

FACT SHEET



RURAL CENTER for AIDS/STD PREVENTION

A Joint Project of

INDIANA UNIVERSITY, UNIVERSITY OF COLORADO,
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Computer Technology-Based HIV Prevention Interventions

A behavioral intervention is a specific collection of prevention activities developed or implemented with a clear aim to promote positive changes in behaviors, either directly or indirectly, to reduce HIV transmission and infection. Most behavioral interventions aim to change risky sexual and drug use practices in efforts to reduce transmission of HIV/AIDS. Such programs tend to operate at the individual, group, community, or structural level. Individual, group, and community-level behavioral interventions seek to change so-called theoretical (behavioral) determinants of risky behaviors, such as sexual and drug use knowledge, attitudes, beliefs, perceptions of risk, barriers, social norms, motivation to change, behavioral intentions, self-efficacy (confidence) and a variety of skills (e.g., partner negotiation skills, correct condom use skills) as a route to behavior change. Structural interventions focus instead on increasing access to HIV testing, condoms, medications, or other services that indirectly affect risk behaviors.

Numerous reviews and meta-analyses find behavioral interventions to be efficacious in reducing sexual risk behavior.^{1, 2} Most behavioral interventions tested to date, however, have been delivered by human experts or laypersons (e.g., counselors, peers, doctors). A newer line of research seeks to test the following question: Are computer-based interventions efficacious in reducing sexual risk behavior? **Computer technology-based interventions** are a type of behavioral intervention that uses computers as the primary or sole medium from which to deliver an intervention.³ Such interventions have a number of unique advantages. First, the cost of implementing these interventions once they are developed is minimal compared to human-delivered interventions. Second, intervention fidelity (the extent to which the intervention is delivered correctly) is completely maintained. Third, computerized interventions are capable of tailoring intervention content to an individual through the use of computer algorithms. Fourth, computer technologies include features such as interactivity and multimedia, which may aid in the fostering of behavior change. Finally, computerized interventions are flexible in terms of dissemination channels, which might include community-based agencies, clinical settings, and the Internet.³⁻⁵

There are a variety of different types of computer technology-based interventions that have been tested to date. **Individually tailored** interventions assess characteristics of individuals (e.g., attitudes, norms, self-efficacy) and provide tailored feedback aimed at changing these theoretical determinants. These kinds of interventions mimic counseling sessions where questions are asked of clients and tailored feedback (based upon client input) is provided. **Interactive video** interventions provide a “virtual date” experience where individuals make sexual decisions and observe the consequences of those decisions. Through this experience, individuals are able to practice risky and safer choices in a “virtual” environment, and may learn more about how to make safer choices when in a real sexual situation. Finally, **group-targeted** interventions contain content that has been developed with a particular group in mind, such as minority youth or men who have sex with men. These types of interventions are different from traditional human-delivered interventions, however, because they take advantage of a variety of features of computers, such as interactive games, videos, quizzes, and other features.

Computer technology-based interventions have now been tested with a number of at-risk populations, including heterosexual adolescents and young adults, men who have sex with men, and at-risk women. While most studies have recruited individuals at clinics or in other community-based settings, a small number of studies have used Internet-based recruitment.^{6, 7} In addition, while most studies have been conducted in urban areas, some interventions have been tested specifically in rural contexts.^{6, 8}

Efficacy of Computer Technology-Based Interventions

Two recent meta-analytic projects examined whether computer technology-based interventions are capable of having an impact.^{9, 10} One project focused on whether interventions were successful in changing mediators of

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safer sexual behavior – such as attitudes, perceived risk, self-efficacy, and so forth.¹⁰ Highlights from that study include the following:

- 16 studies which tested the efficacy of computer technology-based interventions in changing mediators of safer sex were included in the analysis.
- Mean age across the studies was 21.94. Most studies were of heterosexually active individuals and were conducted in the United States. Most interventions were theory-based and group-targeted.
- Interventions were successful in increasing HIV/AIDS knowledge, perceived susceptibility to HIV/STDs, protective sexual attitudes, condom attitudes, condom self-efficacy, condom communication, and intentions to use condoms.
- Interventions were unsuccessful in increasing refusal self-efficacy (an individual's ability to refuse sexual advances).
- Comparison of the impact of computer technology-based interventions with previously tested human-delivered interventions^{2, 11} generally revealed similar effects of these two intervention types.

The second project⁹ focused on whether interventions were capable of changing sexual risk behaviors. Highlights from that study include the following:

- 12 studies which tested the efficacy of computer technology-based interventions in changing sexual risk behaviors were included in the analysis.
- Studies were quite similar to those described above, except that individually tailored interventions were much more common among this group of studies.
- Interventions were efficacious in increasing condom use, reducing numbers of sexual partners, reducing sexual activity, and reducing incidence of sexually transmitted diseases (STDs). Evidence was strongest for increasing condom use.
- The impact of the interventions on condom use was similar to the impact found in studies of human-delivered interventions that are widely used in HIV prevention.^{1, 2}
- Interventions were most efficacious when
 - 1) they targeted a single gender (rather than both genders);

- 2) they used individualized tailoring and a stages of change model; and
- 3) they included multiple intervention sessions.

Interventions Tested in a Rural Context

A small number of computer technology-based interventions have been tested and found to be efficacious in a rural context. Bowen et al.⁶ tested an Internet-based intervention with rural men who have sex with men ages 18 and older who were recruited over the Internet. These men interacted with three intervention modules, each including two 20-minute interactive sessions with printable feedback (see www.wrapphome.net). This group-targeted intervention focused on HIV/AIDS knowledge, sexual partners and risk, and safer sex skill building. Results suggest that the intervention was successful in reducing anal sex and increasing condom use, as well as increasing mediators of safer sex.¹²

Roberto et al.⁸ developed and tested a computer and Internet-based intervention to reduce sexual risk attitudes and behaviors in rural adolescents recruited in schools. This theory-based, group-targeted intervention included several online activities, including a “truth or myth” quiz, risk behavior quiz, activities on sensation seeking and impulsivity, and an interactive video program. Results indicated increases in HIV/AIDS knowledge, attitudes toward waiting to have sex, and condom negotiation, as well as a reduction in sexual activity and number of sexual partners.

Internet-based Interventions

The interventions highlighted here are computer and Internet-based interventions that have been rigorously tested in research trials. Other work to examine Internet-based interventions has been conducted, but many of these intervention approaches have not been rigorously evaluated.¹³ For example, studies have cataloged HIV/STD prevention websites that may be useful to practitioners.¹⁴⁻¹⁷ Also, given that individuals seek and find high-risk sexual partners over the Internet,^{18, 19} studies have begun to look at how to reach out to such individuals, such as through chat room interventions.^{20, 21} Other innovative computer and Internet-based interventions are also being developed and evaluated.²²⁻²⁵ Many of these types of interventions may show promise in terms of innovative HIV prevention strategies, but strong evaluation data on these approaches are not yet available.

Developing Computer-based Interventions

How does one develop a computer or Internet-based intervention? Two unique skill sets are necessary for development of such an intervention. One set of skills are those that are needed for developing any behavioral intervention, and include a clear understanding of the target population, the behavior of interest, behavioral theory, research methods, and so forth. An additional set of skills that are necessary for the development of computer-based interventions, however, include technical programming skills. Intervention developers will often find such technical support on university campuses or within small software/computer-oriented companies.

Rhodes et al.²⁶ suggest six activities to be undertaken in developing any computer technology-based intervention. Once a target population is clearly delineated, developers should:

- 1) Define the program goal and associated objectives;
- 2) Select a theoretical framework to guide intervention design;
- 3) Conduct formative research to identify key attitudes, beliefs and skills related to the behavior of interest;
- 4) Develop computer-based intervention modules that focus on changing those beliefs and enhancing skills;
- 5) Pilot test intervention modules (including measuring immediate impact) and make appropriate refinements to the program based on pilot test results; and
- 6) Conduct a formal outcome study of intervention efficacy.

For additional guidance on the development of a specific type of computer-based HIV prevention intervention, readers are referred to writings on the development of tailored interventions,^{27, 28} interactive computerized interventions,^{15, 29} handheld computer interventions,²⁵ Internet interventions,^{6, 22} and interactive video interventions.³⁰



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