Pakistan Journal of Neurological Sciences (PJNS)

Volume 18 | Issue 2 Article 2

6-2023

Frequency of Depression Among Patients With Parkinson Disease

Mohammad Lateef
Neuro Clinic & Falij Care Center, Karachi

Wasim Ikram Alvi
Dr. Ruth K.M. Pfau Civil Hospital Karachi

Abdul Malik
Liaquat College of Medicine & Dentistry, Karachi

Neelum Jamal
Fazaia Ruth Pfau Medical College, Karachi

Muhammad Umair
Liaquat College of Medicine & Dentistry, Karachi

See next page for additional authors

Frequency of Depression Among Patients With Parkinson Disease

Authors

Mohammad Lateef, Wasim Ikram Alvi, Abdul Malik, Neelum Jamal, Muhammad Umair, and Muhammad Athar Khan

https://doi.org/10.56310/pjns.v18i02.237

FREQUENCY OF DEPRESSION AMONG PATIENTS WITH PARKINSON DISEASE

Mohammad Lateef[1], Wasim Ikram Alvi[2], Abdul Malik[3], Neelum Jamal[4], Muhammad Umair[5], Muhammad Athar Khan[6]
[1].Neuro Clinic & Falij Care Center, Karachi
[2].Department of Psychiatry, Dr. Ruth K.M. Pfau Civil Hospital Karachi
3.Neurology section, Department of Medicine, Liaquat College of Medicine & Dentistry, Karachi
[4].Department of Community Medicine, Fazaia Ruth Pfau Medical College, Karachi
[5].Department of Medicine, Liaquat College of Medicine & Dentistry, Karachi
[6].Department of Community Medicine, Liaquat College of Medicine & Dentistry, Karachi

Corresponding author: ***Muhammad Athar Khan*** *Department of Community Medicine, Liaquat College of Medicine & Dentistry, Karachi* ***Email:*** *matharm@yahoo.com*

Date of submission: *March 30, 2023* ***Date of revision:*** *June 12, 2023* ***Date of acceptance:*** *June 25, 2023*

ABSTRACT

Background and Objective:
Parkinson's disease is a degenerative neurological condition that affects a large number of individuals worldwide. One of the common non-motor symptoms associated with this disease is depression, which can pose challenges for both patients and their caregivers. The main objective of this research was to determine the frequency of depression among patients with Parkinson disease.

Methods:
This was a cross-sectional study that was conducted in Karachi, Pakistan, between March 26, 2022, and September 30, 2022. Male and female patients diagnosed with Parkinson's disease according to the UK Parkinson's Disease Society Brain Bank Clinical Diagnostic Criteria, who were receiving either outpatient or inpatient care at two medical facilities, Neuro Clinic and Falij care center, Karachi and Darul Sehat Hospital, Karachi, were evaluated for depression using the Hamilton Depression Rating Scale. The collected data were analyzed statistically, using the SPSS version.

Results:
According to the results of the study, 100 Parkinson's disease patients were included, out of which 81 individuals were identified as experiencing depression while the rest showed no signs of depression. Among those suffering from depression, 35 individuals were found to have mild depression, 52 had moderate depression, and 13 individuals had severe depression.

Conclusion:
The study concluded that depression is a common non-motor symptom among Parkinson's disease patients, with a substantial number of patients having mild to moderate depression.

Keywords: Depression, Parkinson's disease, Frequency

INTRODUCTION

Around the globe, Parkinson's disease (PD) impacts about 7.5 million people and shows itself with both motor symptoms, such as tremors and slow movements, and non-motor symptoms, such as depression, anxiety, lack of motivation, and cognitive problems.[1-3] Depression is one of the most common and problematic non-motor symptoms that affects not only those with the disease but also those who care for them. Despite their significance, these non-motor symptoms of PD are frequently disregarded and inadequately addressed.[4]

The impact of depression in Parkinson's disease on the lives of patients and caregivers should not be underestimated, even if the symptoms are not severe. Effective treatment depends on understanding the neurobiology of depression and using appropriate medication and non-pharmacological interventions. To achieve this, it is essential to accurately diagnose depression using validated assessment tools, identify risk factors, and acknowledge the presence of other motor and non-motor symptoms. This highlights the need for comprehensive management of depression in Parkinson's disease.[5,6]

According to various systematic reviews, the prevalence rates of depression and anxiety in Parkinson's disease range from 2.7% to 90% and 6% to 55%, respectively.[7-9] These symptoms can significantly impact the quality of life of patients, as highlighted in studies conducted by Shakil et al. where anxiety levels were observed in 41.03% and depression in 33.3% of current Parkinson's disease patients. Risk factors associated with depression in Parkinson's disease include low socioeconomic status, a history of depression, and female gender.[10]

Apart from anxiety, depression, low education and family history, depression in PD patients may also be affected by the severity of motor symptoms, duration and stage of the disease, daily dose of levodopa equivalent, and presence of non-motor symptoms including sleep disturbances, anxiety, and hallucinations. These observations have been reported in earlier studies.[11,12]

Due to the fact that Parkinson's disease affects multiple systems and neuropsychiatric disorders like depression and anxiety can be complicated in patients with Parkinson's disease, it can be difficult to pinpoint their exact causes. Nevertheless, examining the frequency and strength of depression in Parkinson's disease patients could aid in detecting it early and guide future treatment strategies. The objective of this research was to determine the frequency and severity of depression in individuals with Parkinson's disease.

METHODS

Study design: A cross sectional study

Place and duration of study: This study was conducted in Neuro Clinic and Falij care center, Karachi and Darul Sehat Hospital, Karachi. It was a six-month cross sectional study from 26th March 2022 to 30th September 2022.

Sample size: The sample size was calculated using Sample Size for a Proportion (Open-Epi version 3) with consideration of a 5% margin of error, 90% confidence interval, population of Karachi (2022) 16,840,000 and a 9.3% frequency of depression in Karachi reported by Talreja et al[14.] The required sample size after adding the 10% non-response rate was 100.

Sampling technique: Non-probability consecutive sampling method

Data Collection: To gather data, informed consent was obtained from all eligible patients regardless of gender, who had a clinical diagnosis of Parkinson's disease, based on the UK Parkinson's Disease Society Brain Bank clinical diagnostic criteria. Depressive symptoms were evaluated using the International Classification of Diseases 10th revision (ICD-10) diagnostic criteria, while the Hamilton Rating Scale for Depression (HAM-D), a commonly used clinician-administered depression assessment tool, was used to determine the severity of depression. A semi-structured performa was utilized to collect the data.

The Hamilton Depression Scale (HDS or HAMD) is a test that assesses the severity of depression symptoms in individuals, often those who have already received a diagnosis of depressive disorder. It is also known as the Hamilton Depression Rating Scale or the Hamilton Rating Scale for Depression (HRSD). The HDS is more commonly used in its 17-item format than its 21-item format, which includes four additional items assessing depression-related symptoms such as paranoia and preoccupation rather than the severity of depressive symptoms themselves. The 17-item variant of the Hamilton Depression Scale (HDS) can generate scores ranging from 0 to 54. According to a commonly used interpretation, a score of 0 to 6 indicates normal levels of depression, a score of 7 to 17 indicates mild depression, a score of 18 to 24 indicates moderate depression, and a score above 24 indicates severe depression.[13]

Data Analysis: The study collected data on several variables such as patient age, age of onset of Parkinson's disease, duration of illness, mean standard deviation, and HAMD scores. For categorical variables like sex, age group, patient type, marital status, education, and occupation, as well as clinical aspects of Parkinson's disease and depression severity, the frequency and percentage were calculated. SPSS version 20 was utilized for data entry and analysis.

Ethical Consideration: Ethical approval for this study was obtained from the Institutional Review Board (IRB) of Liaquat College of Medicine & Dentistry, Karachi.

RESULTS

Table 1 displays demographic information, including age, gender, marital status, education status, and employment status.

Table 1: Demographic Characteristics of Study Participants (n=100)

Age in Years (mean ± sd)	50 ± 13
Age Groups n(%)	
40 – 49	6(6%)
50 – 59	60(60%)
60 & above	34(34%)
Gendern(%)	
Male	59(59%)
Female	41(41%)
Marital Statusn(%)	
Married	91(91%)
Unmarried	9(9%)
Education Statusn(%)	
Illiterate	37(37%)
Primary	17(17%)
Secondary	31(31%)
Matriculate	8(8%)
Intermediate	4(4%)
Bachelors	3(3%)
Employment Statusn(%)	
Yes	30(30%)
No	70(70%)

Table 2 presents clinical characteristics of study participants with Parkinson's disease, including a history of suicidal tendencies, hypertension, family history of psychiatric or neurological illnesses, age of onset of Parkinson's disease, clinical features (tremors, bradykinesia, rigidity, postural instability), duration of illness, and mean duration of illness

Table 2: Clinical Characteristics of Study Participants (n=100)

History of suicidal tendencies	33(33%)
History of hypertension	4(4%)
Family history of psychiatric illness	5(5%)
Family history of neurological illness	7(7%)
Age of onset of Parkinson's diseasen (%) ≤ 50 years 51 – 59 years ≥ 60 years	 16(16%) 72(72%) 11(11%)
Clinical Featuresn (%) Tremors Bradykinesia Rigidity Postural instability	 96(96%) 100(100%) 99(99%) 39(39%)
Duration of Illess" (%) < 1 year 1 – 2 years > 2 years	 12(12%) 78(78%) 10(10%)
Mean Duration of Illness (mean ± sd)	1.5 ± 1

The mean HAM-D score for the entire sample was 15.1, indicating mild depression. However, some participants experienced moderate (mean HAM-D = 19.2) or severe (mean HAM-D = 28.2) depression. The results indicate that 29 participants had mild depression, 42 had moderate depression, and 10 had severe depression. Additionally, 19 participants reported experiencing symptoms of anxiety.

DISCUSSION

In our study of 100 Parkinson's disease (PD) patients, it was found that depression is a common comorbidity and many participants reported experiencing moderate to severe depressive symptoms. Nevertheless, there is conflicting evidence in the literature regarding the connection between depression and motor/non-motor symptoms in PD, with some studies finding a correlation between depression and both types of symptoms while others have not supported this association.[15,16]

Previous studies conducted in Pakistan have reported similar demographic characteristics of our survey participants. Our research reveals that Parkinson's disease (PD) patients with lesser educational qualifications face a greater risk of experiencing depression, which is consistent with prior studies conducted by Baiano et al. (2020) and Hakulinen et al. (2019).[17,18] Moreover, our findings indicate that females suffering from PD are more prone to depression, which could be due to environmental factors and gender-specific susceptibility factors, as

observed in the general population.[19]

The participants of the present study were mostly married, had finished secondary education, and were jobless, similar to the findings of Cong et al.'s (2022) recent investigation. Cong and team conducted a systematic review and meta-analysis, which revealed that female PD patients with a longer disease duration and lower educational qualifications had a higher incidence of depression.[20]

The study revealed that a significant proportion (33%) of participants had a past experience of suicidal thoughts, indicating the necessity of screening Parkinson's disease patients for such tendencies and offering appropriate interventions. This finding is in line with a previous study that demonstrated a heightened risk of suicide in PD patients (Jeong et al., 2022).[21] Additionally, Khakimova's study suggested that as PD advances, the occurrence of hypertension may decrease, although only a minor percentage (4%) of individuals in the current research reported a history of high blood pressure.[22]

In the study, a small percentage of participants (either 5% or 7%) mentioned that they had relatives with neurological or mental disorders. This is important information for the management and treatment of the disease, highlighting the need for a comprehensive evaluation of family history for people with Parkinson's disease. Torti et al. found that individuals with a first-degree relative who had PD had a slightly higher risk of developing the disease.[23]

According to a study, patients suffering from Parkinson's disease (PD) can experience depression at different levels. The study showed that out of the total participants, 29 had mild depression, 42 had moderate depression, and 10 had severe depression. This highlights the fact that depression severity can vary significantly in PD patients.[24] In another study conducted in Islamabad, 62% of PD patients reported experiencing depression. Sleep disturbance, constipation, and sadness were identified as the most common non-motor symptoms among PD patients by Qayyum et al.[25] Tufail et al. conducted research that demonstrated a significant statistical correlation between PD and various health problems, including depression.[26] This finding is consistent with the findings of Mukhtar et al. research that showed neuropsychiatric symptoms, such as low mood and depression, were prevalent among PD patients. About 47% of the participants experienced low mood and depression, and 36% reported anxiety and panic attacks.[27]

The findings of this research provide insights into the prevalence of depression among Parkinson's disease patients in Pakistan, which contributes to the current knowledge of the subject. The study highlights the significance of thorough screening and mental health treatment for this group, given the high rates of depression and suicidal tendencies observed in the participants. However, further investigation is required to identify the underlying causes of these problems in Parkinson's disease patients in Pakistan. Understanding these factors is crucial for developing effective therapies that can address these mental health issues and improve the well-being of Parkinson's disease patients in the region.

Limitations of the Study:

The generalizability of the study is limited due to the small number of participants and the lack of a control group, which makes it difficult to fully understand the complex relationships among Parkinson's disease, depression, and other related conditions. To gain a better understanding of this relationship, further research is needed.

CONCLUSION

The study's findings indicate that a significant percentage of patients experience moderate (42%) to severe (10%) depression, indicating that it is a frequent comorbidity in Parkinson's disease.

REFERENCES

1. Macías-García P, Rashid-López R, Cruz-Gómez ÁJ, Lozano-Soto E, Sanmartino F, Espinosa-Rosso R, et al. Neuropsychiatric Symptoms in Clinically Defined Parkinson's Disease: An Updated Review of Literature. Behav Neurol. [Internet]. 2022 May [cited 2022 Dec]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9110237/. doi: 10.1155/2022/1213393.
2. Lee Y, Chiou YJ, Hung CF, Chang YY, Chen YF, Lin TK, et al. Prevalence and Associated Factors of Depressive Disorder in Caregivers of Individuals With Parkinson Disease. J Geriatr Psychiatry Neurol. 2021 Sep;34(5):418-425. doi: 10.1177/0891988720933359.
3. Kadastik-Eerme L, Rosenthal M, Paju T, Muldmaa M, Taba P. Health-related quality of life in Parkinson's disease: a cross-sectional study focusing on non-motor symptoms. Health Qual Life Outcomes. 2015 Dec;13(1):1-8. doi: 10.1186/s12955-015-0281-x.
4. Khedr EM, Abdelrahman AA, Elserogy Y, Zaki AF, Gamea A. Depression and anxiety among patients with Parkinson's disease: frequency, risk factors, and impact on quality of life. Egypt J Neurol Psychiatr Neurosurg. 2020 Dec;56(1):1-9.
5. Chikatimalla R, Dasaradhan T, Koneti J, Cherukuri SP, Kalluru R, Gadde S. Depression in Parkinson's Disease: A Narrative Review. Cureus [Internet]. 2022 Aug [cited 2022 Oct]. Available from: https://www.cureus.com/articles/104679-depression-in-parkinsons-disease-a-narrative-review#!/. doi: 10.7759/cureus.27750
6. Prange S, Klinger H, Laurencin C, Danaila T, Thobois S. Depression in Patients with Parkinson's Disease: Current Understanding of its Neurobiology and Implications for Treatment. Drugs Aging. 2022 Jun;39(6):417-439. doi: 10.1007/s40266-022-00942-1.
7. Chuquilín-Arista F, Álvarez-Avellón T, Menén dez-González M. Prevalence of depression and anxiety in Parkinson disease and impact on quality of life: a community-based study in Spain. J Geriatr Psychiatry Neurol. 2020;33(4): 207–13. doi: 10.1177/0891988719874130.
8. Alhadi AN, Alarabi MA, Alshomrani AT, Shuqdar RM, Alsuwaidan MT, McIntyre RS. Arabic translation, validation and cultural adaptation of the 7item Hamilton depression rating scale in two community samples. Sultan Qaboos Univ Med J. [Internet]. 2018 May [cited 2023 Feb]. Available from:https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6132530/.doi: 10.18295/squmj.2018.18.02.008
9. Hallit S, Haddad C, Hallit R, Akel M, Obeid S, Haddad G, et al. Validation of the Hamilton anxiety rating scale and state trait anxiety inventory a and B in Arabic among the Lebanese population. Clin Epidemiol Glob Health. 2019;7(3):464–70. doi.org/10.1016/j.cegh.2020.03.028
10. Asif S, Farooq R, Jawad U, Irfan MS, Fuaad M, Ullah S. Depression and Anxiety among Parkinson's Disease Patients: Prevalence, Risk Factors, and Impact on Life Quality. Pak J Med Health Sci. 2022 Apr 5;16(02):843-46. doi.org/10.53350/pjmhs22162843
11. Chang YP, Lee MS, Wu DW, Tsai JH, Ho PS, Lin CR, et al. Risk factors for depression in patients with Parkinson's disease: A nationwide nested case-control study. PLoS One [Internet]. 2020 Jul [cited 2022 Nov]. Available from: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0236443. doi: 10.1371/journal.pone.0236443.
12. Cui SS, Du JJ, Fu R, Lin YQ, Huang P, He YC, et al. Prevalence and risk factors for depression and anxiety in Chinese patients with Parkinson disease. BMC geriatrics. 2017 Dec;17(1):270-79. doi: 10.1186/s12877-017-0666-2
13. Carrozzino D, Patierno C, Fava GA, Guidi J. The Hamilton rating scales for depression: a critical review of clinimetric properties of different versions. Psychother Psychosom. 2020;89(3):133-50. doi: 10.1159/000506879.
14. Talreja AK, Kumar H, Essrani RK, Lal C, Suneel Arwani S. Prevalence of depression in patients of parkinson's disease presenting to a tertiary care hospital at Karachi. J Neurol Stroke. 2016;4(4):1 6. doi: 10.15406/jnsk.2016.04.00138
15. Ou R, Wei Q, Hou Y, Yuan X, Song W, Cao B, et al. Vascular risk factors and depression in Parkinson's disease. Eur J Neurol. 2018 Apr;25(4):637-43. doi: 10.1111/ene.13551.
16. Santangelo G, Vitale C, Trojano L, Angrisano MG, Picillo M, Errico D et al. Subthreshold depression and subjective cognitive complaints in Parkinson's disease. Eur J Neurol. 2014 Mar;21(3):541-4. doi: 10.1111/ene.12219.
17. Baiano C, Barone P, Trojano L, Santangelo G. Prevalence and clinical aspects of mild cognitive impairment in Parkinson's disease: A meta analysis. Mov Disord. 2020 Jan;35(1):45-54. doi.org/10.1002/mds.27902
18. Hakulinen C, Musliner KL, Agerbo E. Bipolar disorder and depression in early adulthood and long-term employment, income, and educational attainment: A nationwide cohort study of 2,390,127 individuals. Depress Anxiety. 2019 Nov;36(11):1080-8. doi: 10.1002/da.22956.
19. Salk RH, Hyde JS, Abramson LY. Gender differences in depression in representative national samples: Meta-analyses of diagnoses and symptoms. Psychol Bull. 2017 Aug;143(8):783-822. doi: 10.1037/bul0000102.
20. Cong S, Xiang C, Zhang S, Zhang T, Wang H, Cong S. Prevalence and clinical aspects of depression in Parkinson's disease: A systematic

review and meta-analysis of 129 studies. Neurosci Biobehav Rev. [Internet]. 2022 Oct [cited 2023 Jan]. Available from: https://pubmed.ncbi.nlm.nih.gov/35750224/. doi: 10.1016/j.neubiorev.2022.104749.
21. Jeong SH, Hoon Kim S, Lee DW, Park EC, Jang SY. Association between new-onset Parkinson's disease and suicide risk in South Korea: a nationwide cohort study. BMC Psychiatry. 2022 May 17;22(1):341-50. doi: 10.1186/s12888-022-03990-4.
22. Khakimova S, Daminova KH. Parkinson's disease Correlates with Reduced Risk of Hypertension [abstract]. Mov Disord. [Internet]. 2019; 34 (suppl 2) [cited 2023 Jan]. Available from: https://www.mdsabstracts.org/abstract/parkinsons-disease-correlates-with-reduced-risk-of-hypertension/.
23. Torti M, Fossati C, Casali M, De Pandis MF, Grassini P, Radicati FG, et al. Effect of family history, occupation and diet on the risk of Parkinson disease: A case-control study. PLoS One [Internet]. 2020 Dec 17 [cited Dec 2022]. Available from: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0243612. doi: 10.1371/journal.pone.0243612.
24. Saad S, Nomani, AZ, Badshah M, Afzal A. Frequency of non-motor symptoms in Parkinson disease: experience from Pakistan. Pak J Neurol Sci. 2017; 12(1):8-15.
25. Qayyum W, Khan S, Iqbal MS, Khan MF, Yousafzai ZA, Jan F. Non-Motor Symptoms and Their Associated Factors in Parkinson's Disease. J Islamabad Med Dent Coll. 2021;10(4):221-227. doi.org/10.35787/jimdc.v10i4.669
26. Tufail M. Clinical features and risk factors of Parkinson's disease in a population of Khyber Pakhtunkhwa, Pakistan: a case-control study. Neurodegener Dis. 2019;19(5-6):211-217. doi: 10.1159/000506742.
27. Mukhtar S, Imran R, Zaheer M, Zahir M, Tariq H. Frequency of non-motor symptoms in Parkinson's disease presenting to tertiary care centre in Pakistan: an observational, cross-sectional study. BMJ Open [Internet]. 2018 May [cited Nov 2022]. Available from: https://bmjopen.bmj.com/content/8/5/e019172.long. doi:10.1136/bmjopen-2017-019172

Conflict of interest: Author declares no conflict of interest.
Funding disclosure: Nil

Authors' contribution:
Mohammad Lateef; Concept, data analysis and interpretation, manuscript writing, manuscript revision
Wasim Ikram Alvi; Concept, data collection, data analysis, manuscript writing
Abdul Malik; Data collection, manuscript writing, manuscript revision
Neelum Jamal; Data analysis and interpretation, manuscript writing
Muhammad Umair; Concept and design, manuscript revision
Muhammad Athar Khan; Concept and design, manuscript revision
All the authors have approved the final version of the article, and agree to be accountable for all aspects of the work