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Original article

Prevalence of functional limitation in Indian COVID-19 recovered patients

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Abstract

Background: The Coronavirus Disease-2019 manifested as a serious infectious disease that affected people of all ages and genders, particularly older patients with comorbidities. Patients who have recovered from COVID have serious restrictions.

Aims: The purpose of this study was to determine the prevalence of post-COVID-19 functional status (PCFS) in patients and the relationship between post-COVID-19 functional status and selected demographic characteristics.

Methods: This study employed a descriptive survey research design and a quantitative, non-experimental research approach. Data were obtained from 190 COVID-19 recovered patients admitted to an Indian quaternary hospital who met the inclusion criteria utilizing an online survey approach and a mobile app. Prior to the study, the institutional scientific and ethical committees approved it. The study's findings were analyzed using descriptive statistics and chi-square.

Results: The percentage of demographic data is identified, and the post COVID functional limitation of samples shows that 58 percent have negligible functional limitation, 24 percent have no functional limitation, 16 percent have slight functional limitation, 1 percent have moderate functional limitation, and 1 percent have severe functional limitation. There was an association between PCFS and age, as well as PCFS and the COVID-19 group.

Conclusion: Some COVID-19 survivors suffered functional difficulties after infection. The severity of the disease and its duration are important risk factors for the development of post-COVID-19 functional impairments. The study's findings assist healthcare professionals in improving their understanding of post-COPID functional status and providing appropriate care to post-COPID recovered patients.

Keywords: COVID-19, Functional limitation, COVID recovered patients, Comorbidities, SARS-COV-2, India

Introduction

Coronavirus disease 2019 (COVID-19) is a dangerous contagious disease that affects people of all ages worldwide and is caused by SARS-CoV-2, an RNA virus in the beta coronavirus family (1). Because of the increasing number of cases, estimating theCOVID-19 incidence is difficult. The scientific and clinical information on the subacute and long-term effects of COVID-19 is evolving, and it has been discovered that it can damage many organ systems in both asymptomatic and symptomatic individuals, potentially worsening patients' functional status.

In the upcoming days, high stress will gradually take over post-acute care for those recovered from COVID-19. COVID-19 is likely to have a significant impact on

physical, mental, cognitive, and public health states, similar to cases of minor disease manifestations (2). Hussein M, et al. (2021) conducted a study to assess the post COVID-19 functional status in Egypt and discovered that 80 percent of COVID-19 recovered cases have varying degrees of functional restrictions ranging from negligible (63.1 percent), slight (14.4 percent), moderate (2 percent), and severe (0.5 percent) based on PCFS and discovered that these restrictions were affected by age, gender, periodic influenza vaccination, smoking, duration since symptoms onset, and need for treatment (3). The most prevalent post-COVID symptoms described by COVID recovered patients include dyspnea, fatigue, cough, sleep difficulties or insomnia, depression or anxiety, muscle pain or headache palpitations, chest discomfort, thromboembolism, chronic kidney disease, and hair loss (4,5,6,9,10,11).

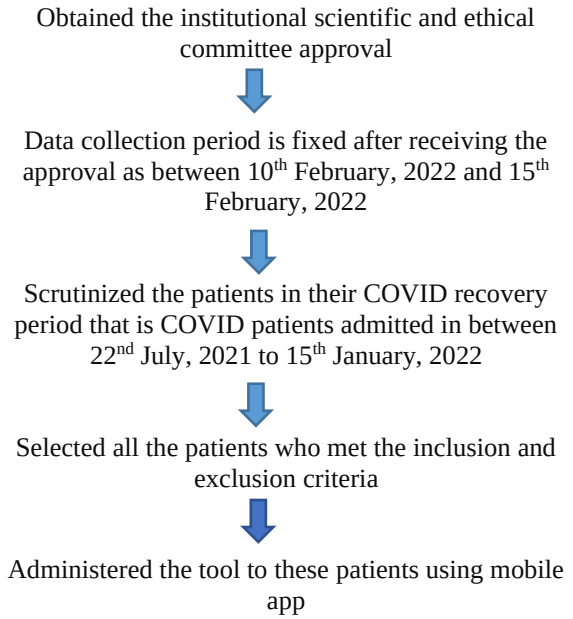
Borghi-Silva A, Krishna AG, and Gracia-Araujo AS (2021) revealed in a study to analyze the impact of functional ability and physical activity in COVID-19 patients that post-COVID patients are more prone to dyspnea and fatigue, which may limit their performance of activities of daily living. (6) Taboada M, et al. (2021) discovered a decline in quality of life in 61 (67 percent) COVID-19 individuals. Mobility (56 percent), regular activities (37 percent), self-care (13 percent), pain/discomfort (48 percent), and anxiety/depression (48 percent) were the proportions of patients with moderate to severe issues in the five domains of quality of life examined with the EQ-5D-3L. (46 percent). Furthermore, advanced age, male sex, need for mechanical ventilation during ICU stay, duration of mechanical ventilation, length of ICU stay, and length of hospital stay were linked with lower quality of life, lower functional status, or both at 6 months following ICU admission. (7) Havervall S, et al. (2021) showed that long-term symptoms impacted post-COVID recovered clients' job, social, and family lives moderately to considerably (8).

Because the number of COVID positive patients is increasing, healthcare practitioners must be educated about the post-COVID functional status in order to provide appropriate need-based care. The purpose of this study is to evaluate the prevalence of post-COVID functional status and whether there is any relationship between post-COVID functional status and the demographic variables chosen.

Materials and methods

Research Design, samples and data collection method

This study employed a descriptive survey research design and a quantitative, non-experimental research approach. After receiving consent from the university, researchers chose to perform the study between February 10th and February 15th, 2022. The samples were then chosen based on the inclusion criteria, which are patients who are in their COVID-19 recovery period, which implies patients who were admitted to a quaternary hospital owing to COVID-19 between 22nd July, 2021 and 15th January, 2022. There were a total of 600 patients admitted to this hospital throughout that time period. Only 200 patients met the inclusion criteria in these samples. All of these patients were handed data collecting forms, and 190 of them returned the questionnaire. Patients in the COVID-19 recovery period (31 days to 180 days after becoming COVID positive), hospitalized COVID-19 patients in categories B and C, and patients who can read either English or Malayalam were the inclusion criteria for this study. Those who were unwilling to engage in the trial, those with any neuromuscular or cognitive disability, and patients under the age of 20 and above the age of 70 were all excluded from this study. The inclusion and exclusion criteria were developed in conjunction with Indian specialists in the subject. After receiving approval from the institutional ethical and scientific council, the study was conducted between February 10th and February 15th, 2022. After gaining informed consent from the participants, data was collected via an online survey approach using a mobile app by delivering the questionnaire.



Survey Instrument

The questionnaire contains socio-demographic information as well as the Post-COVID Functional Status Scale. The questionnaire is divided into two sections. The first section contains demographic information such as age, gender, COVID-19 category, COVID-19 hospitalization length, sickness severity, BMI, comorbidities, and COVID-19 diagnosed date. Following a review of the literature, the demographic characteristics were finalized. The second component is the Post COVID Functional Status scale, which goes from 0 to 4, with 0 indicating no functional constraint, 1 minor functional impairment, 2 modest functional limitation, 3 substantial functional limitation, and 4 severe functional limitation. The tool's validity and reliability are verified, and they are 0.88 and 0.82, respectively.

Statistical Methods

Categorical data were reported using frequency and percentages, and the Chi-square test was utilized to determine the relationship between post COVID functional status and chosen demographic characteristics. The data was analysed with SPSS 20.0 software, and an association was found at a significant value of 0.05.

Results

Demographic Characteristics

The survey included 200 samples that matched the inclusion requirements, with 190 of them responding to the questionnaire. Among the 190 participants, 5% were between the ages of 20 and 24, 8% were between the ages of 25 and 29, 10% were between the ages of 30 and 34, 12% were between the ages of 35 and 39, 13% were between the ages of 40 and 44, 10% were between the ages of 45 and 49, 15% were between the ages of 50 and 54, 10% were between the ages of 55 and 59, 10% were between the ages of 60 and 64, and 7% were Males made up 55% of the samples. Sixty percent of the samples fall into category B, while forty percent go into category C. Sixty-two percent of the samples were hospitalized for 10 days or less, whereas 38 percent were hospitalized for more than ten days. The sickness was classified as mild 40% of the time, moderate 35% of the time, and severe 23% of the time. The BMI of the samples revealed that 46% had normal BMI, 44% were overweight, 7% were obese, and 2% were malnourished. Among 190 samples, 25% had high blood pressure, 23% had diabetes, 13% had asthma, 8% had cancer, 3% had liver illness, and 7% had kidney disease (Table 1).

The Post-COVID Functional Constraint of samples revealed that 58% have insignificant functional limitation, 24% have no functional limitation, 16% have modest functional limitation, 1% have strong functional limitation, and 1% have severe functional limitation (Figure1).

Association findings

The study findings revealed a link between PCFS and age (P-value = 0.001), as well as PCFS and COVID category (P-value = 0.00). There is no association between PCFS and other demographic factors such as gender, hospitalization period, severity, BMI, and co-morbidities at the 0.05 level of significance (Tables 2 and 3).

Discussion

Du, Hw. et al. (2021) evaluated the functional state in discharged patients with coronavirus disease in a study of 95 COVID-19 survivors with a median age of 62. At six months, 70.5 percent of patients had a complete functional outcome (grade 0), 9.5 percent had a negligible limited function (grade 1), 12.6 percent had a mild limited function (grade 2), and 7.4 percent had a moderate limited function (grade 3). The univariable logistic regression analysis revealed a significant association between the onset of symptoms of muscle or joint pain and an increased risk of incomplete functional outcome OR 4.06, 95%CI 1.33–12.37) (12). Another study, conducted by Pant, P., et al. (2021), on the prevalence of functional limitation in COVID-19 recovered patients at Tribhuvan University Teaching Hospital using the post-COVID-19 functional status scale, revealed that more than half of the patients (56.6 percent) reported having no functional limitation (grade 0), while 43.4 percent of patients (grade 1 to 4) reported having some degree of functional limitation (5). However, in this current study, post-covid functional limitation of samples revealed that 58 percent have negligible functional limitation, 24 percent have no functional limitation, 16 percent have slight functional limitation, 1% have moderate functional limitation, and 1% have severe functional limitation.

Table 1. Distribution of samples based on demographic characteristics

n = 190

Variables	Category	Frequency (n)	Percentage (%)
Age	20-24	9	5
	25-29	15	8
	30-34	19	10
	35-39	23	12
	40-44	25	13
	45-49	19	10
	50-54	28	15
	55-59	20	10
	60-64	19	10
	65-69	13	7
Gender	Male	105	55
	Female	85	45.7
Category	B	95	50
	C	94	50
Hospitalization	<10 days	117	62
	>10 days	73	38
Severity	Mild	78	40
	Moderate	71	37
	Severe	43	23
BMI	Malnourished	4	2
	Normal	87	46
	Overweight	85	45
	Obese	14	7
Comorbidities	HTN	48	25
	DM	43	23
	Asthma	25	13
	Cancer	15	8
	Liver disease	5	3
	Kidney disease	14	7

Table 2. Association of post COVID functional status with age of samples

n = 190

Age	PCFS					χ^2	P value
	Grade 0	Grade 1	Grade 2	Grade 3	Grade 4		
20-24	6	4	1	0	0		
25-29	8	5	0	0	0		
30-34	7	16	3	0	0	40.9	0.001*
35-39	6	10	0	0	0		
40-44	14	20	4	0	0		
45-49	0	3	3	0	0		
50-54	2	22	6	1	0		
55-59	0	10	6	0	1		
60-64	3	10	8	0	1		
65-69	0	9	0	1	0		

*-Significant at 0.05 level

Table 3. Association of post COVID functional status with COVID category of samples

n = 190

Category	PCFS					χ^2	P value
	Grade 0	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**		
B	36	68	10	0	0	22.5	0.00*
C	10	41	21	2	2		

*-Significant at 0.05 level

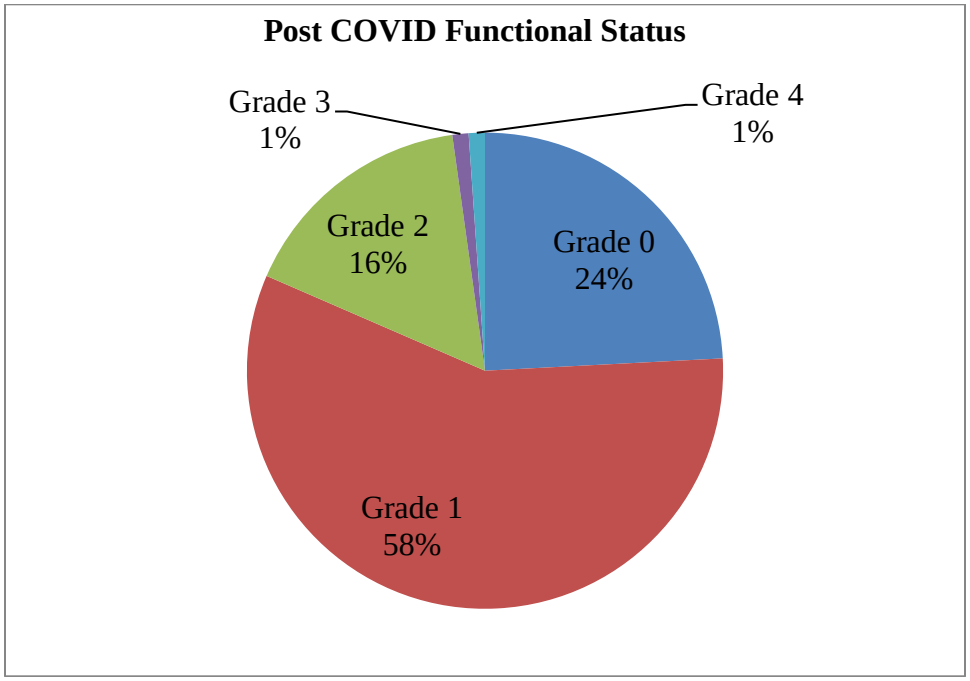


Figure 1. Distribution of samples based on post COVID functional status

A prospective cohort study on the post-COVID-19 syndrome in Egyptian patients conducted by Gamal DM, Ibrahim RA, and Samaan SF. (2022) indicated that 39% experience post-COVID-19 symptoms. There was also a link between post-COVID-19 syndrome and patient age, disease severity, and the existence of prior comorbidities (13). Similarly, the findings of the current study demonstrated that PCFS has an association only with age and the COVID 19 category, with no association with disease severity, comorbidities, or other demographic characteristics.

The study's strength is that it uses a validated standardized method for data collection, and because we used an interview technique, response to the questionnaire was high when compared to other data gathering strategies. The drawback of this study is that the samples were drawn from a single location, and individuals above the age of 70 and under the age of 20 were excluded.

Conclusion

SARS-CoV2 infection is predicted to have physical and mental health consequences in COVID-19 patients. In the post-acute care management of COVID-19 patients, early identification of functional restriction and subsequent planning of rehabilitative therapies is critical. In COVID-19 recovered patients, the PCFS scale is a trustworthy instrument for evaluating the prevalence of functional limitation. There has been very little study done on COVID-19 retrieved clients. We urge large multicenter trials with

extended follow-up periods to validate patients' post-COVID functional limitations. The current study had limited generalizability because it used purposive sampling and was conducted in a single context.

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