

VIRTUAL REALITY AND HEALTH

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EDITORIAL

The use of the virtual world is becoming increasingly widespread due to technological advancements and the current generation's greater interest in technology.¹ Virtual reality, one of the innovative technologies of the 21st century, involves the use of computer technology to create an interactive three-dimensional world that gives the user a sense of spatial presence.^{2,3}

It is known that virtual reality is a new, enjoyable, memorable, immersive, and engaging learning tool that facilitates learning.⁴ It is stated that virtual reality can be used as an alternative or complementary method in nursing education and patient training, especially.^{1,2,5} The virtual reality-based program has been found to enhance parents' knowledge and skills regarding epileptic seizures.⁵

In recent years, studies have reported the significance of virtual reality in improving the health of the elderly. It has been observed that it particularly enhances cognitive and verbal memory, regulates balance, and reduces the risk of falls.⁶⁻⁸ Virtual reality doesn't only have positive effects on aging. It is also reported to have positive effects on various diseases.^{7,9,10,11} Virtual reality is reported to be usable for reducing symptoms that occur in various

conditions such as hemophilic knee arthropathy, stroke, Parkinson's disease, heart diseases, lumbar disc herniation, cancer, kidney diseases, spinal cord injury & cerebral palsy.^{9,10,12-15}

In a study conducted by Ucero-Lozano and colleagues (2022)¹⁵, it was found that a 180° immersive virtual reality motion visualization increased joint strength and reduced joint pain in patients with hemophilic knee arthropathy. In a systematic review and meta-analysis study, it was found that virtual reality-based treatments improved walking function and memory in stroke patients.⁹ In a different study, it was determined that the use of virtual reality rehabilitation in patients with paralysis during the acute phase of stroke improved motor function.¹⁶ Virtual reality rehabilitation training has been observed to improve walking and balance in patients with Parkinson's disease.¹² In a study by Chen and colleagues (2022)¹¹, it is suggested that virtual reality can be utilized to improve exercise capacity and psychological outcomes in individuals undergoing cardiac rehabilitation. It has been found that exercise programs conducted with virtual reality goggles for individuals with lumbar disc herniation reduced pain, decreased the risk of falls, and improved daily life activities and quality of life.¹⁴ It is indicated that virtual reality can be used as a distraction method to reduce pain during venous port entry in oncology patients.¹⁰ In a systematic study conducted by Qian and colleagues (2020)¹³, it was reported that out of twelve articles, eight demonstrated positive effects of virtual reality on physical fitness, muscle strength, balance, and extremity function. Three articles indicated that virtual reality exercise reduced fatigue, tension, and depression, promoted calmness, and enhanced the quality of life. In individuals with hemodialysis, spinal cord injuries, early-onset cerebral palsy, and cognitive decline, virtual reality-based exercise has been observed to have the potential to create positive effects on the individual's physiological, psychological, and rehabilitation outcomes when compared to traditional exercise. Although the literature suggests that virtual reality is important in both the educational field and in reducing various symptoms, there is a need for well-designed, blinded, and large-sample randomized controlled trials to demonstrate its effectiveness.

REFERENCES

1. Shorey S, Ng ED. The use of virtual reality simulation among nursing students and registered nurses: A systematic review. *Nurse Educ Today*. 2021;98:104662. doi:10.1016/j.nedt.2020.104662.
2. Chen FQ, Leng YF, Ge JF, Wang DW, Li C, Chen B, Sun ZL. Effectiveness of virtual reality in nursing education: meta-analysis. *J Med Internet Res*. 2020;22(9):e18290.
3. Sokołowska B. Impact of virtual reality cognitive and motor exercises on brain health. *Int J Environ Res Public Health*. 2023;20(5):4150.
4. Saab MM, Hegarty J, Murphy D, Landers M. Incorporating virtual reality in nurse education: A qualitative study of nursing students' perspectives. *Nurse Educ Today*. 2021;105:105045. doi:10.1016/j.nedt.2021.105045
5. Turan FD, İşler Dalgıç A, Duman Ö. Development of a conceptual framework for a virtual reality-based seizure management education program for parents. *Epilepsy Behav*. 2022 Oct;135:108875.
6. Phu S, Vogrin S, Al Saedi A, Duque G. Balance training using virtual reality improves balance and physical performance in older adults at high risk of falls. *Clin Interv Aging*. 2019;14:1567-1577.
7. Liao YY, Tseng HY, Lin YJ, Wang CJ, Hsu WC. Using virtual reality-based training to improve cognitive function, instrumental activities of daily living and neural efficiency in older adults with mild cognitive impairment. *Eur J Phys Rehabil Med*. 2020;56(1):47-57. doi:10.23736/S1973-9087.19.05899-4
8. Zahedian-Nasab N, Jaber A, Shirazi F, Kavousipor S. Effect of virtual reality exercises on balance and fall in elderly people with fall risk: a randomized controlled trial. *BMC Geriatr*. 2021;21(1):509.
9. Zhang Q, Fu Y, Lu Y, Zhang Y, Huang Q, Yang Y, Zhang K, Li, M. Impact of virtual reality-based therapies on cognition and mental health of stroke patients: systematic review and meta-analysis. *J Med Internet Res*. 2021;23(11):e31007.
10. Semerci R, Akgün Kostak M, Eren T, Avcı G. Effects of virtual reality on pain during venous port access in pediatric oncology patients: A randomized controlled study. *J Pediatr Oncol Nurs*. 2021 Mar-Apr;38(2):142-151. doi:10.1177/1043454220975702.
11. Chen Y, Cao L, Xu Y, Zhu M, Guan B, Ming WK. Effectiveness of virtual reality in cardiac rehabilitation: A systematic review and meta-analysis of randomized controlled trials. *Int J Nurs Stud*. 2022;133:104323. doi:10.1016/j.ijnurstu.2022.104323
12. Lei C, Sunzi K, Dai F, Liu X, Wang Y, Zhang B, He L, Ju M. Effects of virtual reality rehabilitation training on gait and balance in patients with Parkinson's disease: A systematic review. *PLoS One*. 2019;14(11):e0224819.
13. Qian J, McDonough DJ, Gao Z. The Effectiveness of virtual reality exercise on individual's physiological, psychological and rehabilitative outcomes: A systematic review. *Int J Environ Res Public Health*. 2020;17(11):4133.
14. Buztepe S. (Doctorate thesis, Atatürk

University, 2022) The effect of exercise performed with virtual reality glasses on individuals with lumbar disc hernia on pain, daily life activities and quality of life.

15. Uceró-Lozano R, Pérez-Llanes R, López-Pina JA, Cuesta-Barriuso R. Approach to knee arthropathy through 180-degree immersive vr movement visualization in adult patients with severe hemophilia: A pilot study. *J Clin*

Med. 2022 Oct 21;11(20):6216. doi: 10.3390/jcm11206216.

16. Zakharov AV, Khivintseva EV, Chaplygin SS, Starikovskiy MY, Elizarov MA, Kolsanov AV. Motor rehabilitation of patients in the acute period of stroke using virtual reality technology. *Zh Nevrol Psikhiatr Im S S Korsakova.* 2021;121(8.Vyp.2):71-75.