The Bioscan AN INTERNATIONAL QUARTERLY JOURNAL OF LIFE SCIENCES 20(2): S2: 829-831, 2025 www.thebioscan.com

INFLUENCE OF TELEREHABILITATION TO IMPROVE FUNCTIONAL OUTCOMES IN INDIVIDUALS WITH PARKINSON'S DISEASES

VINCY IGNATIOUS[1], Physiotherapist, Sri Ramachandra Faculty of Physiotherapy, Chennai – 600116, India

RADHIKA C.M.[1*], Assistant professor, Sri Ramachandra Faculty of Physiotherapy, Chennai - 600116, India

PRAVEEN KUMAR CHENNIMALAI RAVI[2], Assistant professor, Sri Ramachandra Faculty of Physiotherapy, Chennai - 600116, India

P. PARTHIBAN[3], Lecturer, Sri Ramachandra Faculty of Physiotherapy, Chennai - 600116, India

Address for Correspondence: RADHIKA C.M.,

Email: radhikacm@sriramachandra.edu.in

DOI: 10.63001/tbs.2025.v20.i02.S2.pp829-831

KEYWORDS
Parkinson's diseases, Telerehabilitation, Functional recovery, Telehealth- system.

Received on:

12-04-2025

Accepted on:

15-05-2025

Published on:

23-06-2025

ABSTRACT

Motor, and non-motor symptoms of Parkinson's disease (PD), Regular practice of exercise can improve their functional capacity and overall quality of life (QOL). Interruption of physical therapy in pandemic severely affected the patient's QOL. Tele- rehabilitation services (TR), prevents delay of care, improves, maintain, motivates, and satisfies the patient, also boosted the opportunity to apply technology-based solutions to provide health services without interruption. **Aim:** To find the effectiveness of Tele rehabilitation on functional outcome in clients with Parkinson's disease. **Materials and methods:** An observational study was conducted on 11 individuals diagnosed with Idiopathic PD recruited from a private clinic. Unified Parkinson's Diseases Rating Scale wasused to assess the functional status of the patient. Tele rehab training is given for 4 weeks on alternate days for 30 minutes duration under the guidance of an experienced therapist. At the end of the fourth week, the subjects were re-evaluated using the UPDRS scale. **Results:** Significantly improved UPDRS motor component, as well as total UPDRS score, showed in individuals diagnosed with PD. **Conclusions:** People with PD, who can't reach clinical setup easily, will find Telerehabilitation more affordable. It is possible to perform treatment programs for peoplewith PD using the telerehabilitation system.

INTRODUCTION

Parkinson's disease (PD) is a long-term neurological movement illness that affects speech, swallowing, physical mobility, and cognition. According to Chen et al. (2020), these symptoms invariably lead to a lower quality of life (QOL), more expenses, and a greater burden on caregivers. They also affect a person's ability to carry out their daily activities of living (ADL). The best treatment plans for managing symptoms and enhancing quality of life include medication, rehabilitation, and lifestyle changes.

Regular exercise with Parkinson's disease (PD) can enhance their functional ability, everyday living activities, and general quality of life (QOL) (Lai et al, 2020). According to Gregory et al. (2011), people with Parkinson's disease typically cannot utilize the rehabilitation services because of a number of factors, including limited access to care, low expectations for results, a shortage of medical personnel, fear of falling, time constraints, low exercise self-efficacy, and transportation.

In order to improve functional recovery, telerehabilitation (TR) can be utilized as adjunct to improve rehabilitation services, prevent treatment delays, and motivate and encourage patients. As more reasonably priced internet and communication technologies were available, there was a greater chance that technology-based solutions could be used to provide healthcare services both during and after hospitalization. (2015) Agostini et al.

TR procedures have demonstrated patient satisfaction, excellent care quality, positive interpersonal engagement, and advantages for both patients and the healthcare system in terms of cost-effectiveness and long-term implementation rehabilitation. The QOL of PD patients is significantly impacted when physical therapy is interrupted. TR offers dynamic flexibility to the patient's profile and surroundings and is just as effective as in-person consultations, if not more so (Hung and Fong, 2019). As a result, TR is essential for PD patients to stay active and preserve or enhance their functional results and quality of life.

TR encompasses a wide range of health care services that are delivered through technology, including case management, education, prevention, treatment, consultation, assessment, and supervision. It makes it possible for various medical specialties to employ evidence-based treatments with positive results. (Nuara and others, 2022). TR helps the person maintain function, adhere to treatment, and reduce the need for ongoing professional supervision so that they can continue to be active in their surroundings. For Indian PD patients, Garg & Dhamija et al. (2020) described the requirements, possible advantages, drawbacks, and best practices of TR.

High-end technology and devices required for TR may not be accessible to PD patients in India from all socioeconomic backgrounds. Therefore, we implemented TR using the G-meet platform, which may be more convenient for everyone. This study aimed to examine the impact of telerehabilitation on the functional outcome of patients with Parkinson's disease. Telerehabilitation is a new, technology-based, and economical kind of rehabilitation.

Materials and Methods

The Research Advisory Committee gave its approval to the project (CSP/21/AUG/98/456). The study lasted eight months, from November 2020 to July 2021. Participants were sourced from a private clinic, and informed consent was acquired during a phone call. PD severity rating scale stages II and III in the Hoehn and Yahr score were used to assess subjects who had been clinically diagnosed with idiopathic Parkinson's disease. Participants in the study required to be independently mobile, have good communication skills, and be in a healthy cognitive state. People with skeletal imbalance, speech and hearing impairments, any known illness other than Parkinson's disease (PD) that could impair motor function (stroke, multiple sclerosis, etc.), and any conditions that would prevent them from engaging in physical activity were excluded.

11 subjects who met the inclusion criteria participated in the study. History and initial evaluation were directly taken from the subjects; information on specific points was obtained. These included demographic details, diagnosis, duration, medication, educational level, employment status, family's contribution towards looking after the subject. The subjects were then initially evaluated using UPDRS scale and scores was noted down, depending on the individual's problem exercises was taught and the care were encouraged to take part in the program, following the session they received power point slides via email with a series of Home- Based Exercises which was already taught to them. Tele rehab training was continued for 4 weeks, on alternate days for 30 minutes duration under the guidance of experienced therapist via Google meet. Patients and their relatives received instructions about how to do the exercises. At the end of 4th week, the subject was reassessed using the same outcome measures and the difference in score was noted down.

Results

Results shows total of 11 participants participated in the study with 2 drop outs. 60% are males and 40% are females. The results have shown significant difference in the patients overall score in pre and post UPDRS and Pre and post motor component of UPDRS III.

Table 2: Paired differences of both pre and post UPDRS, and pre and post UPDRS III component.

		Paired Differences					t	D f	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	PreUPDRSIII – PostUPDRSIII	2.778	2.167	.722	1.112	4.443	3.846	8	.005
Pair 2	PreUPDRS - PostUPDRS	3.889	3.371	1.124	1.298	6.480	3.461	8	.009

P< 0.05 * significant; Paired sample t-test

Table 2 shows there is statistical significance in the post UPDRS score as well as Post UPDRS III score.

DISCUSSION

The study's primary conclusion was that patients with Parkinson's disease who received telerehabilitation shown a significant improvement in both their overall UPDRS score and the motor component. Furthermore, the entire cost of rehabilitation using Telesystem was reasonable, and future TR training could be utilized. The UPDRS I, II, and IV component scores were comparable and were not taken into account. We discovered that people with Parkinson's disease can be trained and have their functional results improved by telerehabilitation. As a result, it might be useful for PD patients in stages I, II, and III who require assistance with home-based telerehabilitation.

For those with Parkinson's disease, not exercising during the COVID-19 pandemic is a challenge. This pandemic scenario encouraged medical practitioners to prioritize the use of telemedicine in order to protect patient safety, save costs, promote physical and mental health, enhance treatment results, and expand the possibilities of global health services.

TR is a useful promotion technique that can be widely used in the future to help people with PD achieve a satisfactory functional recovery, according to recent research.

TR can serve as a platform for communication, evaluation, and training for the Person With PD (PWPD) in speech, occupational, and physical therapy, according to evidence-based assessments of PD training. The previous studies used mobile applications or the Telehealth system under clinical or direct supervision to measure the results. These research concentrated on acceptability, safety, efficacy, and patient and therapist satisfaction. Due to the patients' functional level, lack of experience, cost-effectiveness, and education, telesystem monitoring may not be appropriate or be challenging to employ in an Indian setting (Meeka et al, 2018).

In this study, we examined the potential of TR to enhance functional outcomes for people with Parkinson's disease. Six of the nine subjects exhibited significant variations in both motor components and pre- and post-total UPDRS scores. The application of TR aids in maintaining non-motor components and improving functional outcomes and ADLs. However, when compared to non-motor components, the motor component shown more progress.

The individual is able to continue regular rehabilitation exercises in their surroundings without experiencing pandemic attachment, and their motor and functional abilities have improved. The people were able to maintain or increase their ADLs and functional mobility. TR is therefore a viable neuro rehabilitative treatment that can be employed to enhance and sustain functional outcomes in Parkinson's disease patients.

Limitations

- Minimal number of subjects included in the study
- Inability to augment the exercises manually due to pandemic situation

- Not able to track the subjects who were not regular for Telerehabilitation.
- The short duration of the study

CONCLUSION

Telerehabilitation is more cost-effective only for people who have trouble getting to clinical settings. The telerehabilitation system can be used to carry out therapy programs for individuals with Parkinson's disease. This study offers evidence in favor of using telerehabilitation technologies to assess the physical functioning of remote PD clients, due to insufficient sample power further research with larger size is very necessary.

REFERENCES

- Chen, Y. Y., Guan, B. S., Li, Z. K., Yang, Q. H., Xu, T. J., Li, H. B., & Wu, Q. Y. (2020). Application of telehealth intervention in Parkinson's disease: A systematic review and meta-analysis. Journal of Telemedicine and Telecare, 2020 Jan;26.1-2 :3-13.
- Lai, B., Bond, K., Kim, Y., Barstow, B., Jovanov, E., & Bickel, C. S. (2020). Exploring the uptake and implementation of tele-monitored home-exercise programmes in adults with Parkinson's disease: A mixed-methods pilot study. Journal of telemedicine and telecare, 2020 Jan;26.1-2 :53-63.
- Gregory, P., Alexander, J., & Satinsky, J. (2011). Clinical telerehabilitation: applications for physiatrists. PM&R. 2011 Jul 1;3.7:647-56.
- Agostini, M., Moja, L., Banzi, R., Pistotti, V., Tonin, P., Venneri, A., & Turolla, A. (2015). Telerehabilitation and recovery of motor function: a systematic review and meta-analysis. Journal of telemedicine and telecare. 2015 Jun;21.4:202-13.
- Hung KN, G., & Fong, K. N. (2019). Effects of telerehabilitation in occupational therapy practice: A systematic review. Hong Kong Journal of Occupational Therapy,. 2019 Jun;32.1:3-21.
- Nuara, A., Fabbri-Destro, M., Scalona, E., Lenzi, S. E., Rizzolatti, G., & Avanzini, P. (2022). Telerehabilitation in response to constrained physical distance: an opportunity to rethink neurorehabilitative routines. Journal of neurology, 2022 Feb;269.2:627-38.
- Garg, D., & Dhamija, R. K. (2020). Teleneurorehabilitation for Parkinson's disease: a panacea for the times to come?. Annals of Indian Academy of Neurology,. 2020 Sep 1;23.5:592-7.
- Meeka Khanna, M. K., Guru Gowda, G. G., Virupaksha Bagevadi, V. B., Anupam Gupta, A. G., Karishma Kulkarni, K. K., Shyam, R. S., ... & Suresh Math, S. M. (2018). Feasibility and utility of tele-neurorehabilitation service in India: experience from a quaternary center.