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Receptivity of African American Adolescents to an HIV-Prevention Curriculum Enhanced by Text Messaging

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Abstract

PURPOSE—This study assessed African American adolescents' receptivity to an HIV-prevention curriculum enhanced by text messaging.

DESIGN AND METHODS—Two focus groups were conducted with 14 African American adolescents regarding how an HIV-prevention curriculum could be enhanced for text messaging delivery.

RESULTS—The adolescents were receptive to the idea of text messaging HIV-prevention information but wanted to receive a maximum of three messages per day during the hours of 4:00–6:00 p.m.

PRACTICE IMPLICATIONS—By taking the findings of this study, nurses, other healthcare providers, and community-based organizations can adapt evidence-based interventions for text messaging delivery to individuals at high risk for HIV infection.

Search terms

Adolescent HIV prevention; Becoming a Responsible Teen (BART); mobile phone text messaging

In efforts to eliminate health disparities, nurses involved with adolescent health care are challenged to deliver culturally competent care to all patients. Their efforts have been hampered by poor access to care, poor quality care, poverty, and ineffective communication with disenfranchised populations (Frist, 2005). If there is any hope of improving the sexual health of minority adolescents, then nurses involved with adolescent health care must look beyond traditional practice patterns and seek new opportunities to communicate safer sex information to this high-risk population.

Background

Minority adolescents are among those most at risk for acquiring sexually transmitted infections, including HIV, and HIV infections among these adolescents continue to rise (Centers for Disease Control and Prevention, 2007). This at-risk population is not being reached as well by prevention efforts as at-risk populations were in the past (Institute of Medicine, 2001). As a result, there is a need for innovative HIV prevention interventions that are accessible and contextually and culturally relevant to the lives of minority

adolescents. The mobile phone has become a communication tool for adolescents of all socioeconomic and cultural groups (Caron & Caronia, 2003). Thus, the mobile phone has potential as a format for delivery of HIV-prevention information.

Text messaging (TM), a major feature of the mobile phone, is a popular means of communication for adolescents who use TM to keep in touch with friends and family, feel safe, acquire knowledge, and manage time effectively. Since December 2006, more than 18.5 million text messages have been sent each month, a 250% increase over the preceding 2 years (Kaiser Family Foundation, 2007). The ability to communicate “on demand” is an added incentive for adolescents (Lenart, Munoz, Perez, & Bansod, 2004; Ling & Yttri, 2002). Having friends and maintaining social interactions are important to many adolescents, particularly those who text message (Cole & Robinson, 2002; Ito & Daisuke, 2003; Katz & Rice, 2002). According to Telephia, mobile phone usage by adolescents is 71% more than the total minutes used by all other age groups combined (Business Wire, 2006). TM is convenient, inexpensive, confidential, and accessible to young people at all times, making it a potential health-promotion mechanism for adolescents.

“The growing use of text messaging provides an important opportunity to link people with simple and portable health information” (Kaiser Family Foundation, 2007, Dr. Kevin Fenton, ¶ 6). Mobile phone TM has been successfully used to provide personalized advice, support, reinforcement of healthy lifestyles, and distraction in smoking cessation programs (Bramley et al., 2005; Obermayer, Riley, Asif, & Jean-Mary, 2004; Rodgers et al., 2005), obesity prevention (Tufano & Karras, 2006), depression (Joyce & Weibelzahl, 2006), aftercare intervention with bulimia nervosa (Bauer, Percevic, Okon, Meermann, & Kordy, 2003), alcohol recovery (Campbell & Kelley, 2005), medication and appointment reminders (Puccio et al., 2006), and asthma education and management (Neville, Greene, McLeod, Tracy, & Surie, 2002). Recently, mobile phones have been investigated for use as reminders for traumatic brain injury patients (Stapleton, Adams, & Atterton, 2007).

In one study (Utting, 2004), a school nurse received text messages from a sample of 147 students; 42% of the messages were related to sexual health and 54% were sent during the evening hours; 86% of the students said that they benefited from the TM service, and 83% indicated that they would text message a question anonymously. Franklin, Waller, Pagliari, and Greene (2003) developed a novel TM support network (Sweet Talk) for intensive insulin therapy for young people with diabetes that increased adherence to insulin regimens. Wangberg, Arsand, and Andersson (2006) tested the feasibility of TM with 11 parents of children with type 1 diabetes; parents indicated that the TM pop-up reminders were effective in increasing adherence to their children’s treatment regimen.

A study conducted by Puccio and colleagues (2006) used TM to assist 11 HIV-infected adolescents and young adults to adhere to highly active antiretroviral therapy. Most participants found the calls helpful, and the level of intrusion in their daily lives was acceptable. In Washington, DC, a media campaign called “Text Message,” which features high school students text messaging each other about how a friend acquired HIV, is part of a major awareness program targeting adolescents (Donovan, 2005). Recently, the Centers for Disease Control and Prevention and Verizon Wireless partnered with the University of Georgia to launch a mobile phone initiative to increase HIV testing among youth. The project aims to deliver videos via mobile phones to encourage students to get tested for HIV on National HIV Testing Day (Kaiser Daily HIV/AIDS Report, 2008). San Francisco became the first city in the country to direct safer sex messages to young people through TM (Allday, 2006). Users send questions to a “Sexinfo” phone number in the health department, and within seconds they get a text message reply to the question. This approach, modeled after a program in London, has produced promising preliminary results, with over 4,000 text

messages received in the first 6 months of implementation (Levine, McCright, Dobkin, Woodruff, & Klausner, 2008).

Few of the studies that have used TM to deliver health promotion and disease prevention interventions have been conducted in the United States. None of the studies used a theory-driven, evidence-based curriculum to reduce the risk of health disorders, and few used randomized, controlled designs to assess their effectiveness. Nevertheless, while research on TM as a format for delivering safer sex messages is limited, the findings to date are encouraging. TM sustains health-promotion behaviors and improves outcomes with health disorders, such as smoking cessation, diabetes, asthma management, and depression. It also increases medication and appointment adherence. An added incentive to TM is the confidentiality it permits with the healthcare provider, an important consideration for adolescents.

Research on HIV prevention suggests that to be effective, interventions must (a) be tailored to the study population or culture and (b) have an explicit theoretical basis. The research task force of the National Campaign to Prevent Teen Pregnancy (2001) has identified five programs with particularly strong evidence for success in delaying sex or increasing condom use. Becoming a Responsible Teen (BART) is one of the five programs with demonstrated success (St. Lawrence et al., 1995).

BART

BART is a community-based abstinence-plus-HIV risk-reduction curriculum that is designed for African American adolescents, ages 14–18 years. The curriculum consists of eight 1.5–2 hr sessions that emphasize skill acquisition using interactive group discussion and role play. Participants practice safer-sex communication skills and learn to use effective health communication strategies to spread the word about HIV prevention to their friends. Unique features of this curriculum include adolescent involvement in all aspects of the curriculum, gender-specific groups facilitated by both male and female facilitators, and effectiveness with both sexually experienced and abstinent youth in increasing HIV knowledge and sexual assertiveness.

In the original evaluation study, 246 southern African American adolescents were randomly assigned to a 2-hr HIV-prevention educational program or the 8-week BART curriculum. Following the intervention, the BART group had higher HIV/AIDS knowledge scores, more skill in handling pressure for sexual intercourse, reduced incidence of unprotected sex, more condom use, and less unprotected anal intercourse. Other studies also support BART's efficacy. A meta-analysis of risk-reduction intervention studies, including adolescent and adult studies, showed that the BART intervention (St. Lawrence et al., 1995) produced the highest effect size among all HIV-prevention interventions (Butts & Hartman, 2002; Kalichman, Carey, & Johnson, 1996). Using a pretest/posttest design with 112 adolescents, ages 12 to 18 years, Butts and Hartman found significant changes in HIV/AIDS knowledge and attitudes toward condom use at posttest. McGuinness, Mason, Tolbert, and DeFontaine (2002) reported similar findings in a convenience sample of adolescent females, and Malow (2004) reported similar findings in a sample of Haitian youth. One disadvantage of any HIV curriculum like BART, however, is that positive outcomes begin to diminish over time (Pedlow & Carey, 2004). TM may be an effective booster strategy for reinforcement of key prevention concepts with BART (J. St. Lawrence, personal communication).

Boosters in Adolescent Health Education

Boosters are an important option for broadening the effects of face-to-face interventions and reinforcing an initial intervention (Wu, Stanton, Galbraith, & Kaljee, 2003). Numerous

adolescent health-education programs have incorporated booster sessions following their intervention, to better sustain long-term behavioral changes. Boosters have been used effectively to reduce long-term adolescent risk behaviors (Stanton et al., 2004), to prevent smoking (Dijkstra, Mesters, DeVries, van Breukelen, & Parcel, 1999), and to prevent alcohol abuse (Wu et al.). Recently, various kinds of boosters have been introduced in adolescent intervention studies, including additional didactic content via print literature or the Internet. One or more boosters administered through TM might result in a more sustained impact on HIV prevention than is found from a traditional, basic face-to-face intervention such as BART. However, before we can adapt the BART curriculum for TM, we must assess the receptivity of the intended participants. To address this need, this study utilized the ADAPT-ITT model and focus-group methodology to examine African American adolescents' receptivity to a TM-enhanced HIV-prevention curriculum.

Theoretical Framework

The ADAPT-ITT model is a novel method of adapting evidence-based interventions (Wingood & DiClemente, 2008). The eight steps of the model are assessment, decision, adaptation, production, topical experts, integration, training, and testing. Unique features of the model include direct involvement of the new target population from the initial phase to the last phase of development. This process allows HIV researchers to triangulate diverse measures of qualitative assessments (focus groups and needs assessments) and quantitative assessments (theater-test surveys and pilot-test surveys) and multiple pretesting methodologies to indicate what needs to be adapted and how adaptation should proceed. The model allows researchers to achieve a balance between fidelity and adaptation. The process prescriptively indicates: (a) when during the adaptation process a draft of the adapted evidence-based intervention is to be generated and (b) the number of drafts that should be created. Most persons at risk for HIV infection possess insufficient information about preventive behavior, insufficient personal and social motivation to practice prevention, and inadequate skills for practicing prevention effectively (St. Lawrence et al., 1995). This study reports data from the assessment phase of the model, which involved focus groups with the target population for which the curriculum was created: African American adolescents.

Method

Procedure

After receiving institutional review board (IRB) approval, agency staff at a community organization were asked to identify adolescents who might be interested in participating in a focus group session on TM and HIV prevention. Adolescents identified by the agency staff were contacted about participating in the study and were invited to bring a friend. Adolescents were eligible to participate if they self-identified as African American, were 13–18 years old, English speaking, and had knowledge of mobile phone TM. Using the standard procedures for focus group methodology (Krueger & Casey, 2000), we invited twice the number of participants required to achieve our targeted number of participants. Participants who expressed interest in the study were invited with their parents to an informational session to discuss particulars about the project. Those who expressed interest completed IRB-approved consent and assent forms and were informed of the dates and times that the study would be held. One week before the study began, the participants received a reminder telephone call. Based on our previous research, we conducted separate focus groups with the adolescents based on gender (Cornelius & LeGrand, 2008). Fourteen adolescents participated, with seven participants per group. Participants were equally male and female, primarily 14 and 16 years of age, and in high school (10th grade).

Focus Groups

Upon arrival for the focus group sessions, introductions and explanations were given, a survey about mobile-phone use was completed, and refreshments were served. After an ice-breaker activity, the session began. The adolescents were asked (a) what they could tell us about how they used TM; (b) what they knew about HIV; (c) what they thought about text messaging HIV-prevention messages to adolescents their age; and (4) how we could modify the curriculum for TM delivery. Key concepts were written on poster board and the participants corrected the information as needed. The focus groups lasted approximately 60 min, and the adolescents received \$15 for their time and participation in the study. Audiotapes of the sessions were transcribed verbatim and compared to the original recordings. Transcripts were read numerous times for key phrases using the participants' own words. Comparisons were made between groups, and the data were organized around major categories.

Results

Participants spoke openly about their TM use, HIV prevention needs, and ways to modify BART for TM delivery. The following four categories were used to summarize the findings: TM use, HIV knowledge, receptivity to HIV prevention messages, and BART curriculum modifications.

Mobile Phone TM Use

The adolescents primarily sent text messages to their friends. All participants had access to mobile phones with TM capacity. One female adolescent said: "I text my friends all of the time." One male adolescent (13 years old) said: "I am expecting a cell phone for Christmas so that I will not have to use my mom's." On average, the adolescents had owned a mobile phone for 4 years, sent an average of 42 messages per day (range 10–100), received an average of 42 messages per day (range 10–150), responded immediately (in less than 1 min) when text messages were received, and expected an immediate response (in less than 1 min) when they sent a text message (see Table 1). One adolescent said: "I hate it when someone does not respond to me as soon as I send a text message." Another adolescent said: "People are 'texting' every minute of the day."

HIV Knowledge

Not all of the adolescents were knowledgeable about modes of HIV/AIDS transmission and prevention. Their knowledge was evident when one male said: "If you don't wrap it [penis], you will die. I know guys who do not use protection [condoms], and I do not want to die from AIDS so I keep a condom with me at all times." Their lack of knowledge was evident when one female said: "My boyfriend, who is 10 years older than me, infected me with a sexually transmitted disease [STD]." Participants were unable to correctly state what the acronyms HIV and AIDS stood for and could not distinguish between the two. One adolescent said: "What's the difference between HIV and AIDS?" Another said: "How long do you have HIV before you get AIDS?"

The responses varied when the adolescents were asked in what grade did they receive sexuality education. One adolescent said: "Safer sex practices are discussed in high school (9th and 10th grades), but only during health class." Another adolescent said:

There is an assembly in the 11th grade where they discuss STDs. During the assembly, no condoms are given out but teens can participate in assertiveness exercises. They use school assemblies as a scare tactic, which doesn't work. They

show us the worst pictures possible. People do not believe that anyone can wait so long before going to the doctor with those symptoms.

When asked where they obtained additional HIV information, the adolescents responded their parents, friends, and the media.

The discussion about why African American adolescents and young adults have high rates of HIV infection was revealing. Participants acknowledged that youth continue to engage in risky sexual behavior. When asked why adolescents engage in unsafe sex practices, they pointed to feelings of immortality and invulnerability, perceived monogamy in serial relationships that were brief in duration, and fear of disclosing past sexual histories. One male adolescent said: "If my girlfriend tells me that she has had sexual relations with other guys, then I would perceive her to be a whore." One female adolescent laughed, then said: "Girls just don't talk about it (sexual history) with boys. We just don't ask 'Who have you been sleeping with?'"

Responses varied by gender on how adolescents could protect themselves from HIV. One male adolescent said: "Wear a condom all the time." One female adolescent said: "Being abstinent and going to church." The discussion continued with participants acknowledging that they knew adolescents who attended church regularly and were pregnant, clearly engaging in unprotected sex. One male adolescent said: "Teens who do go to church are the worst ones. They are sexually active too." The female participant who had the older boyfriend said that "using birth control pills protects you from HIV." Another female adolescent pointed out that birth control pills do not protect you from HIV.

Participants varied in their fear of HIV infection. Some adolescents were fearful of becoming infected, while others were not. Many of the participants did not know what to do if someone had an allergy to latex condoms. The youngest male in the group indicated that his peers were having sexual relations on school property. Participants agreed that sexual relations on school property occurred both during school and after school. One male adolescent said: "It is happening all of the time. Kids know which corridors and bathrooms they can go into for a quickie [sexual intercourse]".

Receptivity to HIV Prevention Messages

The group overwhelmingly thought that text messaging HIV-prevention messages as a booster to the BART curriculum content was an exciting idea. They said that they would read and respond to the text messages. Their ideas about how many messages should be sent per day ranged from 1 to 3. One adolescent said: "If you send too many messages, a kid will get bored." Responses also varied on when text messages should be sent, from during school hours to after school hours, before 6:00 p.m. One adolescent said: "Send the messages when the kids are in school because they are more likely to focus on them at that time." Another adolescent noted that it might be problematic to send text messages during school because if you forget to silence your mobile phone, the teacher can take it away.

When asked if they knew about the hazards of TM such as headache, car accidents, brain tumors, and thumb texting (repetitive thumb strain injury and pain), they responded, "No." One female adolescent said she thought addiction was a hazard of TM. One male adolescent said he sent text messages frequently and, therefore, he would be comfortable participating in a study in which he received HIV-prevention text messages. The adolescents also said that research staff should give mobile phones to adolescents who did not have one so that they could participate in the study. They agreed with the policy that if an adolescent damaged or lost a mobile phone during participation in the study, then the adolescent should receive a replacement phone. Participants agreed that the cost of TM should be covered by

the study so that their parents would not be burdened with additional expenses. However, several participants cautioned the research staff about the possibility that adolescents might abuse their TM plan if they knew that someone would pay for the costs of their messages. One adolescent said: “Kids will go wild with their text messages if someone is paying for them other than their parents.” Another adolescent said: “I always go over my limit, and if I know that a grant is paying for it, then I will go over.”

Participants varied on ways in which HIV-prevention messages could be disseminated. One adolescent recommended using MySpace to post messages to teens about HIV prevention. Another adolescent said: “Not everyone has access to the Internet and MySpace and therefore might not be able to respond to messages.”

BART Curriculum Modifications

Participants agreed that sending text messages as boosters after the last session of the BART curriculum was an innovative idea. They felt that adding text messages would enhance the core components of the curriculum. One adolescent said: “I will probably remember safer sex practices if I receive a text message about it every day.” They agreed that HIV information was essential. When asked if they would feel comfortable buying condoms (as a required activity of Session 4), one adolescent said: “At least I am being safe when I buy condoms.” Another adolescent said: “It is nobody’s business what I buy.” However, one female said: “I would be embarrassed if my pastor saw me buying condoms.” The adolescents did not feel that the BART curriculum needed to be shortened or that the activities needed to be changed with the added TM component. Participants were enthusiastic about the possibility of creating text messages to send to their friends and family. One said: “I would like to participate in designing text messages for the booster sessions.” Another said: “Wow! That would be fun.”

Participants gave suggestions as to how adolescents could text responses to the messages sent by the research staff. They suggested that the process be quick, simple, and convenient. One said: “You could use multiple choice responses to a question and have teens text the correct response such as A, B, or C, instead of texting words.” Another adolescent said: “With Session 2, you could have teens text F for fact and M for myth when you text statements about HIV risks and modes of transmission.”

Discussion

This study examined the receptivity of adolescents to an HIV-prevention curriculum enhanced with TM. Consistent with other research, HIV scare tactics introduced at school assemblies were considered ineffective in reducing adolescents’ fear of contagion and promoting safer sex practices (Stein, 1999). As with previous research, some adolescents in the study indicated that they were knowledgeable about HIV and sexually transmitted infections but nevertheless practiced high-risk sexual behaviors (Montgomery, 2004). Although adolescent HIV-prevention interventions have focused on provision of information about HIV disease, risk behaviors, and protected sex practices, adolescents clearly still have little understanding of how to protect themselves (Montgomery; Silver & Bauman, 2006). Thus, education alone is insufficient to prevent HIV (Grunbaum et al., 2002). Despite having been taught about HIV, more than one third of sexually active teens continue to report inconsistent condom use (Grunbaum et al.).

Adolescent spirituality has been associated with reductions in illicit drug and alcohol use (Wills, Yaeger, & Sandy, 2003) and delayed sexual activity (Lammers, Ireland, Resnick, & Blum, 2000). As in previous research, one adolescent in this study viewed the church as a

protective factor against risky adolescent behavior and HIV infection (Cornelius & LeGrand, 2008), but the others did not.

Not surprisingly, we found that adolescents obtained additional HIV information from their parents and the media. Parents have consistently been identified as sex educators for their children (Baptiste, Tolou-Shams, Miller, McBride, & Paikoff, 2007; Forehand et al., 2007), while the media have been found to have a negative impact on how adolescents view themselves as sexual beings (Peterson, Wingood, DiClemente, Harrington, & Davies, 2007). Music videos and degrading music have been associated with the probability of adolescents having multiple sex partners and being infected with a sexually transmitted disease (Wingood et al., 2003). Adolescents who perceive support from the media for sexual behaviors report more sexual activity and a greater likelihood of being infected with a sexually transmitted disease (L'Engle, Brown, & Kenneavy, 2006; Wingood et al.). This finding is disturbing because music videos and music send subliminal messages about sexual promiscuity to girls and violence to boys.

As in previous research, these youth were intrigued with the modality of text messaging safer-sex messages (Levine et al., 2008). Such boosters on health-promotion behaviors and daily HIV-prevention messages have the potential to reinforce and remind adolescents to practice safer sex behaviors while increasing their knowledge about HIV (Stanton et al., 2004).

Billions of text messages are sent each day, yet we have not examined the effect of TM on HIV risk-reduction behaviors. TM has only recently been assessed as a safer sex approach (Levine et al., 2008; Allday, 2006). Theory-based, age-appropriate, culturally sensitive text messages could booster the effectiveness of HIV prevention efforts. Furthermore, the confidentiality of mobile phones is a clear advantage for adolescents desiring to access health information.

This study found that adolescents were receptive to TM as a booster to the BART curriculum. Consistent with the ADAPT-ITT model, the next step will involve agency staff's input on their ability to implement the adapted BART curriculum for TM delivery. Feedback from the focus groups will be followed by a preparation and implementation phase. The curriculum will be adapted for text messaging, and drafts of the adapted curriculum will be produced for topical experts to review. Feedback from topical experts will be integrated into Draft 2 of the adapted curriculum. Surveys will be used to measure the content of the adapted curriculum. Readability testing will then be integrated to create Draft 3 of the curriculum. Next, staff will be trained to implement Draft 3 of the adaptation. Lastly, a pilot study will be conducted to test the efficacy of the adapted curriculum. This study of adolescents' receptivity to text messaging HIV-prevention messages provides a basis for designing appropriate messages for delivery. Important considerations that should be considered are how many messages should be sent, how often, and when.

The flexibility of TM allows an intervention to optimally time the delivery of effective messages. In addition to ascertaining what the content of those messages should be for maximum benefit, there remain unanswered questions about the timing of their delivery. The focus group participants suggested 4:00–6:00 p.m., primarily for convenience and to ensure that messages arrived after school. However, there are additional considerations that warrant attention. For example, would it be more effective to have a reminder timed to arrive before adolescents leave home on a date or social occasion to remind them to be prepared? This is an empirical question for which we do not have answers at this time, but it may be an important consideration in gaining maximum benefit from the use of text messages as a booster to any sexual risk-reduction intervention.

The study results need to be generalized cautiously given the use of a small convenient sample from one geographic region of the country. Yet this study, with its focus on enhancing an effective HIV-prevention curriculum with TM, makes an important contribution to the design of effective HIV-prevention interventions for African American adolescents. Studies are now needed to examine the efficacy of HIV text messages in reducing adolescent risk behaviors. If efficacious, large-scale randomized control trials should be conducted to compare the effects of a TM-enhanced curriculum to a comparable attention control-group curriculum.

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How Do I Apply This Evidence to Nursing Practice?

For nurses involved with adolescent health, the findings from this study can be used to communicate with adolescents about health-promotion and disease-prevention information using TM. The confidentiality that TM permits with the healthcare provider, the booster impact, cost effectiveness, and practicability make TM a viable health-promotion mechanism for youth. The accessibility of mobile-phone TM technology has implications for adaptation in countries with high rates of HIV infection and where this technology is readily available. By taking the findings of this study, nurses, other healthcare providers, and community-based organizations can use evidence-based interventions, such as BART, and adapt them for TM delivery to individuals at high risk for acquiring the virus that causes AIDS. Future work is needed to address issues of cultural specificity in health-promotion messages with TM delivery. From a public health perspective, nurses will be able to contact individuals in their natural settings with personalized health-promotion and disease-prevention messages.

Table 1

Mobile Phone Use

	Male (N = 7)	Female (N = 7)
Age		
13 years	1	1
14 years	2	3
16 years	3	2
17 years	1	1
Mobile phone messages sent		
10 messages	2	1
11 messages	1	1
15 messages	1	1
50 messages	2	2
100 messages	1	2
Mobile phone messages received		
10 messages	2	2
15 messages	2	2
15 messages	2	2
150 messages	1	1
Response time to messages		
1 second	1	1
20 seconds	2	3
30 seconds	4	3
Expected return-response time to messages		
1 second	2	2
20 seconds	2	3
30 seconds	3	2
Whom do you text the most		
Friends	7	6
Parents	0	1