolescent/parent communication. One parent expressed how useful the materials were to her and how they supported her values and approaches to parenting. Another parent stated that she was unable to read or write, but that her son read the materials out loud to her. She felt this opportunity enriched their discussion of these important topics.

Curriculum Layout. The evaluation surveys at the end of each lesson and the end of the curriculum provided beneficial feedback. Students unanimously rated the features of the website as "good" to "very good." They found the format and instructions for using the site easy to follow. We anticipated that students with limited computer experience would find the website difficult to use, but we were pleasantly surprised by how readily they learned to navigate through the program. The students found the reading content easy to understand and captivating. They appreciated the graphics and design, but they suggested that we add music and video features to the website. They also expressed an interest in accessing other teen's views and responses.

FLEXIBILITY. We learned that, generally, teens are busy people and that they struggle to find time to do all the TeenSmart components. Many students were involved in after-school sports and other extracurricular activities. Since most of the teens were economically disadvantaged, they also tended to work. Even though computer laboratories were available after school, teens could not use computers then because of their schedules. During school hours, there was little opportunity to engage in TeenSmart. There were no homeroom periods, and lunch was only 25 minutes long. We learned that time set aside to engage in TeenSmart is an important consideration in designing and implementing such a program. Ideally, TeenSmart could be an integral, complementary component to a required health education course. One health education teacher engaged the teens by conducting group, problem-based case discussions after the teens had individually completed the case analysis on the computers. Teens enjoyed these group discussions. It became apparent that many of the teens were engaged in risky sexual behavior, alcohol, and drug use. The school nurses and counselors suggested they would like to "prescribe" TeenSmart as an enhancement or part of their routine health care services and/or counseling. The teen clinic nurse put a computer in the clinic to offer the TeenSmart curriculum to those teens waiting for appointments.

EFFECTIVENESS OF THE TEENSMART INTERVENTION

The effectiveness of the website intervention ultimately will depend on its ability to change the knowledge, attitudes, and risk behaviors of teenagers. Effectiveness, as measured by individual behavior change, was not the focus of this pilot feasibility study. Nonetheless, teens expressed some positive results. One 17-year-old girl stated, "It has improved my self esteem a lot. I used to talk down to myself, beating myself into the ground. Now I think about the good things I do, instead of focusing on the bad." A 16-year-old boy stated, "My attitude with my parents changed. I was bad and then tried to calm down following the steps in the TeenSmart lesson. And then things got better. Listen first to understand was helpful." A 15-year-old stated, " I want to thank all of you who made me sit in front of the computer for hours and also who made me not go out and drink or smoke cuz whenever I was on the computer I forgot about drinking and smoking." And last, a 16-year-old young woman stated, "What I liked about TeenSmart, is that it helped me to become more responsible for my actions. Before I was messing up a lot and didn't pay attention too much. TeenSmart showed me how taking responsibility for your own actions helps you out in life.... It kept me off of assistance."

CONCLUSION

Adolescence is a period of rapid physiological, social, and emotional growth and change. The issues, opportunities, and challenges for healthy lifestyle choices are dynamic. This Internet health promotion program is intended to foster self-care and self-management to reduce the morbidity and mortality associated with six preventable health behaviors: ATOD use, RSB, lack of physical exercise, poor nutritional habits, and intentional and unintentional injuries. There are no easy answers for promoting positive health behaviors. However, Internet programs such as TeenSmart may serve to enhance existing youth development programs throughout the nation and the world by providing a new avenue to reach teens and their families. This article provides some options and lessons learned. Further field research is needed to assess utilization and cost-effectiveness of such an approach to health promotion and disease prevention.

REFERENCES

Ahl, C., Bumgardner, A., Byelick, H., Krieder, M., Nevens, J., Schiller, A., et al. (2002). Helping at-risk kids get "TeenSmart." *Minority Nursing,* 62–72.

Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention. (2000). *Assessing health risk behaviors among young people: Risk behavior surveillance system.* Washington, DC: U.S. Government.

Covey, S. (1989). *The 7 habits of highly effective people.* New York: Simon & Schuster.

Huyhn, K., Kosmyna, B., Lea, H., Munch, K. R., Renolds, H. S., Specht, C., et al. (2001). Creating an adolescent health promotion internet site: A community partnership between nursing students and an inner-city high school. *Nursing and Health Care Perspectives, 21*(3), 122–126.

Lillie-Blanton, M., Parsons, P. E., Gayle, H., & Dievler, A. (1996). Racial differences in health: Not just Black and White, but shades of gray. *Annual Review of Public Health, 17,* 411–448.

Lindenberg, C. S., Gendrop, S. C., Nencioli, M., & Adames, Z. (1994). Substance abuse among inner-city Hispanic women: Exploring resiliency. *Journal of Obstetrics, Gynecology and Neonatal Nursing, 23*(7), 609–616.

Lindenberg, C. S., Gendrop, S. C., & Resikin, H. K. (1993). Empirical evidence for the Social Stress Model of Substance Abuse. *Research in Nursing and Health, 16*(5), 351–362.

Lindenberg, C. S., Solorzano, R. M., Bear, D., Strickland, O., Galvis, C., & Pittman, K. (2002). Reducing substance use and risky sexual behaviors among young low-income Mexican-American women: Comparison of two interventions. *Applied Nursing Research, 15*(3), 137–148.

Lindenberg, C. S., Solorzano, R. M., Kelly, M., Darrow, V., Gendrop, S. C., & Strickland, O. (1998). Competence and drug use: Theoretical frameworks, empirical evidence and measurement. *Journal of Drug Education, 28*(2), 117–134.

Lindenberg, C. S., Solorzano, R. M., Krantz, M. S., Galvis, C., Baroni, G., & Strickland, O. (1998). Risk and resilience: Building protective factors: An intervention for preventing substance abuse and sexual risk-taking and for promoting

strength and protection among young, low-income Hispanic women. *Maternal and Child Nursing, 23*(2), 99–104.

Lindenberg, C. S., Solorzano, R. M., Munet-Vilaro, F., & Westbrook, L. O. (2001). Challenges and strategies for conducting intervention research with culturally diverse populations. *Journal of Transcultural Nursing, 12,* 132–139.

Lindenberg, C. S., Strickland, O., Solorzano, R. M., Galvis, C., Dreher, M., & Darrow, V. C. (1999). Correlates of alcohol and drug use among low-income Hispanic childbearing-age women living in the USA. *International Journal of Nursing Studies, 36,* 3–11.

Miller, W. R., & Rollnick, S. (1991). *Motivational interviewing: Preparing people to change addictive behavior.* New York: The Guilford Press.

Rhodes, J. E., & Jason, L. A. (1988). The social stress model of alcohol and other drug abuse: A basis for comprehensive, community-based prevention. *Prevention Research Findings* (pp. 155–171). Washington, DC: Division of Health and Human Services, Office of Substance Abuse Prevention.

Rideout, V. (2001). *GenerationRx.com: How young people use the internet for health information.* Menlo Park, CA: The Kaiser Family Foundation.

Spoth, R., Redmond, C., Hockaday, C., & You, S. (1996). Protective factors and young adolescent tendency to abstain from alcohol use: A model using two waves of intervention study data. *American Journal of Community Psychology, 24*(6), 749-770.

United States Department of Commerce and News, Economics and Statistics. (1997). *Census.* Washington, DC: U.S. Government.

ACKNOWLEDGMENTS. *This pilot demonstration project was funded, in part, by the Alcohol and Drug Abuse Institute and by the Center for Women's Research at the University of Washington, the National Institute of Nursing Research (K07-NR00054) and the National Institute of Drug Abuse (R03110011) of the National Institutes of Health, a Hershey Family Foundation grant, a Strachan Family Foundation grant, and a Rockefeller Foundation Individual Residency at the Bellagio Study and Conference Center. The authors wish to express their appreciation to each of the teenagers who participated in the pilot, and to the faculty and staff at Cleveland High School.*

OFFPRINTS. *Requests for offprints should be directed to Cathy Strachan Lindenberg, RN, DrPH, University of Washington, P. O. Box 357262, Seattle, WA 98195. E-mail: clindenb@u.washington.edu*

USD University of San Diego

Hahn School of Nursing and Health Science offers...

- Flexible Part-Time Study
- Day and Evening Courses
- Individual Academic Advising
- Opportunities for Professional Growth
- Financial Assistance

Programs Offered:

Bachelor of Science for the RN
Accelerated RN-MSN
Master of Science in Nursing
- *Adult Nurse Practitioner*
- *Adult Clinical Nurse Specialist*
- *Family Nurse Practitioner*
- *Health Care Systems*
- *Pediatric Nurse Practitioner*

Joint MSN/MBA Program
Masters Entry Program (non-RNs)
Doctor of Philosophy in Nursing
Non-Degree Programs
- *School Nurse Credential*
- *Post-MSN Adult, Family and Pediatric Nurse Practitioner Certificates*

Hahn School of
Nursing and Health Science
(619) 260-4548 (800) 248-4873
www.sandiego.edu/nursing

The Chelsea-Village Program

Department of Community Medicine
St. Vincent's Hospital Manhattan
Saint Vincent Catholic Medical Centers

The **Chelsea-Village Program** provides long-term medical care to elderly men and women in their own homes.

We bring teams of doctors, nurses, and social workers to the apartments of frail, homebound men and women, who are 65 years and over, and who reside in lower Manhattan, below 34th Street.

This service comes at no out-of-pocket expense to the patient.

For more information, please call:
Millie Torres, RN, at 212-604-3735.