

## Comparison of Quality of Life Between Young Onset and Late Onset Parkinson's Disease

Rana MM<sup>1</sup>, Islam MS<sup>2</sup>, Habib MA<sup>3</sup>, Alam SKM<sup>4</sup>, Khan MN<sup>5</sup>, Shafiq S<sup>6</sup>, Raknuzzaman M<sup>7</sup>, Hasan M<sup>8</sup>, Miah MBA<sup>9</sup>, Rahman ZHR<sup>10</sup>, Hossain MRZ<sup>11</sup>

<sup>1</sup>**Dr. Md. Masud Rana**, Associate Professor, Department of Neurology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh

<sup>2</sup>**Dr. Md. Sirajul Islam**, Resident, Department of Neurology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh

<sup>3</sup>Prof. Dr. Md. Ahsan Habib, Professor, Department of Neurology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh

<sup>4</sup>**Prof. Dr. SK. Mahbub Alam**, Department of Neurology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh

<sup>5</sup>**Dr. Mohammad Nuruzzaman Khan**, Associate Professor & Head, Department of Neurosurgery, Shaheed Suhrawardy Medical College & Hospital, Dhaka, Bangladesh

<sup>6</sup>**Dr. Sabrina Shafiq**, Assistant Professor, Department of Laboratory Medicine, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh

<sup>7</sup>**Dr. Md. Raknuzzaman**, Assistant Professor (Interventional Neurology), National Institute of Neurosciences and Hospital, Dhaka, Bangladesh

<sup>8</sup>**Dr. Mehedi Hasan**, Assistant Professor, Department of Neurology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh

<sup>9</sup>**Prof. Dr. Md. Bahadur Ali Miah**, Department of Neurology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh

<sup>10</sup>**Prof. Dr. Hasan Zahidur Rohman**, Department of Neurology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh

<sup>11</sup>**Dr. Md Rifat Zia Hossain**, Assistant Professor, Department of Clinical Oncology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh

**Corresponding Author:** Dr. Md. Masud Rana, Associate Professor, Department of Neurology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh, Email: [mrananeuro@gmail.com](mailto:mrananeuro@gmail.com)

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### ABSTRACT

**Background & purpose:** Parkinson's disease (PD) is a neurodegenerative disorder and impair different dimensions of quality of life (QoL). The impact of Parkinson's disease on QoL may vary depending on age as onset. Knowledge regarding impact of Parkinson's disease on QoL is limited. Appropriate address dimensions of QoL. may improve QoL in PD patients. Our study is aimed to compare quality of life between young onset Parkinson's disease (YOPD) and late onset Parkinson's disease (LOPD).

**Materials and Methods:** This study was cross-sectional in nature and involved all PD patients at Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, both indoor and outdoor movement disorder clinics. A total of 122 samples were gathered during the course of the study period in order to assess the quality of life between patients with YOPD and LOPD. SPSS version 26 software was used to analyse the gathered data. Appropriate statistical instruments, such as the student's t-test, the chi-square test and Mann Whitney U test were used to do statistical analysis. P values less than 0.05 were considered statistically significant.

**Result:** In this study we enrolled 122 PD patients (61 YOPD & 61 LOPD). The QoL was lower in our study for patients with YOPD, and there was a significant difference in the self-care ( $p < 0.003$ ) and anxiety/depression ( $p < 0.001$ ) domains. Furthermore, a noteworthy distinction was also demonstrated by the Health State Visual Analogue Scale ( $p < 0.001$ ), indicating that those with a YOPD had a lower overall quality of life. Patients with Parkinson's disease who live in rural locations have a lower quality of life, experience comorbidities, face wearing off, and have advanced Parkinson's disease.

**Conclusion:** YOPD had a worse quality of life than those with LOPD and commonly experience depression.

**Keywords:** *Young onset Parkinson's Disease (YOPD), Late onset Parkinson's Disease (LOPD), Quality of Life (QOL)* Introduction

Parkinson's disease is the second most common neurodegenerative disease after Alzheimer's disease and it is the most common movement disorder<sup>1</sup>. It is an age-related disease and showing gradual increase in prevalence beginning after the age of 50 years and rise in prevalence after the site of 60<sup>2</sup>. The prevalence of PD in developed countries is 0.3 % of the entire population and about 1% in people over 60 years of age. Incidence rates of PD are 8-18 per people per year<sup>3</sup>. Prevalence of Parkinson's disease has become double between 1996-2016 & the burden of Parkinson disease (PD) in developing nations is expected to double again over the next generation as a result of increasing life expectancy<sup>4</sup>.

Symptoms of Parkinson's disease (PD) begin characteristically above the age of 50 years with a mean age of onset around 60 years; however, a substantial minority of patients develop PD at a younger age. Young adults in their 30s and 40s confront problems that are fundamentally different from those faced by people in their sixties or seventies, and the impact of PD in young-onset patients is therefore likely to differ from that in older patients<sup>5</sup>.

By developing PD, patients might experience premature aging, increasing dependency, and impairment of occupational performance. The longer the duration of the disease is, the higher physical, economic, and psychological burden of PD often occurs in patients, especially in younger adults with greater socioeconomic responsibilities. On the other hand, treatment induced motor complications would be higher among the young onset PD patients and may contribute to a greater degree of physical impairment and social sequels<sup>6</sup>.

PD has major adverse impact on patients' lives. Patients' symptoms such as tremor, hypokinesia, rigidity, hypo phonic voice, painful dystonia, postural abnormalities, gait disorders, sleep disturbances, depression and drug related problems may progressively lead to falls, social embarrassment, loneliness and increasing dependence on others for everyday activities<sup>7</sup>. Medical treatment and management of patients with PD has primarily aimed at preserving life expectancy and limiting motor disabilities. Health care professionals are now convinced that the objective of medical care is not only the care of disease or increased survival but also the enhancement of health-related quality of life<sup>8</sup>.

## Methodology

### Study Settings and Population

This was designed as a cross-sectional comparative study. This present study was carried out from May 2023 to September 2024. The study was conducted in the Movement Disorder clinic, Inpatient and Outpatient, Department of Neurology, Bangabandhu Sheikh Mujib Medical University. All the patients, both young onset and late onset Parkinson's disease, diagnosed on the basis of MDS diagnostic criteria for Parkinson's disease attending in Movement Disorder clinic, Inpatient and Outpatient Department of Neurology, Bangabandhu Sheikh Mujib Medical University during the study period. Patients who suffering from Parkinson's Disease and were unwilling to give informed consent were excluded from the study.

### Study Procedure

Proper history was taken, and physical and neurological examination was done meticulously, considering the demographic and clinical variables confirmed by MDS diagnostic criteria for PD. The patient was classified into the young onset and late onset subgroups, and it was confirmed by a proper history, clinical examination. The study subjects were selected according to inclusion and exclusion criteria. Participants enrolled in the study using the purposive sampling technique after obtaining informed written consent from the patients. History focused on basic demographic information, past medical records, and co-morbidities, and EQ5D5L scale. The quality of life is measured in young onset & late onset PD and compared between them.

### Data processing and analysis

Statistical analysis was carried out using SPSS 26.0 for Windows software. Continuous variables (age) were presented as mean standard deviation, while categorical variables were expressed as percentages (sex, co morbidities). Group comparisons for categorical variables were conducted using Mann Whitney U test. The association of variables with EQ5D5L was tested using Mann Whitney test with a significance level set at  $p < 0.05$  to determine statistical

significance.

### Ethical consideration

The protocol of this study involving human subjects was submitted to the Institutional Review Board (IRB) of Bangabandhu Sheikh Mujib Medical University (BSMMU) for approval. A certificate of ethical clearance was obtained after proper review by the members of the IRB. The aims and objectives of the study, along with its procedures, risks, and benefits, were explained to the respondents in the easily understandable local language and informed written consent was obtained from each. It was assured that all information and records were kept confidential.

### RESULTS

This was a hospital-based prospective comparative study conducted at the Department of Neurology, Bangabandhu Sheikh Mujib Medical University, Dhaka. Regardless of their gender, race, or ethnicity, 122 individuals with Parkinson disease-61 with early onset and 61 with late onset-fulfilled the inclusion and exclusion criteria after a thorough history, examination, and testing process. Comparison of QoL between patients with young onset and those with late PD was the primary goal of the study.

**Table-1: Demographic characteristics of the study subjects in two groups (N=122)**

Variables	Young Onset		Late Onset		p-value
	(n=61)		(n=61)		
	n	(%)	n	(%)	
Age group (year)					
31-40	11	18.0%	0	0.0%	
41-50	19	31.1%	0	0.0%	
51-60	31	50.8%	12	19.7%	
61-70	0	0.0%	31	50.8%	
0.7	0	0.0%	18	29.5%	
Mean ± SD	48.6 ± 6.64		67.3 ± 8.82		<0.001
Range (min-max)	(31-60)		(51-95)		
Sex					
Male	37	60.7%	43	70.5%	0.253
Female	24	39.3%	18	29.5%	
Residence					
Urban	25	41.0%	29	47.5%	0.466
Rural	36	59.0%	32	52.5%	

p-value obtained by Unpaired t-test and Chi-square test,  $p < 0.05$  was considered as a level of significant

Significant differences in the age distribution were found when comparing the young onset (n=61) and late onset (n=61) cohorts. The younger participants (mean age 48.6 years, SD = 6.64 ) were primarily in the 31-60 year age range, while the older participants (mean age 67.3 years SD = 8.82 ) were primarily in the 61-70 year category ( $p < 0.001$ ) There were no statistically significant between the groups in terms of residence ( $p = 0.466$ ) or sex distribution ( $p = 0.253$ ) Women made up 39.3% and 29.5% of the young onset and late onset categories, respectively, whereas men made up 60.7% and 70.5% of both groups. Forty-one percent of the young onset group and forty-seven percent of the late onset group lived in urban areas, while fifty-nine percent and fifty-two percent, respectively, lived in rural areas.

**Table-2: Comparison of Quality-of-life score between Young Onset and Late Onset of PD patients (N-122)**

Quality of life scale (QoL scale)	Young Onset (n=61) Median (IQR range)	Late Onset (n=61) Median (IQR range)	p-value
Mobility	2.0 (2-3)	2.0 (2-3)	0.099
Self-care	2.0 (2-3)	2.0 (1-2.5)	<0.001*
Usual activities	2.0 (1-3)	2.0 (1-2)	0.413
Pain / discomfort	2.0 (1-2)	2.0 (1-2)	0.363
Anxiety / Depression	3.0 (3-3.5)	2.0 (1-2)	<0.001*
Health State Visual Analogue Scale	45 (45-55)	60 (55-65)	<0.001*

p-value obtained by Mann-Whitney U test,  $p < 0.05$  was considered as a level of \*significant

The quality of life (QoL) scores of 122 Parkinson's disease (PD) patients with Young Onset (YO) and Late Onset (LO) are compared in the table. The Mann-Whitney U test was used to analyse the medians and interquartile ranges (IQR) for several QoL measures; statistical significance was indicated at a threshold of  $p < 0.05$ .

Mobility ( $p=0.099$ ), usual activities ( $p=0.413$ ), pain/discomfort ( $p=0.363$ ), and self-care scores ( $p < 0.001$ ) did not show any significant differences, with YOPD patients reporting a median score of 2.0 (IQR 2-3) compared to LOPD patients' median score of 2.0 (IQR 1-2.5). LOPD patients reported median scores of 2.0 (IQR 1-2), while YOPD patients reported higher median scores of 3.0 (IQR 3-3.5), indicating significant differences in anxiety/depression ( $p < 0.001$ ). Furthermore, there was a significant difference ( $p < 0.001$ ) between YOPD and LOPD patients on the Health State Visual Analogue Scale, with YOPD patients having a median score of 45 (IQR 45-55) and LOPD patients having a median score of 60 (IQR 55-65).

These findings highlight the differences in quality-of-life outcomes between patients with YOPD and LOPD, specifically with regard to self-care, anxiety/depression, and general health perception, indicating a lower quality of life for the younger group. This study emphasizes the necessity of customized interventions to address the unique quality of life issues that PD patients, especially those with young onset, confront.

## DISCUSSION

Parkinson's disease is the second most common neurodegenerative disease next to Alzheimer's disease (AD). Among the non-motor manifestations, depression is one of the most common non-motor symptoms, with a prevalence of about 40%. This study was conducted in one of the highest-level tertiary care hospitals in the country, where patients from all over the country are referred and admitted. This comparative study aimed to compare QoL between young onset and late onset PD patients. A total of 122 (61 young onset and 61 late onset PD) patients diagnosed with MDS diagnostic criteria for PD.

According to the distribution of socio-demographic conditions in this study, minimum of 9% of the patients were discovered to be between the ages of 31 and 40, while a maximum of 35.2% of the patients were currently between the ages of 51 and 60. For the early-onset Parkinson's patients, the mean age ( $\pm$ SD) was  $48.6 \pm 6.64$ , and for the late-onset Parkinson's patients, it was  $67.3 \pm 8.82$ . There was a clear male predominance in this investigation. There were roughly 34.4% female participants and 65.6% male participants. In our study, most of them were rural (55.7%), and less than 44.3% lived in urban areas.

Young onset patients in our study reported lower quality of life (QoL), with a significant difference seen in the self-care ( $p < 0.003$ ) and anxiety/depression ( $p \leq 0.001$ ) areas. Moreover, a significant difference was also shown State Visual Analogue ( $p < 0.001$ ) where individuals with young onset showed a lower overall quality of life. On the other

were no discernible variations between the two groups in the categories of mobility, routine activities, and pain/discomfort<sup>5,11</sup>.

In our study, there were significant variations in the QoL ratings between female (n=42) and male (n 80) in several domains. Men specifically reported being more active (p = 0.041) and moving about more (p = 0.029) than women. On the other hand, women reported feeling and anxious than (p = 0.028). There was no statistically significant difference observed in the visual analogue scale (VAS) -care, pain/discomfort, and health state between the two groups<sup>11</sup>. The findings show that there is a statistically significant difference (p < 0.001) in the quality of life (QoL) scores between individuals who have had Parkinson's disease (than five years and those who have had the condition for five years or more. In particular, QoL scores in all subscales mobility, self-care, typical activities, pain/discomfort, anxiety/depression were lower, and the health state visual analogue scale (VAS) was significantly higher in patients whose disease had been active for a shorter period of time. In our study, the findings show that all domains evaluated (mobility, self-care, normal activities, pain/discomfort, anxiety/depression, and health state) had significantly lower QoL scores for PD patients with EDWO (p < 0.05)<sup>13</sup>. Overall, the findings suggest that comorbidities may have a negative impact on the anxiety and of Parkinson's disease patients, but not on their general quality of life<sup>14</sup>.

The comparison of QoL between young onset and late onset PD patients show that poor QoL in young onset than late onset PD patients. Similarly, another study supported these findings.

#### **Conclusion:**

We found that younger-onset Parkinson's disease patients had a lower quality of life than those with late-onset Parkinson's disease. In addition, patients with comorbidities, depression, protracted disease duration, and wearing off were more likely to have low quality of life. Depression is more prevalent in patients with young-onset Parkinson's disease (PD) than late-onset patients.

**Ethical Issue:** All patients gave informed written consent and the study was approved by Institutional Review Board of Bangabandhu Sheikh Mujib Medical University.

**Conflict of Interest:** None

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