Chapter XXIII
An Overview of Using Electronic Games for Health Purposes

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ABSTRACT

This chapter aims to provide an overall picture of the applications of electronic games for various health-related purposes, particularly for health education, health risk prevention, behavioral intervention, and disease self-management. We first summarize the electronic games for health that have been empirically tested by researchers in the past 20 years. Games that have not yet been evaluated but are promising and noteworthy are also included. These games are categorized based on their specific health-related functions (i.e., prevention, self-management, medical training, etc). Second, we synthesize the key features of electronic games that make them promising to be used for health-related purposes. Finally, implications of using electronic games for health-related purposes and future direction for research in this area are discussed. Game researchers, health providers, game designers, and potential game consumers will all find informative content in this chapter.

INTRODUCTION

The benefit of electronic gaming is no longer limited to entertainment. Electronic games have the potential to alter the lives of many people in fundamental ways. In the last two decades, plenty of research has been conducted to evaluate use of electronic games in the educational setting (for a general review, see Lee & Peng, 2006; Lieberman, 2006). Recently, a new movement of "serious games for health" has been proposed to apply electronic games for health-related purposes.

This chapter aims to provide an overall picture of the applications of electronic games for various health-related purposes, particularly for health education, health risk prevention, behavioral intervention, and disease self-management.

In this chapter, we first summarize the electronic games that have been empirically tested by researchers in various health-related settings. The research studies included in this part were obtained by a comprehensive search in Web of Science and MEDLINE databases using meaningful combinations of keywords including "video game," "computer game," "intervention," "health," and "cancer." Papers published within the past 20 years were used in order to focus on modern electronic games and their applications. A thorough check of the references in the retrieved articles was conducted to locate more studies. Additionally, some newly developed health-related electronic games that have not been evaluated but demonstrate potential were also included for a more comprehensive overview. We categorized the located electronic games based on their specific health-related functions (i.e., prevention, self-management, medical training, etc). In the second part of this chapter, we discuss the key features of electronic games that make them promising to be used for health-related purposes. Finally, implications of using games for health-related purposes and future direction for research in this area are discussed. Different issues about these games faced by health providers, game designers, and researchers are discussed separately.

REVIEW OF HEALTH-RELATED ELECTRONIC GAMES

Disease and Risk-Prevention Games

Games in this category focus on promoting a healthier lifestyle and behaviors by delivering relevant knowledge and shifting unhealthy attitudes. These games are set in a variety of health domains, including promoting healthy nutrition, safe sexual behavior, anti-smoking, injury prevention, and heart attack early treatment.

Squire's Quest! is a 10-session computer game designed to increase children's consumption of fruit, juice, and vegetable (FJV), and thus prevent cancer and other illnesses in the long run (Baranowski et al., 2003). This game is set in a fantasy kingdom where the kid plays as a squire who faces challenges in his or her quest to become a knight helping the king and queen defeat invaders. The challenges for the squire were to master the skills to prepare FJV recipes to provide energy for the king and his court, with goals related to eating more nutritious FJVs. There was a wizard mentoring the squire through the challenges. Researchers at the Children's Nutrition Research Center in Houston, Texas, developed this game and examined the impact of playing this game over five weeks, involving 1,578 children in a school setting. They found that children in the treatment group increased their FJV consumption by 1.0 serving more than those in the control group. This study demonstrated that the electronic game approach can be a very effective means to promote a healthier diet among children, because it achieved the second largest increase of serving size of FJVs compared to other school-based interventions (Baranowski et al., 2003).

Several factors contribute to the success of this gaming intervention. First, the program including the game design and associated activities was based on social cognitive theory, which provides a framework to explain how people acquire and maintain behavioral patterns (Bandura, 1997). According to this theory, environment, people, and behavior are constantly influencing each other and contribute to a behavioral change all together. Environment includes both social and physical environments. Social environment includes family members, friends, and peers. Physical environment refers to the element such as a room and temperature. A relevant concept to physical environment is situation, which is the

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