Prevalence on Musculoskeletal Disorders among Post Covid-19 Patients in Bengaluru

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Abstract

Background: Corona virus is infection related with novel COVID strain. The first case was diagnosed in Wuhan city, China. Due to rapid transmission rate an associated complication such as ARDS, pneumonia, shock, respiratory failure and death, in 2019 outbreak of severe ARDS COVID virus causing COVID-19 has global concern. Lack of sleep, Vision impairment, muscle atony are the signs and symptoms in patients whose nervous system and musculoskeletal system is affected thus, identifying the symptoms related to musculoskeletal disorders will help to provide better diagnosis for patients of COVID- 19 and will help to improve the line of treatment. **Objective:** To determine the prevalence of musculoskeletal disorders in both male and female COVID-19 patients, as well as the relationship between epidemiological determinants of musculoskeletal disorder status in COVID-19 patients. **Design:** Comparative Cross-Sectional study. **Method:** After obtaining the consent form from all the patients, Cornell Musculoskeletal Discomfort Questionnaire (CMDQ) was given. Data were examined using Descriptive analysis (SPSS). **Result:** The result shows that highest prevalence of musculoskeletal disorder was found in Low back region i.e. 54% as compared to other regions of body which were affected due to COVID-19. The prevalence was found to more in female i.e. (61%) as compared to male i.e. (39%). The prevalence among the patients who recovered from hospitalization was more i.e. (52.9%) as compared to the individuals who benefited from home quarantine i.e. (47.1%). Patients who had received both doses of the vaccine had a higher prevalence of the condition i.e. (52%) as compared to the patients who took only one dose of vaccine i.e. (48%). The prevalence was more among the patients who had not taken the steroids i.e. (51.1%) as compared to who had taken steroids i.e. (48.9%). **Conclusion:** The study concluded that more Female were affected as compared to men and in patients with post COVID-19 low back was commonly affected in comparison from other regions of body.

Keywords: Covid-19, Lifestyle Disorder, Muscle Fatigue, Musculoskeletal Disorder, Myalgia

1. Introduction

Coronavirus is infection related with novel COVID strain. The first case was diagnosed in Wuhan city, China. Due to rapid transmission rate an associated complication such as pneumonitis, ARDS, respiratory failure, shock and death, the 2019 outbreak of severe ARDS COVID virus causing COVID-19 has global concern. Clinical symptoms might range in severity from asymptomatic disease to severe respiratory failure and even death[1]. Due to increase in number of cases and high risk to humanity, lockdown was imposed all over the world under guidelines and rules by WHO. Over 200 countries were affected till 7th April 2020 around 1,400,000 cases were reported[2]. The virus mainly spread from one individual to another. Clinical symptoms like the flu are brought on by tissue swelling and serve as symptoms of illness. Plasma levels of IL-6 and TNF-alpha have been linked to viral replication in cases of upper respiratory symptoms, fever and musculoskeletal pain[3,4]. Angiotensin converting enzyme 2 (ACE-2) found in skeletal muscles as well as CNS and PNS.Recent immunological research has added to the evidence that "Cytokine Storm" is caused by enormous synthesis and release of pro-inflammatory cytokines. It may trigger off a harmful immune reaction that results in ARDS and multiple organ failure syndrome. It also causes variety of auto-immune symptoms and molecular mimicry appears to be the root cause of autoimmunity[5].

The virus initially affects Respiratory system. Individual suffering from COVID-19 showed fever, dry cough and breathlessness in initial stage.

Depending on the intensity of infection in initial period of time, the patients suffering from COVID-19 can be classified into 3 basic groups. Among all the cases reported, maximum cases were of MILD COVID-19 and were mostly asymptomatic. MILD COVID-19 was identified by clinical features like fever,

migraine loss of taste and smell, dyspnea, gastrointestinal discomfort. Such cases may require the medical treatment, and sometimes Pneumonia may also be diagnosed. The patients suffering from severe illness and with respiratory issues were classified as SEVERE COVID-19 and those who faced severe respiratory issues and require the mechanical ventilator support were classified as CRITICAL CASES. Prevalence of Mild COVID cases was 80%, severe cases were 14% and critical cases were 6%[6-8]. Mostly individuals who are aged and suffering from diseases such as High Blood Pressure, COPD, Asthma, and Diabetes Mellitus are more prone to get infected. Among the cases 5% requires Mechanical Ventilation[9,10].

But in later stage asphyxia and Respiratory Distress Syndrome with acute onset (ARDS) was also recorded. Apart of respiratory system, musculoskeletal system and nervous system were also affected. Lack of sleep, vision impairment, and muscle atony are the signs and symptoms in patients whose nervous system and musculoskeletal system is affected[11-14]. Patients had arthralgia, myalgia, and weariness. In all cases, patients reported myalgia in 59% of cases, arthralgia in 31% of cases, and exhaustion in 50% of cases[15]. With the chronic illness such as weakness, post-exertional discomfort, dyspnea, headache and variety of other neurocognitive problems such as cerebrum mist, inability to do every day physical chores and higher risk of stress, melancholy irritability, sleeplessness, dis-orientation and frustration. This illness, known as post COVID-19 syndrome, is impacting more and more people as the epidemic spreads[16]. A study was conducted on pain in COVID-19 patients which concluded that individuals with swelling and Cytokine response showed Myalgia. In people, the capacity to do ADL is related with acceptable personal satisfaction and healthy quality of life, hence signs such as muscle atony may lead to complications like muscle contractures or may lead to deformity in later stage.[1] There is evidence that exercise prevents in the short, middle, and long terms, delay, alleviate, and even reverse a variety of cardiovascular, pulmonary, metabolic, neurocognitive, rheumatic, inflammatory and MSD conditions[17-19]. Many studies had been conducted on the respiratory symptoms and its effect on the health of patient of COVID-19 but there was lack of research on musculoskeletal conditions and symptoms. Thus, identifying the symptoms related to musculoskeletal disorders will help to provide better diagnosis for patients of COVID-19 and will help to improve the line of treatment.

2. Methodology and Procedure

The Ethical clearance was taken from the ethical board of Krupanidhi College of Physiotherapy Bangalore (Ref: EC-MPT/21/PHY/002). It was Comparative Cross-Sectional study design where convenience sampling technique was used for sampling. The Inclusion criteria were Patients between the age of 40-60 years including both male and female, who were discharged from General wards of hospital due to COVID-19 Delta variant or were Home/self-Quarantine patients with RT-PCR positive report and with Lung CT-Score (9-15) and CT severity (moderate) and who has taken minimum one Dose of vaccine. Patients diagnosed with COVID-19 before 5 months and who had taken Steroids, Remdesivir injections and medications were also included. Patients having Post traumatic disorders including fracture, Diabetes, Degenerative musculoskeletal disorder, endocrine, metabolic disorders, cardiac disorders and women who were pregnant, patients with smoking history or history of admission to ICU and with present positive report of RTPCR were excluded from the study. The consent form was collected from all the participants and procedure was explained to all the patients. The study was conducted on 331 patients from different locations of Bengaluru and its duration was from January 2022 to July 2022.

3. Outcome Measures

3.1 Cornell Musculoskeletal Discomfort Questionnaire (CMDQ)

Cornell Musculoskeletal Discomfort Questionnaire (CMDQ) is the most common questionnaire after Nordic questionnaire for determining musculoskeletal disorders. It is used to determine the level of pain in response to rest breaks. The CMDQ is a 54-item survey that questions on the frequency of musculoskeletal pain, discomfort, or aching over the course of the previous week in 18 different body areas and includes a body map diagram. For the CMDQ's test-retest reliability, three weeks in between assessments showed a 7% difference in upper body part responses and a 1% difference in lower body part responses.

It contains 3 main features for scoring. Frequency, Discomfort, Interference: Scoring for frequency parameters (Never = 0, times/week = 1.5, 3-4 times/week = 3.5, Everyday = 5, Several times every day = 10), Scoring for discomfort parameters: (Slightly uncomfortable = 1, moderately uncomfortable = 2, very uncomfortable = 3), Scoring for interference parameters: (Not at all = 1, Slightly interfered = 2, Substantially interfered = 3).

For total score = Score of frequency * score of discomfort *score of interference

3.2 Statistical Analysis

The statistical analysis was done using SPSS 29.0 software and the charts and tables were created using Microsoft Excel. Descriptive Statistics was performed for the demographic and

2.1 Sample Size Estimation
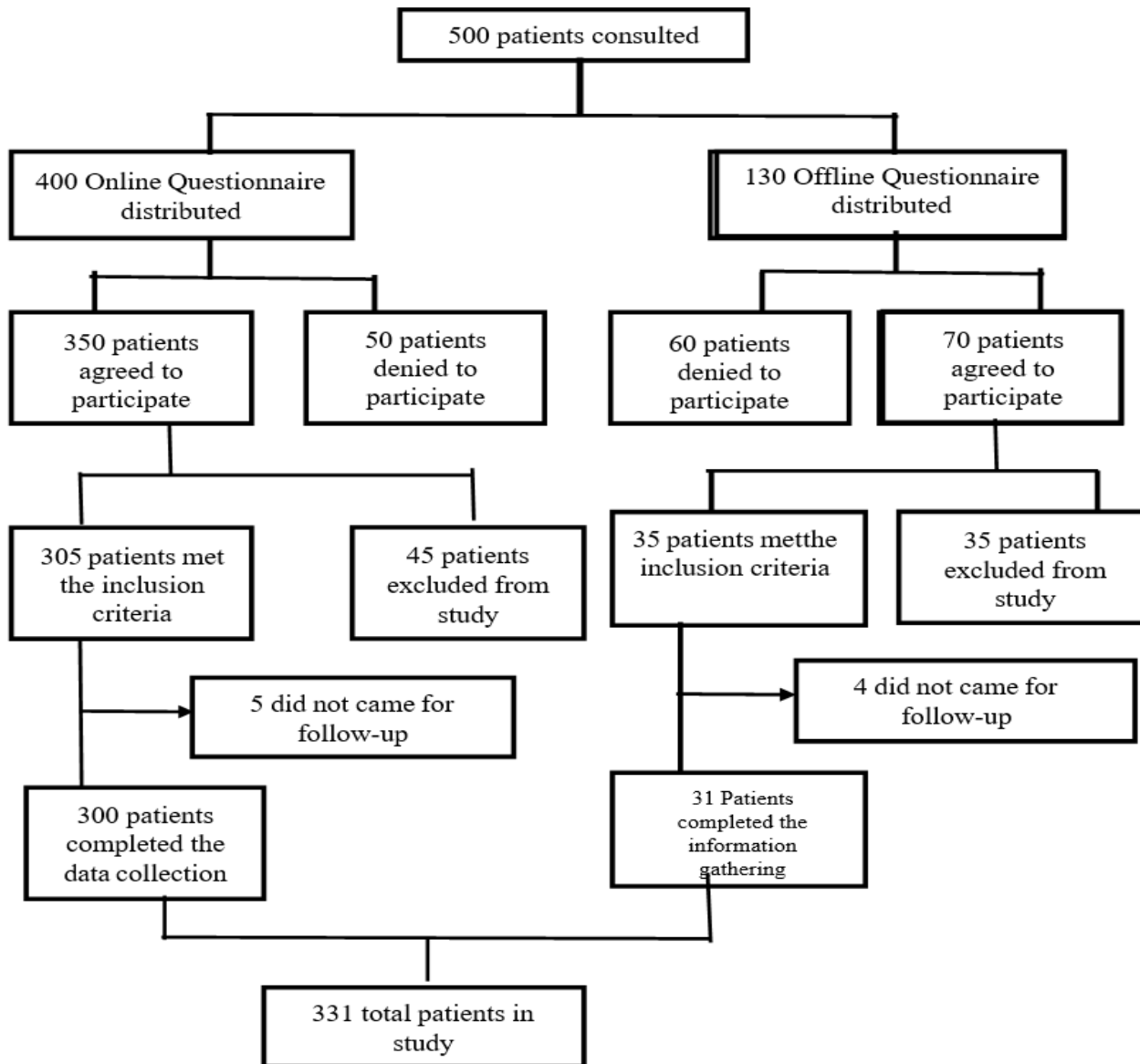
outcome variables. The age group showed a higher prevalence of the condition was 40-50 years as compared to 50-60 years.

The prevalence was found to more in female (61%) as compared to male i.e. (39%). The prevalence among the patients who recovered from hospitalization was more i.e. (52.9%) as compared to the patients who recovered from Home Quarantine i.e. (47.1%). More patients who had taken both doses of the vaccine were affected by the condition i.e. (52%) as compared to the patients who took only one dose of vaccine i.e. (48%). The prevalence was more among the patients who had not taken the steroids i.e. (51.1%) in contrast to who had taken steroids i.e. (48.9%). The average and the standard deviation for different variables were: Age group (50.73 ± 6.235), Gender (1.61 ± 0.488), Vaccine Dose (1.52 ± 0.500), mode of recovery (1.53 ± 0.500) and steroids taken (1.51 ± 0.501) Highest prevalence rate was found in Lower Back region i.e. (54.4%) among all the regions of body affected due to COVID-19 followed by prevalence rate of Shoulder as 42.1%, Neck as 32.6%, Hip as 30.2%, Upper Back as 29.6%, Lower Leg as 23.45%, Thigh as 23%, Knee as 22%, Upper Arm as 21%, Forearm as 18.1%, Wrist as 13.15% and Least in foot with 11.65%.

4. Result

Table 1. Frequency distribution for demographic variables

Variables	Items	Frequency	Percent
Gender	Male	129	39
	Female	202	61
Dosage	Dose 1	159	48
	Both	172	52
Mode of Recovery	Home Quarantine	156	47.1
	Hospitalized	175	52.9
Steroids Taken or Not	Yes	162	48.9
	No	169	51.1
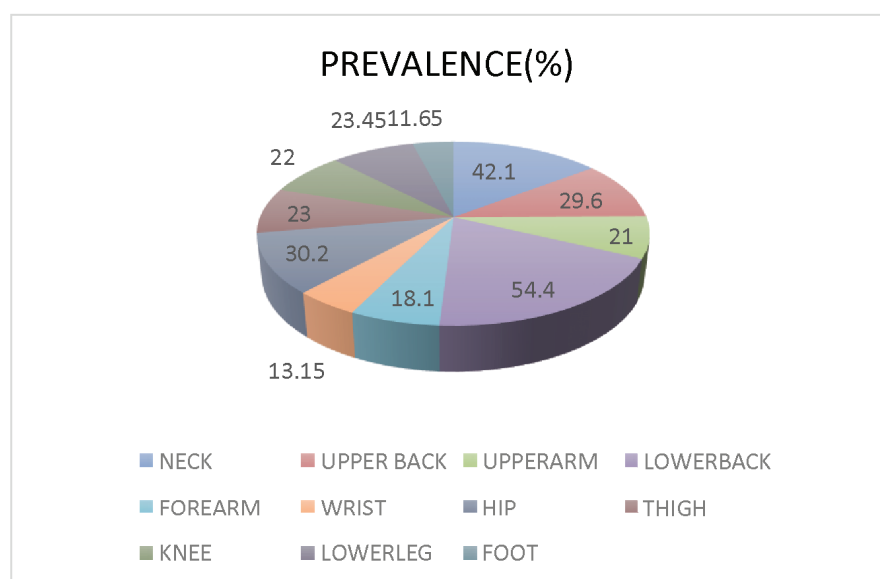
Graph 1. Prevalence of body region affected in Covid-19 patients.

5. Discussion

COVID-19 affected mostly all the individuals of the world. More than 50 percent of COVID-19 victims indicate that their symptoms persisted even after they had recovered from their acute illness. These symptoms can last for as long as 6 to 7 months. Excessive tiredness, weak muscles, coughing or shortness of breath, joint or chest pain, difficulty concentrating, and memory issues are among physical symptoms that persist. This study was undertaken to find the frequency of musculoskeletal disorders among Bangalore patients who had COVID-19.

According to the result and analysis high prevalence was found in Low back region (54%) in contrast to other regions affected with mean and SD as (31.75 ± 16.899). the prevalence of other regions of body were found as Shoulder as 42.1%, Neck as 32.6%, Hip as 30.2%, Upper Back as 29.6%, Lower Leg as 23.45%, Thigh as 23%, Knee as 22%, Upper Arm as 21%, Forearm as 18.1%, Wrist as 13.15% and Least in foot with 11.65%.

The analysis indicates female (61%) were more affected than men (39%) with mean and SDas (1.61 ± 0.488) in the age group of 40-50 years more than 50-60 years. According to analysis the patients who were hospitalized (52.9%) recovered more than the patients from Home Quarantine (47.1%) with mean and SD as (1.53 ± 0.500). The analysis indicates the patients who had not taken steroids (51.1%) were recovered more in contrast to patients who had taken steroids (49.9%) with mean and SD as (1.51 ± 0.501). The study that was done on the reliability and validity of CMDQ for finding the frequency of musculoskeletal illnesses with ICC of 0.987.

More females were affected than men because it has been noted that females produce more IgG antibodies in the early stages of disease; this may favour women's outcomes but may also contribute to the persistence of disease signs. Even after recovery, hormones may still contribute to the acute phase's hyper-inflammatory state[20]. Low back pain becomes most common among the COVID patients because of the sedentary life style and occupational work load as in contrast to other regions of the body. It also showed that it might affect the areas of neck and Shoulder[21]. García-Salirrosas EE, *et al.,* 2020 stated that University professors experience a high rate of musculoskeletal problems, primarily in the dorso-lumbar spine and neck, and these conditions are linked to occupational risk factors such protracted posture and long workdays[22]. Except for the thigh, COVID-19 had a substantial impact on the abnormalities in numerous body systems. In the majority of these organs, particularly the neck, knees and pelvis, the disorders worsened and only improved in the ankles and legs. The study also revealed that women experience more musculoskeletal illnesses than men do, and that these disorders can be prevented by engaging in regular physical activity. 75% of patients who were hospitalised for COVID-19 reported one or more symptoms, out of which many of the patients are affected with any musculoskeletal issue in one month.

Fatigue was the most prevalent musculoskeletal symptom, followed by neck discomfort, back pain, arthralgia, low back pain and myalgia. The persistence of myalgia, arthralgia, and fatigue were all associated with BMI. The study's findings advance our understanding of the COVID-19 spectrum[24,25]. Thus finding the prevalence might be helpful in providing the preventive measures and exercise to the affected population.

6. Limitations

The study was conducted online and was conducted in only one organization. Due to which we could not get the access more patients and could not conduct proper assessment because of online data.

7. Conclusion

This study concludes that in post COVID-19 patients the 40-50 age range was more adversely affected and among which Female were more affected in comparison to Male. The study also concluded that more prevalence was found at Low Back region as compared to other regions affected by the COVID-19.

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