International
Journal of
**Health
Science**

IMPACT OF COVID-19 ON THE FUNCTIONAL CAPACITY OF HOSPITALIZED ADULTS

Bianca de Sousa Freire
Students of the institution's Physiotherapy Course: Centro Universitário Padre Anchieta, Jundiaí, São Paulo, Brazil
https://orcid.org/0000-0003-0496-5005

Bianca Caroline Siqueira de Souza
Students of the institution's Physiotherapy Course: Centro Universitário Padre Anchieta, Jundiaí, São Paulo, Brazil
https://orcid.org/0000-0003-0128-4247

Daniel Gimenez da Rocha
Professor of the Physiotherapy Course at the institution: Centro Universitário Padre Anchieta, Jundiaí, São Paulo, Brazil
Physiotherapy coordinator of the institution: Hospital de Caridade São Vicente de Paulo, Jundiaí, São Paulo, Brazil
https://orcid.org/0000-0001-9248-4978

Monique Olivia Burch
Fisioterapeuta da instituição: Hospital de Caridade São Vicente de Paulo, Jundiaí, São Paulo, Brazil
https://orcid.org/0000-0002-3153-4473

Renata Pletsch Assunção
Professor of the Physiotherapy Course at the institution: Centro Universitário Padre Anchieta, Jundiaí, São Paulo, Brazil
Coordinator of the Physiotherapy Course at the institution: Centro Universitário Padre Anchieta, Jundiaí, São Paulo, Brazil
https://orcid.org/0000-0003-2188-1700

Abstract: INTRODUCTION: COVID-19 is an acute respiratory infection of high transmissibility and global distribution, where the most known damages are pulmonary infections, although physical, psychological and cognitive impairment can be reported, with the most common complaints being fatigue, muscle weakness, anxiety and depression. Questionnaires are highly reliable instruments such as the Barthel Index (BI) that assess the performance of patients' functional capacity. In order to assist in physical therapy treatment, the objective of this study was to evaluate the functional capacity of patients hospitalized for COVID-19. **METHOD:** This is a cross-sectional study with patients who were hospitalized in the infirmary of the Hospital de Caridade São Vicente de Paulo for seven days or more. The BI and 10-CS cognitive screening were applied. **RESULTS:** 21 participants were included. From the results of the IB questionnaire, 6 patients were independent, 11 slightly dependent, 1 moderately dependent and 3 severely dependent. Of those classified as severely dependent, 66% of them did not perform physical activity and 33% did, while those classified as independent 50% performed physical activity and another 50% did not. No patient who had severely dependent BI had severe cognitive impairment on 10-CS showing that there was no correlation between the two findings. **CONCLUSION:** Through this study, we can conclude that post-covid patients who remained hospitalized for more than seven days will be able to return to society with deficits, even if mild, in their activities of daily living, especially in mobility and cognitive skills such as time, space orientation. and memory.

Keywords: Covid-19. Respiratory mechanics. Physiotherapy. Physical conditioning.

INTRODUCTION

COVID-19 is an acute respiratory infection caused by the SARS-CoV-2 coronavirus, potentially serious, of high transmissibility and global distribution (EJAZ et al., 2023). The first case of this type of coronavirus was registered on December 31, 2019, in the city of Wuhan, China (ALVES; DE SOUZA; CALÓ, 2021). Due to rapid transmissibility and aggressiveness, on May 11, 2020, it was declared a pandemic by the World Health Organization (WHO). Epidemiological data show that 4,927,723,605 deaths caused by the virus have been confirmed worldwide, with 605,644 of them in Brazil, so far (FRUMER et al., 2021; XIMENES et al., 2021). Approximately 80% of infected individuals are asymptomatic, while 15% have moderate/ severe disease and 5% have very severe disease (WU; MCGOOGAN, 2020). The most well-known damages are lung infections that can cause respiratory failure and that may require the use of mechanical ventilation (GUAN et al., 2020; HUANG et al., 2020). However, there are other factors that can be caused due to COVID-19 infection, for example: physical, psychological and cognitive impairment and these need to be investigated (VITACCA et al., 2020). A high prevalence of muscle weakness and impaired physical performance has been described in hospitalized patients recovering from COVID-19 who had no previous motor limitations (PANERONI et al., 2021). Among the complaints of COVID-19 survivors are fatigue, muscle weakness, sleeping difficulties, anxiety and depression six months after the acute infection (GASTALDI, 2021). Patients with impaired functional and muscular performance, dyspnea and a negative perception of health status may benefit from rehabilitation (HUANG et al., 2021). In order to identify patients who may need rehabilitation and screen them effectively, it is necessary to use data

collection instruments that provide measures with reliability, coherence and consistency in the results (SOUZA; ALEXANDRE; GUIRARDELLO, 2017), such as example, validated questionnaires. For functional performance analysis, the Barthel Index is a questionnaire capable of carrying out the assessment of functional capacity in relation to activities of daily living (ADL's). Created to assess functionality in terms of responses to the therapeutic practice of rehabilitation in patients who have suffered a cerebrovascular accident (CVA), it is already used in several other situations. The instrument assesses the level of assistance needed to perform ten ADLs (eating, bathing, personal hygiene, dressing, bladder and bowel control, transfer from chair to bed, ambulation, going up and down stairs) (ZHU et al, 2020). Cognitive deficits can also be measured using instruments such as the 10-Point Cognitive Screening, developed by Apolinario (ZAMPOGNA et al., 2021). It assesses temporal orientation, category fluency, and memory. The score on this test ranges from zero to ten points and cognition is considered normal for those who achieve between eight and ten points, mild cognitive impairment when the result is between six and seven points, and severe cognitive impairment in those who score less than or equal to to five (ZAMPOGNA et al., 2021). Based on the results of functional performance questionnaires and cognitive screening, in order to generate information to assist the decision-making process of the physiotherapeutic treatment of patients hospitalized with COVID-19, the objective of this study was to evaluate the functional capacity of patients hospitalized for COVID-19. -19.

METHODS

STUDY DESIGN AND PARTICIPANTS

This is a cross-sectional study, with 21 participants who were hospitalized in the infirmary of Hospital de Caridade São Vicente de Paulo, Jundiaí, São Paulo, due to COVID-19. Inclusion criteria were participants hospitalized for at least seven (7) days with a medical diagnosis of COVID-19 with identified virus, lucid, oriented and collaborative at the time of data collection, aged between 18 and 59 years, of both sexes. The study exclusion criteria were participants hospitalized with suspected COVID-19, that is, without a confirmed diagnosis, participants with COVID-19 with identified virus on mechanical ventilation, participants with neurological diseases, confused and disoriented participants or any condition that could make it unfeasible. the application of the questionnaire.

DATA COLLECT

After the project was approved by the Research Ethics Committee (CEP), the researchers followed up on hospitalized COVID-19 cases through the epidemiological bulletin issued by the hospital. Patients who were scheduled to be discharged within the next 48 hours were recruited for the study. After the identification of this patient and approval by the medical team, the researchers approached the patient's bedside to explain the research and the questionnaire applied.

The Barthel Index questionnaire was used to assess functional capacity. In this questionnaire, each item is scored according to the patient's performance in performing tasks, dependently, with some help or independently. An overall score is formed by assigning points in each category, depending on the time and assistance required for each patient. The score ranges from 0 to 100, in

five-point intervals, and higher scores indicate greater independence in the assessed ADLs. In the clinical context, the Barthel Index gives us important information, not only from the total score, but also from the partial scores for each activity evaluated, because it allows us to know what the specific disabilities of the person are and, as such, to adapt the care to the needs. To analyze the notion of temporal orientation, category fluency and three-word recall, the 10-point Cognitive Screening (10-CS) was used.

ETHICAL PROCEDURES

The guidelines of the National Health Council of the Ministry of Health, which regulate research involving human beings, provided for in Resolutions 466/20212 and 510/2016 were observed. This work was approved by the Ethics and Research Committee of the Centro Universitário Padre Anchieta, CAAE 47348821.5.0000.5386 and by the Ethics and Research Committee of the Faculdade de Medicina de Jundiaí by the CAAE 47348821.5.3001.5412. Participants were invited to voluntarily participate in the study. When invited, participants were informed of the objectives and procedures of this study. Those who were interested in participating received an informed consent form for reading and those who agreed to participate signed it. Participants were guaranteed the confidentiality of the information and the right to withdraw consent at any time during the research without any prejudice. They were also informed that they would not receive any compensation for participating in the study. Participants were assured that they could fail to answer any question or even drop out of the study, without any harm to the researchers.

STATISTICAL ANALYSIS

The Shapiro-Wilk test was used to assess the type of distribution of continuous variables. Qualitative variables were described as absolute and relative frequencies; quantitative variables were expressed as means and standard deviations or medians and interquartile ranges, depending on their distribution (parametric or nonparametric). Statistical analysis was performed using Microsoft Excel 2016 and IBM® SPSS® Software 20.2.

RESULTS

The results presented below are related to data collected at Hospital de Caridade São Vicente de Paulo de Jundiaí, São Paulo in July and August 2021, as shown in flowchart 1.

The general characteristics of the patients who were included in the study are shown in table 1.

Regarding the cognitive level assessed by the 10-CS screening, 57% of the patients did not have cognitive impairment, 29% had mild cognitive impairment and 14% had severe cognitive impairment, as shown in graph 1.

Regarding the results of the Barthel Index questionnaire, 6 patients were independent, 11 slightly dependent, 1 moderately dependent and 3 severely dependent, as shown in graph 2.

Regarding the patients who were classified as severely dependent on the Barthel Index, 66% of them did not perform physical activity and 33% did it, while the patients who were classified as independent, 50% of them performed physical activity immediately before admission and another 50% did not. performed. Considering comorbidities, there was no relationship between pre-existing comorbidity and a worse patient classification in the Barthel Index.

When we verified whether there was a relationship between the BI and the 10CS cognitive screening, no patient who presented BI with a severely dependent classification presented a result with severe cognitive deficit
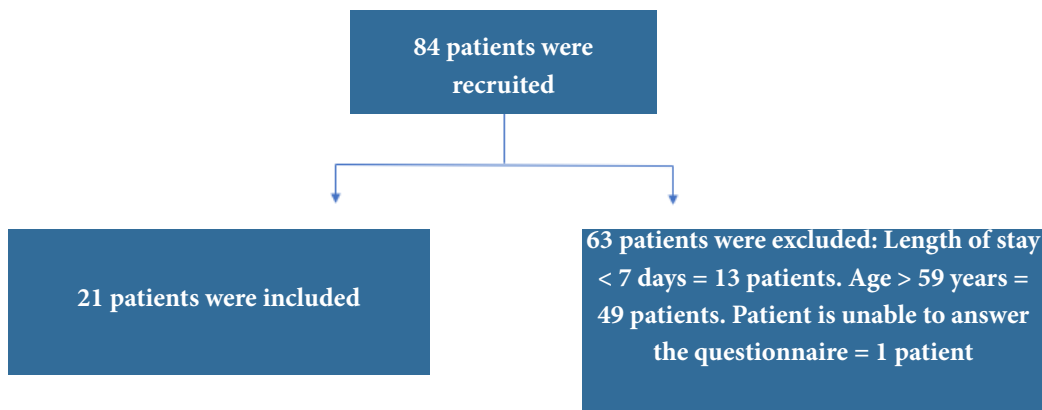
Flowchart 1. Data collect

| Patient characteristics	Results
Age	43,04±(31-55) years
Gender	52,38%, male
Passage through the ICU	57,14, yes
Functional independence before admission	100%, yes
Physical activity	52,38%, yes
Walk	38,09% (8)
Work out	9,52% (2)
Run	4,76%(1)
martial arts	9,52% (2)
length of stay	9±2 days
Known illness before admission	49,3%, yes
systemic arterial hypertension	23,80%
diabetes mellitus	16,02%
Depression	4,76%
Chagas disease	4,76%

Table 1. Characteristics of patients hospitalized for COVID-19.

Table 1. Characteristics of patients regarding age, gender, passage through the ICU, functional independence before admission, physical activity (walking, weight training, running, martial arts), length of stay, known disease before admission (high blood pressure, diabetes mellitus, depression, Chagas disease).
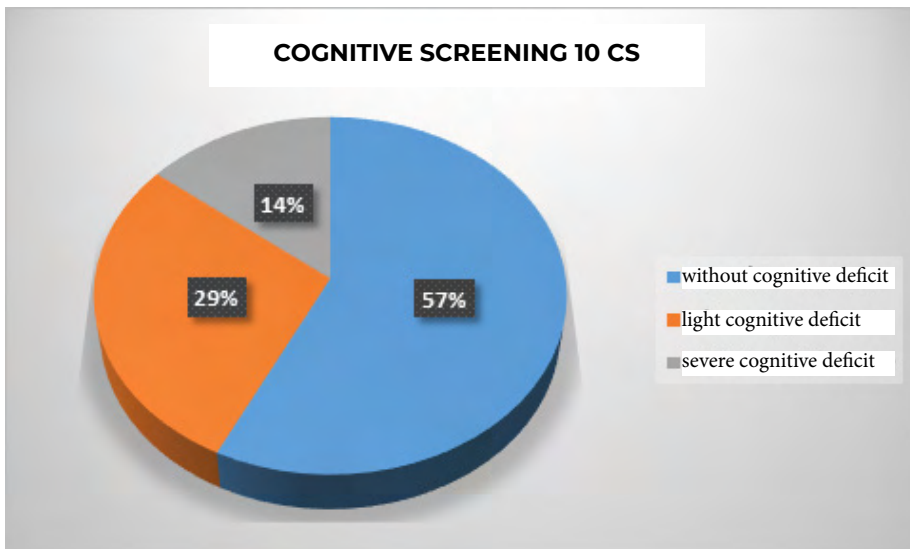
Graph 1. Cognitive Level assessed by the 10-CS Screening

Graph 1. Cognitive screening 10-CS representing in blue the percentage of patients who do not have cognitive impairment, in orange the percentage of patients who have mild cognitive impairment and in gray the percentage of patients who have severe cognitive impairment.
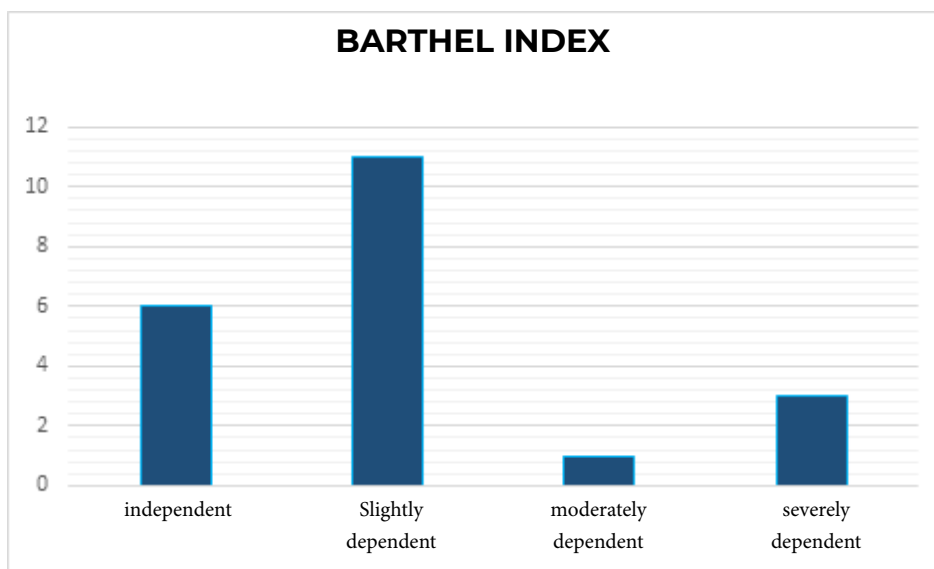
Graph 2. Questionnaire: Barthel Index

Graph 2. Barthel index illustrating independent percentage, slightly dependent, moderately dependent, severely dependent

in the 10CS Cognitive Screening.

DISCUSSION

COVID-19 is a virus that affects both men and women. Some studies indicate that, in fact, there is a difference in contagion between genders and this factor may be correlated with the hierarchical, social and cultural issue in which men work to support the house and women historically have the most domestic service performing tasks at home. (LOYOLA, 2020; MEDRADO et al., 2021; MOREIRA et al., 2020). Drawing a parallel with this study, we cannot point out a significant difference in terms of gender in our sample of patients (52.38% were male). Age is another major factor in COVID-19. The world population as a whole is susceptible to being affected by COVID-19, but it is known that the patients who are most severely affected are mostly elderly (MACINKO et al., 2020; ROMERO et al., 2021). ; SILVA et al., 2021). With the process of vaccination of the elderly population more advanced, younger people began to be more seriously affected (ESCOBAR; RODRIGUEZ; MONTEIRO, 2020). Thus, in this population, young patients with comorbidities are those who normally develop the most severe form of the disease (MALTA et al., 2021).

Even in the case of a sample of adult patients, 19% of the patients evolved with classification moderate or severely dependent for functional independence. Studies show that hospitalization for COVID-19 causes several damages to structures and functions of the body fundamental for functionality with the negative impact on muscle mass, strength and function and impairs functional capacity (CHEN et al., 2020; HUANG et al, 2020). Because COVID-19 is a relatively new disease, only a few studies have analyzed the impact of COVID-19 along with the deleterious effects of hospitalization on post-hospital discharge functionality. The scarcity of prognostic studies in patients with COVID-19 shows the need to identify the main effects on mobility, functionality, lung capacity and postural control of these patients after hospitalization (DE GODOY et al., 2021).

Another important issue is that many of these young people have comorbidities associated with physical inactivity and obesity. In this context, the pandemic caused the closure of public environments that encouraged healthy habits, leaving the population even more at the mercy of a sedentary lifestyle and away from the practice of physical activity (DA SILVA et al., 2021). In our study, there were no better results in relation to the Barthel index related to physical activity. This can be explained because the consequences generated by hospitalization in ICUs or longer hospitalizations end up generating muscle weakness related to immobility, low blood glucose and neuromuscular blockers commonly used for these patients (SILVA; SOUSA, 2020). Even in high-performance athletes, as well as generating weakness and loss of muscle power, which together generate the fear and uncertainty of returning to sport again (E CÔRTE et al., 2020). Among the 21 participating individuals who were classified as moderately or severely dependent on the Barthel Index, only one was classified in the 10-CS cognitive screening as a normal exam (≥ 8 points), the others varied between mild cognitive impairment and severe cognitive impairment. According to a study conducted in England by Varatharaj et al., 2020, it was seen that altered mental status is common in patients in post-COVID-19 patients who were admitted to hospital with severe infection, especially in those who required intensive care.

Some studies carried out to assess functional independence of patients with COVID-19 address the fact that the greatest limitation in the IB would be ambulation

(PÉREZ-RODRÍGUEZ et al., 2021), a fact that coincides with data collected in this research, with the cognitive was not differently, some studies recommend the application of 10-CS cognitive screening as a screening method (DE GODOY et al., 2021).

The long-term post-contamination effects of COVID-19 are unknown and feared (ROSA et al., 2021), as it is not known what the consequences will be in functionality and cognitive deficit. Based on the research carried out in acute patients, it was possible to identify disorders in relation to these two issues, but it is necessary to carry out follow-up of patients to elucidate whether the issues pointed out are related to the hospital environment and recent illness or whether they will be definitive consequences. The physical therapist, as a rehabilitative agent, must be willing to accompany these patients in the medium to long term so that they can effectively track how the resumption of their functionality will be (MELO, 2020).

CONCLUSION

Through this study, we can conclude that post-covid patients who remained hospitalized for more than seven days will be able to return to society with deficits, even if mild, in their activities of daily living, especially walking and climbing stairs, as well as cognitive deficits in relation to the time/space/memory recognition. Despite the small sample size, our findings can guide physical therapists treating COVID-19 survivors in the development of adequate rehabilitation programs, especially in the impairment of functional and muscular performance.

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