

ORIGINAL ARTICLE

Prevalence of Psychotropics Used and Occurrence of falls among older patients with Parkinson's disease

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ABSTRACT

Older patients diagnosed with Parkinson's disease (PD) often experience a range of both motor and non-motor symptoms, including psychiatric issues. Managing these patients effectively typically requires a combination of medications, which raises concerns about potential side effects, such as an increased risk of falls. This study aims to explore the prevalence of psychotropic medication use and the occurrence of falls among PD patients aged 65 years and older at a quaternary care center in Malaysia. This retrospective cohort study included all idiopathic PD patients aged 65 years and above who were under follow-up at the interdisciplinary geriatric unit in Hospital Kuala Lumpur from 1st January to 31st December 2023. A total of 42 patients were eligible in this study. We collected baseline demographic data, information on psychiatric conditions (e.g., duration, management, and types of psychotropic medications prescribed), and the incidence of falls during the study period. The median age of participants was 75 years (IQR 10), with slightly more males (52%). The mean duration of PD was 6 years (SD 5), and 50% of patients were in stages 1 to 3 of the Hoehn and Yahr scale. All participants had comorbidities and were on polypharmacy. Sixty-two percent were diagnosed with a psychiatric disorder, and 77% were prescribed psychotropic medications. The most common psychotropic medications were antidepressants (75%), followed by antipsychotics (15%), anxiolytics (5%), and



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hypnotics (5%). None had psychotropic polypharmacy. This study highlights the high prevalence of psychiatric disorders, psychotropic medication use, and fall incidents in this population. Regular medication reviews and fall assessments should be integral to the comprehensive geriatric evaluation for PD patients.

INTRODUCTION

Parkinson's disease (PD) is a progressive movement disorder of the nervous system. It causes nerve cells (neurons) in parts of the brain to weaken, become damaged, and die, leading to symptoms that include problems with movement, tremor, stiffness, impaired balance and non-motor symptoms that significantly impair quality of life (Tanner & Ostrem, 2024).

It is a neurological disorder that causes significant physical and mental complications (Tysnes & Storstein, 2017). Older individuals diagnosed with PD frequently experience a range of both motor and non-motor symptoms including psychiatric issues. Among the various non-motor symptoms, psychiatric disorders such as depression, anxiety, and hallucinations are common and often treated with psychotropic medications (Weintraub, 2020). Cognitive decline is another significant non-motor symptom in PD, with the development of Parkinson's disease dementia (PDD) being a concerning long-term outcome (Aarsland et al., 2017). As a result, the need for anti-dementia treatment is often required.

Effective management of these patients requires a combination of multiple medications. Pharmacological treatment with psychotropic drugs (i.e. antipsychotics, anxiolytics, hypnotics, and antidepressants) and anti-dementia medication is usually the standard intervention and provision of psychotherapy is scarce in this age group (Resnick et al., 2023). While these medications offer therapeutic benefits, their use in older individuals, particularly those with PD, raises concerns due to the potential for side effects,

including an increased risk of falls.

Falls are a significant concern in individuals with Parkinson's disease, as they can lead to severe complications such as fractures, disability, and even death. The use of psychotropic drugs, including antidepressants, antipsychotics, and benzodiazepines, has been implicated in exacerbating this risk, potentially by affecting motor control, cognitive function, and balance (Muench & Hamer, 2010). Despite the growing prevalence of both PD and psychotropic medication use, there remains limited comprehensive data on the relationship between psychotropic drug use and the occurrence of falls in this vulnerable population.

Studies in Malaysian aged-care facilities indicate that between 68% and 74% of older residents are prescribed at least one fall risk increasing drug (FRID) (Fujita et al., 2023), but there is a lack of data specifically focusing on psychotropic use among older PD patients. Given Malaysia's unique demographic profile, healthcare delivery system, and prescribing practices, local data are crucial to quantify the magnitude of this problem and guide safer pharmacotherapy and fall prevention strategies. Therefore, this study aims to determine the prevalence of psychotropic use and its association with falls among older patients with PD in Malaysia. By understanding these dynamics, we can better inform clinical decision-making and improve patient care strategies to minimize fall-related injuries and enhance the quality of life for individuals living with PD.

MATERIALS AND METHODS

The retrospective observational study was conducted at Hospital Kuala Lumpur, a 2,700-bed government-owned tertiary care hospital located in the capital city of Malaysia. The hospital's geriatric unit provided a list of all patients aged 65 years and older with a diagnosis of idiopathic PD, as determined by a geriatrician and documented using ICD-10 codes. These patients were under follow-up at

the interdisciplinary geriatric clinic between 1st January and 31st December 2023. Only patients who were actively followed up at the interdisciplinary geriatric unit during the study period were included. Inclusion criteria encompassed all individuals aged 65 years and above with a confirmed diagnosis of idiopathic PD within the specified timeframe. Patients were excluded if they were younger than 65 years, diagnosed outside the study period, had missing data, or were diagnosed with Parkinson-plus syndromes.

A total of 42 patients were eligible for this study during the specified period. As this was a retrospective observational study, all patients who met the inclusion criteria and were followed up at the interdisciplinary geriatric clinic in Hospital Kuala Lumpur during the study period were included. Therefore, a formal sample size calculation was not required. The sample represents the full population of eligible patients during the study period, helping to reduce selection bias. Although exploratory, the study offers meaningful insights based on real-world clinical data. Data was collected by a single researcher using an agreed data collection tool by investigators. Findings were presented as numbers and percentages for categorical data and either median with interquartile range (IQR) or mean with standard deviation (SD) based on the parametric distribution of the data using Kolmogorov-Smirnov test. Missing values will be regarded as missing, and analysis will be performed on available data. All analyses were performed using SPSS version 26.

In February 2025, the Malaysia Research Ethics Committee (MREC) of the Ministry of Health reviewed and approved the study under registration number NMRR ID-25-00738-9EG (IIR). Access to the data was restricted to the principal investigators, and the data were solely used for research purposes. The study adhered to the ethical guidelines outlined in the Malaysian Good Clinical Practice Guidelines and the Declaration of Helsinki.

RESULTS

Among the 42 patients, the median age was 75 years (IQR 10), with a slight male predominance (52%) and the majority being of Chinese ethnicity (59%). The mean duration of PD was 6 years (SD 5). Half of the patients were in stages 1 to 3 of the Hoehn and Yahr scale. All patients had multi-comorbidity (≥ 2 long-term health conditions) (Harrison et al., 2021) and were on polypharmacy (≥ 5 medications) (Masnoon et al., 2017) (Table 1).

Table 1: Demographic characteristics of the PD patients.

	Total (n = 42)
Age (Median, IQR) years	75 (10.0)
Gender (Count, %)	
Male	2.8 mg/L
Female	0.11 ng/mL
Race (Count, %)	
Malay	9 (21.4)
Chinese	25 (59.5)
Indian	8 (19.1)
Other	0 (0.0)
Multi-morbidity (Count, %) ^a	
Yes	42 (100.0)
No	0 (0.0)
Polypharmacy (Count, %) ^b	
Yes	42 (100.0)
No	0 (0.0)
Duration of PD (Mean, SD) years	6 (5.0)
PD Hoehn and Yahr Stage (Count, %)	
1	2 (4.8)
2	7 (16.7)
3	12 (28.5)
4	17 (40.5)
5	4 (9.5)
Diagnosed with psychiatric disorder (Under DSM-V) (Count, %)	
Yes	26 (61.9)
No	16 (38.1)
Diagnosed to have dementia (Count, %)	
Yes	19 (45.2)
No	23 (54.8)

^a Multi-morbidity: ≥ 2 long-term health conditions
^b Polypharmacy: ≥ 5 medications

Of the patients, 62% had been diagnosed with a psychiatric disorder, and 45% had dementia. A total of 77% were prescribed psychotropic medications, while 32% were on anti-dementia medications.

Antidepressants were the most commonly prescribed psychotropics (75%), followed by antipsychotics (15%), anxiolytics (5%), and hypnotics (5%). Notably, none of the patients were prescribed psychotropic polypharmacy (the use of two or more psychiatric medications in the same patient) (Kingsbury et al., 2001) (Table 2).

Table 2: PD patients with psychiatric disorders.

	Total (n = 26)
Duration of psychiatric disorders (Median, IQR) years	1 (2.0)
Management of psychiatric disorders (Count, %)	
Non-Pharmacological	6 (23.1)
Combination (Non-Pharmacological and Pharmacological)	20 (76.9)
Types of psychotropic medications used (Count, %)	20 (76.9)
Anti-depressant	15 (75.0)
Anti-psychotic	3 (15.0)
Anxiolytic	1 (5.0)
Hypnotic (Zolpidem, Melatonin)	1 (5.0)
Psychotropic polypharmacy (Count, %) ^c	
Yes	0 (0)
No	20 (100)
Cognitive enhancer (Count, %)	
Yes	6 (31.6)
No	14 (68.4)
Fall post initiation of psychotropic medications (Count, %)	
Yes	15 (75.0)
No	5 (25.0)

^c Psychotropic polypharmacy: ≥ 2 psychiatric medications

Among those on psychotropic medications, 75% experienced falls. PD patients on psychotropic medications, especially those with concurrent dementia, had an increased risk of falls (Table 3).

DISCUSSION

This is the first study looking into the prevalence of psychotropics used and occurrence of falls among older patients with PD in the Malaysia hospital setting. A significant proportion of PD patients studied had psychiatric disorders, were on psychotropic medications and experienced at least a fall during the period of the study (75%). PD often leads to comorbid psychiatric conditions such as depression, anxiety, and hallucinations (Dorsey et al., 2018). To manage these, psychotropic drugs such as antidepressants, antipsychotics, hypnotics, and mood stabilizers are frequently prescribed. While these medications are essential for managing psychiatric symptoms, they often come with significant side effects that could exacerbate the motor symptoms of PD, such as dizziness, sedation, or motor impairment. They can also increase the risks of various PD-related complications, including drug-drug interactions, increased all-cause mortality, cognitive impairments, and an elevated likelihood of falls (Csoti et al., 2019). These factors highlight the need for careful management and monitoring of psychotropic drug use in this patient group to minimize potential adverse outcomes.

Older patients with PD are particularly vulnerable to polypharmacy (Bhagavathula et al., 2022), and in this study, all patients experienced it, which presents several challenges. A primary concern is the risk of drug interactions, which can either reduce the effectiveness of Parkinson's medications or cause adverse reactions. Additionally,

Table 3: Occurrence of PD patients on psychotropic medication with at least a fall.

Characteristics	Fall		No (n = 5)
	Yes (n = 15)	No (n = 5)	
Age (Count, %)			
Less than 75 years old	7 (100.0)	0 (0.0)	0.058
75 years old and more	8 (61.5)	5 (38.5)	
Dementia (Count, %)			
Yes	10 (100.0)	0 (0.0)	0.010
No	5 (50.0)	5 (50.0)	
Cognitive enhancer (Count, %)			
Yes	4 (66.7)	2 (33.3)	0.197
No	11 (78.6)	3 (21.4)	

managing and monitoring complex medication regimens can be difficult, especially for older patients who may experience cognitive decline or struggle with medication adherence. Polypharmacy also heightens the risk of medication errors (Savva et al., 2022), potentially leading to hospitalization or exacerbated symptoms (Gradalski, 2019). The complexity of medication schedules can result in confusion and missed doses, further diminishing treatment effectiveness. To mitigate these risks, it is crucial to implement careful monitoring, personalized treatment plans, and regular medication reviews. In some cases, non-pharmacological approaches such as physical therapy, cognitive rehabilitation, and support groups can help alleviate the burden of polypharmacy.

This study found that PD patients on psychotropic medications concomitant with dementia have an increased risk of falls. This finding is consistent with previous studies that have examined the relationship between psychotropic medication use and falls or fall-related injuries in community-dwelling older people with cognitive impairment (Hart et al., 2019; Santiago Martinez et al., 2023). Dementia may amplify this risk through several mechanisms. Cognitive decline can impair attention, judgment, and hazard perception, making it more difficult for individuals to recognize and respond appropriately to environmental risks (Sturnieks et al., 2025). In addition, dementia often reduces the ability to maintain postural stability and dual-tasking, further compromising balance and coordination (Zhong et al., 2025). Psychotropic medications, particularly sedatives, antidepressants, and antipsychotics, can exacerbate these deficits by causing drowsiness, delayed reaction time, and orthostatic hypotension, thereby increasing the overall sedative burden. Moreover, individuals with dementia may have difficulties adhering to safety precautions, further elevating their vulnerability to falls. Several studies have emphasized the detrimental effects of psychotropic drugs on

fall risk, underscoring the potential benefits of deprescribing these medications in individuals with PD and dementia. By carefully managing medication use, healthcare providers may be able to reduce the risk of falls, improve patient safety, and enhance overall quality of life for these individuals.

The findings of this study have important clinical implications for the management of fall risk among older patients with PD who are prescribed psychotropic medications. Given the association between psychotropic drug use, cognitive impairment, and increased fall risk, clinicians should adopt a proactive and multifaceted approach to mitigate these risks. Regular medication reviews and deprescribing where appropriate are essential strategies to minimize sedative burden and reduce exposure to medications known to increase fall risk. Whenever feasible, non-pharmacological interventions should be integrated into the care plan, including physiotherapy to improve gait and balance, cognitive rehabilitation to strengthen attention and executive function, and caregiver education to enhance environmental safety and support. Additionally, incorporating routine fall risk assessments into comprehensive geriatric care can facilitate early identification of high-risk individuals and timely implementation of targeted interventions. Such a multidisciplinary approach not only enhances patient safety but may also improve functional outcomes, quality of life, and reduce healthcare burden associated with fall-related injuries in this vulnerable population.

There were limitations associated with this study. Important factors that could have influenced PD patients falls were not analyzed, such as frailty, disability, morbidity and illness severity. This would support targeting attention on factors associated high risk of falls. In addition, the study involved a relatively small sample size, which may limit the statistical power to detect significant associations and increases the possibility errors. The findings were also derived from a single urban hospital, which restricts the external validity and

generalizability of the results to broader or more diverse populations. Furthermore, the retrospective study design meant that data accuracy and completeness were entirely dependent on existing clinical notes and electronic health records, which may be prone to recall bias, missing data, and inconsistent documentation. These limitations should be carefully considered when interpreting the results and planning future prospective, multicenter studies with larger sample sizes.

Further research into the factors influencing falls in PD patients at this stage could offer valuable insights into what clinicians consider when making decisions and the reasoning behind those choices. Additionally, risk stratification to identify characteristics and factors linked to high-risk falls would enable clinicians and stakeholders to target interventions more effectively. A deeper understanding of these factors would help optimize care organization and improve the delivery of high-quality services to meet the healthcare needs of an aging population. Future work should build on these findings to offer a clearer, locally relevant picture for our healthcare system.

CONCLUSION

A significant proportion of PD patients studied had psychiatric disorders, were on psychotropic medications and experienced at least a fall during the period of the study. Regular review of the ongoing need for these medications and a fall assessment should therefore be central to the comprehensive geriatric assessment in this cohort.

Given the complexity of PD, a tailored approach to fall prevention is essential. Although general strategies are commonly applied to older adults, individuals with PD face distinct challenges stemming from impaired motor coordination, postural instability, and autonomic dysfunction. To address these specific risks, future prospective multicenter studies involving larger cohorts and standardized fall assessment tools are

needed to develop and validate targeted interventions for this population.

As the first study of its kind in a Malaysia hospital setting, these findings provide valuable local insight. Nonetheless, they highlight the urgent need for context-specific strategies to improve care and outcomes for older adults living with PD.

ACONFLICT OF INTEREST

None

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