International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Impact of Functional Limitation on Quality of Life Among Covid-19 Survivors

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ABSTRACT:

Background: It has been evident that after viral infections (e.g., SARS-1), patients often sustain functional limitations over a long period after discharge from the hospital. Persisting symptoms with subsequent progression to poor functional status have been reported in a substantial proportion of these patients. These patients are susceptible to developing reduced functional status that impact their ability to care for themselves and to perform usual activities of daily living in the months following hospital admission. Previous severe acute respiratory syndrome (SARS) outbreaks showed to affect the survivors lung function, exercise capacity, health-related quality of life (HrQoL), mental health, and lead to increased symptoms of fatigue and dyspnea from 6 months to 2 years after symptom onset. This study aims to assess those recovering from COVID-19 for symptoms of functional limitation and its impact on quality of life, thus identifying a group worthy of further study and early intervention.

Objective: To determine the impact of functional limitation on quality of life among COVID– 19 survivors

Methods

87 patients exposed with covid-19 virus was followed up and assessed for functional limitation and quality of life. Participants were asked on a telephone to choose an appropriate option for each question in relation to current situation from the functional status scale and WHOQOL-BREF among COVID 19 survivors.

Result: Karl Pearson correlation coefficient was used to determine the impact of functional limitation on quality of life among COVID19 survivors. Impact of functional limitation on four domains of quality of life was statistically significant at $p<0.001$. There was significantly strong negative correlation found between functional status scale and domain1 ($r=-0.823$) and functional status scale and domain 3 ($r=-0.902$) whereas there was significantly moderate negative correlation between functional status scale and

domain 2 (r=0.584), functional status scale and domain 4 (r=-0.416).
Conclusion: Present study concludes that there is a profound functional limitation after 6 months of post COVID. Hence the functional limitation and its associated symptoms need to be monitored and early intervention needs to be planned in post COVID19 patients.

Keywords: COVID-19, quality of life, functional limitation, functional Status.

INTRODUCTION:

The coronavirus disease 19 (COVID-19) is an infectious disease caused by the relentless spread of the severe acute respiratory coronavirus 2 (SARS-CoV-2) from human to human, all across the world.[1] COVID-19 is a viral infection caused by SARS-CoV-2 that primarily targets the respiratory system, with initial symptoms often including shortness of breath and fever.[2] As of 28 May 2020, there are over 5.5 million confirmed cases of people who have contracted COVID-19 globally and over 353,000 have expired.[3] For coronavirus disease COVID-19 patients, overcoming the acute symptoms of the disease may only be the beginning of a long and challenging path to recovery.[4] In many cases, physical, cognitive, and psychological impairments persist for multiple years.[5] In addition to the pulmonary system, COVID-19 can impact multiple other organ systems, including neurological[6], cardiovascular[7], hematopoietic[8], and psychological.[9] Our understanding is evolving regarding the threats COVID-19 poses to patient quality of life, mental health and life expectancy.[10]

It has been shown that after viral infections (e.g., SARS-1), patients often sustain functional limitations over a long period after discharge from the hospital.[11] It is anticipated that COVID-19 may have a major impact on physical, cognitive, mental and social health status, also in patients with mild disease presentation.[12] Previous outbreaks of coronavirus have been associated with persistent pulmonary function impairment, muscle weakness, pain, fatigue, depression, anxiety, vocational problems, and reduced quality of life to various degrees.[13-15] Persisting symptoms with subsequent progression to poor functional status have been reported in a substantial proportion of COVID-19 survivors.[16] Previous severe acute respiratory syndrome (SARS) outbreaks showed to affect the survivors lung function, exercise capacity, health-related quality of life (HrQoL), mental health, and lead to increased symptoms of fatigue and dyspnea from 6 months to 2 years after symptom onset.[17] Pulmonary function impairment, mental health problems, and reduced quality of life to a various extent have been reported in COVID-19 patients.[18-20] These factors could have a long term impact on physical, mental, social and cognitive health and well being of COVID-19 infected patients, causing a decline in functional status.[16] Patients who survive may be susceptible to developing poor health-related quality of life (HRQoL) and persistent symptoms after ICU discharge.[21] Cognitive and physical function is among the most important factors for quality of life and independent living in older people.[22] Health related quality of life is an important measure used to assess patient's perception of the impact of disease and disability on different dimensions of health.[22] These patients are susceptible to developing reduced functional status that impact their ability to care for themselves and to perform usual activities of daily living in the months following hospital admission.[23] Hence the need of my study is to determine the impact of functional limitation on quality of life among COVID– 19 survivors.

METHODOLOGY:

Design and setting:

A tele-based cross sectional study was conducted in a tertiary care hospital and was approved by the Institutional Ethical Committee.

Participants:

87 COVID 19 survivors more than 6 months of testing negative by RT PCR at tertiary care hospital aged 18-55 years were included in this study. Patients with active COVID-19 infection, known cardiac or respiratory co-morbidities with Medical Research Council (MRC) grade >0 and New York Heart Association (NYHA) grade >1, patients with known functional disabilities and known illness likely to progress and limit physical ability like trauma, malignancies, progressive myopathies, and neuropathies or having no contact details available or with dementia, learning disability, cognitive or communication impairments and those who refused to respond were excluded from the study.

Procedure

A brief introduction about the procedure was explained to all the participants. Participants were recruited on basis of the inclusion and exclusion criteria and an initial examination including demographic data such as name, age, gender, contact no, date of COVID19 positive, date of discharge, occupation. Participants were asked to choose an appropriate option for each question in relation to current situation for the functional status scale and quality of life questionnaire among COVID 19 survivors.

Outcome measures:

Functional limitation:

Functional limitations were observed using the post – COVID – 19 functional status (PCFS) scale. PCFS scale covers the full spectrum of functional outcomes and focuses on both limitations in usual duties/activities and lifestyle changes in five scale grades ranging from 0 to 4. Patients were graded from 0 to 4 according to the PCFS scale. The patients falling in all grades except grade 0 were observed to have some degree of functional limitation, which was further graded from 1 to 4 into negligible, slight, moderate, and severe groups depending on the severity of functional limitation[24].

Quality of Life:

This questionnaire is short version of a generic Wealth health organization Quality of life assessment instrument (WHOQOL-100). The survey in this study contained a total 26 questions from WHOQOL-BREF which provides fast profile of 4 areas (domains) [25, 26].

1 Physical domain
2 Psychological domain
3 Social domain
4 Environmental domain

Statistical analysis:

SPSS ver.20 was used to analyse data and descriptive statistics was used for demographic data such as age, gender co-morbidities. Karl Pearson correlation coefficient was used to find the impact of functional limitation on quality of life among COVID19 survivors.

RESULT:

The total number of 87 COVID19 survivors aged 18 – 55 years, tested negative by RT-PCR 6 months back with the minimum age of 23years to maximum of 53years with average age of 39.32±8.444 were

included in this study. Descriptive statistics was used to find out the age, functional limitation and four domains of quality of life. The study consisted of 49(56.3%) males and 38(43.7%) females. P<0.001 was considered statistically significant.

Descriptive Statistics			
	N	Mean	Std. Deviation
Fss	87	2.7586	.96407
domain1	87	41.6437	9.21825
domain2	87	54.5747	17.56359
domain3	87	60.9080	18.34719
domain4	87	62.1149	19.68438

Table1. Mean and standard deviation of functional status scale and quality of life

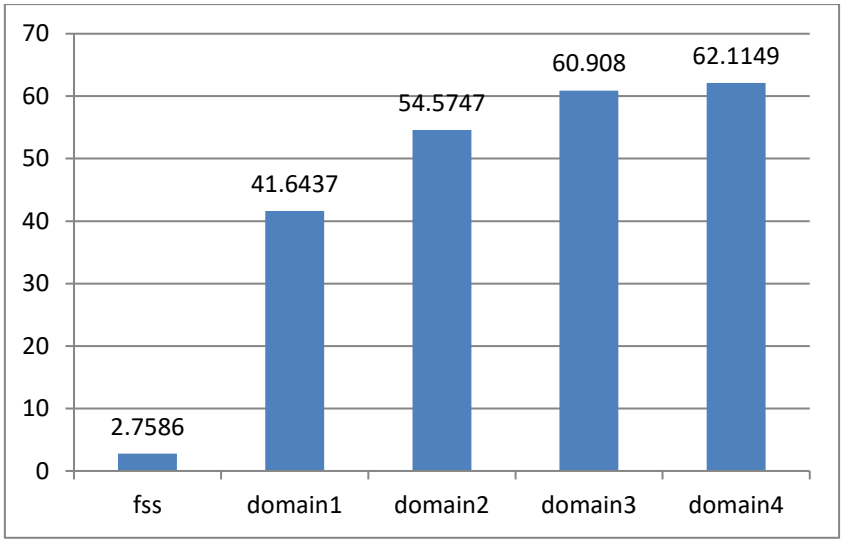

Fig1. Graph showing mean of functional status scale and domain1, domai2, domain3, domain4 of quality of life.

		domain1	domain2	domain3	domain4
Fss	Pearson Correlation	-.823	-.584	-.902	-.416
	P value	.000	.000	.000	.000

Table2. Correlation between fss and 4 domains of quality of life.

There is significantly strong negative correlation between fss and domain1(r=-0.823) and fss and domain 3(r=-0.902) whereas there was significantly moderate negative correlation between fss and domain 2(r=-0.584) fss and domain 4(r=-0.416).

DISCUSSION:

Present study was designed to determine the impact of functional limitation on four domains of quality of life among COVID19 survivors. Total 87 COVID19 survivors with RT-PCR negative status among age group of 18-55 years and mean value of 39.32±8.444 were assessed using functional status score and four domains of quality of life. However males were comparatively more than females. PCFS (Post COVID19 Functional Status) scale is a simple tool developed recently by Klok FA et al[24] to monitor the course of symptoms and its impact on patients' functional status in COVID-19 survivors. This tool was used in present study as it is simple and inexpensive. PCFS scale covers the full spectrum of functional outcomes and focuses on both limitations in usual duties/activities and lifestyle changes in five scale grades ranging from 0 to 4. Based on the PCFS scale, we observed that during the post-COVID-19 recovery state after RT-PCR negative status, 12 (13.79%) reported having no functional limitation (PCFS grade 0) while the prevalence of some degree of functional limitation was observed in 46 (43.4%) patients. Nearly 35 (40.22%) of the patients had negligible functional limitation (PCFS grade 1). Slight functional limitation (PCFS grade 2) was seen in 22 (25.28%) patients. Moderate functional limitation (PCFS grade 3) was seen in 12(13.79%) and severe functional limitations (PCFS grade 4) was observed in 6 (6.89%).

Present study shows impact of functional limitation on physical, psychological, social and environmental quality of life among COVID 19 survivors. Strong negative correlation was found between functional status score and physical domain(r=-0.823) and also with social domain(r=-0.902). Whereas moderate negative correlation was found between functional status score and psychological domain(r=-0.584) and also with environmental domain(r=-0.416) which was proved to be statistically significant at $p<0.001$. Pankaj pant[16] studied prevalence of functional limitation in COVID19 recovered patients using the post COVID19 functional status scale and reported that the prevalence of some degree of functional limitation was observed in 46 (43.4%) patients. It might be due to strict isolation centres which have resulted in significant reduction of patient's mobility[27] which was in support with this study. Taboada M[28] reported a decreased functional status measured with PCFS scale in 87 (47.5%) patients. Prolonged length of hospital stay, mechanical ventilation, and ICU admission were associated with limitations in the functional status which can affect his quality of life and it supports this study.

The physical dimension of quality of life includes of activities of daily lives, energy and fatigue, mobility, pain, discomfort, sleep and work capacity. The importance of ADLs lies in fact that they allow patients to be easily stratified by level of dependency and activity limitation and guide to rehabilitation stratergies[29, 30]. There has been a huge impact of functional limitation on psychological, social as well as environmental dimension of quality of life.

Walle – Hansen M[31]. Studied HRQoL, functional decline, and long term mortality in older patients following hospitalization due to COVID19 and reported clinically relevant decline in HRQoL and functional decline months after hospitalization due to COVID 19, compared to before hospital admission. Many patients with COVID19 require long-term oxygen treatment, both isolation measure and persistent hypoxemia might promote immobilization hence causing functional decline which is in agreement with this study.

Hence there is a significant impact of functional limitation on quality of life among COVID19 survivors which should be monitored and treatment planning to be done.

LIMITATION:

- Face to face interview was not possible hence selection bias which may affect generalization of study. Non response rate is probably high. Responses to some of the questions, such as symptoms during COVID-19, may have been influenced by recall bias.

CONCLUSION:

The study concludes that there a predominant impact of functional limitation on quality of life in COVID 19 survivors. A lengthy post-infection functional limitation impairs quality of life and will have significant impact on individuals, families and the healthcare system. So it's a need to screen for post COVID 19 symptoms especially the functional limitation and quality of life and to provide the low-cost and effective interventions.

ACKNOWLEDGEMENT:

Authors wish to thank the participants who took part in the study.

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