

Virtual Reality and Interactive Digital Game Technology: New Tools to Address Obesity and Diabetes

Albert “Skip” Rizzo, Ph.D., Belinda Lange, Ph.D., Evan A. Suma, Ph.D., and Mark Bolas, Ph.D.

Abstract

The convergence of the exponential advances in virtual reality (VR)-enabling technologies with a growing body of clinical research and experience has fueled the evolution of the discipline of clinical VR. This article begins with a brief overview of methods for producing and delivering VR environments that can be accessed by users for a range of clinical health conditions. Interactive digital games and new forms of natural movement-based interface devices are also discussed in the context of the emerging area of exergaming, along with some of the early results from studies of energy expenditure during the use of these systems. While these results suggest that playing currently available active exergames uses significantly more energy than sedentary activities and is equivalent to a brisk walk, these activities do not reach the level of intensity that would match playing the actual sport, nor do they deliver the recommended daily amount of exercise for children. However, these results provide some support for the use of digital exergames using the current state of technology as a complement to, rather than a replacement, for regular exercise. This may change in the future as new advances in novel full-body interaction systems for providing vigorous interaction with digital games are expected to drive the creation of engaging, low-cost interactive game-based applications designed to increase exercise participation in persons at risk for obesity.

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Author Affiliation: Institute for Creative Technologies, University of Southern California, Playa Vista, California

Abbreviations: (3D) three-dimensional, (ADHD) attention deficit hyperactivity disorder, (ASD) autistic spectrum disorder, (DDR) *Dance Dance Revolution*, (HMD) head-mounted display, (VE) virtual environment, (VR) virtual reality

Keywords: exergaming, interactive digital games, virtual environment, virtual reality

Corresponding Author: Albert “Skip” Rizzo, Ph.D., Institute for Creative Technologies, 12015 Waterfront Dr., Playa Vista, CA 90064; email address arizzo@usc.edu