MEDICINE UPDATES JOURNAL

Faculty of Medicine Port Said University

Volum: 23 No:7 PP:72 -84

" *The Impact of Post COVID-19 Infection on Cognitive Functions and Quality of Life: A prospective cross-sectional observational study*"

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Submitted: 06/02/2025

Accepted:23/03/2025

DOI: 10.21608/muj.2025.368654.1214

ISSN : 2682-2741

ABSTRACT:

Background: Post-COVID-19 syndrome includes persistent cognitive impairment and reduced quality of life (QOL). This study aimed to assess cognitive functions and QOL among recovered COVID-19 patients in Port Said, Egypt.

Methods: A prospective cross-sectional study was conducted on 100 recovered COVID-19 patients across four hospitals. Cognitive function was assessed using the Arabic version of Montreal Cognitive Assessment (MoCA), and QOL was evaluated using the Arabic version of World Health Organization Quality of Life Brief Version (WHOQOL-BREF). Statistical analysis was performed to explore associations between cognitive impairment, disease severity, and QOL outcomes.

Results: A significant proportion of patients exhibited cognitive impairment, with severity correlating with older age, longer infection duration, and severe COVID-19 cases. Female patients had lower psychological, social, and environmental QOL scores. Negative correlations were found between MoCA scores and disease severity.

Conclusion: Cognitive impairment and reduced QOL are common post-COVID-19 complications. Long-term follow-up and targeted rehabilitation are essential for improving patient outcomes.

Keywords: Post-COVID-19, Cognitive Impairment, Quality of Life, Neuropsychiatric Sequelae, Rehabilitation

Introduction:

The coronavirus disease 2019 (COVID-19) pan¬demic has resulted in widespread health con¬sequences, affecting multiple organ systems beyond its initial respiratory manifestations [1]. Among these, post-COVID-19 syndrome has emerged as a significant concern, with persis¬tent neurological and psychiatric symptoms affecting a considerable proportion of recov-ered patients [2]. Cognitive dysfunction, often referred to as "brain fog," has been reported in individuals following COVID-19 recovery, im¬pacting memory, executive function, and at¬tention [3]. The exact mechanisms underlying these cognitive deficits remain unclear, but hypotheses suggest neuroinflammation, hy¬poxia, endothelial dysfunction, and immune dysregulation as potential contributors [4].

The impact of COVID-19 on quality of life (QOL) has also been substantial, with many survivors experiencing persistent fatigue, anxi-ety, depression, and social isolation, further exacerbating cognitive impairment [5]. QOL is a multidimensional concept encom¬passing physical, psychological, social, and en-vironmental well-being, all of which are often affected in post-COVID-19 patients [6]. Studies have indicated that severe COVID-19 infections requiring hospitalization and intensive care admission are associated with worse long-term cognitive and QOL outcomes [7]. However, the precise relationship between COVID-19 severi¬ty and post-recovery cognitive impairment re¬mains an area of ongoing investigation [8].

Several recent studies have attempted to as-sess the prevalence of cognitive impairment in post-COVID-19 patients, but findings have var¬ied widely due to differences in study popula¬tions, assessment tools, and follow-up dura¬tions [9]. Some studies report a high preva¬lence of cognitive dysfunction, while others suggest a more limited impact, highlighting the need for further research in this area [10]. Un¬derstanding these relationships is essential for developing targeted rehabilitation and inter¬vention strategies to support COVID-19 survi¬vors [11].

The present study aims to evaluate cognitive function and QOL in recovered COVID-19 pa-tients in Port Said, Egypt. Specifically, it seeksto determine the prevalence of cognitive impairment using Montreal Cognitive Assessment (MoCA), assess the impact of COVID-19 severity on cognitive outcomes, evaluate QOL using World Health Organization Quality of Life Brief Version (WHOQOL-BREF), and identify demographic and clinical factors associated with post-COVID-19 cognitive and QOL impairments. The findings of this study are expected to provide insights into the long-term neuropsychiatric effects of COVID-19 and inform future public health and clinical interventions.

Methods

This study was a prospective cross-sectional observational study conducted from July 1, 2023, to December 30, 2023, across four hospitals in Port Said, Egypt, including Port Said Fever Hospital, Al Salam Port Said Hospital, Al Hayat Port Fouad Hospital, and Port Said Mental Health and Addiction Treatment Hospital. A total of 100 recovered COVID-19 patients were recruited based on laboratory-confirmed diagnoses with two prior Polymerase Chain Reaction (PCR) tests separated by at least one month.

The inclusion criteria required participants to be aged between 18 and 60 years, literate in Arabic, have a positive severe acute respiratory syndrome (SARS-CoV-2) antibody test, and have recovered from COVID-19 for a minimum of 12 weeks before enrollment.

Exclusion criteria in¬cluded individuals with prior infections from other coronaviruses, pre-existing neuropsychi¬atric disorders affecting cognition, and chronic medical conditions that could impact overall health and QOL.

Sample Size Calculation

The sample size was determined based on prior research assessing cognitive deficits in post-COVID-19 patients using the formula $n = (Z^2 \times P \times (1 - P)) / d^2$, where $Z = 1.96$ for a 95% confidence level, P represents the estimated prevalence of cognitive impairment, and d is the margin of error.

Recruitment Process:

Eligible participants were identified through hospital records of recovered COVID-19 patients. Invitations were extended via telephone calls and in-person follow-ups during clinic visits. Participants were thoroughly briefed about the study objectives and procedures, ensuring informed consent was obtained before enrollment.

Data Collection Instruments:

A structured questionnaire was used to collect patient demographics, including gender, smoking status, marital status, socioeconomic status, and residence, along with clinical history, COVID-19 severity, and hospitalization details.

Participants underwent structured clinical interviews, comprehensive neurological examinations, and assessments of cognitive function using the Arabic version of MoCA scale, with scores categorized as normal, mild, moderate, or severe cognitive impairment [12].

QOL was evaluated using the Arabic version of WHOQOL-BREF questionnaire, which measures physical, psychological, social, and environmental domains, with scores transformed into standardized values [13].

COVID-19 severity was classified based on the WHO Clinical Progression Scale, stratifying patients into asymptomatic, mild, moderate, severe, and critical categories [14].

Data Collection Procedures:

Patients were first given a detailed overview of the study to alleviate anxiety and ensure cooperation, with assessments conducted in a quiet, private room to minimize distractions.

Trained researchers administered the MoCA and WHOQOL-BREF instruments, while sociodemographic and clinical data were collected through structured interviews. To ensure reliability and clarity, data collection was piloted on a small subset of patients (n = 10) before full implementation.

Statistical analysis

All gathered data were statistically analyzed was conducted using IBM SPSS 23.0 and Jamovi 2.3, with descriptive sta¬tistics summa-rizing categorical and continuous variables [15],[16].

Descriptive analysis was conducted, where continuous variables (e.g., age, MoCA scores) were summarized as means ± standard deviations, while categorical variables (e.g., gender, COVID-19 severity) were presented as frequencies and percentages.

For inferential analysis, Pearson or Spearman correlation coefficients were used to explore relationships between COVID-19 severity, cognitive scores, and QOL domains. Independent t-tests (for two-group comparisons) and ANOVA (for multiple-group comparisons) were employed to assess differences across demographic and clinical variables.

Additionally, multivariable linear regression models were used to determine the key factors influencing cognitive impairments and quality of life outcomes. A p-value of <0.05 was considered statistically significant.

Ethical Considerations

The study was approved by the Ethics Committee of the Faculty of Medicine at Port Said University, ensuring adherence to ethical research standards. To protect patient privacy, all data were anonymized, and participants were assigned unique study IDs to maintain confidentiality. Participation was entirely voluntary, with individuals having the right to withdraw at any time without repercussions.

Results

As illustrated in Table (1), this cross-sectional study included 100 participants who were confidentially diagnosed with COVID-19. Their ages ranged from 18 to 60 years, with a mean of 35.8 ± 11.6 years. Fifty-eight percent (58%) of the participants were male, while 42% were female. The majority were married (74%), classified as having a middle socioeconomic status (78%), and 88% resided in urban areas.

Table (1): Sociodemographic Data of Participants

Variable	Category	Frequency (%)
Age (years)	Mean ± SD	35.8 ± 11.6
	Range	18 – 60
Age Groups	18 – 29	20%
	30 – 39	14%
	40 – 49	27%
	50 – 60	39%
Gender	Male	58%
	Female	42%
Marital Status	Single	16%
	Married	74%
	Divorced	7%
	Widowed	3%
Socioeconomic Status	High	6%
	Middle	78%
	Low	16%
Residence	Rural	12%
	Urban	88%
Smoking Status	Smoker	33%
	Non-smoker	67%

According to table (2), the overall duration of COVID-19 infection was 13.2 days, while the median hospital stay was 9 days. The majority of patients (82%) were admitted to the general ward, and 51% experienced mild cases of infection, while 18% had severe cases.

Table (2): Infection Characteristics of Participants

Variable	Category	Frequency/ Median (IQR)
Duration of Infection	Median (IQR)	13.2 (11.4)
Hospital Stay (days)	Median (IQR)	9 (5)
Admission Site	Ward	82%
	ICU	18%
Severity of Infection	Asymptomatic	0%
	Mild	51%
	Moderate	31%
	Severe	18%

-IQR: inter quantile range

Table (3) presents the distribution of Montreal Cognitive Assessment (MoCA) scores. The mean total MoCA score was 24.1 ± 6. Notably, 58% of patients exhibited some degree of cognitive impairment, of whom 34% had mild impairment, 21% had moderate impairment, and 3% had severe impairment.

Table (3): Montreal Cognitive Assessment Scores of Participants

MoCA Score	Category	Frequency (%)
Total Score	Mean ± SD	24.1 ± 6
Grades	Normal (26–30)	42%
	Mild (18–25)	34%
	Moderate (10–17)	21%
	Severe (<10)	3%

Table (4) presents MoCA scores according to demographic data. It demonstrates that patients with severe cognitive impairment were significantly older than those with moderate or no impairment ($p = 0.03$). Furthermore, a longer duration of COVID-19 infection and higher disease severity were strongly correlated with lower MoCA scores ($p < 0.001$).

Table (4): MoCA Scores by Demographic Data

Variables	Normal (n=42) Mean ± SD	Mild (n=34) Mean ± SD	Moderate (n=21) Mean ± SD	Severe (n=3) Mean ± SD	p-value
Age (years)	35.6 ± 10.8	37 ± 12.1	40.2 ± 12	45 ± 12.9	0.03*
Gender (N.%)					0.86
Male	23 (56.1%)	22 (62.9%)	11 (52.4%)	2 (66.7%)	
Female	18 (43.9%)	13 (37.1%)	10 (47.6%)	1 (33.3%)	
Smoking status					0.97
Smoker	14 (33.3%)	12 (35.3%)	6 (28.6%)	1 (33.3%)	
Non-smoker	28 (66.7%)	22 (64.7%)	22 (64.7%)	2 (66.7%)	
Marital status					0.37
Single	4 (9.5%)	7 (20.6%)	4 (19%)	1 (33.3%)	
Married	35 (83.3%)	23 (67.6%)	15 (71.4%)	1 (33.3%)	
Divorced	2 (4.8%)	3 (8.8%)	1 (4.8%)	1 (33.3%)	
Widowed	1 (2.4%)	1 (2.9%)	1 (4.8%)	0 (0%)	
Socioeconomic status					0.23
High	2 (4.8%)	2 (5.9%)	1 (4.8%)	1 (33.3%)	
Middle	36 (85.7%)	25 (73.5%)	16 (76.2%)	1 (33.3%)	
Low	4 (9.5%)	7 (20.6%)	4 (19%)	1 (33.3%)	
Residence					0.26
Rural	3 (7.1%)	6 (17.6%)	2 (9.5%)	1 (33.3%)	
Urban	39 (92.9%)	28 (82.4%)	19 (90.5%)	2 (66.7%)	
Covid duration					<0.001*
Median (IQR)	11.3 (5.8)	12.5 (3.5)	13.2 (4.4)	15.6 (4.5)	
Covid Severity					<0.001*
Mild	28 (66.7%)	20 (58.8%)	3 (14.3%)	0 (0%)	
Moderate	14 (33.3%)	10 (29.4%)	6 (28.6%)	1 (33.3%)	
Severe	0 (0%)	4 (11.8%)	12 (57.1%)	2 (66.7%)	

Note: * Statistically significant ($p < 0.05$); ** Highly significant ($p \leq 0.001$).

Table (5) displays the WHOQOL-BREF scores by demographic data. The psychological and environmental domains recorded the lowest mean scores (60.4 ± 12.9 and 60.8 ± 11.7, respectively), whereas the physical health domain had the highest mean score (69.1 ± 12.7). Statistically significant differences were observed in the psychological ($p = 0.001$), social ($p = 0.03$), and environmental ($p = 0.01$) domains, with females consistently showing lower scores in these areas. No statistically significant differences were found in any quality of life (QOL) domains with respect to smoking status ($p > 0.05$), marital status ($p > 0.05$), socioeconomic status ($p > 0.05$), or residence ($p > 0.05$). Furthermore, the analysis did not demonstrate any significant differences between rural and urban residents, suggesting that QOL outcomes were not substantially influenced by place of residence in this study.

Table (5): WHOQOL-BREF Scores by Demographic Data

Variables	Physical Mean ± SD	Psychological Mean ± SD	Social Mean ± SD	Environmental Mean ± SD
All patients (n=100)	69.1 ± 12.7	60.4 ± 12.9	66.1 ± 15.1	60.8 ± 11.7
Gender				
Male (n=58)	71.1 ± 12.9	69.1 ± 4.6	65.3 ± 2.1	65.1 ± 12.8
Female (n=42)	68.8 ± 11.9	65.4 ± 6.4	63.4 ± 6.1	61.2 ± 12.8
p value	0.19	0.001**	0.03*	0.01*
Smoking status				
Smoker (n=33)	70.2 ± 15.6	67.8 ± 12.4	68.7 ± 16.5	65.23 ± 11.7
Non-smoker (n=67)	72.6 ± 17.5	67.2 ± 12.1	67.5 ± 17.3	65.4 ± 12.3
p value	0.51	0.82	0.23	0.95
Marital status				
Single (n=16)	74.1 ± 14.8	67.6 ± 9.8	65.3 ± 8.1	64.5 ± 6.9
Married (n=74)	68 ± 11.3	60.3 ± 13.1	68.1 ± 17.63	59.2 ± 12.57
Divorced (n=7)	69.8 ± 8.3	62±8.57	71.3 ± 17.5	60.6± 7.9
Widower (n=3)	66.5 ± 6.59	63.1 ± 6.74	68.2 ± 8.33	62.9 ± 6.14
p value	0.19	0.2	0.81	0.41
Socioeconomic status				
High (n=6)	66.4 ± 17.3	60.1 ± 19.2	64.4 ± 18.01	62.4 ± 11.1
Middle (n=78)	66.8 ± 13.7	65.2 ± 12.9	66.9 ± 16.3	64.6 ± 13.6
Low (n=16)	72.8 ± 15.9	67.1±17.6	70.2 ± 15.8	69.6± 1.9
p value	0.09	0.19	0.16	0.24
Residence				
Rural (n=12)	66.4 ± 11.8	64.6 ± 12.3	59.1 ± 12.7	62.1 ± 13.6
Urban (n=88)	68.7 ± 14.5	66.1 ± 13.9	63.7 ± 10.9	64.8 ± 15.1
p value	0.6	0.72	0.18	0.56

Note: * Statistically significant ($p < 0.05$); ** Highly significant ($p \leq 0.001$).

Table (6) explores the relationship between WHO-QOL domain scores and MoCA classifications of cognitive impairment (normal, mild, moderate, severe). Physical ($p = 0.001$) and psychological ($p = 0.004$) domain scores were substantially lower in patients with severe cognitive impairment. This discovery emphasizes the influence of cognitive function on quality of life.

Table (6): Association Between WHO-QOL and MoCA Scores

Domain	Normal (n=42)	Mild (n=34)	Moderate (n=21)	Severe (n=3)	p-value
Physical	70.6 ± 12.7	68.4 ± 11.1	69.2 ± 12.5	62.6 ± 13.4	0.001**
Psychological	64.7 ± 14.9	59.7 ± 12.9	51.8 ± 13.2	60.5 ± 13.6	0.004*
Social	64.6 ± 16.6	64.1 ± 14.1	66.7 ± 13.7	67.1 ± 10.5	0.81
Environmental	62.1 ± 11.9	64 ± 11.8	65.3 ± 12.1	62.9 ± 7.9	0.21

Note: * Statistically significant ($p < 0.05$); ** Highly significant ($p \leq 0.001$).

Table (7) presents the correlations between MoCA scores, WHOQOL-BREF scores, and COVID-19 infection characteristics. A statistically significant negative correlation was observed between age and MoCA scores ($r = -0.442$, $p = 0.02$), indicating that increasing age was associated with lower cognitive performance. Additionally, age and WHOQOL-BREF scores were also negatively correlated ($r = -0.254$, $p = 0.004$), suggesting that older patients reported lower quality of life. Moreover, the duration of COVID-19 infection showed a highly significant negative correlation with MoCA scores ($r = -0.528$, $p < 0.001$), implying that a longer infection period was linked to greater cognitive impairment. Similarly, the severity of COVID-19 infection exhibited a highly significant negative correlation with MoCA scores ($r = -0.504$, $p < 0.001$), indicating that more severe infections were associated with worse cognitive outcomes, as illustrated in Figure (a).

Table (7): Correlation Between MoCA, WHO-QOL Scores, and COVID-19 Infection Characteristics

Variable	MoCA (r)	p-value	WHO-QOL (r)	p-value
Age	-0.442	0.02*	-0.254	0.004*
Duration of COVID	-0.528	<0.001**	0.271	0.523
Duration of Hospital Stay	-0.145	0.06	0.325	0.122
COVID Severity	-0.504	<0.001**	0.422	0.095

Note: * Statistically significant ($p < 0.05$); ** Highly significant ($p \leq 0.001$).

Table (8) summarizes the correlation between COVID-19 severity and individual subscales of the Montreal Cognitive Assessment (MoCA). Statistically significant negative relationships were identified across many cognitive domains, including visuospatial/executive functioning, naming, memory/delayed recall, attention, language, and orientation. The data indicate that when COVID-19 severity escalates, cognitive function in these domains markedly deteriorates. Figures from (b) to (h) depict these connections using scatter plots for each subscale.

Table (8): Correlation Between COVID-19 Severity and MoCA Subscales

MoCA Subscale	Correlation (r)	p-value
Visuospatial/Executive	-0.433	<0.001**
Naming	-0.415	<0.001**
Memory/Delayed Recall	-0.327	<0.001**
Attention	-0.509	<0.001**
Language	-0.451	<0.001**
Abstraction	-0.043	0.668
Orientation	-0.224	0.045*

Note: * Statistically significant ($p < 0.05$); ** Highly significant ($p \leq 0.001$).

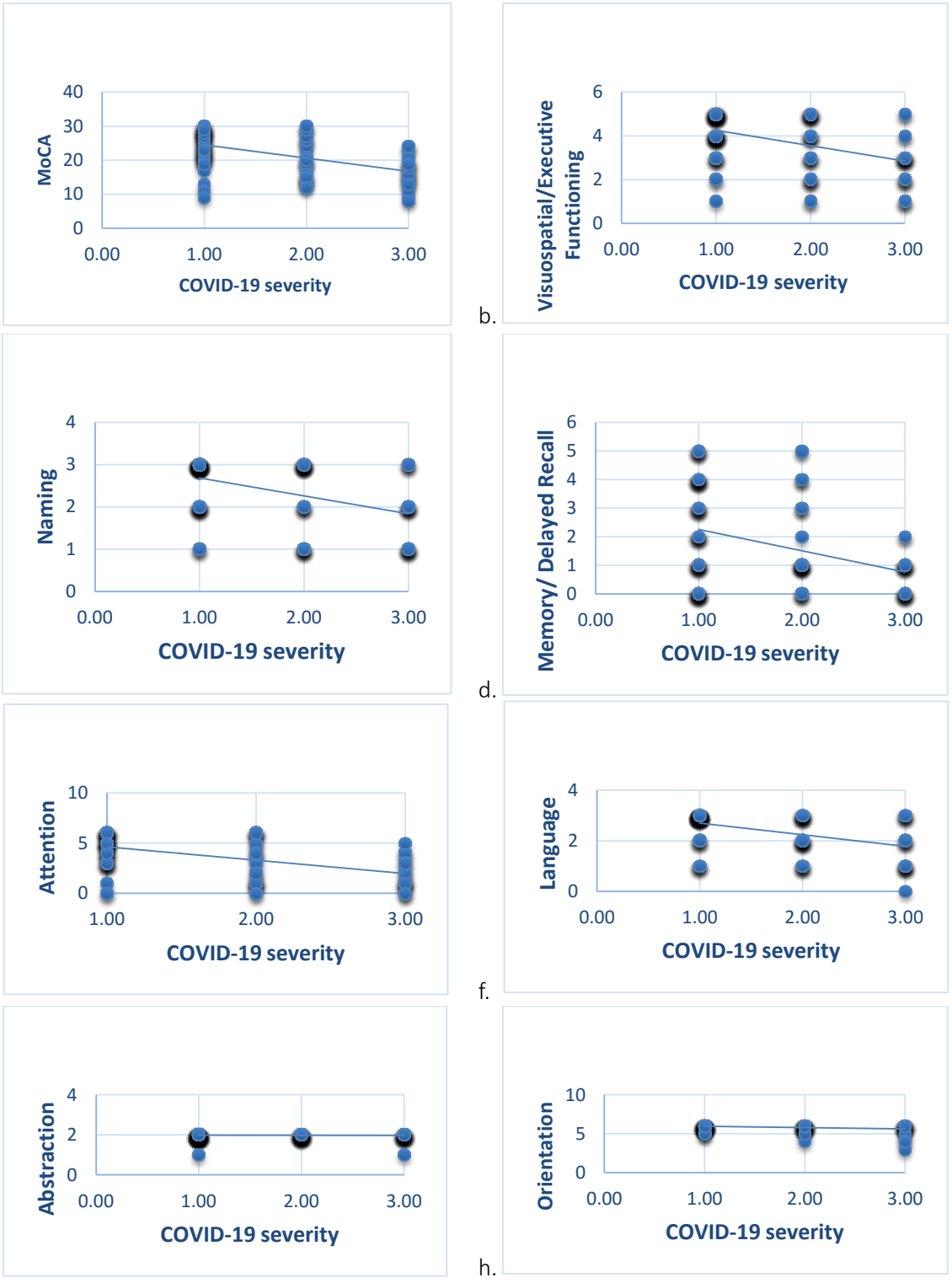

Figure (a): A scatter plot shows a substantial negative correlation between COVID-19 severity and MoCA scores ($r = -0.504$, $p < 0.001$). As COVID-19 severity increases, MoCA scores decrease, suggesting greater cognitive impairment. Figure (b): Scatter plot showing a significant negative correlation between COVID-19 severity and visuospatial/executive functioning ($r = -0.433$, $p < 0.001$). Figure (c): Scatter plot showing a significant negative correlation between COVID-19 severity and naming ($r = -0.415$, $p < 0.001$). Figure (d): Scatter plot showing a significant negative correlation between COVID-19 severity and memory/delayed recall ($r = -0.327$, $p < 0.001$). Figure (e): Scatter plot showing a significant negative correlation between COVID-19 severity and attention ($r = -$

0.509, p < 0.001). Figure (f): Scatter plot showing a significant negative correlation between COVID-19 severity and language (r = -0.451, p < 0.001). Figure (g): Scatter plot showing no significant correlation between COVID-19 severity and abstraction (r = -0.043, p = 0.668). Figure (h): Scatter plot showing a significant negative correlation between COVID-19 severity and orientation (r = -0.224, p = 0.045).

Discussion

The results of this study revealed that a signifi¬cant proportion of post-COVID-19 patients ex¬hibited cognitive impairment, with severity cor¬relating with older age, longer infection dura¬tion, and severe COVID-19 cases. These findings align with recent studies that highlight the persistent neurocognitive deficits observed in COVID-19 survivors, particularly in memory, attention, and executive function [17]. Neuroin¬flammation, hypoxia, and immune dysregulation have been proposed as key mechanisms con¬tributing to these impairments, with evidence suggesting that COVID-19 may lead to direct neuronal injury and long-term neuropsychiatric sequelae [18].

Our findings also indicated a strong negative cor-relation between COVID-19 severity and cogni¬tive function, where patients who required in¬tensive care or prolonged hospitalization exhib¬ited worse cognitive outcomes. Similar re¬sults were observed in a study evaluating post-ICU COVID-19 patients, where a significant pro¬portion demonstrated cognitive deficits, resem¬bling patterns seen in other critical illnesses with prolonged ICU stays [19]. The observed impact of disease severity on cognition underscores the importance of early intervention and rehabilita¬tion strategies for severely affected patients [20].

Furthermore, this study found significant differ-ences in quality of life among post-COVID-19 patients, with female participants reporting low¬er psychological, social, and environmental well-being scores compared to males. These findings are consistent with prior research indi¬cating that women experience greater psycho¬logical distress, increased rates of anxiety and depression, and a higher burden of post-COVID fatigue compared to men [21]. The interplay be¬tween biological, social, and psychological fac¬tors likely contributes to these disparities, neces¬sitating targeted interventions to support female COVID-19 survivors in their recovery [22].

Our results also support the hypothesis that pro-longed COVID-19 infection duration is associated with greater cognitive impairment, with patients who experienced extended symptomatic periods exhibiting worse cognitive performance. This aligns with findings from prior studies demonstrating that individuals with long COVID are at a higher risk of neurocognitive dysfunc¬tion, particularly those experiencing persistent systemic inflammation and prolonged viral shedding [23]. The association between pro¬longed illness and cognitive deficits further em¬phasizes the need for ongoing monitoring and rehabilitation efforts to mitigate the long-term effects of COVID-19 [24].

Contrary to some previous findings, our study did not identify a significant association between smoking status and cognitive impairment in post-COVID-19 patients. While some reports have suggested that smoking exacerbates COVID-19 severity and its long-term conse¬quences, others have found no clear link be¬tween smoking and cognitive outcomes [25]. The variability in these results may be attributed to differences in study populations, smoking in¬tensity, and underlying health conditions, high¬lighting the need for further research in this area [26].

Additionally, we found no significant correlation between socioeconomic status and cognitive impairment, despite previous studies suggesting that lower socioeconomic backgrounds are asso-ciated with poorer post-COVID outcomes due to disparities in healthcare access, nutritional sta¬tus, and comorbid conditions. While our findings suggest that cognitive function may be influenced more by biological rather than socio¬economic factors, larger studies with more di¬verse populations are needed to explore these relationships further [27]. In terms of quality of life, we observed a signifi-cant correlation between cognitive impairment and lower WHOQOL-BREF scores, particularly in the physical and psychological domains. Similar findings have been reported in recent studies, where cognitive deficits in post-COVID-19 patients were associated with reduced func¬tional independence, increased emotional dis¬tress, and greater difficulty in daily activities [28]. Addressing cognitive impairment in COVID-19 survivors may therefore play a crucial role in improving overall quality of life and reducing the burden of long COVID [29].

One of the strengths of our study is the use of standardized cognitive and quality of life as-sessments, allowing for reliable comparisons with existing literature. However, certain limitations should be acknowledged. The rela¬tively small sample size may have limited the generalizability of our findings, and the lack of a control group prevents direct comparisons with non-COVID populations. Future research should aim to include larger cohorts with control groups to further elucidate the cognitive and psychological impact of COVID-19.

Additionally, our study relied on self-reported data for certain aspects of quality of life, which may introduce response bias. Objective measures, such as neuroimaging and biomarker analysis, could enhance future studies by provid¬ing more definitive insights into the mechanisms underlying post-COVID cognitive impairment. Another important consideration is the fol¬low-up period, as our study only assessed pa¬tients within a six-month post-recovery timeframe. Longer follow-up durations are nec¬essary to determine the persistence and pro¬gression of cognitive deficits in COVID-19 survi¬vors.

In conclusion, our study highlights the significant impact of COVID-19 on cognitive function and quality of life, particularly among older patients, those with severe disease courses, and female survivors. These findings reinforce the need for ongoing post-COVID monitoring, targeted reha-bilitation programs, and early interventions to improve long-term outcomes in affected individ-uals. Future studies should aim to further explore the underlying mechanisms of post-COVID cognitive impairment and identify effec¬tive therapeutic strategies to enhance recovery and quality of life in survivors.

Conclusion

Post-COVID-19 syndrome significantly impairs cognitive functions and QOL, particularly in pa-tients with severe infections. These findings un-derscore the necessity for long-term monitoring and tailored rehabilitation strategies to enhance cognitive recovery and overall well-being.

Recommendations

Routine cognitive and QOL assessments should be integrated into post-COVID-19 follow-up care. Psychological support programs should be pro-vided to mitigate long-term emotional distress. Further longitudinal studies are needed to as¬sess the durability of cognitive deficits and QOL impairment.

Limitations

Small sample size limits generalizability. Lack of pre-COVID baseline cognitive and QOL assess-ments. Self-reported QOL assessments may in-troduce response bias.

Abbreviations

ANOVA: Analysis of Variance

COVID-19: Coronavirus Disease 2019

IBM: International Business Machines

ICU: Intensive Care Unit

IQR: Interquartile Range

MoCA: Montreal Cognitive Assessment

n: Number of participants (sample size indicator)

PCR: Polymerase Chain Reaction

QOL: Quality of Life

r: Pearson correlation coefficient

SARS-CoV-2: Severe Acute Respiratory Syndrome Coronavirus 2

SD: Standard Deviation

SPSS: Statistical Package for the Social Sciences (IBM SPSS Statistics)

p: p-value (statistical significance indicator)
WHO: World Health Organization
WHOQOL-BREF: World Health Organization Quality of Life - Brief Version
Acknowledgments None.
Funding None.
Conflicts of Interest The authors declare no conflicts of interest.

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