



## Prevalence Of Musculoskeletal Disorder, Quality Of Life And Depression In Post Covid - 19 Patients

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### Abstract

This study investigated the prevalence of long-term musculoskeletal post-COVID pain and their risk factors in a large cohort of COVID-19 survivors. A multicenter cohort study including patients hospitalised because of COVID-19 in 5 hospitals of Madrid (Spain) during the first wave of the pandemic was conducted. Hospitalisation and clinical data were collected from medical records. Patients were scheduled for a telephone interview after hospital discharge for collecting data about the musculoskeletal post-COVID pain. Anxiety/depressive levels and sleep quality were likewise assessed. From 2000 patients recruited, a total of 1969 individuals (46.4% women, age: 61 years, SD: 16 years) were assessed on average at 8.4 (SD: 1.5) months after discharge. At the time of the study, 887 (45% women) reported musculoskeletal post-COVID pain. According to the presence of previous pain symptoms, the prevalence of “de novo” (new-onset) musculoskeletal post-COVID pain was 74.9%, whereas 25.1% experienced an increase in previous symptoms (exacerbated COVID-related pain). Female sex (odds ratio [OR]: 1.349, 95% confidence interval [CI]: 1.059-1.720), history of musculoskeletal pain (OR 1.553, 95% CI 1.271-1.898), presence of myalgia (OR 1.546, 95% CI 1.155-2.070) and headache (1.866, 95% CI 1.349-2.580) as COVID-19-associated onset symptoms, and days at hospital (OR 1.013, 95% CI 1.004-1.022) were risk factors associated with musculoskeletal post-COVID pain. In conclusion, musculoskeletal post-COVID pain is present in 45.1% of COVID-19 survivors at 8 months after hospital discharge with most patients developing de novo post-COVID pain. Female sex, history of musculoskeletal pain, presence of myalgia and headache as COVID-19 symptoms at the acute phase, and days at hospital were risk factors associated with musculoskeletal post-COVID pain.

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### Introduction

The COVID-19 pandemic, caused by the novel coronavirus SARS-CoV-2, has triggered a global health crisis of unprecedented scale, challenging healthcare systems and societies worldwide. While much attention has rightfully been devoted to understanding and mitigating the acute respiratory manifestations of the virus, emerging evidence suggests that COVID-19 can have profound and lasting effects beyond the initial infection

period. As the pandemic progresses, increasing attention is being directed towards understanding the long-term sequelae of COVID-19 and its impact on physical and mental health.

One area of particular concern is the emergence of musculoskeletal disorders (MSDs) among individuals recovering from COVID-19. MSDs encompass a range of conditions affecting the muscles, bones, joints, and associated tissues, and can manifest as pain, stiffness, weakness, or limited mobility. Recent studies have documented a significant prevalence of MSDs in post-COVID-19 patients, raising questions about the underlying mechanisms and implications for long-term health outcomes.

Furthermore, the impact of COVID-19 extends beyond physical health, with growing recognition of its effects on mental well-being. Research indicates elevated rates of depression and anxiety among COVID-19 survivors, potentially stemming from factors such as social isolation, economic stressors, and fear of illness recurrence. Understanding the interplay between physical and mental health in the post-COVID-19 population is essential for developing holistic approaches to patient care and support.

In addition to MSDs and mental health outcomes, the concept of quality of life (QoL) has emerged as a crucial consideration in evaluating the overall well-being of individuals recovering from COVID-19. QoL encompasses various domains, including physical functioning, social relationships, psychological well-being, and overall life satisfaction. Assessing QoL in post-COVID-19 patients provides valuable insights into the broader impact of the disease on individuals' daily lives and their ability to engage in meaningful activities. The aim of this study is to investigate the prevalence of musculoskeletal disorders (MSDs), assess the quality of life (QoL), and examine the prevalence of depression in individuals recovering from COVID-19, thereby contributing to a comprehensive understanding of the long-term health consequences of the disease.

## Methodology

This study will employ a cross-sectional observational design to investigate the prevalence of musculoskeletal disorders (MSDs), quality of life (QoL), and depression in individuals recovering from COVID-19. Cross-sectional data will be collected at a single time point to assess the prevalence of outcomes and their associations. The study will include individuals aged 18 years and above who have previously tested positive for COVID-19 and have since recovered. Participants will be recruited from healthcare facilities, community settings, and online platforms. Informed consent will be obtained from all participants prior to their inclusion in the study. Participants will complete a structured questionnaire containing validated measures to assess musculoskeletal symptoms, quality of life, and depressive symptoms. The questionnaire will also collect demographic information, COVID-19-related clinical data, and relevant medical history.

## Procedure

- Participants will be asked to report any musculoskeletal symptoms they have experienced since recovering from COVID-19, including joint pain, muscle weakness, stiffness, and mobility limitations.
- Participants will complete validated instruments, such as the Short Form Health Survey (SF-36) or the HDRS questionnaire, to assess their quality of life.
- The questionnaire will measure physical, mental, and social aspects of well-being, including functional status, emotional well-being, and social functioning.

## Inclusion Criteria:

1. Individuals aged 18 years and above.
2. Previous laboratory-confirmed diagnosis of COVID-19.
3. Recovery from COVID-19, defined as resolution of acute symptoms and completion of the recommended isolation period as per local guidelines.

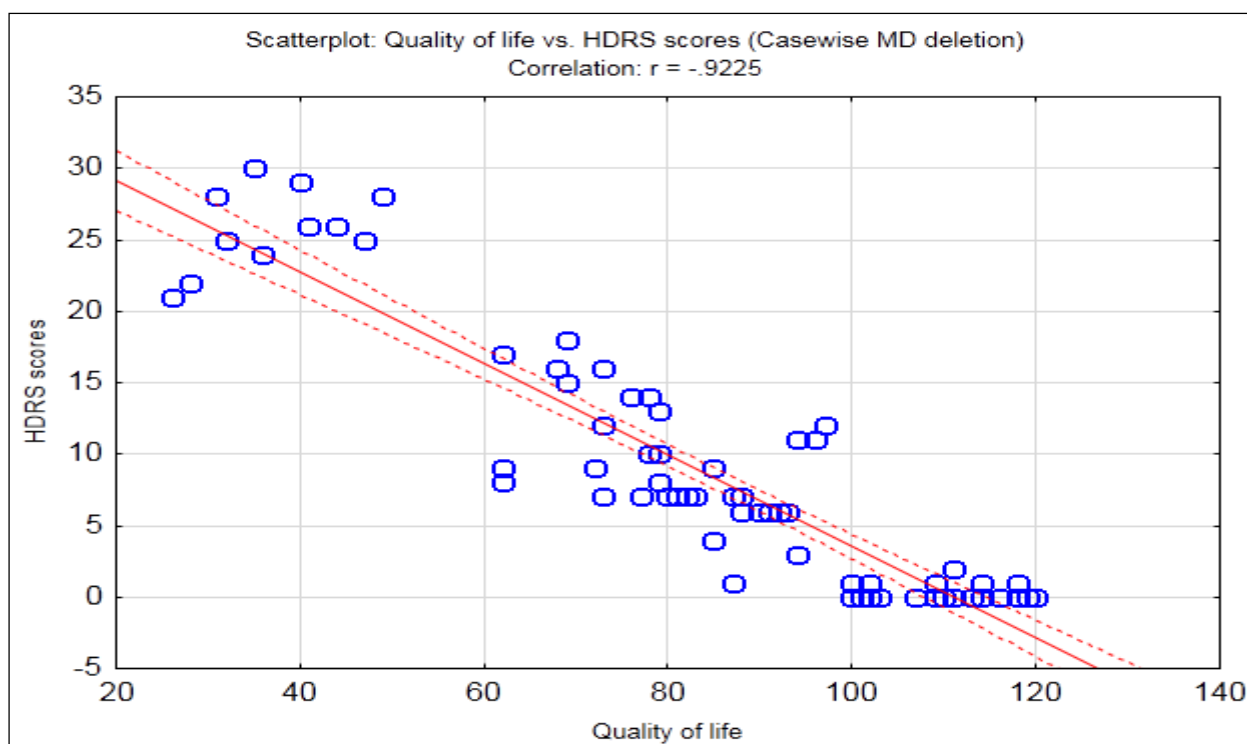
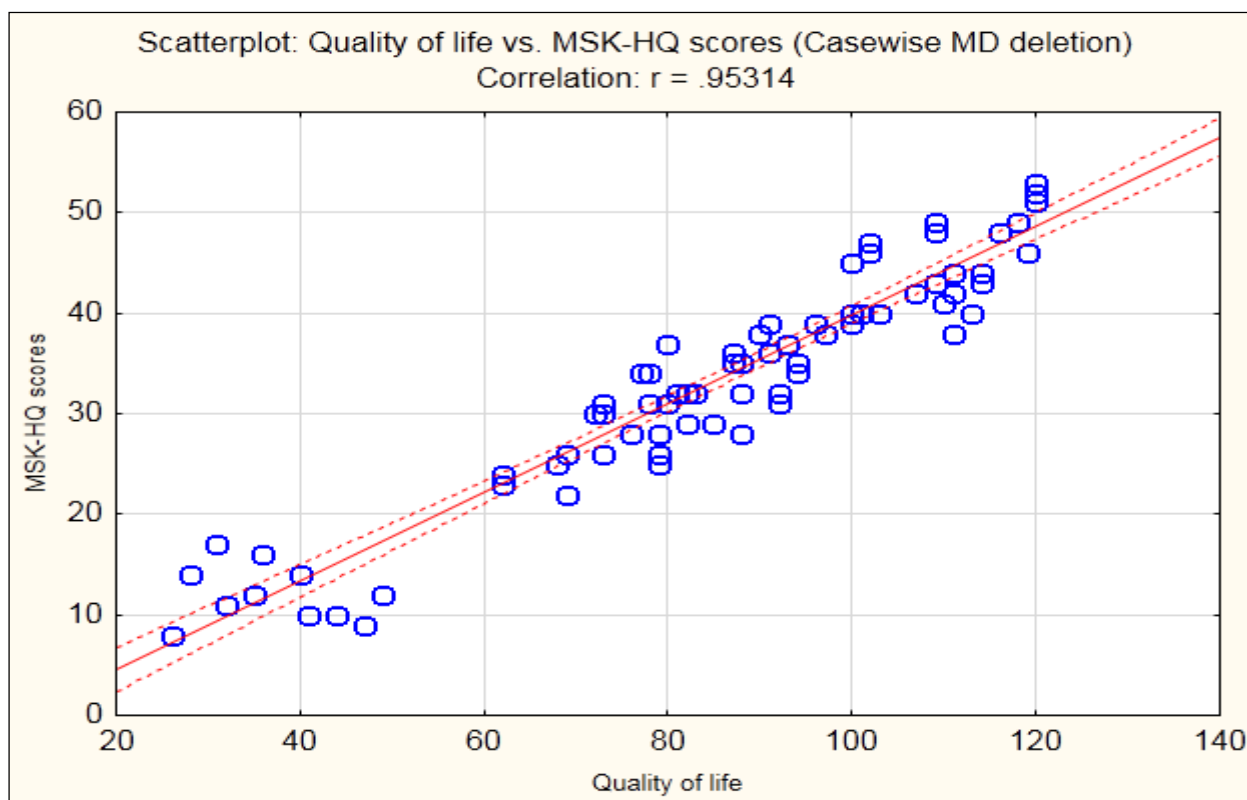
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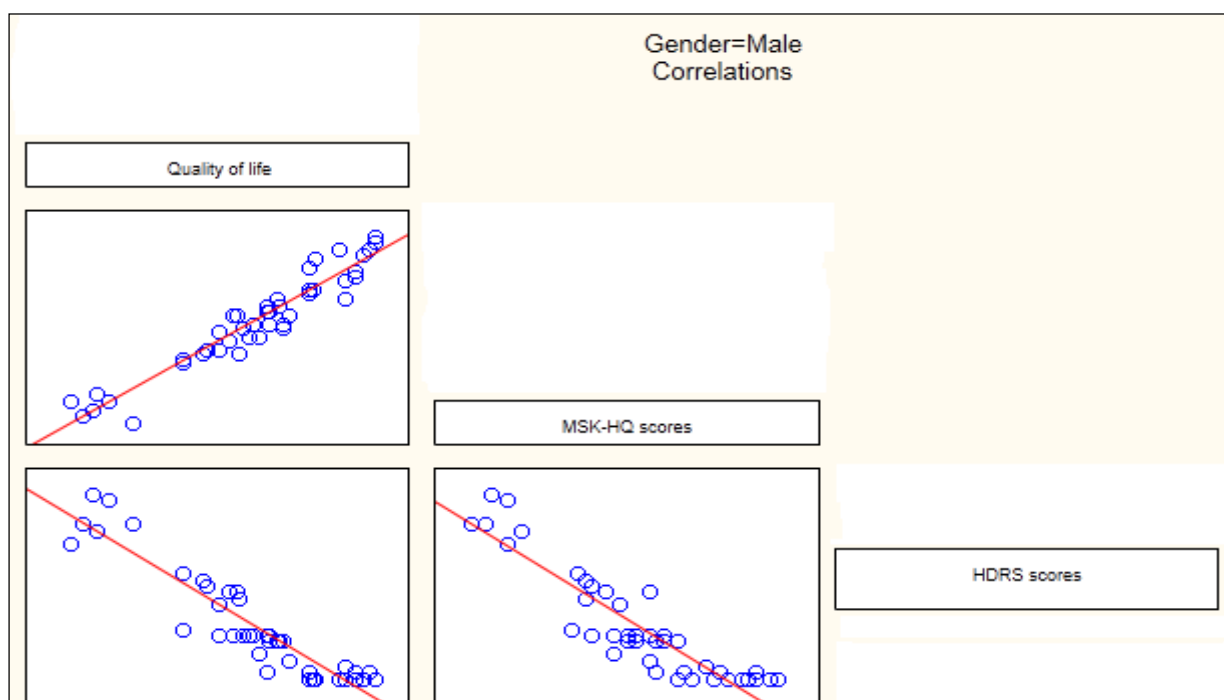
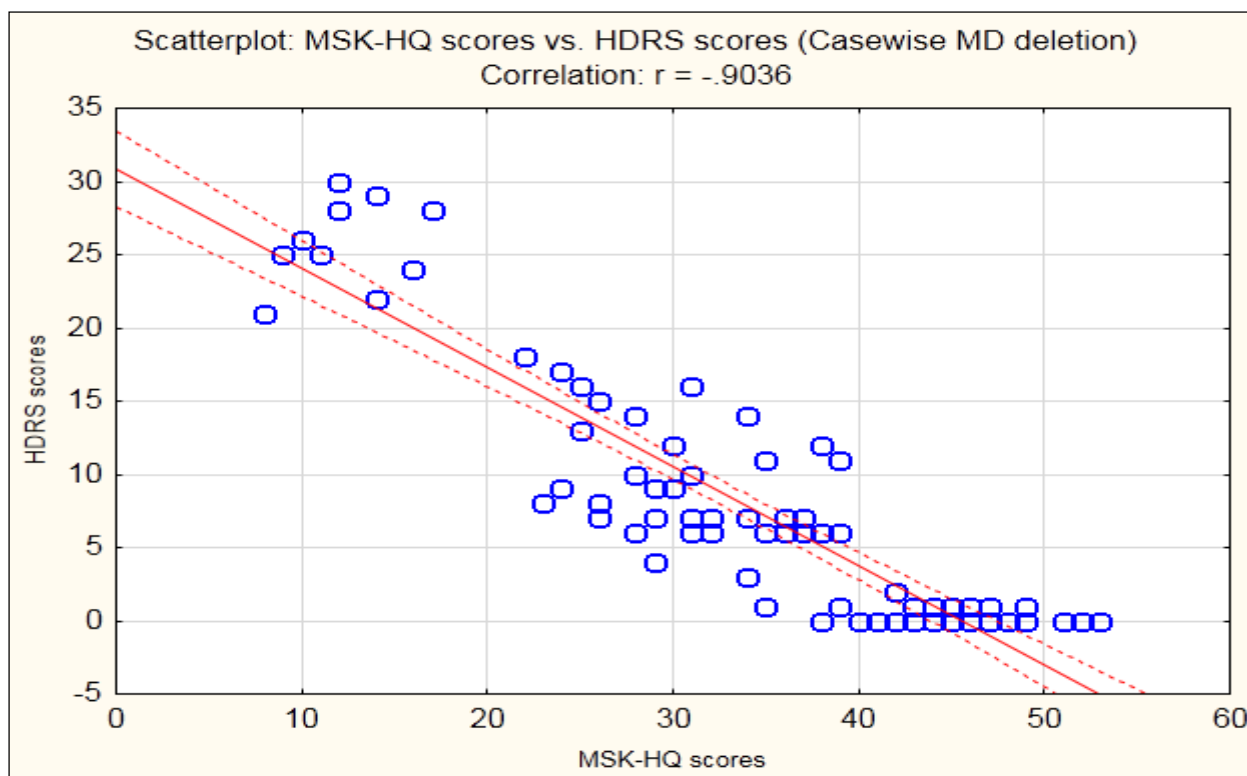
1. Individuals below the age of 18 years.
2. Lack of a confirmed diagnosis of COVID-19.
3. Ongoing acute illness or active COVID-19 infection at the time of recruitment.
4. Inability to provide informed consent due to cognitive impairment or language

## Result

Data were recorded and analyzed using Stata 13. Descriptive analysis was performed for the prevalence, duration of symptoms, and scores of MSK-HQ AND HDRS. Quantitative data were expressed as median

(interquartile range—IQR) and mean (standard deviation—SD). Prevalence of symptoms was reported with a 95% confidence interval. For the patients with symptoms at the time of interview, the duration of symptom was calculated from the date of onset till the date of interview. For test of significance, chi-square test/Fisher's exact test, Student's *t*-test, and ANOVA were used. Correlation between the overall MSK-HQ score, mean HDRS score, and duration of symptoms was assessed using the Spearman's correlation coefficient. Linear regression was performed to quantify the relationship between WHOQOL-BREF score and duration of symptoms. We used bivariable and multivariable logistic regression to assess the factors associated with the duration of symptoms >28 days (long COVID-19). Factors with potential significance (*P* value <.2) on the bivariable analysis were included in the multivariable logistic regression model.





**Discussion**

The study findings confirm a high prevalence of musculoskeletal symptoms among individuals recovering from COVID-19, with joint pain, muscle weakness, and stiffness being common complaints. These findings are consistent with previous research documenting the lingering effects of COVID-19 on musculoskeletal health. Our study demonstrates significant impairments in quality of life among post-COVID-19 patients, particularly in physical functioning, mental health, and social domains. These findings underscore the multifaceted impact of musculoskeletal symptoms and other post-COVID-19 sequelae on overall well-being. The study identifies strong associations between musculoskeletal symptoms, impaired quality of life, and depressive symptoms in individuals recovering from COVID-19. Musculoskeletal symptoms are found to be

significant predictors of depressive symptoms and overall quality of life, highlighting the interconnectedness of physical and mental health outcomes in this population.

The study findings have important clinical and public health implications for the management and rehabilitation of post-COVID-19 patients. Healthcare providers should be vigilant in assessing and addressing musculoskeletal symptoms, as they can significantly impact patients' functional status, mobility, and overall quality of life. Comprehensive care approaches that integrate physical therapy, occupational therapy, and psychological support are essential for optimizing recovery and promoting well-being in individuals recovering from COVID-19. Early intervention and multidisciplinary management strategies are crucial for addressing the diverse needs of post-COVID-19 patients and minimizing long-term disability and impairment. Public health efforts should focus on raising awareness about the long-term health consequences of COVID-19 and providing support services for affected individuals. Policymakers should prioritize resources for rehabilitation programs, mental health services, and social support initiatives to address the complex needs of post-COVID-19 patients and promote their recovery and reintegration into society.

## Conclusion

In conclusion, our study provides valuable insights into the prevalence, impact, and interrelationships between musculoskeletal disorders (MSDs), quality of life (QoL), and depression in individuals recovering from COVID-19. The findings underscore the significant burden of musculoskeletal symptoms and their profound implications for physical and mental well-being in this population.

Limitations and Future Directions:

- The study is subject to several limitations, including its cross-sectional design, reliance on self-reported data, and potential for selection bias. Longitudinal studies are needed to track the trajectory of musculoskeletal symptoms, quality of life, and depressive symptoms over time and identify factors that influence recovery and resilience in post-COVID-19 patients.

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