

WellSpring

Active Video Games: A Good Way to Exercise?

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In recent years, a new type of video game has emerged: the active video game, which gets people out of their seats and moving around as they play the game.

Wii and other active gaming products have become incredibly popular. Almost six million units of Wii sold in its first five months on the market (Morales, 2007), and DanceDanceRevolution, the PlayStation Eye, and the GameBike have received lots of attention as well. Active video games are being played in arcades, homes, schools, hospital and rehabilitation facilities, gym and fitness facilities, and research settings.



Many people are wondering if active video games are a good way to exercise, but academic research investigating this question has been slow. Research began sparsely, about 10 years ago, and even now the pace has not picked up enough in comparison to the abundance of active video game products. That being said, the research that has been done has yielded promising results about the physical and psychological outcomes of playing active video games.

This article describes some of the most popular active video game products, what research has discovered about active video games so far, what we still need to find out, and how these games can help us.

What's in This Article for You?

- Types of Active Video Game Products
- The Outcomes of Active Video Games: What the Research Says So Far
- What We Still Need to Learn
- How These Games Can Help Us



Types of Active Video Game Products

A number of active video games and gaming systems have hit the market. Below are some of the most popular:

- **Nintendo Wii:** This gaming system uses a wireless controller that assesses a person's movement and position in space. The Wii can be used to play active games as well as traditional sedentary games.
- **Konami DanceDanceRevolution:** This game, often seen in arcades, uses a mat, a screen, and music. The screen gives players directions for where to step on the mat in rhythm to the music.
- **Sony PlayStation Eye:** This device is similar to a webcam and works with the Sony PlayStation 3 (the predecessor compatible with PlayStation 2 is called EyeToy). It uses a microphone, as well as gesture recognition and computer vision, to place the player in the game on the television.
- **Cateye Fitness GameBike:** This stationary bike links into gaming consoles such as PlayStation, Xbox, or GameCube and allows the player to control the game by pedalling and steering with the bike.

The Outcomes of Active Video Games: What the Research Says So Far

The majority of research conducted so far has focused on short-term physiological outcomes, or what happens to a person's body while playing an active video game.

There is less research on fitness outcomes, the longer-term effects of how a person's body changes in ability to do physical activity after playing active video games regularly. There is also less research

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on the psychological and behavioural outcomes of active video gaming. Nonetheless, some key research results around the fitness, psychological, and behavioural outcomes of playing active video games have emerged.

Physiological Outcomes

In comparison to playing a traditional sedentary video game, many physiological changes occur in the body while playing an active video game. Many of the changes can be considered beneficial.

For example, energy expenditure (or calories used) is higher during active video game sessions than during sedentary video game sessions and rest periods (Graves, Ridgers, & Stratton, 2008; Graves, Stratton, Ridgers, & Cable, 2007; Lanningham-Foster et al., 2006; Maddison et al., 2007; Ridley & Olds, 2001; Sell, Lillie, & Taylor, 2008; Wang & Perry, 2006).

Heart rates are also higher during active video games than during sedentary video games (Graves et al., 2008; Maddison et al., 2007; Sell et al., 2008; Wang & Perry, 2006).

Fitness Outcomes

There is some evidence that people who regularly play active video games can improve different components of their fitness, particularly cardiovascular fitness.

Studies on the GameBike have shown that people who regularly used the GameBike improved their vertical jump, reduced their heart rate response to exercise, and increased their maximal oxygen uptake compared to before they started using the GameBike (Warburton et al., 2007). All three of these measures are good indicators of improved physical fitness.

DanceDanceRevolution has been tested against the guidelines of the American College of Sports Medicine (ACSM) for developing and maintaining cardio-respiratory fitness. It was found that with regular use of the game, players of DanceDanceRevolution met the requirements of the ACSM guidelines (Tan, Aziz, Chua, & Teh, 2002).

Psychological and Behavioural Outcomes

Research has also explored the behavioural and psychological benefits of active gaming as compared to sedentary video games and traditional exercise equipment. Key results are outlined below:

- **Frequency of Play:** Studies have shown that people play active video games about as much as they play traditional sedentary video games (Chin A Paw, Jacobs, Vaessen, Titze, & van Mechelen, 2008; Madsen, Yen, Wlasiuk, Newman, & Lustig, 2007; Mhurchu et al., 2008). Thus, many people like to play active games about as much as they like to play standard sedentary games.
- **Exercise Adherence:** People's adherence to laboratory exercise sessions was significantly higher for active gaming sessions in comparison to sessions using traditional exercise equipment (Annessi & Mazas, 1997; Rhodes, Warburton, & Coble, 2008; Warburton et al., 2007).
- **Regular Attendance:** People's attendance of exercise sessions using virtual reality-enhanced stationary bikes was significantly higher than people's attendance of exercise sessions using traditional stationary bikes (Annessi & Mazas, 1997).

- **Enjoyment:** People's enjoyment during active gaming was significantly higher in comparison to when they were using a traditional stationary bike (Annessi & Mazas, 1997; Rhodes et al., 2008).

What We Still Need to Learn

Research supporting the use of active video games for exercise is quite encouraging; however, it remains limited.

For example, studies examining the use of virtual reality-enhanced stationary bikes have been performed only with college-age individuals. All studies examining active gaming systems and games (Wii, DanceDanceRevolution and EyeToy) have used only youth and adolescent populations. As a result, it is not possible to compare results.

As well, most studies have taken place in laboratory settings and therefore cannot transfer to real life.

Last, most of these studies have focused on short-term physiological outcomes associated with the games. Very limited literature is available on whether these games actually improve people's adherence to exercise over the long-term, which is clearly an important question.

There is also little research into the mechanisms behind the success of these games. While studies have shown that active video games provide more enjoyable experiences than traditional exercise, the exact mechanism behind this is unclear.



Distraction could play a part, such that the players of these games are distracted from what is going on in their bodies during the exercise (e.g., pain, fatigue, increased exertion).

Another explanation could be that players enter a state of flow where skill and challenge are balanced, and they focus entirely on the task at hand. Video games are well-established mechanisms for inducing flow states, so this seems likely (Sherry, 2004).

How These Games Can Help Us

Due to both the limited literature surrounding active video games and the growing demand for these games, there is a clear need for further research. Still, there are a number of positive initial findings from research on active video games.

We know that several active video games provide significant levels of energy expenditure that can translate into positive health outcomes.

We also know that active video games provide a high level of enjoyment, and this is encouraging in terms of people adhering to exercise.

The insignificant differences between the frequency of play for traditional sedentary video games versus active video games is also encouraging, as it affirms that if people want to play a video game, they are just as likely to pick an active game as a sedentary game.

From the findings we have so far, and with the extreme popularity of these types of games, it can be suggested that active video games are a valuable addition to our tools for promoting physical activity.

By no means are active video games the solution to inactivity or obesity, nor are they a replacement for exercise in the real world. But they may augment our current approaches to promoting physical activity by serving as a fun exercise option.

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Mission Statement of the Alberta Centre for Active Living

Working with practitioners, organizations, and communities to improve the health and quality of life of all people through physical activity.

IF YOU HAVE ANY SUGGESTIONS OR QUESTIONS, WE'D LIKE TO HEAR FROM YOU.

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