https://doi.org/10.35845/kmuj.2025.23757

LETTER TO THE EDITOR

Revolutionizing visual biofeedback therapy in Parkinson disease management: beyond traditional therapy

Fouzia Hussain [1]

THIS ARTICLE MAY BE CITED AS: Hussain F. Revolutionizing visual biofeedback therapy in Parkinson disease management: beyond traditional therapy. Khyber Med Univ J 2025;17(1):123-4. https://doi.org/10.35845/kmuj.2025.23757

1: Department of Physical Therapy, Ziauddin College of Physical Therapy, Faculty of Allied Health Sciences, Ziauddin University, Karachi, Pakistan

Email: fouziaphysio1@gmail.com
Contact #: +92-310-1136008

Parkinson's disease (PD) is the second most prevalent age-related neurodegenerative disorder after Alzheimer's disease, affecting over 6.5 million individuals worldwide. The global prevalence of PD is projected to double within the next 20 to 30 years.[1] Currently, the disease affects approximately one to two individuals per 1,000 people.[2] In Asia, the highest prevalence of PD is reported in China, accounting for 36% of all neurological disorders.[3] In Pakistan, population-based data on the prevalence of Parkinson's disease (PD) remain limited. However, a systematic review of seven studies reported a total of 1,016 cases, including 600 from Khyber Pakhtunkhwa, 85 from Lahore, and 50 from Rawalpindi.[4] An additional observational study conducted in Islamabad contributed to these findings. The review highlighted a rise in PD cases over the past decade, with a higher prevalence among males compared to females, reflecting global trends.[5]

The PD encompasses both motor and non-motor symptoms (NMS). Motor symptoms include tremors, rigidity, akinesia, postural instability, and balance impairments, while NMS involve cognitive and psychological impairments.[6] Various exercises are utilized in the management of PD, including traditional physical therapy (PT) approaches such as balance training, strengthening exercises, stretching, and treadmill training. However, traditional PT has limitations, including inadequate follow-up, financial challenges, and concerns regarding patient safety.[7]

To address the limitations of traditional PT, there has been a paradigm shift toward neurological technological advancements.[8] Among these, Visual Biofeedback Therapy (VBFT) utilizing Wii-Fit exercises has gained significant interest from researchers.[9] VBFT is a cost-effective device consisting of a balance board and an interactive real-time stimulation interface. It incorporates four components: balance, strength training, yoga, and aerobics. During therapy, PD patients perform exercises displayed on a screen using an avatar, while therapists provide visual cues to guide them.[10] A 2024 meta-analysis demonstrated that VBFT using Wii-Fit exercises significantly improves balance in patients with stage I to IV PD.[11]

Despite advancements in PD rehabilitation, there remains a lack of data, particularly in Pakistan, regarding the effectiveness of VBFT with Wii-Fit in improving motor functions such as balance and gait in PD patients. VBFT has proven to be more engaging and safer compared to traditional PT, with high patient receptivity and compliance. Beyond motor improvements, VBFT also positively impacts NMS, including cognition and psychological well-being.

By transitioning from traditional PT to VBFT, Parkinson's patients can benefit from a more holistic and interactive rehabilitation approach. Incorporating VBFT into treatment plans enables healthcare professionals to provide advanced and comprehensive care, addressing the multifaceted needs of PD patients while enhancing their independence and overall quality of life.

REFERENCES

1. Hussain F, Farooqui S, Khan IA, Hassan B, Afridi ZK. Effects of exercise-based management on motor symptoms in parkinson's disease-a meta-analysis. J Coll Physicians Surg Pak 2023;33(8):919-26.https://doi.org/10.29271/jcpsp.2023.08.919
2. Moore S, Knowles S. Beliefs and knowledge about Parkinson's disease. E-J Appl Psychol 2006;2:15-21.
3. Nouroz F, Mehboob M, Khan S, Mobin T. Global prevalence and therapeutic strategies for Parkinson's disease. Pak J Clin Biomed Res 2014;2:48-52.
4. Jamali YA, Rahu HN, Kumar A, Khuhro AB, Shaikh AS, Soomro S. Prevalence of Parkinson's disease in Pakistan–a systematic review: Prevalence of Parkinson's Disease in Pakistan. Pak BioMed J 2024;7(1):60-5. https://doi.org/10.54393/pbmj.v7i01.1027
5. Imtiaz N, Mehreen S, Saeed K, Akhtar N, Ur H, Rehman SA, et al. Study of prevalence of Parkinson's disease in elderly population in Rawalpindi, Pakistan. Pakistan. J Entomol Zool Stud 2016; 4(6):845-7
6. National Parkinson Foundation. Falls Prevention. Updated: May 1, 2020. [Accessed on: July 11, 2024]. Available from URL: http://www.parkinson.org.
7. Khobkhun F, Khacharoen S, Tretriluxana J, Richards J. The effectiveness of exercise on gait, turning and falls in individuals with Parkinson's disease: a scoping review. Int J Pharm Pharm Res 2021;13:1-25.
8. Cao S. Virtual reality applications in rehabilitation. InHuman-Computer interaction. Theory, design, development and practice: 18th International Conference, HCI International 2016, Toronto, ON, Canada, July 17-22, 2016.

Proceedings, Part I 18 2016 (pp. 3-10). Springer International Publishing.http://dx.doi.org/10.1007/978-3-319-39510-4_1

9. Golla A, Müller T, Wohlfarth K, Jahn P, Mattukat K, Mau W. Home-based balance training using Wii Fit™: a pilot randomised controlled trial with mobile older stroke survivors. Pilot Feasibility Stud 2018;4:1-0. https://doi.org/10.1186/s40814-018-0334-0

10. Karasu AU, Batur EB, Karataş GK. Effectiveness of Wii-based rehabilitation in stroke: a randomized controlled study. J Rehabil Med 2018;50:406-12. https://doi.org/10.2340/16501977-2331

11. Hussain F, Farooqui S, Khan AA, Khan MU, Khan MA, Hasan A. Effects of nonimmersive virtual reality using Wii-Fit exercises on balance and cognition in Parkinson disease: a meta-analysis. Medicine 2024;103(30):e38940.https://doi.org/10.1097/MD.0000000000038940

CONFLICT OF INTEREST

The author declares no conflict of interest - financial or otherwise - that could compromise the integrity, objectivity, or validity of the opinion or viewpoint expressed.

GRANT SUPPORT AND FINANCIAL DISCLOSURE

Author declared no specific grant for this research from any funding agency in the public, commercial or non-profit sectors

KMUJ web address: www.kmuj.kmu.edu.pk
Email address: kmuj@kmu.edu.pk