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PHYSICAL ACTIVITY PATTERNS AMONG MIDDLE-AGED MALES WITH STAGE III PARKINSON'S DISEASE

Original Research

Atiqa Niamat[1], Ifrah Suhail[1]*, Abida Wahab[2], Suffain Khalid[2], Nadia Azam[3], Maryam Nazir Bhutta[4]
[1]Physical Therapist, Ghurki Trust and Teaching Hospital, Lahore, Punjab, Pakistan.
[2]Senior Physical Therapist, Ghurki Trust and Teaching Hospital, Lahore, Punjab, Pakistan.
[3]Rehabilitation House Officer, University of Management and Technology, Pakistan.
[4]Rehabilitation House Officer, Ghurki Trust and Teaching Hospital, Lahore, Punjab, Pakistan.
Corresponding Author: Ifrah Suhail, Physical Therapist, Ghurki Trust and Teaching Hospital, Lahore, Punjab, Pakistan, Ifrahs08@gmail.com
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ABSTRACT

Background: Parkinson's disease (PD) is a progressive neurodegenerative disorder that significantly impacts motor and non-motor functions, leading to reduced mobility and quality of life. Among its various consequences, physical inactivity is a major concern, especially in the mid to advanced stages of the disease. As the disease progresses, physical activity levels decline, contributing to further functional deterioration. Assessing physical activity in PD is critical to designing targeted interventions that help maintain independence and delay disability.

Objective: To determine the level of physical activity among middle-aged male patients diagnosed with stage III Parkinson's disease using a standardized physical activity assessment tool.

Methods: A descriptive case series was carried out over six months involving 36 male participants aged 45–69 years with confirmed stage III PD. The sample size was calculated using the WHO sample size calculator, based on a prevalence rate of 0.015, 4% margin of error, and 95% confidence interval. Participants were recruited through non-probability convenience sampling from General and Shalimar Hospitals, Lahore. Physical activity was assessed through a single face-to-face interview using the International Physical Activity Questionnaire (IPAQ), a validated tool with a reliability coefficient of 0.8912. Activity levels were categorized into low (0–600 METs), moderate (600–3000 METs), and high (>3000 METs). Data were analyzed using SPSS version 21.

Results: Of the 36 participants, 5 (13.9%) fell in the low physical activity category, 22 (61.1%) demonstrated moderate activity, and 9 (25%) exhibited high physical activity. The mean age was 61 ± 6.81 years. Among those with a disease chronicity of 5–10 years (88.9%), moderate activity was most prevalent, while those with over 10 years of disease duration demonstrated lower physical activity levels.

Conclusion: Most middle-aged male patients with stage III Parkinson's disease maintained moderate levels of physical activity. However, disease chronicity was inversely related to activity level, emphasizing the need for early and sustained physical activity interventions.

Keywords: Aged, Exercise, Male, Parkinson Disease, Physical Activity, Physical Fitness, Surveys and Questionnaires.

INTRODUCTION

Parkinson's disease (PD) is a progressive neurodegenerative disorder primarily characterized by motor symptoms such as bradykinesia, rigidity, postural instability, and tremors, all of which significantly increase the risk of falls among affected individuals (1). Beyond these hallmark motor impairments, non-motor symptoms such as fatigue, depression, apathy, pain, and bladder dysfunction further exacerbate the disease burden, often impacting a patient's ability to carry out physical, mental, and social activities (2). Among these symptoms, fatigue stands out as one of the most prevalent and disabling features, often reported even in the early stages of the disease (1,2). Despite advancements in pharmacological interventions, the progressive nature of PD continues to limit patient independence and quality of life over time (3). Globally, Parkinson's disease affects approximately 1% of individuals over the age of 55, with a prevalence rate of 2802 per 100,000 people in North America, Australia, and Europe (4,5). The neuropathological hallmark of PD involves the degeneration of dopaminergic neurons in the substantia nigra and the presence of Lewy bodies, which collectively disrupt normal motor control and voluntary movement facilitation (6). The most recognized risk factor remains advancing age, particularly between the ages of 50 and 60, although environmental and lifestyle exposures such as high body mass index, metal exposure (copper, manganese, lead), iron intake, and a history of anemia have also been implicated (7,8).

Physical activity, defined as any bodily movement that results in energy expenditure, is notably impaired in PD patients due to abnormal gait patterns and postural instability (9). However, emerging research identifies physical activity as a potentially modifiable lifestyle factor that may influence the course, severity, and progression of Parkinson's disease (10). Regular engagement in physical exercise has been associated with improvements in gait, muscle strength, cardiovascular health, coordination, and overall quality of life in individuals with PD (11). Exercise is further defined as planned, structured, repetitive, and purposeful physical activity aimed at enhancing or maintaining physical fitness (11,12). Notably, physical activity is one of the few non-pharmacologic strategies thought to offer neuroprotective benefits, potentially lowering the risk of developing PD and mitigating functional decline in diagnosed individuals (10). While pharmacologic management remains the mainstay of PD treatment, it does not fully address the broad spectrum of disability experienced by patients. There is growing recognition of the role of physical exercise programs in not only managing symptoms but also delaying the progression of functional deficits (3,6). These programs may yield secondary benefits through enhanced patient education, motivation, and support systems, which are essential for maintaining autonomy and well-being. Given the multifaceted benefits of physical activity and its rising prominence in the therapeutic landscape for Parkinson's disease, it is imperative to assess its implementation and impact among affected populations. The current study is thus designed to quantify the level of physical activity among patients with Parkinson's disease and to recommend evidence-based interventions aimed at improving their functional status and overall quality of life.

METHODS

A descriptive case study was conducted over a six-month period involving 36 male patients diagnosed with stage III Parkinson's disease. The study was carried out at two tertiary care hospitals in Lahore—General Hospital and Shalimar Hospital. The sample size was determined using the World Health Organization (WHO) sample size calculator, with parameters set at a prevalence rate of 0.015, a 4% margin of error, and a 95% confidence interval. A non-probability convenience sampling technique was employed to recruit participants who met the study criteria. Inclusion was limited to male patients aged between 45 and 69 years with a confirmed diagnosis of stage III Parkinson's disease (12). Exclusion criteria included individuals with documented mental or physical disabilities and those with comorbid neurological disorders such as multiple sclerosis or supranuclear palsy, which could affect multiple body systems and confound physical activity measurements. Data collection was conducted through a single, in-person interview with each participant (13). The International Physical Activity Questionnaire (IPAQ) was used as the primary instrument for measuring physical activity levels. This standardized tool comprises 27 variables distributed across five domains: job-related physical activity, transportation-related activity, household chores and caregiving, participation in sports or recreational activities, and time spent sitting. The instrument demonstrated high reliability with a Cronbach's alpha value of 0.8912. Physical activity scores were categorized based on metabolic equivalent task (MET) values: scores ranging from 0–600 METs indicated low physical activity, 600–3000 METs indicated moderate activity, and values above 3000 METs represented vigorous activity levels.

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Data was analyzed using IBM SPSS Statistics version 21. Descriptive statistics were applied to summarize categorical variables in terms of frequencies and percentages. Results were displayed using appropriately labeled tables and graphical representations to illustrate deviations and distributions across physical activity categories. Ethical considerations were thoroughly addressed. The study protocol received approval from the Ethical Review Committee of LMDC, and all participants gave written informed consent prior to their inclusion in the study. Ethical standards for human research as outlined in the Declaration of Helsinki were strictly followed throughout the study.

RESULTS

The study included a total of 36 male participants diagnosed with stage III Parkinson's disease. The mean age of participants was 61 years with a standard deviation of ±6.81. Age distribution revealed that 47.2% of participants were between 54–62 years, 13.9% were aged 45–53 years, and 38.9% fell within the age bracket of 63–69 years. In terms of chronicity, the majority of patients (88.9%) reported living with the disease for 5–10 years, while 2.8% had experienced the condition for 11–15 years. A minor discrepancy was noted with an 8.3% subgroup reported as suffering for 6–10 years, which appears to overlap with the primary 5–10-year category, suggesting a need for clarification in disease duration categorization. Socioeconomic status distribution showed that 52.7% of participants belonged to the middle class, 27.7% to the upper class, and 19.4% to the lower middle class. Occupational data indicated that 44% of the patients were shopkeepers, 33% were involved in business, and 22% worked as operators. Regarding sedentary behavior, sitting time was measured across specific intervals. About 8.3% of the sample reported daily sitting time between 0–300 minutes, 47.2% sat for 301–600 minutes, 30.6% for 601–900 minutes, and 13.9% exceeded 900 minutes per day. Analysis of physical activity levels based on MET values revealed that 13.9% of participants engaged in low levels of physical activity, 61.1% in moderate levels, and 25% reported high levels of physical activity. Based on the subgroup analysis, a notable relationship was observed between age and levels of physical activity. Participants in the 54–62-year age group were predominantly engaged in moderate activity (n=11), with fewer individuals reporting low (n=2) or high (n=4) levels of physical activity. In the older age group (63–69 years), a substantial number maintained moderate (n=9) or high (n=3) activity levels, while 2 participants reported low activity. Among the youngest group (45–53 years), physical activity was more evenly distributed, though a smaller sample size limits interpretation. When analyzing sedentary behavior by occupation, the majority of shopkeepers and business owners reported sitting times in the 301–600 minute range (n=7 and n=5, respectively), while operators showed a similar trend (n=5). Longer sitting durations (601–900 minutes) were particularly frequent among shopkeepers (n=6), whereas shorter sitting times (0–300 minutes) were equally represented across all occupational categories. These findings suggest that both age and occupation may influence physical activity levels and sedentary patterns, underscoring the need for tailored physical activity interventions in Parkinson's disease management.

Table 1: Demographic and Clinical Characteristics of Study Participants

Variable	Category	Number	Percentage
Mean age (in years)	61 ± 6.81 years		
Chronicity of disease	5-10 years	32	88.9%
	11-15 years	1	2.8%
Socioeconomic status	Upper class	10	27.7%
	Middle class	19	52.7%
	Lower middle class	7	19.4%
Occupation	Business	12	33%
	shopkeeper	16	44%
	Operator	8	22%

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Table 2: Distribution of Total Daily Sitting Time Among Participants

Total sitting time in minutes	Frequency	Percent
0-300	3	8.3
301-600	17	47.2
601-900	11	30.6
901-1200	5	13.9
Total	36	100.0

Table 3: Classification of Physical Activity Levels Among Participants

Level of physical activity	Frequency	Percent
Low	5	13.9
Moderate	22	61.1
High	9	25.0
Total	36	100.0

Table 4: Subgroup Analysis: Age vs Physical Activity

Age Group	Low PA	Moderate PA	High PA
45-53	1	2	2
54-62	2	11	4
63-69	2	9	3

Table 5: Subgroup Analysis: Occupation vs Sitting Time

Occupation	0-300 min	301-600 min	601-900 min	901-1200 min
Business	1	5	4	2
Shopkeeper	1	7	6	2
Operator	1	5	1	1

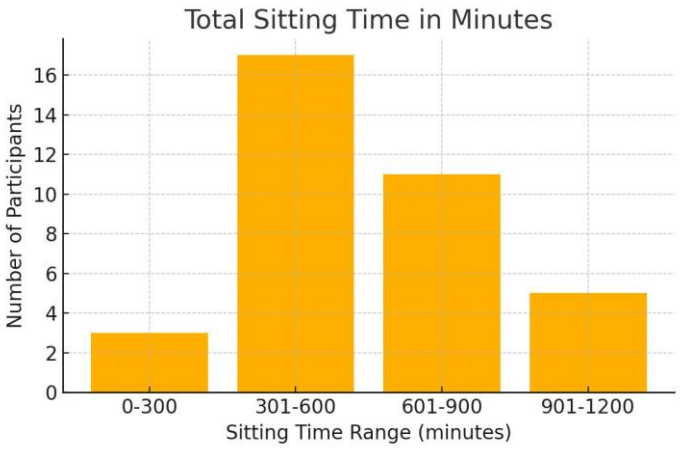

Figure 1 Total Sitting Time in Minutes

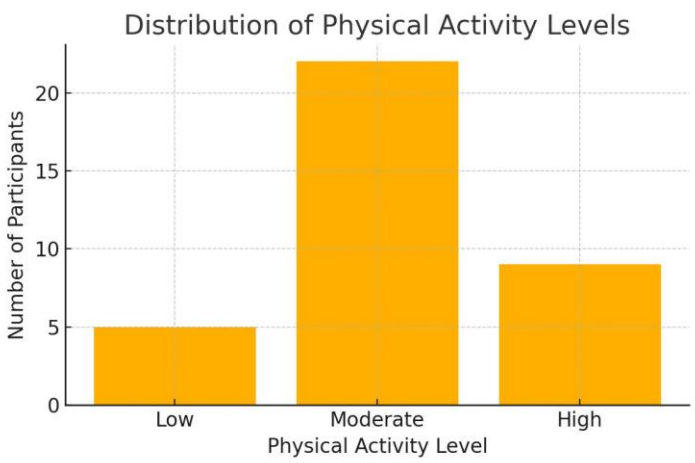

Figure 2 Distribution of Physical Activity Levels

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DISCUSSION

Parkinson's disease (PD) is a complex and progressive neurodegenerative disorder that impacts multiple body systems, leading to a combination of motor and non-motor symptoms that gradually diminish functional capacity and quality of life. The present study represents a unique contribution by evaluating the levels of physical activity among middle-aged male patients with stage III PD using the International Physical Activity Questionnaire (IPAQ). The results demonstrated that a significant proportion of the participants (61.1%) engaged in moderate physical activity, while 25% were categorized as highly active and only 13.9% showed low physical activity levels. These findings align with previous literature, which has indicated that although PD patients spend a considerable portion of their waking hours in sedentary behavior, a moderate degree of physical activity is still attainable in earlier disease stages (14,15). Studies exploring physical activity interventions in PD populations have consistently reported improvements in motor functions, balance, and overall mobility following structured exercise regimens. One such study highlighted the benefits of a nine-week adapted physical activity program, showing significant gains in lower limb strength, walking distance, and balance among participants with early to moderate PD. These improvements reflect the therapeutic potential of targeted physical exercise programs in mitigating disease-related motor decline (16,17). Similarly, broader reviews incorporating multiple trials over several decades have concluded that physical activity plays a crucial role in maintaining both physical and cognitive functioning in PD patients, particularly when programs are sustained over weeks and include moderate to vigorous intensity sessions (18,19).

The current study adds to this growing body of evidence by emphasizing that even among middle-aged individuals at stage III of the disease, engagement in physical activity remains feasible and beneficial. The moderate to high physical activity levels reported suggest a degree of preserved mobility and motivation among participants, which is an encouraging sign for clinicians aiming to implement non-pharmacological interventions in PD care (20). Additionally, this study's use of the IPAQ—a validated and reliable tool for assessing physical activity—adds methodological strength and supports the credibility of its findings. However, studying is not without limitations. The exclusive inclusion of male participants restricts the generalizability of the results across genders. The use of non-probability convenience sampling may have introduced selection bias, as those more active or motivated could have been more likely to participate. Furthermore, the cross-sectional nature of the study limits its ability to establish causal relationships between physical activity levels and disease progression. Another key limitation is the lack of objective physical activity measurement, such as wearable activity trackers or clinical performance tests, which would provide more precise and real-time data compared to self-reported estimates.

Despite these limitations, the study offers several strengths. It targeted a well-defined patient group—middle-aged males with stage III PD—thus contributing focused insight into a subpopulation that is often underrepresented in physical activity research. Moreover, it draws attention to the critical importance of encouraging physical activity even at moderate disease stages, where patients are still capable of meaningful participation in exercise routines. Future studies should aim to expand the demographic diversity of participants, incorporate longitudinal follow-ups, and apply objective activity measurement tools to complement self-reported data (21). Exploring correlations between physical activity levels and specific clinical outcomes, such as UPDRS scores or fall incidence, may also yield more actionable insights. Overall, the present study reinforces the role of physical activity as a key component of holistic PD management and supports its promotion as a safe, accessible, and impactful intervention strategy.

CONCLUSION

This study concluded that middle-aged male patients with stage III Parkinson's disease predominantly maintain a moderate level of physical activity, highlighting the potential for physical engagement even in more advanced stages of the condition. These findings underscore the value of incorporating structured physical activity into clinical care to support functional independence and overall well-being in Parkinson's disease management. Although the study was limited by its small sample size, brief duration, and restricted clinical settings, it sets a foundation for broader, multi-centered research that can further validate and expand upon these observations in more diverse populations.

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AUTHOR CONTRIBUTION

Author	Contribution
Atiqa Niamat	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Ifrah Suhail*	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Suffain Khalid	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published

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