

## ORIGINAL ARTICLE

# Depression and Anxiety among Parkinson's Disease Patients: Prevalence, Risk Factors, and Impact on Life Quality

SHAKIL ASIF<sup>1</sup>, RIZWAN FAROOQ<sup>2</sup>, UNAIZA JAWAD<sup>3</sup>, MUHAMMAD SHOAIB IRFAN<sup>4</sup>, MUAZZAM FUAAD<sup>5</sup>, SUBHAN ULLAH<sup>6</sup>

<sup>1</sup>Associate Professor Psychiatry, Mohtarma Benazir Bhutto Shaheed Medical College/ Div HQ hospital, Mirpur AJK

<sup>2</sup>Assistant Professor Psychiatry & Behavioral Sciences PGMI/AMC/LGH Lahore, Pakistan

<sup>3</sup>Assistant Professor Psychiatry & Behavioral Sciences, Rashid Latif Medical College, Lahore

<sup>4</sup>Assistant Professor Psychiatry, Sialkot Medical College, Sialkot

<sup>5</sup>Assistant Professor Medicine Rai Medical College, Sargodha

<sup>6</sup>Assistant Professor Psychiatry, Aziz Fatimah Medical College, Faisalabad

Corresponding author: Unaiza Jawad, Email: [unaizajawad@hotmail.com](mailto:unaizajawad@hotmail.com), Cell: +92 323 7316141

## ABSTRACT

**Background and Aim:** Parkinson's disease's common symptoms are anxiety and depression and play a determinant role in the quality of a patient's life. Numerous studies identified several risk factors but very few investigated the specific risk factors associated with Parkinson's disease (PD). The objective of the present study was to assess the depression and anxiety among Parkinson's disease patients, prevalence, risk factors, and impact on life's quality.

**Methodology:** This cross-sectional study was conducted on 78 Parkinson's disease patients at the department of Psychiatry & Behavioral Sciences LGH Lahore, Pakistan and Div HQ hospital, Mirpur AJK in collaboration with Neurology department for the duration from 15 May 2021 to 15 November 2021. All the patients were assessed for anxiety and depression. Unified Parkinson's Disease Rating Scale (UPDRS) and Holmes and Rahe scale were used for the evaluation of staging and severity among Parkinson's disease patients. Clinically diagnosed Parkinson's disease patients aged between 25 and 85 years and stages 1 to 4 on the H-Y scale were enrolled. Patients with movement disorders other than PD, atypical Parkinson's, deep brain stimulation (DBS), visual loss, and secondary Parkinsonism were excluded. Ethical approval was taken from the institutional ethical committee. Depression and anxiety impact on life quality were assessed using World Health Organization Quality of Life (WHOQOL)-BREF.

**Results:** Of the total 78 Parkinson's disease patients, the prevalence of depression and anxiety was 26 (33.3%) and 32 (41.03%) respectively. About 40 were male and 38 were female patients. The overall mean age was 67±5.9 years. The young population was more susceptible to anxiety and depression was significantly higher in females. The depression and anxiety overlap were in 19 (24.4%) patients. The UPDRS and H-Y scale variance accounted for depression 34.5% and anxiety 38.9%. The severity and advanced disease stage were depression independent predictors whereas younger age and severity were anxiety main predictors. Overall, anxiety and depression had adverse impacts on life quality of Parkinson's disease patients.

### Conclusion:

Depression and anxiety were found in 33.3% and 41.03% of current Parkinson's disease patients, respectively. Depression and anxiety are relatively common in Parkinson's disease. The main risk factors for developing depression were female gender, low socioeconomic status, and a history of depression. Anxiety was associated with a young age and a history of anxiety. Both had a negative effect on one's quality of life.

**Keywords:** Depression, Anxiety, Risk factors, Prevalence

## INTRODUCTION

Parkinson's disease (PD) common mood disorders are depression and anxiety. According to systematic reviews, the average estimated prevalence of depression and anxiety in Parkinson's disease varied from 2.7–90% to 6–55%, respectively [1, 2], and both play a determinate role in the quality of a patient's life [3]. However, there have been few studies that look at the incidence of mood disorders. As a result, it is critical to investigate the occurrence of mood disorders among Parkinson's disease patients and identify the factors that contribute to these symptoms' development. Numerous risk factors for depression and anxiety in Parkinson's disease have been identified, both specific and non-specific to the disease. The Parkinson's disease associated risk factors that cause depression are advanced stage of disease, sleep disturbance as non-motor symptoms, severe motor symptoms, a higher dose of levodopa, and a longer duration of disease [4, 5].

Anxiety-related factors in Parkinson's disease were less well understood than depression-related factors [6]. Anxiety in Parkinson's disease was associated with the presence of motor fluctuations, depression, and dysautonomia [7, 8]. Parkinson's disease is significantly associated with age, marital status, gender, chemical and pesticide exposure, and comorbidities which leads to depression and anxiety [9]. The previous history of depression and anxiety, family history, conduct disorder, and dependency on social support are other factors that contribute to the development of anxiety and depression [10, 11].

The majority of Parkinson's disease patients had coexistence of depression and anxiety, however, it was not clear that their mechanisms are the same or different. Previous studies reported no association of both depression and anxiety [12]. The pathophysiology of anxiety and depression in Parkinson's disease patients

remains unknown. Previous research has linked depression to decreased dopamine transporter (DAT) activity and dysfunction of severe motor [13]. Another study concluded that psychological response to non-motor symptoms and disabling motor development could be the cause of anxiety in Parkinson's disease patients. The aim of the present study was to assess the prevalence, risk factors, and impact of depression and anxiety among Parkinson's disease patients.

**METHODOLOGY**

This cross-sectional study was conducted on 78 Parkinson's disease patients at the department of Psychiatry & Behavioral Sciences LGH Lahore, Pakistan and Div HQ hospital, Mirpur AJK in collaboration with Neurology department for the duration from 15 May 2021 to 15 November 2021. All the patients were assessed for anxiety and depression. Unified Parkinson's Disease Rating Scale (UPDRS) and Holmes and Rahe scale were used for the evaluation of staging and severity among Parkinson's disease patients. Clinically diagnosed Parkinson's disease patients aged between 25 and 85 years and stages 1 to 4 on the H-Y scale were enrolled. Patients with movement disorders other than PD, atypical Parkinson's, deep brain stimulation (DBS), visual loss, and secondary Parkinsonism were excluded. Ethical approval was taken from the institutional ethical committee. Depression and anxiety impact on life quality were assessed using World Health Organization Quality of Life (WHOQOL)-BREF. All information was gathered through a one-time face-to-face interview in outpatient clinics. The Hamilton Depression Rating Scale (HAMD) and Hamilton Anxiety Rating Scale (HARS) were used to assess depression and anxiety, respectively.

Non-specific PD data includes demographics, exposure, and lifestyle factors. During a clinical interview, demographic information such as age, educational attainment, gender, and marital status was gathered. For data analysis, SPSS version 23 was used. Means were assigned to continuous variables. Percentages were used to summarize categorical variables. For between-group comparisons, chi-square tests, t-tests, and Mann-Whitney tests for categorical variables, normally distributed variables, and non-parametric variables.

**RESULTS**

Of the total 78 Parkinson's disease patients, the prevalence of depression and anxiety was 26 (33.3%) and 32 (41.03%) respectively. About 40 were male and 38 were female patients. The overall mean age was 67±5.9 years. The young population was more susceptible to anxiety and depression was significantly higher in females. The depression and anxiety overlap were in 19 (24.4%) patients. The UPDRS and H-Y scale variance accounted for depression 34.5% and anxiety 38.9%. The severity and advanced disease stage were depression independent predictors whereas younger age and severity were anxiety main predictors. Overall, anxiety and depression had adverse impacts on life quality of Parkinson's disease patients. Figure 1 illustrates the gender distribution. Table-I shows the socio-economic details and medical history especially risk factors for Parkinson's disease patients. The

prevalence of depression is depicted in Figure-2. A comparison of Parkinson's disease patients with anxiety and depression is shown in Table II. The impact of anxiety and depression on the life quality of Parkinson's disease patients is shown in Table III.

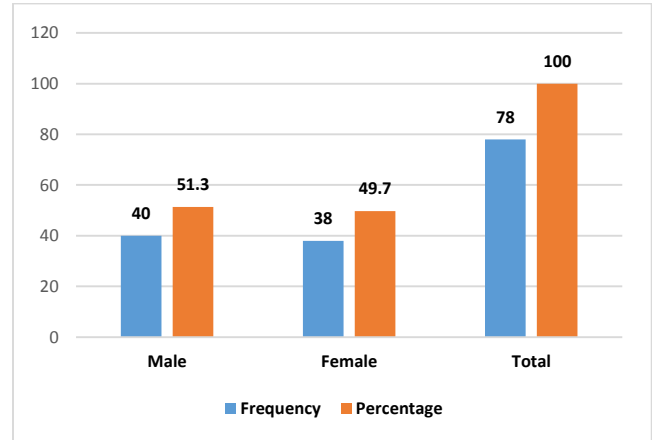


Figure 1: Gender distribution

Table 1: Socioeconomics details and Medical history of Parkinson's disease patients

Parameters	Parkinson's disease patients N=78	p-value
Gender (M/F)	40/38	0.897
Age (years)	67±5.9	0.563
Marital status (S/M)	28/50	0.079
Education (Illiterate/literate)	45/33	0.812
Smoking (male) (Y/N)	25/15	0.891
Risk Factors (Y/N)		
Hypertension	16/62	0.241
Diabetes	11/67	0.482
Cardiac	6/72	0.608

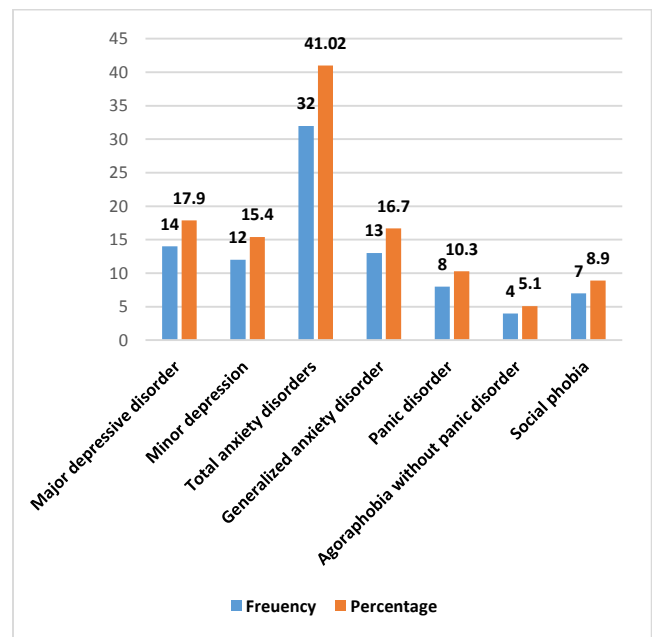


Figure 2: Frequency of Depression in PD patients

Table 2: Comparison of Parkinson's disease patients with anxiety and depression

Variables	Depressed PD N=26	PD with Anxiety N=32	p-value
Age at Onset (M±SD)	66.5±8.5	67.5±3.3	<0.001
Disease Duration (M±SD)	4.9±2.8	4.8±2.9	0.125
Treatment Duration (M±SD)	4.2±2.8	4.3±2.6	0.179
H-Y stages			0.037
S 1.5	1	2	
S 2.5	5	19	
S 3	14	8	
S4	6	3	
UPDRS	121.8±28.9	113.9±28.6	<0.001
Mental	8.9±2.7	8.3±2.5	
ADL	32.8±9.8	29.8±10.3	
Motor	71.9±14.6	39.8±22.8	
Therapy Complications	6.9±4.9	7.8±3.9	

Table 3: Impact of anxiety and depression on life quality of Parkinson's disease patients

Domain of QOL (M±SD)	PD patients with Depression	PD Patients with Anxiety	P-value
Physical	30.9±8.7	35.9±10.7	0.001
Psychological	49.7±16.9	56.8±11.3	<0.001
Social	48.9±24.6	52.9±23.6	0.892
Environmental	38.72±15.8	49.7±19.8	0.316
Overall QOL	39.8±12.7	46.9±13.8	0.001

## DISCUSSION

Parkinson's disease patient's mood disorders symptoms are anxiety and depression affecting illness outcomes and life quality. The current study used semi-structured scales to assess anxiety and depression in Parkinson's disease patients. The prevalence of single depressive disorder meeting DSM-IV was 29%. Anxiety disorder meeting DSM-IV criteria were 39%. Zhou et al [14] used the BDI-score to study non-motor symptoms in 97 Parkinson's disease patients and discovered a depression frequency of 76.7 percent. Rutten et al, on the other hand, discovered a prevalence of 47.5 percent [15]. Several studies [16, 17] found that the prevalence of depression in Parkinson's disease ranged from 32.6 to 41 percent. According to Reijnders et al systematic's review, 17 percent and 22 percent of PD patients, respectively, had MDD and minor depression [18].

PD patients were diagnosed with MDD and minor depression, respectively [19]. According to BDI-score, Cui S-S et al investigated 256 PD patients and reported about 35.4% and 13.2% prevalence of minor and major depression respectively [20]. This variation in findings can be attributed to the use of various methodologies, sample size, and genetic variability of study populations. According to Zhu K et al. and Van Hilton et al., the prevalence of anxiety among patients with Parkinson's disease varies from 24.5 to 46.7%. The single disorder with GAD was common and mixed anxiety disorder prevalence was 30.8% [21, 22]. In Egypt, the incidence of anxiety was 29% [23]. A China-based study reported 26% prevalence [24].

Females are more susceptible to Parkinson's disease as depression was found higher in females as per various

studies [25, 26]. This could be due to males' reluctance to show signs of depression, but it could also be due to biological rather than psychosocial factors. Other studies, however, found no association with gender [30]. Previous studies revealed that younger patients were more depressed [27], and many other studies did not confirm any association [28].

The present study found a significantly positive association of elevated rate of depression with disease severity and lower socioeconomic status. These findings matched with Georgiev results according to which low socioeconomic status was a risk factor for depression in Parkinson's disease patients [29]. Depression and anxiety both are significantly related to illness higher stage as per Holmes and Rahe staging and reported in a previous study [30]. Gait disturbance, non-motor symptoms, motor disability, and bed restraint are all predisposed to Parkinson's disease later stage depression.

The present study reported that Quality of life (QOL) had an insignificant association with both anxiety and depression. These findings resembled with the previous study conducted by Khedr et al, [30], who found that QOL impairment could be determined by depression as a primary predictor. Other studies [31, 32] suggested that the Parkinson's disease impact on life quality could be affected by aspects of non-motor disease independently. Psychiatric disorders in Parkinson's disease, such as anxiety and depression, have a significant influence on life quality in disease early stages [33]. This demonstrates that depression and anxiety are not a reaction to the disability, but rather an integral part of the PD spectrum.

## CONCLUSION

Depression and anxiety were found in 33.3% and 41.03% of current Parkinson's disease patients, respectively. Depression and anxiety are relatively common in Parkinson's disease. The main risk factors for developing depression were female gender, low socioeconomic status, and a history of depression. Anxiety was associated with a young age and a history of anxiety. Both had a negative effect on one's quality of life.

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