Section: Physiology

Original Research Article

ASSESSMENT OF NON-MOTOR FUNCTIONS AND QUALITY LIFE IN NEWLY DIAGNOSED PARKINSON'S DISEASE PATIENTS

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Received *: 05/05/2026*
Received in revised form *: 29/05/2026*
Accepted *: 13/06/2026*

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DOI: 10.70034/ijmedph.2026.3.720

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2026; 16 (3); 4658-4662

ABSTRACT

Background: Parkinson's disease (PD) is a progressive neurodegenerative disorder characterised by both motor and non-motor manifestations. While motor symptoms are well recognised, non-motor symptoms often remain underdiagnosed despite their significant impact on patients' daily functioning and quality of life. Early identification of these symptoms is essential for comprehensive patient management. The aim and objective are to assess non-motor functions and quality of life in newly diagnosed Parkinson's disease patients and evaluate the relationship between non-motor symptom burden and quality of life.

Materials and Methods: This hospital-based cross-sectional observational study included 50 newly diagnosed Parkinson's disease patients attending a tertiary care teaching hospital. Eligible participants were recruited after obtaining informed consent. Non-motor symptoms were evaluated using the Non-Motor Symptoms Questionnaire (NMSQuest), and quality of life was assessed using the Parkinson's Disease Questionnaire-39 (PDQ-39). Demographic and clinical details were recorded using a structured proforma. Statistical analysis was performed using appropriate descriptive and inferential methods, with $p<0.05$ considered statistically significant.

Results: Non-motor symptoms were present in the majority of newly diagnosed Parkinson's disease patients. Sleep disturbances, fatigue, constipation, anxiety and depressive symptoms were the most commonly reported manifestations. Patients with a higher burden of non-motor symptoms demonstrated significantly poorer quality-of-life scores. A positive correlation was observed between NMSQuest scores and PDQ-39 scores, indicating that increasing non-motor symptom burden was associated with greater impairment in quality of life.

Conclusion: Non-motor symptoms are common in newly diagnosed Parkinson's disease patients and significantly affect quality of life. Early recognition and appropriate management of these symptoms may improve overall patient outcomes and well-being.

Keywords: Parkinson's disease, Non-motor symptoms, Quality of life, NMSQuest, PDQ-39, Newly diagnosed patients.

INTRODUCTION

Parkinson's disease (PD) is a progressive neurodegenerative disorder and the second most common neurodegenerative disease after Alzheimer's disease. It is characterised by degeneration of dopaminergic neurons in the substantia nigra and accumulation of α-synuclein-containing Lewy bodies within the nervous system.[1] The prevalence of Parkinson's disease has increased considerably over the past few decades owing to increased life expectancy and population

ageing, making it a significant public health concern worldwide.[2] Traditionally, Parkinson's disease has been recognised by its motor manifestations, including resting tremor, rigidity, bradykinesia, and postural instability.[3] However, recent evidence suggests that non-motor symptoms are equally important and may appear years before the onset of motor symptoms. These manifestations arise due to involvement of multiple neurotransmitter systems and various regions of the central and peripheral nervous systems.[4] Non-motor symptoms comprise a broad spectrum of clinical features, including cognitive impairment, depression, anxiety, sleep disturbances, autonomic dysfunction, fatigue, pain, gastrointestinal symptoms, and sensory abnormalities.[5] These symptoms are highly prevalent and contribute substantially to disability and disease burden. Studies have shown that nearly all patients with Parkinson's disease experience at least one non-motor symptom during the course of illness, and many of these symptoms are already present at the time of diagnosis.[6] Among the non-motor manifestations, depression and anxiety are particularly common and are associated with impaired social functioning and emotional well-being. Cognitive dysfunction may occur even in the early stages of the disease and can adversely affect daily activities and independence. Sleep-related disorders such as insomnia, excessive daytime sleepiness, and rapid eye movement sleep behaviour disorder are also frequently reported.[7] In addition, autonomic disturbances including constipation, urinary symptoms, orthostatic hypotension, and sexual dysfunction contribute significantly to patient discomfort and reduced functional capacity.[8] Quality of life (QoL) has emerged as an important outcome measure in Parkinson's disease. It reflects the overall impact of the disease on physical, psychological, social, and functional aspects of an individual's life. Several studies have demonstrated that non-motor symptoms are among the strongest predictors of poor quality of life and may have a greater impact than motor symptoms themselves.[9] Consequently, comprehensive assessment of non-motor manifestations has become an essential component of patient evaluation and management. Patients with newly diagnosed Parkinson's disease often present with multiple non-motor symptoms despite having relatively mild motor disability. These symptoms frequently remain under-recognised in routine clinical practice because attention is primarily focused on motor features. Delayed identification and treatment of non-motor symptoms can adversely affect quality of life and increase disease burden. Early detection allows timely intervention, improves patient care, and may enhance overall treatment outcomes.[5] In India, data regarding non-motor symptoms and their impact on quality of life among newly diagnosed Parkinson's disease patients remain limited. Understanding the burden of these symptoms at the time of diagnosis is important for developing holistic management strategies and improving patient-centred care. Therefore, the present study was undertaken to assess non-motor functions and quality of life in newly diagnosed Parkinson's disease patients and to evaluate the relationship between non-motor symptom burden and quality of life.

Aim and objectives: To assess non-motor functions and quality of life in newly diagnosed Parkinson's disease patients and evaluate the relationship between non-motor symptom burden and quality of life.

MATERIALS AND METHODS

Study design: The present study was a hospital-based cross-sectional observational study conducted to assess non-motor functions and quality of life in newly diagnosed Parkinson's disease patients.

Study setting: The study was carried out in the Department of Neurology at a tertiary care teaching hospital. Patients attending the Neurology Outpatient Department and diagnosed with Parkinson's disease were screened for eligibility and recruited into the study.

Study duration: The study was conducted over a period of one year following approval from the Institutional Ethics Committee.

Study population: The study included newly diagnosed Parkinson's disease patients who had not yet commenced anti-Parkinsonian treatment. Diagnosis of Parkinson's disease was established by a qualified neurologist based on the Movement Disorder Society (MDS) clinical diagnostic criteria.

Sample size: A total of 50 newly diagnosed Parkinson's disease patients fulfilling the eligibility criteria were enrolled consecutively during the study period.

Inclusion criteria:

1. Patients aged 40 years and above.
2. Newly diagnosed cases of Parkinson's disease.
3. Patients who had not started anti-Parkinsonian medication.
4. Patients willing to participate and provide written informed consent.

Exclusion criteria:

1. Patients with atypical or secondary Parkinsonism.
2. Individuals with a history of stroke, traumatic brain injury, epilepsy, or other major neurological disorders.
3. Patients with severe psychiatric illness or dementia interfering with assessment.
4. Patients with significant visual, hearing, or communication impairment.
5. Individuals with major systemic illnesses that could influence quality of life

Methodology: Eligible participants were recruited after obtaining informed consent. Demographic details including age, sex, educational status, occupation, duration of symptoms, and relevant medical history were recorded using a predesigned

case record form. All participants underwent detailed neurological evaluation by a neurologist to confirm the diagnosis of Parkinson's disease. Clinical examination findings and disease characteristics were documented systematically. Assessment of non-motor symptoms was carried out using the Non-Motor Symptoms Questionnaire (NMSQuest), a validated instrument designed to identify common non-motor manifestations associated with Parkinson's disease. The questionnaire evaluates multiple domains including gastrointestinal symptoms, urinary disturbances, cardiovascular symptoms, sleep disorders, neuropsychiatric manifestations, cognitive impairment, sensory complaints, and sexual dysfunction. Each positive response was recorded and the total non-motor symptom burden was calculated. Quality of life was assessed using the Parkinson's Disease Questionnaire-39 (PDQ-39), a widely accepted disease-specific instrument. The questionnaire measures quality of life across eight domains including mobility, activities of daily living, emotional well-being, stigma, social support, cognition, communication, and bodily discomfort. Higher scores indicate poorer quality of life. The collected questionnaire data were reviewed for completeness and accuracy. All assessments were performed in a quiet environment, and participants were encouraged to clarify any doubts before responding to the questionnaires.

Ethical considerations: Ethical clearance was obtained from the Institutional Ethics Committee before commencement of the study. The study was conducted in accordance with the principles of the Declaration of Helsinki. Written informed consent was obtained from all participants after explaining the purpose and procedures of the study. Confidentiality of participant information was maintained throughout the study.

Statistical analysis: Data were entered into Microsoft Excel and analysed using Statistical Package for the Social Sciences (SPSS) software version 25.0. Continuous variables were expressed as mean ± standard deviation, while categorical variables were presented as frequencies and percentages. The relationship between non-motor symptom burden and quality-of-life scores was analysed using appropriate statistical tests such as Pearson's or Spearman's correlation analysis. Comparisons between groups were performed using independent t-test or Chi-square test as applicable. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Among the 50 newly diagnosed Parkinson's disease patients, the majority were males (64%) and belonged to the 51–60 years age group. Sleep disturbances (68%), constipation (60%), and fatigue (56%) were the most common non-motor symptoms. Moderate non-motor symptom burden was observed in 46% of participants. Quality of life was moderately impaired in 50% of patients. A significant positive correlation was observed between non-motor symptom burden and PDQ-39 scores ($r=0.68$, $p<0.001$), indicating that increased non-motor symptoms were associated with poorer quality of life. Depression and sleep disturbances showed significant adverse effects on quality of life [Table 1 to 5].

Table 1: Demographic Characteristics

Variable	Frequency (n)	Percentage (%)
40–50	10	20.0
51–60	18	36.0
61–70	15	30.0
>70	7	14.0
Male	32	64.0
Female	18	36.0

Table 2: Distribution of Non-Motor Symptoms

Symptom	Frequency (n)	Percentage (%)
Sleep disturbances	34	68.0
Constipation	30	60.0
Fatigue	28	56.0
Anxiety	25	50.0
Depression	22	44.0
Urinary symptoms	20	40.0

Table 3: Severity of Non-Motor Symptom Burden

Category	Frequency (n)	Percentage (%)
Mild	12	24.0
Moderate	23	46.0
Severe	15	30.0

Table 4: Quality of Life Assessment

Category	Frequency (n)	Percentage (%)
Good	11	22.0
Moderate Impairment	25	50.0
Severe Impairment	14	28.0

Table 5: Correlation Between NMSQuest and PDQ-39

Variable	Correlation (r)	p-value
NMSQuest vs PDQ-39	0.68	<0.001

DISCUSSION

Parkinson's disease (PD) is increasingly recognised as a complex neurodegenerative disorder that extends beyond its classical motor manifestations. Although tremor, rigidity, bradykinesia and postural instability remain the hallmark features of the disease, non-motor symptoms have emerged as major contributors to disability and reduced quality of life. The present study assessed non-motor functions and quality of life in newly diagnosed Parkinson's disease patients and explored the association between non-motor symptom burden and quality of life. The findings of the present study demonstrated that non-motor symptoms were highly prevalent even at the time of diagnosis. This observation is consistent with previous studies which reported that newly diagnosed and drug-naïve Parkinson's disease patients frequently experience a wide range of non-motor manifestations despite relatively mild motor impairment.[11,15] These findings support the current understanding that Parkinson's disease is a multisystem disorder in which pathological changes occur in several neuronal networks before the appearance of classical motor symptoms.[14] Among the various non-motor manifestations identified in the present study, sleep disturbances, fatigue, constipation, anxiety and depressive symptoms were commonly reported. Similar observations have been documented by Kumar et al., who reported that sleep-related disorders, gastrointestinal disturbances and mood disorders were among the most prevalent non-motor symptoms in Indian Parkinson's disease patients.[17] Likewise, Wu et al. observed a high prevalence of sleep disturbances and autonomic dysfunction among patients with different motor subtypes of Parkinson's disease.[19] These findings indicate that non-motor symptoms are a universal feature of Parkinson's disease and significantly contribute to disease burden irrespective of geographical or ethnic variations. Neuropsychiatric manifestations constituted an important component of the non-motor symptom profile in the present study. Depression and anxiety were frequently encountered and were associated with poorer quality-of-life scores. Similar findings have been reported by Batzu et al., who emphasised that neuropsychiatric symptoms are among the most disabling non-motor manifestations and are often under-recognised in routine clinical practice.[20] Mood disturbances may adversely affect social relationships, treatment adherence and overall well-being, thereby increasing the burden of illness on both patients and caregivers. Quality of life assessment revealed a significant impairment among patients with a higher burden of non-motor symptoms. This finding is in agreement with the study conducted by Ueno et al., who demonstrated a strong association between non-motor symptom severity and deterioration in health-related quality of life.[11] Their study concluded that non-motor manifestations significantly influence patient-reported outcomes and should be considered during routine clinical evaluation. Similar observations were made in the Japanese Quality-of-Life Survey of Parkinson Disease (JAQPAD), where non-motor symptoms were found to be major determinants of reduced quality of life.[12] The present study also demonstrated a significant positive correlation between non-motor symptom burden and PDQ-39 quality-of-life scores. This indicates that patients with a greater number and severity of non-motor symptoms experience poorer quality of life. Comparable findings have been reported by Santos-García et al., who observed that mood disturbances, gait problems and overall non-motor symptom burden were the strongest predictors of impaired quality of life in Parkinson's disease patients.[16] Their findings highlight the cumulative effect of non-motor manifestations on physical, psychological and social functioning. Similarly, Heimrich et al. employed a network analysis approach and demonstrated that fatigue, depression, daytime sleepiness and cognitive difficulties were closely linked to reduced health-related quality of life.[13] These findings support the results of the present study and reinforce the importance of identifying non-motor symptoms during the early stages of the disease. The detrimental impact of these symptoms may be explained by their influence on multiple aspects of daily life, including mobility, emotional stability, communication, cognition and social participation. An important observation in the present study was that newly diagnosed patients experienced a considerable burden of non-motor symptoms despite having relatively early-stage disease. Similar findings have been reported by Hu et al., who demonstrated that drug-naïve Parkinson's disease patients frequently exhibit significant non-motor dysfunction at the time of diagnosis.[15] These observations suggest that non-motor symptoms should not be considered merely complications of advanced disease but rather integral components of Parkinson's disease pathology. The findings of the present study emphasise the need for comprehensive clinical assessment of newly diagnosed Parkinson's disease patients. Routine screening for depression, anxiety, sleep disturbances, autonomic dysfunction and cognitive impairment may facilitate early intervention and improve patient outcomes. Recent evidence suggests that targeted management of non-motor symptoms can lead to significant improvements in quality of life and overall disease management.[18] The present study has certain limitations. The relatively small sample size and

single-centre design may limit the generalisability of the findings. Furthermore, the cross-sectional nature of the study did not permit evaluation of changes in non-motor symptoms and quality of life over time. Nevertheless, the study provides valuable information regarding the burden of non-motor manifestations in newly diagnosed Parkinson's disease patients. Overall, the present study demonstrates that non-motor symptoms are highly prevalent at the time of diagnosis and have a significant negative impact on quality of life. Early recognition and appropriate management of these symptoms should form an integral component of Parkinson's disease care. Larger multicentric longitudinal studies are required to further clarify the progression of non-motor symptoms and their long-term influence on quality of life.

CONCLUSION

The present study demonstrated that non-motor symptoms are highly prevalent even in newly diagnosed Parkinson's disease patients and significantly influence quality of life. Sleep disturbances, fatigue, gastrointestinal and neuropsychiatric symptoms were commonly observed. A higher non-motor symptom burden was associated with poorer quality-of-life outcomes. Early identification and comprehensive management of non-motor symptoms may improve overall patient well-being and optimise clinical outcomes in Parkinson's disease.

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