International Journal of Research and Review
[Indexed, Peer-Reviewed Journal]
Volume 13; Issue: 8; August 2026
Website: www.ijrrjournal.com
Research Paper *E-ISSN: 2349-9788; P-ISSN: 2454-2237*

Correlation Between Disability and Quality of Life in Patients with Parkinson's Disease

Vrima Vijay Shukla[1], Dr. Yagna Unmesh Shukla[2]

[1]PhD Scholar, Department of Physiotherapy, Gujarat University, Ahmedabad, Gujarat, India.
[2]PhD Guide, Gujarat University; Principal, Government Physiotherapy College & Government Spine Institute, Ahmedabad, Gujarat, India.

Corresponding Author: Vrima Vijay Shukla

DOI: https://doi.org/10.52403/ijrr.20260808

ABSTRACT

Background: Parkinson's disease (PD) is a progressive neurodegenerative disorder characterized by motor and non-motor impairments that lead to increasing disability and reduced health-related quality of life (HRQoL). Although disability and quality of life are closely related, limited evidence exists regarding their association using patient-reported outcome measures in the Indian population.

Objectives: To determine the relationship between disability and health-related quality of life in individuals with Parkinson's disease using the Self-Assessment Parkinson's Disease Disability Scale (SPDDS) and the Parkinson's Disease Questionnaire-8 (PDQ-8).

Methods: A cross-sectional observational study was conducted among 50 individuals diagnosed with idiopathic Parkinson's disease attending physiotherapy outpatient departments and neurology clinics in Ahmedabad, Gujarat. Disability was assessed using the Self-Assessment Parkinson's Disease Disability Scale (SPDDS), while health-related quality of life was evaluated using the Parkinson's Disease Questionnaire-8 (PDQ-8). Descriptive statistics were used to summarize demographic and clinical characteristics. The association between disability and quality of life was analysed using Spearman's rank correlation coefficient, with statistical significance set at $p < 0.05$.

Results: The mean age of the participants was 67.6 years, with males constituting 88% of the study population. The mean SPDDS score was 53, and the mean PDQ-8 score was 14.3. Spearman's rank correlation analysis demonstrated a statistically significant moderate positive correlation between disability and quality of life ($\rho = 0.501$, $p < 0.05$), indicating that greater disability was associated with poorer health-related quality of life.

Conclusion: Disability is significantly associated with health-related quality of life in individuals with Parkinson's disease. The findings highlight the importance of routinely assessing disability and quality of life using disease-specific patient-reported outcome measures such as the SPDDS and PDQ-8. Early identification of functional limitations may assist physiotherapists in planning individualized rehabilitation interventions aimed at maintaining functional independence and improving quality of life.

Keywords: Parkinson's disease, Disability, Quality of life, Self-Assessment Parkinson's Disease Disability Scale, SPDDS, Parkinson's Disease Questionnaire-8, PDQ-8, Physiotherapy, Activities of daily living.

INTRODUCTION

Parkinson's disease (PD) is a progressive neurodegenerative disorder that primarily affects the dopaminergic neurons of the substantia nigra pars compacta, resulting in dopamine depletion within the basal ganglia. This loss of dopaminergic activity disrupts normal motor control and gives rise to the characteristic clinical features of the disease. PD is recognized as the second most common neurodegenerative disorder after Alzheimer's disease and predominantly affects older adults, although younger individuals may also develop the condition. [1,2]

The clinical presentation of Parkinson's disease is complex and includes both motor and non-motor manifestations. The cardinal motor symptoms comprise bradykinesia, resting tremor, muscular rigidity, and postural instability, whereas non-motor symptoms such as depression, anxiety, cognitive impairment, sleep disturbances, autonomic dysfunction, fatigue, and pain contribute substantially to disease burden and adversely affect patients' daily functioning and overall well-being. [2–4,28]

The prevalence and global burden of Parkinson's disease have increased considerably over recent decades, largely due to population ageing and longer life expectancy. It is currently regarded as one of the fastest-growing neurological disorders worldwide, placing a significant burden on healthcare systems, caregivers, and society. [5,6]

As Parkinson's disease progresses, individuals experience increasing difficulty performing activities of daily living (ADLs), including walking, transferring, dressing, bathing, feeding, writing, and other self-care activities. Progressive deterioration in these functional abilities often leads to loss of independence, increased reliance on caregivers, and reduced participation in social, occupational, and recreational activities. Consequently, disability in daily living has emerged as one of the major determinants of health-related quality of life (HRQoL) in individuals with Parkinson's disease. [2,6,8,10,17–19]

Accurate assessment of disability and quality of life is therefore essential for comprehensive evaluation and rehabilitation planning in Parkinson's disease. Clinician-rated instruments such as the Movement Disorder Society–Unified Parkinson's Disease Rating Scale (MDS-UPDRS) and the Hoehn and Yahr staging system are widely used to assess disease severity and motor impairment. However, these measures may not fully reflect the patient's own experience of functional limitations encountered during everyday activities. [8,9]

Patient-reported outcome measures (PROMs) provide valuable complementary information by capturing the patient's perspective on disability and its impact on daily life. The Self-Assessment Parkinson's Disease Disability Scale (SPDDS) is a disease-specific questionnaire developed to evaluate disability related to activities of daily living and has demonstrated satisfactory validity and reliability in individuals with Parkinson's disease. [11,12]

Health-related quality of life is commonly assessed using disease-specific instruments such as the Parkinson's Disease Questionnaire-39 (PDQ-39) and its abbreviated version, the Parkinson's Disease Questionnaire-8 (PDQ-8). The PDQ-8 is a concise, reliable, and valid measure that evaluates key domains of quality of life, including mobility, activities of daily living, emotional well-being, stigma, cognition, communication, social support, and bodily discomfort. Owing to its brevity and strong psychometric properties, it has become a practical tool for both clinical practice and research. [13–16,20]

Previous studies have consistently demonstrated that motor disability, non-motor symptoms, and functional dependence are major contributors to reduced health-related quality of life in individuals with Parkinson's disease. Nevertheless, relatively few studies have specifically examined the relationship between patient-reported disability

measured using the Self-Assessment Parkinson's Disease Disability Scale (SPDDS) and quality of life assessed with the PDQ-8, particularly within the Indian population. [17–20,28,29]

Therefore, the present study was undertaken to determine the relationship between disability and quality of life among individuals with Parkinson's disease using the Self-Assessment Parkinson's Disease Disability Scale (SPDDS) and the Parkinson's Disease Questionnaire-8 (PDQ-8). Understanding this relationship may provide valuable insights for physiotherapists and other rehabilitation professionals in planning individualized interventions aimed at maintaining functional independence and improving health-related quality of life. [7,21–24,34–36]

MATERIALS & METHODS

Study Design

This observational, cross-sectional study was conducted to determine the relationship between disability and quality of life among patients with Parkinson's disease. A cross-sectional study design was considered appropriate for evaluating the association between variables at a single point in time. [25]

Study Setting

The study was conducted among patients with Parkinson's disease attending physiotherapy outpatient departments and neurology clinics in Ahmedabad, Gujarat.

Study Participants

Patients diagnosed with idiopathic Parkinson's disease by a neurologist according to the Movement Disorder Society (MDS) Clinical Diagnostic Criteria for Parkinson's Disease were recruited for the study. [3]

Inclusion Criteria

Patients were included if they:

- Had a confirmed diagnosis of idiopathic Parkinson's disease;
- They were classified between Hoehn and Yahr stages I to V. [8]
- Patients were able to understand and respond to questionnaires independently or with minimal assistance;
- They had adequate cognitive function as assessed using the Mini-Mental State Examination (MMSE). [26]

Exclusion Criteria

- Patients with atypical parkinsonism,
- Severe cognitive impairment,
- Unstable medical conditions,
- Other neurological disorders affecting functional performance, or
- Musculoskeletal conditions significantly limiting mobility were excluded from the study.

Outcome Measures

Self-Assessment Parkinson's Disease Disability Scale (SPDDS)

Disability was assessed using the Self-Assessment Parkinson's Disease Disability Scale (SPDDS), a disease-specific patient-reported outcome measure that evaluates disability in activities of daily living among individuals with Parkinson's disease. The SPDDS consists of 24 items scored on a five-point Likert scale, with higher scores indicating greater disability. The instrument has demonstrated satisfactory validity and reliability for assessing disability from the patient's perspective. [11,12]

Parkinson's Disease Questionnaire-8 (PDQ-8)

Health-related quality of life was assessed using the **Parkinson's Disease Questionnaire-8 (PDQ-8)**, the short-form version of the PDQ-39. The PDQ-8 evaluates eight domains of health-related quality of life, including mobility, activities of daily living, emotional well-being, stigma, cognition, communication, social support, and bodily discomfort. It has demonstrated good reliability, validity, and responsiveness in individuals with Parkinson's disease. [13–16,20]

Data Collection Procedure

Eligible participants were screened according to the inclusion and exclusion criteria. After obtaining informed consent, demographic and clinical information was recorded. Participants completed the SPDDS and PDQ-8 questionnaires under the supervision of the investigator. All assessments were performed during a single session using standardized procedures.

Statistical Analysis

Data were analysed using the Statistical Package for the Social Sciences (SPSS) software. Descriptive statistics were used to summarize demographic and clinical characteristics. The relationship between disability and quality of life was evaluated using Spearman's rank correlation coefficient (rho). Statistical significance was set at $p < 0.05$. [27]

RESULTS

A total of 50 patients with Parkinson's disease participated in the present study. The mean age of the participants was 67.6 years. The mean disability score measured using the Self-Assessment Parkinson's Disease Disability Scale (SPDDS) was 53, whereas the mean quality-of-life score measured using the Parkinson's Disease Questionnaire-8 (PDQ-8) was **14.3**.

Demographic Characteristics

Among the 50 participants, **44 (88%)** were males and **6 (12%)** were females. The majority of participants in the present study were male (88%). This finding is consistent with previous epidemiological studies reporting a higher prevalence of Parkinson's disease among men than women. The male predominance observed in the present study may therefore reflect the known sex distribution of Parkinson's disease. [1,2,5,6]

Table 1. Demographic Characteristics of the Participants

Variable	Value
Sample size (n)	50
Mean age (years)	67.6
Male	44 (88%)
Female	6 (12%)

Distribution According to Hoehn and Yahr Stage

The disease severity of the participants was classified according to the Hoehn and Yahr staging system. Fourteen participants (28%) belonged to Stage II, followed by Stage III (22%), Stage I (20%), Stage IV (16%), and Stage V (14%).

Table 2. Distribution of Participants According to Hoehn and Yahr Stage

Hoehn and Yahr Stage	Number (n)	Percentage (%)
Stage I	10	20
Stage II	14	28
Stage III	11	22
Stage IV	8	16
Stage V	7	14
Total	**50**	**100**

Mean Questionnaire Scores

The mean SPDDS score among the participants was 53, indicating the overall level of disability in activities of daily living. The mean PDQ-8 score was 14.3, reflecting the overall quality of life of the study population.

Table 3. Mean Scores of Outcome Measures

Outcome Measure	Mean Score
Self-Assessment Parkinson's Disease Disability Scale (SPDDS)	53
Parkinson's Disease Questionnaire-8 (PDQ-8)	14.3

Correlation Between Disability and Quality of Life

The relationship between disability and quality of life was evaluated using Spearman's Rank Order Correlation.

The analysis demonstrated a statistically significant moderate positive correlation between the disability scores obtained using the Self-Assessment Parkinson's Disease Disability Scale (SPDDS) and the quality-of-life scores obtained using the Parkinson's Disease Questionnaire-8 (PDQ-8), with a Spearman's correlation coefficient (ρ) of 0.501 ($p < 0.05$).

Table 4. Correlation Between Disability and Quality of Life

Variables	Statistical Test	Correlation Coefficient (ρ)	P value
SPDDS and PDQ-8	Spearman's Rank Order Correlation	0.501	<0.05

These findings indicate that participants with greater disability tended to report poorer health-related quality of life, and the observed association was statistically significant.

DISCUSSION

In the present study, the relationship between disability and health-related quality of life among individuals with Parkinson's disease was examined using the Self-Assessment Parkinson's Disease Disability Scale (SPDDS) and the Parkinson's Disease Questionnaire-8 (PDQ-8). The findings demonstrated a statistically significant moderate positive correlation (Spearman's rho = 0.501), indicating that increasing disability is associated with poorer health-related quality of life among patients with Parkinson's disease. This finding supports the concept that functional impairment plays a significant role in determining patients' perceived quality of life, although it is not the sole contributing factor. [17–20,28,29]

Parkinson's disease is characterized by progressive degeneration of dopaminergic neurons, leading to deterioration in both motor and non-motor functions. As the disease advances, impairments in gait, balance, postural control, manual dexterity, and mobility gradually reduce an individual's ability to perform activities of daily living independently. Functional decline often results in increased dependence on caregivers, reduced participation in social and occupational roles, and diminished self-confidence, all of which adversely affect health-related quality of life. Previous studies have consistently identified disability as one of the strongest determinants of quality of life in Parkinson's disease, and the findings of the present study are in agreement with these observations. [2,4,17–20,28,29]

The moderate strength of the observed correlation suggests that although disability significantly influences quality of life, the relationship is multifactorial. Health-related quality of life in Parkinson's disease is also affected by several non-motor symptoms, including depression, anxiety, fatigue, cognitive impairment, sleep disturbances, autonomic dysfunction, pain, and reduced social participation. These factors may explain why some individuals with comparable levels of physical disability report different perceptions of their quality of life. Similar observations have been reported by Schrag and colleagues as well as subsequent investigations evaluating determinants of quality of life in Parkinson's disease. [4,17–20,28,29]

The current study employed the Self-Assessment Parkinson's Disease Disability Scale (SPDDS) to evaluate disability. Unlike clinician-rated scales, the SPDDS reflects the patient's own perception of functional limitations experienced during routine daily activities. Previous validation studies have demonstrated satisfactory reliability and validity of the SPDDS for assessing disability in individuals with Parkinson's disease, making it an appropriate patient-reported outcome measure for both clinical and research settings. The use of patient-reported

measures provides valuable information that may not be fully captured through clinician-based assessments alone. [11,12]

Health-related quality of life was assessed using the Parkinson's Disease Questionnaire-8 (PDQ-8), a concise version of the PDQ-39 that retains the essential domains of quality of life while reducing respondent burden. The PDQ-8 has demonstrated good reliability, validity, and responsiveness across different cultural settings and has been recommended for routine clinical assessment and research because of its practicality and strong psychometric properties. [13–16,20]

An important strength of the present study is the simultaneous use of two disease-specific patient-reported outcome measures to evaluate disability and quality of life. Since both instruments capture the patient's perspective, the observed relationship may more accurately reflect the functional challenges experienced in daily life than clinician-rated assessments alone. Such patient-centred evaluations are increasingly recognized as essential components of comprehensive Parkinson's disease management. [11–20]

From a clinical perspective, the findings highlight the important role of physiotherapists and multidisciplinary rehabilitation teams in preserving functional independence among individuals with Parkinson's disease. Early identification of disability through standardized outcome measures enables clinicians to design individualized rehabilitation programmes that target gait, balance, postural stability, transfers, upper-limb function, and activities of daily living. Evidence from systematic reviews and clinical practice guidelines suggests that structured exercise programmes, task-specific functional training, balance rehabilitation, gait training, and patient education contribute to improved mobility, reduced disability, and enhanced quality of life in individuals with Parkinson's disease. [21–24,30–36]

The findings of study also support the routine incorporation of patient-reported outcome measures into physiotherapy practice. Instruments such as the SPDDS and PDQ-8 provide valuable insight into patients' perceptions of disability and quality of life, facilitate goal-oriented rehabilitation planning, and enable clinicians to monitor treatment outcomes over time. These measures may complement traditional clinical assessments by providing a more comprehensive understanding of the patient's functional status and rehabilitation needs. [11–20,30–36]

Despite these important findings, the present study has certain limitations. The cross-sectional study design limits the ability to establish causal relationships between disability and quality of life. Furthermore, participants were recruited from a limited geographical area, which may affect the generalizability of the findings to the broader population of individuals with Parkinson's disease. The study also relied on self-reported outcome measures, which may be influenced by individual perceptions and response bias. [25]

Future research should include multicentre studies with larger and more diverse populations to improve the generalizability of the findings. Longitudinal investigations are warranted to examine changes in disability and quality of life over different stages of disease progression and to determine whether targeted physiotherapy interventions can modify these outcomes over time. Further studies may also explore the influence of non-motor symptoms, cognitive impairment, disease duration, medication status, and psychosocial factors on the relationship between disability and health-related quality of life.

CONCLUSION

The present study demonstrated a statistically significant moderate positive correlation between disability and health-related quality of life among individuals with Parkinson's disease ($\rho = 0.501$, $p < 0.05$). These findings indicate that increasing disability is associated with poorer perceived quality of life,

emphasizing the close relationship between functional independence and overall well-being.

The use of disease-specific patient-reported outcome measures, such as the Self-Assessment Parkinson's Disease Disability Scale (SPDDS) and the Parkinson's Disease Questionnaire-8 (PDQ-8), provides valuable information regarding patients' functional status and perceived quality of life. Routine assessment of these outcomes may assist physiotherapists in identifying functional limitations, planning individualized rehabilitation programmes, and monitoring treatment outcomes. Early rehabilitation strategies aimed at maintaining functional independence may contribute to improved quality of life in individuals with Parkinson's disease.

Declaration by Authors

Ethical Approval: Approved
Acknowledgement: None
Source of Funding: None
Conflict of Interest: No conflicts of interest declared.

REFERENCES

1. Kalia LV, Lang AE. Parkinson's disease. Lancet. 2015 Aug 29;386(9996):896-912. doi:10.1016/S0140-6736(14)61393-3.
2. Poewe W, Seppi K, Tanner CM, Halliday GM, Brundin P, Volkmann J, Schrag AE, Lang AE. Parkinson disease. Nat Rev Dis Primers. 2017; 3:17013. doi:10.1038/nrdp.2017.13.
3. Postuma RB, Berg D, Stern M, Poewe W, Olanow CW, Oertel W, et al. MDS clinical diagnostic criteria for Parkinson's disease. Mov Disord. 2015 Oct;30(12):1591-1601.
4. Chaudhuri KR, Healy DG, Schapira AHV; National Institute for Clinical Excellence. Non-motor symptoms of Parkinson's disease: diagnosis and management. Lancet Neurol. 2006 Mar;5(3):235-245.
5. GBD 2016 Parkinson's Disease Collaborators. Global, regional, and national burden of Parkinson's disease, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet Neurol. 2018 Nov;17(11):939-953.
6. Bloem BR, Okun MS, Klein C. Parkinson's disease. Lancet. 2021 Jun 12;397(10291):2284-2303.
7. Ellis T, Rochester L. Mobilizing Parkinson's disease: the future of exercise. J Parkinsons Dis. 2018;8(s1):S95-S100.
8. Hoehn MM, Yahr MD. Parkinsonism: onset, progression and mortality. Neurology. 1967 May;17(5):427-442.
9. Goetz CG, Tilley BC, Shaftman SR, Stebbins GT, Fahn S, Martinez-Martin P, et al. Movement Disorder Society-sponsored revision of the Unified Parkinson's Disease Rating Scale (MDS-UPDRS): Scale presentation and clinimetric testing results. Mov Disord. 2008 Nov 15;23(15):2129-2170.
10. Shulman LM, Armstrong M, Ellis T, Gruber-Baldini AL, Horak F, Nieuwboer A, et al. Disability rating scales in Parkinson's disease: Critique and recommendations. Mov Disord Clin Pract. 2016;3(2):145-151.
11. Biemans MAJE, Dekker J, van der Woude LHV. The internal consistency and validity of the Self-Assessment Parkinson's Disease Disability Scale. Clin Rehabil. 2001;15(2):221-228.
12. Brown RG, MacCarthy B, Jahanshahi M, Marsden CD. Accuracy of self-reported disability in patients with parkinsonism. Arch Neurol. 1989;46(9):955-959.
13. Jenkinson C, Fitzpatrick R, Peto V, Greenhall R, Hyman N. The Parkinson's Disease Questionnaire (PDQ-39): development and validation of a Parkinson's disease summary index score. Age Ageing. 1997;26(5):353-357.
14. Peto V, Jenkinson C, Fitzpatrick R. PDQ-39: a review of the development, validation and application of a Parkinson's disease quality of life questionnaire and its associated measures. J Neurol. 1998; 245(Suppl 1):S10-S14. doi:10.1007/PL00007730.
15. Tan LCS, Luo N, Nazri M, Li SC, Thumboo J. Validity and reliability of the PDQ-39 and the PDQ-8 in English-speaking Parkinson's disease patients in Singapore. Parkinsonism Relat Disord. 2004;10(8):493-499. doi: 10.1016/j.parkreldis.2004.05.007.
16. Jenkinson C, Fitzpatrick R. Cross-cultural evaluation of the short-form 8-item Parkinson's Disease Questionnaire (PDQ-8): results from America, Canada, Japan, Italy

and Spain. Parkinsonism Relat Disord. 2007;13(1):22-28.
17. Schrag A, Jahanshahi M, Quinn N. What contributes to quality of life in patients with Parkinson's disease? J Neurol Neurosurg Psychiatry. 2000;69(3):308-312.
18. Soh SE, McGinley JL, Watts JJ, Iansek R, Murphy AT, Menz HB, Morris ME. Determinants of health-related quality of life in people with Parkinson's disease: a path analysis. Parkinsonism Relat Disord. 2011;17(9):693-697.
19. Martínez-Martín P. The importance of non-motor disturbances to quality of life in Parkinson's disease. J Neurol Sci. 2011;310(1-2):12-16.
20. Ruotolo I, Sellitto G, Berardi A, Simeon R, Panuccio F, Amadio E, et al. *Psychometric properties of the Parkinson's disease Questionnaire-39 and its short form Parkinson's disease Questionnaire-8: A systematic review and meta-analysis.* J Clin Neurosci. 2024; 123:100-117. doi: 10.1016/j.jocn.2024.03.032
21. Tomlinson CL, Patel S, Meek C, Herd CP, Clarke CE, Stowe R, et al. Physiotherapy intervention in Parkinson's disease: systematic review and meta-analysis. BMJ. 2012;345: e5004. doi:10.1136/bmj. e5004.
22. Keus SHJ, Munneke M, Graziano M, Paltamaa J, Pelosin E, Domingos J, et al. European Physiotherapy Guideline for Parkinson's Disease. Nijmegen: KNGF/ParkinsonNet; 2014.
23. Domingos J, Keus SHJ, Dean J, de Vries NM, Ferreira JJ, Bloem BR. The European Physiotherapy Guideline for Parkinson's Disease: Implications for Neurologists. J Parkinsons Dis. 2018;8(4):499-502. doi:10.3233/JPD-181383.
24. Armstrong MJ, Okun MS. Diagnosis and treatment of Parkinson disease: A review. JAMA. 2020;323(6):548-560.
25. Setia MS. Methodology series module 3: Cross-sectional studies. Indian J Dermatol. 2016;61(3):261-264.
26. Folstein MF, Folstein SE, McHugh PR. "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res. 1975;12(3):189-198.
27. Conover WJ. Practical Nonparametric Statistics. 3rd ed. New York: John Wiley & Sons; 1999.
28. Schapira AHV, Chaudhuri KR, Jenner P. Non-motor features of Parkinson disease. Nat Rev Neurosci. 2017;18(7):435-450.
29. Duncan RP, Earhart GM. Measuring participation in individuals with Parkinson disease: relationships with disease severity and quality of life. Disabil Rehabil. 2011;33(15-16):1440-1446.
30. Shulman LM, Gruber-Baldini AL, Anderson KE, Fishman PS, Reich SG, Weiner WJ. The clinically important difference on the Unified Parkinson's Disease Rating Scale. Arch Neurol. 2010;67(1):64-70.
31. Canning CG, Sherrington C, Lord SR, Close JCT, Heritier S, Heller GZ, et al. Exercise for falls prevention in Parkinson disease: A randomized controlled trial. Neurology. 2015;84(3):304-312.
32. Goodwin VA, Richards SH, Taylor RS, Taylor AH, Campbell JL. The effectiveness of exercise interventions for people with Parkinson's disease: A systematic review and meta-analysis. Mov Disord. 2008;23(5):631-640.
33. Morris ME, Martin CL, Schenkman ML. Striding out with Parkinson disease: Evidence-based physical therapy for gait disorders. Phys Ther. 2010;90(2):280-288.
34. Allen NE, Sherrington C, Paul SS, Canning CG. Balance and falls in Parkinson's disease: A meta-analysis of the effect of exercise and motor training. Mov Disord. 2011;26(9):1605-1615.
35. Bloem BR, de Vries NM, Ebersbach G. Nonpharmacological treatments for patients with Parkinson's disease. Mov Disord. 2015;30(11):1504-1520.
36. Mak MKY, Wong-Yu ISK. Exercise for Parkinson's disease. Int Rev Neurobiol. 2019; 147:1-44.

How to cite this article: Vrima Vijay Shukla, Yagna Unmesh Shukla. Correlation between disability and quality of life in patients with Parkinson's disease. *International Journal of Research and Review*. 2026; 13(8): 89-96. DOI: *https://doi.org/10.52403/ijrr.20260808*

******