Concept: Behavior Change

Virtual Worlds: Taking Health Promotion to New Levels

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INTRODUCTION

Traditionally, health promotion practice has relied on print and popular media for information dissemination. However, technology sprawl has challenged this tradition, and progressive health promotion professionals are integrating email, text messaging, Web sites, and online support groups into their repertoire.[1] A less familiar, yet attractive, platform for health promotion specialists is the virtual world. An online virtual world is "an interactive computer simulation which allows participants to see, hear, use, and modify simulated objects in a computer-created world."[2(p 145)] Virtual worlds can be designed for single participants; simultaneous participants; or multiple groups of users, referred to as a virtual community.[3]

We explore the possibilities of using virtual worlds to broaden the reach and scope for health promotion.

Use of Technology in Health Promotion

The Internet is a demonstrably effective, vast channel for health programming implementation. Successful Web-based interventions include tutorials designed to increase knowledge and change attitudes,[4,5] counseling designed to aid behavior change,[5,6] and personalized disease management offered to help control health conditions.[7] A meta-analysis of a variety of Web-based and non–Web-based behavior change interventions showed improved knowledge increases, intermediate and main behavioral outcomes, and long-term behavioral maintenance from Web-based interventions.[8] These Web-based interventions have been effective in changing behaviors, primarily through interactive messaging and information dissemination. However, the use of virtual worlds provides a platform for expanding the horizons of health promotion even more.

Examples of Online Virtual Worlds

Several current instances of virtual world use are relevant to public health and are presented here on the basis of their public health applicability and/or content. The River City Project (http://muve.gse.harvard.edu/rivercityproject/index.html), funded by the National Science Foundation, invites middle-school science students to address emerging health problems of a simulated 19th century town. Students use the interface, which closely resembles a video game, to study illnesses of River City inhabitants, to create experiments to test hypotheses about the nature of these illnesses, and to make recommendations on the basis of their research findings.[9] Students who have used River City in their classroom have experienced changes in self-efficacy and learning processes, which suggests that increased use of such platforms may be beneficial to young people.[10]

Whyville (http://www.whyville.net), a virtual world for preteens and teens, allows citizens to learn about science, journalism, civics, economics, and public health.[11] The Centers for Disease Control and Prevention (CDC) has used Whyville to expose youth to real-world health lessons about vaccinations for whypox and whyflu.[12,13] This interactive community has been lauded for increasing awareness, improving education, and generating real-world discussion by youth about health issues with their peers and family members.[14]

A third example, Second Life (http://secondlife.com), is a virtual world designed for recreation.[15] With more than 13 million users, Second Life offers a variety of venues to reach massive audiences at once. It has been recognized for fostering explorative interaction and communication for users to build social networks.[3,16] Several illustrations of Second Life use include academic courses offered exclusively in Second Life; educational tool warehouses created by nonprofit organizations for inhabitants; and a virtual office established by the CDC that is complete with evolving event

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billboards, a mission video, and links to health-related information.

The growth of virtual worlds is reminiscent of the extension of mainstream entertainment into entertainment-education.[17] Examples of such programming include the prime-time television drama ER; daytime dramas; and selected episodes of other television shows, such as *Friends* and *The Practice.*[18] Although the primary intent of mainstream entertainment is to amuse consumers, entertainment-education adds an educational component to impact audience members' knowledge, attitudes, and behavior during the entertainment process.[19–21] Analogous to this, capitalizing on the entertainment factor of virtual worlds can provide a platform for integrating health promotion content.

Health Promotion Practice in a Virtual World: A Contextual Framework

Although the aforementioned examples showcase current uses for virtual worlds in public health, the possibilities for health educators, behavioral scientists, and health professionals to expand this modality in health promotion are numerous.[22] However, the feasibility of implementing a full scope of health promotion strategies in virtual settings demands additional attention. For example, Kahan and Goodstadt[23] identify health promotion practice strategies within a larger public health framework as health education, health communication, community change, organizational change, policy development, advocacy, mediation, intersectoral collaboration, self-help, and modeling. Applications of several approaches are highlighted; however, the spectrum of strategies implemented online is widespread.

Health Education. At the most basic level, virtual worlds can be used to educate. Associated advantages include the anonymity and confidentiality that virtual worlds afford, particularly related to sensitive topics. Virtual worlds can be an effective way to reach people who might feel uncomfortable or embarrassed about accessing medical information in person or by phone.

Collaboration and Self-Help. It is also feasible to implement intersectoral collaboration and self-help health promotion strategies in virtual worlds, whereby information about the prevention of drug abuse, sexual health, and sexually transmitted infection can be disseminated by clinicians. Virtual worlds can provide confidentiality in a rich medium in which the user has the ability to talk with professionals in what could be a very personal environment (i.e., the computer location). This platform also offers individuals the chance to meet others with similar health-related questions or concerns. In addition to having the ability to gather information, people also can create groups for sharing questions, experiences, or concerns about a particular issue from the privacy of their computer with minimal risk of others discovering their real-world identities.

Modeling. Virtual worlds are conducive for teaching or modeling behavioral science research. Although there is debate about whether research should actually be conducted in the field,[24] virtual worlds can be used as a proxy for the real world when going into the field is impractical. This research could take the form of ethnographies in which online behavior is observed, or it could be used to access audiences needed for specific research. For instance, it may not be feasible for students studying health communication to pre-test materials or messages on a particular segment of the population within the confines of an academic calendar. However, the pre-testing may be conducted expeditiously within these virtual worlds. Additionally, simulated epidemics offer students an opportunity to study disease outbreaks, to examine effects of those infected, and to create solutions to address the impact of these outbreaks.[25] Another example of this use could be as a simulation platform for emergency response. Given the recent onslaught of natural disasters and the attention to prevention and management of these events, interactive role-playing and team training of emergency responders could be a cost-effective method of skill-building in preparation for public health disasters.

Alternatively, modeling can also be applied in virtual worlds to examine risk behavior tendencies. Not only can direct online use behavior, but also associations to real-world risk behaviors, can be examined—as persons in Second Life can smoke cigarettes, drink alcohol, and proposition others for sex. There may not be real-world consequences of engaging in these virtual risk behaviors, but—similar to the use of health narratives to promote pro-social behaviors[26]—there is evidence suggestive of parallels between virtual-world tendencies and real-world actions.[27,28] In addition, educating persons through modeling of prescribed health behaviors by virtual characters could likely impact real-world behaviors. By applying theoretical concepts to the implementation of virtual worlds, such as observational learning from Social Cognitive Theory,[29,30] health promotion practitioners and researchers may discover innovative, theory-driven methods of influencing human behavior.

Potential Challenges of Health Promotion Practice in a Virtual World

Research and Ethics. Researchers continue to debate whether social norms and behaviors in virtual worlds are comparable to those in the real world.[31] Similarly, characters or personas in the virtual world may or may not be true representatives of people in the real world. Although some people in virtual worlds express the identities of their human owners, others may, in fact, be operating as characters or imagined (or desired) selves in these environments.[21] Additionally, ethical issues should be of concern. To date, there are no standard protocols regarding online human participant protection. When creating simulated environments, should citizens of these worlds be notified? Would such notification skew simulation results? Would usage rates remain consistent or decline as users fear becoming a study participant without prior knowledge/consent? Future research should be conducted to elucidate this context, as it will have far-reaching impact on the study of behaviors in virtual settings.

Diffusion. First, there is a paucity of published empirical work regarding the impact of incorporating virtual worlds in health promotion, although the published amount is expanding. Second, on the basis of the demographic characteristics of

virtual-world users (e.g., 10% of 18–24 year olds, 12% of 25–34 year olds, 5% of women, and 7% of men participate in virtual worlds),[32] there is concern for reaching a diverse audience. Third, although the tide is changing toward increased accessibility, there are still unwired segments of the population who experience a digital divide from the more technologically engaged mainstream.

Logistics. Although health professionals will possess the health-related knowledge to integrate with the virtual world platform, additional technical assistance may be required to create, operate, and maintain virtual world environments, which is a noted challenge of adapting to a new modality. Persons interested in using virtual worlds should anticipate the need to learn new technical skills and/or should seek assistance from trained experts as a resource.

Through health promotion, we aim to reach communities in need of health information and resources. We attempt to meet these needs by tailoring strategies for dynamic target audiences through experimentation with innovation to promote health and prevent, treat, and cure disease. Virtual worlds represent a cutting-edge avenue for reaching audiences who may benefit from health-related information or study. Health educators, professionals and advocates, should seize this as an opportunity to broaden the reach and scope of health promotion practice.

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