

Allie Carlson

Alison Berner

TO Composition for College

23 December 2020

*The Power of Video Games in a Healthcare Setting*

When talking about video games, the majority of people think about kids running around arcades or teenagers glued to their game consoles. However, video games can be used for a lot more than just entertainment. Ever since the rise in popularity of video gaming, researchers have been finding new applications of this technology. One specific application that has been gaining traction in recent years is the use of video games in healthcare, with applications in clinics ranging from education to research to rehabilitation. Video games like *Symptom Scenes* teach their users how to spot symptoms of life-threatening diseases that need immediate treatment, while surgical games can give medical students a first-person view of operation practice (Kearns 160). *Cure: Genes in Space* is a video game that allows normal people to contribute to cancer research by exploring space while highlighting genetic anomalies (Kearns 152). While these are all impressive uses for video games, arguably the most researched application lies in video game therapy (VGT). Video game therapy can “make engagement with the activity enjoyable” and “take advantage of low-cost, widely-available hardwares” (Kearns 155). Video game therapy has previously relied on application of pre-existing games designed for enjoyment that can also be used in therapy, but now video games are being designed with the intent of treating mental and physical conditions. Video games are valuable healthcare tools that have a multitude of

applications such as treating mental illnesses, disabilities, and brain trauma, making them cost-effective, accessible, and enjoyable options for therapy and clinics.

Commercial video game consoles like Nintendo's Wii and WiiFit, as well as Microsoft's Xbox 360 Kinect require the user to move around in order to play the game and complete objectives, making them inherently useful in treating physical disabilities. As a result, "clinicians worldwide are embracing the use of these systems" (Levac 427). Cerebral palsy is an example of one such disability that can effectively be treated using video game therapy with the Wii and WiiFit systems. In a study comparing video game supplemented therapy and conventional therapy for children with cerebral palsy, Wii-supplemented therapy significantly improved their upper limb functioning and had similar results compared to traditional therapy in "balance, visual perceptual skills, and functional mobility" (Sajan 366). This demonstrates that video game therapy does not in any way detract from conventional therapy, because of the similar results between those who used VGT and those who did not. Upper limb functioning, which is targeted by the Wii, improved even more for those who participated in video game therapy. Wii-based therapies have also proven to improve balance and posture control, two other important rehabilitation factors for children with cerebral palsy (Sajan 365). Along with all of these benefits, the children participating in video game therapy were more "enthusiastic and motivated to play games" and many said that "the Wii game sessions were more enjoyable than conventional therapy" (Sajan 366). Children who are more motivated to complete their therapy exercises are likely to improve more than those who are not. So, Wii based video game-supplemented therapy is proven to be just as effective as, if not better than, conventional therapy but more enjoyable for children with cerebral palsy.

Another use of Nintendo systems in rehabilitation is with stroke patients, as “in Australia, 76% of stroke rehabilitation units have access to the Nintendo Wii” (Levac 427). This proves that video game therapy is becoming more widespread. The Wii has been proven to be effective with upper limb recovery for stroke patients, just like with cerebral palsy (Morone 1). The WiiFit can also be used in rehabilitation of stroke patients. While the Wii primarily focuses on arm movement, the WiiFit focuses more on balance and lower body movement. The results of a study that gave subacute stroke patients WiiFit based video game therapy declared that VGT is “effective in enhancing balance and independency in activity of daily living” (Morone 5). This adds on to the evidence that video game therapy can be used as an effective supplement to traditional rehabilitation therapy. This study also mentions that the “high diffusion” and “low cost” contributes to the increased attention directed towards video games from a clinical and research perspective (Morone 1). This once again shows that video game therapy is important because it is more readily available and cheaper than other forms of therapy. The WiiFit has also been proven to be effective in a clinical setting, as seen in the study of subacute stroke patients, contributing to the evidence that commercial consoles can be used in physical therapy.

Other than the Wii and WiiFit, the Xbox 360 Kinect has also been proven to be useful in a therapy setting. According to medical professionals like Danielle Levac and others working with her on the evaluation of this console, “Kinect for Xbox 360 games are accessible, motivating, and potentially challenging options for a variety of rehabilitation clients” (435). This once again brings up the point that these games can be much more accessible than other forms of therapy, both because of their availability and their price. The Kinect has demonstrated that it can assist in the recovery of patients with traumatic brain injury (TBI). In one study using the Xbox

Kinect, patients with ambulatory chronic TBI played the games *Kinect Adventures* and *Kinect Sports*. Both games require various motor activities in a standing position (Straudi et. al 2). The conclusion of this study was that “patients appeared to benefit from 6 weeks of VGT in terms of dynamic balance, mobility and selective attention” (Straudi et. al 6). This further proves that commercial consoles can be used in more productive ways than simply for entertainment. One might argue that video game therapy would only be effective with children, as they tend to enjoy and be motivated by video games more than adults, however the average age in this study was 36 (Straudi et. al 3). This shows that video game therapy can be effective and enjoyable for people of all ages. The Xbox 360 Kinect is also a viable commercially produced form of video game therapy, as seen with the rehabilitation of traumatic brain injury patients.

As video game therapy becomes more researched and popularized, companies and researchers have begun to create video games with the specific intent of treating illnesses. Video games that are created with an intent other than entertainment are called serious games. In the healthcare industry, serious games have been developed targeting “psycho-education or specific behavioural changes in patients suffering from a variety of medical illnesses, such as: asthma, cancer, obesity, diabetes, stroke, and pain”. However, these games can also be used to treat mental illnesses, “including obsessive-compulsive disorders, schizophrenia, eating disorders (EDs), addictive behaviours and anxiety disorders” (Fernández-Aranda 365). An example of a serious game designed for healthcare is *PlayMancer*, an “EU initiative to develop a video game prototype for treating specific mental disorders” that is currently focusing on “eating disorders and impulse control disorders” (Fernández-Aranda 365). This game treats these disorders by targeting “problem solving, impulse control, confronting situations associated to frustration and

adverse emotion management” by using biofeedback of emotions (Fernández-Aranda 366). Higher emotions cause the game to be more difficult, encouraging patients to regulate their emotions. If emotions become too high, the game directs them to a calm area so that they can calm themselves before trying again (Fernández-Aranda 368). The early results of this study show that patients who undergo video game therapy using this game display “new coping styles with negative emotions in normal stress life situations, additional generalization patterns and more self-control strategies when confronted with them” (Fernández-Aranda 371). The patients using *PlayMancer* also were very accepting of video game therapy, and they were highly participative (Fernández-Aranda 370). This study proves not only that serious games for healthcare are effective, but also that patients enjoy video game therapy, because of the patients’ high rates of participation. The rise of video game therapy has prompted the creation of serious games intended for healthcare, adding to the list of video games that can effectively treat both physical and mental illnesses.

Akili Interactive Labs is a frontrunner in the industry of serious games in healthcare, both as researchers and as creators. While also contributing research into video game therapy, they developed the serious game *Project:EVO*, which has successfully been used to treat a variety of disorders that affect cognitive functioning. While it has been used with children, many studies have used this game with older patients. *Project: EVO* is an “effective intervention for both mood and cognitive symptoms of” late life depression. The game was also described as easy to use, portable, and enjoyable, as patients used the game beyond what was expected of them (Anguera 514). This demonstrates that even games designed for medical treatment, not entertainment, are still enjoyable alternatives to conventional therapy. Participants in this study

experienced “cognitive control enhancements” as well as “decline in negativity bias” by the end of the therapy period (Anguera 515). This means that *Project:EVO* was effective in treating symptoms of late life depression. All of the participants in this study were 60+ years old, so this study once again proves that video game therapy is effective for all ages, not just children (Anguera 508). *Project: EVO* provides additional proof that video game therapy is effective in the treatment of mental illnesses, as well as the idea that it is enjoyable for all ages.

Recently, Akili Interactive Labs made history by creating a Food and Drug Administration (FDA) cleared prescription video game. *EndeavorRx* is a prescribed treatment for children with attention deficit hyperactivity disorder (ADHD). This serious game, a racing game, has been proven to improve attention function in 8-12 year olds who have ADHD. (“Akili Announces FDA Clearance of EndeavorRx™”). *EndeavorRx* is another excellent example of a serious game designed for improving cognitive functioning that is effective and enjoyable. FDA approval means that clinicians can prescribe the usage of this video game to their patients, either alongside or in place of ADHD medication. *EndeavorRx* is a product of the growing recognition of video game therapy in healthcare.

As video games become more popular, researchers find new ways to apply them constructively, like video game therapy in healthcare. Through an abundance of research, both video game consoles created with the intent of entertainment and serious games created to treat specific cognitive functions have been proven to be effective treatments for physical and mental illnesses. The culmination of this research can be seen in the groundbreaking serious game *EndeavorRx*. Many clinicians and researchers acknowledge that video game therapy is important because it is accessible, cost-effective, and enjoyable for patients. Video games have been proven

to be valuable healthcare tools through a multitude of research studies displaying the effectiveness of video game therapy for a variety of illnesses.

*Works Cited*

- Akili. "Akili Announces FDA Clearance of EndeavorRx™ for Children with ADHD, the First Prescription Treatment Delivered Through a Video Game." *Business Wire (English)*, 2020 Autumn 6AD. *EBSCOhost*, search.ebscohost.com/login.aspx?direct=true&db=keh&AN=bizwire.bw37069392&site=ehost-live.
- Anguera, Joaquin A., et al. "Improving Late Life Depression and Cognitive Control through the Use of Therapeutic Video Game Technology: A Proof-of-Concept Randomized Trial." *Depression & Anxiety (1091-4269)*, vol. 34, no. 6, June 2017, pp. 508–517. *EBSCOhost*, doi:10.1002/da.22588.
- Fernández-Aranda, Fernando, et al. "Video Games as a Complementary Therapy Tool in Mental Disorders: PlayMancer, a European Multicentre Study." *Journal of Mental Health*, vol. 21, no. 4, Aug. 2012, pp. 364–374. *EBSCOhost*, doi:10.3109/09638237.2012.664302.
- Kearns, Ciléin. "Prescription Play: A Primer on Innovative Use of Video Games Technology in Healthcare." *Journal of Visual Communication in Medicine*, vol. 38, no. 3/4, Nov. 2015, pp. 152–163. *EBSCOhost*, doi:10.3109/17453054.2015.1100981.
- Levac, Danielle, et al. "'Kinect-Ing' With Clinicians: A Knowledge Translation Resource to Support Decision Making About Video Game Use in Rehabilitation." *Physical Therapy*, vol. 95, no. 3, Mar. 2015, pp. 426–440. *EBSCOhost*, doi:10.2522/ptj.20130618.
- Morone, Giovanni, et al. "The Efficacy of Balance Training with Video Game-Based Therapy in Subacute Stroke Patients: A Randomized Controlled Trial." *BioMed Research International*, vol. 2014, Jan. 2014, pp. 1–6. *EBSCOhost*, doi:10.1155/2014/580861.



- Sajan, Jane Elizabeth, et al. "Wii-Based Interactive Video Games as a Supplement to Conventional Therapy for Rehabilitation of Children with Cerebral Palsy: A Pilot, Randomized Controlled Trial." *Developmental Neurorehabilitation*, vol. 20, no. 6, Aug. 2017, pp. 361–367. *EBSCOhost*, doi:10.1080/17518423.2016.1252970.
- Straudi, Sofia, et al. "The Effects of Video Game Therapy on Balance and Attention in Chronic Ambulatory Traumatic Brain Injury: An Exploratory Study." *BMC Neurology*, vol. 17, May 2017, pp. 1–7. *EBSCOhost*, doi:10.1186/s12883-017-0871-9.