

Mental Health, Physical Activity, and Quality of Life in Parkinson's Disease During COVID-19 Pandemic

Patients with Parkinson's disease (PD) might be affected by compromised health care, lockdown restrictions, and global stress during the COVID-19 pandemic, similar to the general population.¹⁻³ Therefore, we investigated the impact of the COVID-19 pandemic on the mental health, physical activities, and quality of life (QoL) of PD patients.

Using telephone calls, we were able to reach and interview 38 of 50 PD patients who had recently completed comprehensive assessments in the movement disorders outpatient clinic, Ain Shams University Hospitals, Cairo (Table 1). They were assessed using 11 questions regarding their perception of impact of COVID-19 (supplementary document), the Depression, Anxiety, and Stress Scale-21 (DASS-21),⁴ the short form of the international physical activity questionnaire (IPAQ)⁵ and the PD questionnaire (PDQ39); and were compared with 20 age- and sex-matched controls who were recruited from volunteers and relatives of patients with other medical problems. We excluded patients and controls with medical comorbidities, that might affect mobility and relatives of PD patients and persons with more risk of anxiety/stress such as healthcare workers as controls.

TABLE 1 Demographic and clinical characteristics of PD patients and controls

	PD patients (n = 38)		Controls (n = 20)		t test / Mann-Whitney U test ^d /chi-square test ^e	
	Mean/median/frequency	SD/IQR	Mean/median/frequency	SD/IQR	t/z	P
Age ^b	55.579	9.956	55.550	5.708	0.012	0.990
Sex (male/female) ^a	29 (76.3%)/9 (23.7%)		14 (70%)/6 (30%)		0.273 ^e	0.601
Education (years) ^a	6.763	5.55	11.65	5.68	-3.161	0.003
Charlson Comorbidity Index ^b	0.903	0.097	0.938	0.049	-1.837	0.072
MMS ^a	27.139	2.642				
AOO ^a	50.135	10.522				
DOI ^a	4.726	3.209				
MDS-UPDR III off ^a	44.351	19.799				
MDS-UPDRS III on ^a	25.730	16.186				
HY scale off ^a	2.342	0.839				
BDI ^a	18.297	8.300				
Pre-lockdown total IPAQ ^a (median/IQR)	3012	6504.75				
(MET minutes /week)						
Latency from last visit till phone call (months) ^b	3.876	1.490				
LEDD (mean/SD) ^b	652.92	307.79				
DASS (mean/SD), % ^b						
DASS depression	7.026 (60.5%)	5.726	3.500 (30%)	3.606	2.500	0.015
DASS anxiety	4.790 (60.5%)	3.573	2.050 (25%)	2.395	3.472	0.001
DASS stress	7.342 (52.6%)	4.884	4.500 (25%)	3.818	2.261	0.028
DASS total	19.158	12.883	10.050	8.140	2.868	0.006
IPAQ (median/IQR) ^b						
Vigorous activity (MET minutes/week)	0.00 ^d	30	60	1200	-1.864 ^d	0.062
Moderate activity (MET minutes/week)	280	1680	1080	3840	-2.387 ^d	0.017
Total score (MET minutes/week)	1009.5	4018.13	4410	7718.50	-2.732 ^d	0.006
PDQ39 (median/IQR) ^b						

(Continues)

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Key Words: COVID-19, Parkinson's disease, physical activity, quality of life, stress

***Correspondence to:** Dr. Ali Shalash, Department of Neurology, Faculty of Medicine, Ain Shams University, 168 Elnozha St., Saint Fatima Square, Heliopolis, Cairo, Egypt; E-mail: ali_neuro@yahoo.com, drali_shalash@med.asu.edu.eg

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TABLE 1. Continued

	PD patients (n = 38)		Controls (n = 20)		t test / Mann-Whitney U test ^d /chi-square test ^e	
	Mean/median/frequency	SD/IQR	Mean/median/frequency	SD/IQR	t/z	P
Mobility	30 ^d	55	11.25	11.88	-3.610 ^d	<0.001
ADL	33.33	50	0	0	-5.919 ^d	<0.001
Emotional well-being	29.17	35.42	14.58	19.79	-2.366 ^d	0.018
Stigma	50	87.50	0	0	-4.752 ^d	<0.001
Social support	0	25	0	14.58	-1.063 ^d	0.288
Cognition	25	31.25	12.50	21.88	-3.339 ^d	0.001
Communication	0	20.83	0	8.33	-1.221 ^d	0.222
Bodily discomfort	33.33	41.67	8.33	16.67	-3.614 ^d	<0.001
PDQ39 total	30.88	32.16	7.84	9.39	-4.899 ^d	<0.001
COVID-19 related questions ^b no/frequency of (yes answer)						
Q1: Adopting protective measures against COVID-19	35 (92.1%)					
Q2: family members/neighbors diagnosed with COVID-19	4 (10.5%)					
Q3: Patients with questions regarding COVID-19	5 (13.2%)					
Q4: worried about regular contact with physician ^c	29 (76.3%)					
Q5: Patients reported disrupted contact with physician ^c	31 (81.6%)					
Q6: patients reported anxiety/stress due to COVID-19 ^c	20 (52.6%)					
Q7: patients reported decline of physical activity ^c	26 (68.4%)					
Q8: patients worry of catching the COVID-19 ^c	22 (57.9%)					
Q9: patients worry about unavailability of their medications ^c	20 (52.6%)					
Q10: Patients reported interest of virtual visits	22 (57.9 %)					
Q11: Patients need medication adjustment	16 (42.1%)					

MMSE, Mini-Mental State Examination; AOO, age of onset; DOI, duration of illness; MDS-UPDRS, MDS Unified Parkinson's Disease Rating Scale; HY, Hoehn and Yahr scale; BDI, Beck Depression Inventory; LEDD, levodopa-equivalent daily dose; DASS, Depression, Anxiety, and Stress Scale; IPAQ, international physical activity questionnaire, PDQ, Parkinson's disease questionnaire; ADL, activities of daily living; IQR, interquartile range, n, number.

^aData obtained from prior visits.

^bData obtained from recent phone call.

^cFrequency of positive answers (slight, mild, marked, very marked) vs negative answer (no)

Student t test, for normally distributed continuous data comparison.

^dMann-Whitney test, for comparison of skewed distribution of continuous variables.

^eChi-square test for categorical data comparison.

Significance at P < 0.05.

TABLE 2 Correlations of DASS, IPAQ, and PDQ39 to prepandemic characteristics

		DASS_depression	DASS_anxiety	DASS_stress	DASS_total	IPAQ_total ^a	PDQ-39_total ^a
Age	r	0.206	0.052	0.202	0.183	-0.249	-0.138
	p	0.215	0.756	0.224	0.273	0.132	0.416
AOO	r	0.149	0.076	0.075	0.116	-0.213	-0.076
	p	0.378	0.654	0.659	0.495	0.207	0.661
DOI	r	0.174	0.160	0.295	0.234	-0.120	0.290
	p	0.302	0.344	0.076	0.164	0.478	0.086
Years of education	r	-0.189	-0.240	-0.216	-0.233	0.360	-0.233
	p	0.255	0.147	0.192	0.160	0.026	0.165
MMSE	r	-0.379	-0.096	-0.347	-0.326	0.485	-0.331
	p	0.023	0.579	0.038	0.052	0.003	0.052
MDS UPDR motor off	r	0.430	0.426	0.317	0.432	-0.240	0.632
	p	0.008	0.009	0.056	0.008	0.152	<0.001
MDS UPDRS motor on	r	0.162	0.205	0.097	0.165	-0.367	0.433
	p	0.339	0.223	0.568	0.328	0.026	0.008
HY scale off	r	0.397	0.435	0.300	0.411	-0.203	0.486
	p	0.013	0.006	0.067	0.010	0.221	0.002
BDI	r	0.344	0.213	0.189	0.284	-0.333	0.413
	p	0.037	0.206	0.262	0.089	0.044	0.012

DASS, Depression, Anxiety, and Stress Scale; IPAQ, international physical activity questionnaire; PDQ, Parkinson's disease questionnaire; AOO, age of onset; DOI, duration of illness; MMSE, Mini-Mental State Examination; MDS-UPDRS, MDS Unified Parkinson's Disease Rating Scale; HY, Hoehn and Yahr scale, BDI, Beck Depression Inventory, r, correlation coefficient.

^aSpearman coefficient correlation, for nonparametric data. Other correlations by the Pearson coefficient correlation (parametric data). Significance at P < 0.05 (boldface).

Most PD patients reported a negative impact on their mental health, physical activity, and health care and an interest in virtual visits. Compared with controls, patients showed significantly worse stress, depression, anxiety, total DASS, moderate physical activity, walking, total IPAQ, total and most of the PDQ39 dimensions (Table 1). PD patients showed a significant decline in physical activity compared with pre-lockdown ($P = 0.002$).

DASS-total, depression, and anxiety were correlated with pre-lockdown motor severity-off. DASS depression was positively correlated with pre-lockdown Beck Depression Inventory (BDI) and negatively with cognition. Total IPAQ scores were negatively correlated with total DASS ($r_s = -0.354$, $P = 0.029$), DASS depression ($r_s = -0.441$, $P = 0.006$), pre-lockdown motor severity-on, and BDI, but positively correlated with education and cognition. Total PDQ39 scores were significantly correlated with total and subscores of DASS, pre-lockdown motor severity, BDI, (Table 2), and patients' worry about unavailability of medication ($r_s = 0.347$, $P = 0.035$).

The current report demonstrated that PD patients had worse stress, depression, anxiety, physical activity, and QoL compared with controls during the COVID-19 pandemic, which were correlated with current mental health and pre-lockdown characteristics. In addition, subjective negative impact of the pandemic on mental health, physical activity, and health care was reported by most of PD patients. Furthermore, worsening of physical activity of patients was detected compared with their pre-lockdown state.

These findings are consistent with expected indirect sequelae of the COVID-19 pandemic² and previous studies beyond the era of COVID-19.¹ Consistently, Prasad et al reported increased stress and depression in 9% of PD patients during COVID-19 lockdown,⁶ and the reported 10 PD patients with COVID-19 showed worsening of anxiety and other nonmotor symptoms.⁷

The current findings should be interpreted in the context of possible variability in pandemic severity, degree of lockdown, patients' perception, and cultural characteristics.⁶ The smaller

number of subjects and higher education of controls were the limitations of the study.

The current study confirmed the impaired mental health, physical activity, and QoL of PD patients and identified their correlates during the COVID-19 pandemic, implying the importance of managing these issues and continuing care of PD patients, particularly by adopting telemedicine.³ ■

Ali Shalash, MD, PhD,^{1*} Tamer Roushdy,¹
 Mohamed Essam, MSc,¹ Mai Fathy, PhD, MD,¹
 Noha L. Dawood, PhD, MD,¹
 Eman M. Abushady, PhD, MD,¹ Hanan Elrassas, PhD, MD,²
 Asmaa Helmi, MSc,¹ and Eman Hamid, PhD, MD¹
¹Department of Neurology, Faculty of Medicine, Ain Shams
 University, Cairo, Egypt
²Okasha institute of Psychiatry, Faculty of Medicine, Ain Shams
 University, Cairo, Egypt

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