

Wii can rehabilitate?

The gaming device Nintendo Wii is now recognised as a successful tool in young and elderly rehabilitation. Not just a physical therapy, “Wii-habilitation” is helpful even in palliative patients as a means of distraction and improving concentration skills. Our review reflects current practice and discusses the varied scope of the Wii as an enjoyable therapy.

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The Nintendo “Wii” is a popular games console,¹ which has a wireless motion-sensing controller that allows users to do a range of activities (from playing “tennis” to copying dance moves). Although often marketed as something for entertainment, the Wii is increasingly being used by the NHS as form of a rehabilitation therapy.²

The health benefits of the Wii are currently being investigated. For example, the now completed EVEREST study assessed the benefits of the game console for stroke rehabilitation.³ The results of this pilot study will form the basis of a much larger, multicentre trial.

Previous studies have shown the benefits of Wii for younger age groups. It was shown to improve visual-perceptual processing, postural control and functional mobility in an adolescent patient with spastic diplegic (a form of cerebral palsy).⁴ Another study found that regular use of the Wii could help patients to lose weight (12.25 kg a year).⁵ However, a 2007 *BMJ* study found that, for a young adult, exercise via a Wii sports game was not an adequate replacement for regular exercise.⁶

Therapeutic benefits

According to individual accounts, when used correctly in a therapeutic setting, the Wii can help patients to build new connections within the brain and between the brain and the muscles. Therefore, it may have the potential to be a versatile tool for improving strength, endurance, and flexibility. It could also be used to help patients develop problem-solving skills.⁷

The St Mary’s Medical Centre in San Francisco has been running a “Wiihab” programme since 2008. Dr Justin Liu, who initiated the programme, claims the Wii helps patients in several ways. He says that:

- The buttons of the Wii controller help patients to improve their motor skills
 - The flicking and swinging motion required to play some of the games helps improve hand-to-eye coordination; and
 - The Wii Balance Board can assist with balance, core strengthening, and retraining muscles.⁸
- An tool that improves balance

would be useful in patients with postural instability, which is a common cause of falling.⁸ People aged >65 years have an up to 80% risk of falling at least once in their lifetime.⁹ If a fall is severe, it can lead to permanent disability and possibly death. A fall can also immensely affect an elderly person’s confidence and impair their quality of life. The University of Aberdeen and NHS Grampian showed that “Wii Fit” (which is specifically designed for exercise) can improve balance in the elderly through a series of weekly exercises.¹⁰

The Wii may also help patients with specific conditions. For example, playing videos games is associated with an increase in the release of dopamine and thus may be potentially beneficial for patients with Parkinson’s disease. A small study found that playing Wii games improved dexterity, fine motor skills, and balance in patients with the condition.¹¹ It also showed that using Wii on a regular basis improved mood.

In another study, post stroke and fracture patients were given graded exercises that helped to increase power in targeted parts

of the body and also enhanced their daily activity performance.¹² Therefore, gaming could help coordination and help the recovery of lost cognitive skills in this subgroup of patients.

A problem with traditional stroke rehabilitation therapy is that patients can find the stretching and lifting exercises painful, possibly finding them dull and repetitive as well (therefore, losing motivation to do them). However, there have been reports that patients become so engrossed in playing Wii games that they “forget” are doing exercise.¹³ Thus, potentially, patients (if using the Wii) may not need to be encouraged to do rehabilitation exercises as they will want to do them.

For all patients, the Wii can enhance mental well being. It can help patients to remember past experiences, and provide a distraction for patients with chronic or terminal illnesses. Additionally if patients see their friends and family and other patients play on the Wii, they will be further motivated to use it themselves.¹⁴

The Wrexham Maelor hospital Elderly Rehabilitation Ward runs different Wii sessions including active physiotherapy, balance exercises, and palliative programs with an emphasis on distraction and team building. Though still in the experimental phase, the unit believes that they could use the console to involve and get the best out of even their most unmotivated patients. Bernice Worrall, Senior Physiotherapist, says: “It is good to see patients getting fully involved and compete as if they are playing in real-life situations”.

Safety precautions

One potential problem of using the Wii is that over use can lead to addiction and the development of physical strain injuries (informally termed “Wiiitis”).¹³

The blog www.wiihaveaproblem.com details the side effects of Wii and includes pictures of people with black eyes, broken bones and smashed windows. However, sensible use of the Wii is unlikely to lead to such problems and there have been no reports of Wii-related injuries in the elderly population.

More information

The website *Wii-Habilitation* (www.wiihabilitation.co.uk) is a useful resource that contains information for professionals and patients regarding how the Nintendo Wii can be used to maximise a patient’s physical potential while enjoying the interaction with computer gaming.

Conclusion

With the current evidence and evolving research, the usage of Wii in rehabilitation is yet to be fully explored in the UK. But as an alternative to aggressive and “stressful” physical therapy, Wii-habilitation is a revolution in bringing “fun” into provision of physical and mental therapy for elderly and/or disabled patients. More research is needed on this new type of therapy.

Conflict of interest: none

References

1. Eurogamer. Wii and DS thrash competition in US News. <http://bit.ly/5SFthj> (accessed 1 April 2011)
2. Basingstoke and North Hampshire NHS Foundation Trust. Alton physiotherapists offer Wii-habilitation. <http://bit.ly/fkQuPw> (accessed 1 April 2011)
3. Saposnik G, Mamdani M, Bayley M, et al. Effectiveness of Virtual Reality Exercises in STroke Rehabilitation (EVREST): rationale, design, and protocol of a pilot randomized clinical trial assessing the Wii gaming system. *Int J Stroke* 2010; **5**: 47–51
4. Deutsch JE, Borbely M, Filler J, et al. Use of a low-cost, commercially available gaming console (Wii) for rehabilitation of an adolescent with cerebral palsy. *Phys Ther* 2008; **88**: 1196–07
5. BBC News Online. Computer games ‘burn up calories’. <http://bbc.in/bBMuk> (accessed 1 April 2011)
6. BBC News Online. Wii players need to exercise too. <http://bbc.in/YkJS> (accessed 1 April 2011)
7. Wiihab. Wii-Hab Meets Medical Illustration. <http://bit.ly/41lr93> (accessed 1 April 2011)
8. Escapist magazine. Waggle therapy. <http://bit.ly/14CIZI> (accessed 1 April 2011)
9. Białoszewski D, Stupik A, Lewczuk E, et al. Incidence of falls and their effect on mobility of individuals over 65 years of age relative to their place of residence. *Ortop Traumatol Rehabil* 2008; **10**: 441–48
10. BBC News Online. Elderly wanted for Wii experiment. <http://bbc.in/1ACwco> (accessed 1 April 2011)
11. Live Science. Parkinson’s Patients Go to Wii-hab. <http://bit.ly/dIDL1Y> (accessed 1 April 2011)
12. Wii-Habilitation. Hemiplegia & the Wii. <http://bit.ly/fwjgOq> (accessed 1 April 2011)
13. Herrin Hospital. Doctors Use Wii Games For Rehab Therapy After Strokes, Surgery, Even Combat Injuries. <http://bit.ly/eayRNN> (accessed 1 April 2011)
14. Ramchandani A, Carroll K, Buenaventura R, et al. *Virtual Rehabilitation* 2008; **69**
15. Reuters. If it’s not tennis elbow, it may be “Wiiitis”. <http://reut.rs/hnoica> (accessed 1 April 2011)