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Original Article

Occupational Therapy intervention in the training of activities of daily living with patients affected by COVID-19 in inpatient units of a university hospital

Atuação da terapia ocupacional no treino de atividade de vida diária com pacientes acometidos pela COVID-19 em enfermarias de um hospital universitário

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Abstract

Introduction: COVID-19 causes multisystemic compromises, resulting in functional impairments, mainly related to the Activities of Daily Living (ADLs). Therefore, the occupational therapist is one of the professionals needed to favor the rehabilitation process. **Objective:** To analyze the proportion of ADLs training and the main activities that were trained with patients with COVID-19. **Method:** This is a documental study developed in a teaching hospital in the southeast region of Brazil. Occupational therapy records were analyzed in electronic medical records of patients admitted to COVID-19 infirmaries between June 2020 and January 2021. **Results:** The prevalence of occupational therapy attendances was 53.1%. The patients who were prioritized were those restricted to bed, with worse functionality and longer hospital stay. In all, 413 attendances were performed; the average per patient was three, the minimum was one, and the maximum was 15. The proportion of ADLs training was 76.9%. The most trained activities in the infirmaries by the occupational therapy team were feeding (96.8%), personal hygiene (93.9%), and functional mobility (59.8%). **Conclusion:** The development of this study promoted the discussion of the careful multidimensional analysis performed by occupational therapists to carry out ADLs training with patients diagnosed with Covid-19 hospitalized in wards. Furthermore, it brought important results related to the profile of the patients seen, the proportions of interventions aimed at ADLs training and the elements that guided this practice.

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Keywords: Covid-19, Activities of Daily Living, Rehabilitation, Health Records; Personal, Occupational Therapy Department; Hospital.

Resumo

Introdução: A Covid-19 acarreta comprometimentos multissistêmicos, ocasionando prejuízos funcionais, principalmente voltados às Atividades de Vida Diária (AVDs), sendo imprescindível a atuação do terapeuta ocupacional no processo de reabilitação. **Objetivo:** Analisar a proporção de treino de AVDs e as principais atividades treinadas com pacientes com Covid-19. **Método:** Trata-se de um estudo documental realizado em um hospital universitário da região sudeste do Brasil. Foram analisados registros da terapia ocupacional em prontuário eletrônico de pacientes internados em enfermarias de Covid-19, entre junho de 2020 e janeiro de 2021. **Resultados:** A prevalência de atendimentos terapêuticos ocupacionais foi de 53,1%. Os pacientes atendidos estavam restritos ao leito, com maior dependência para as AVDs e mais tempo de hospitalização. Foram realizados 413 atendimentos no total, sendo que a média por paciente foi de três, o mínimo de um e o máximo de 15. A proporção do treino de AVDs foi de 76,9%. As AVDs mais treinadas foram alimentação (96,8%), higiene pessoal (93,9%) e mobilidade funcional (59,8%). **Conclusão:** O desenvolvimento deste estudo promoveu a discussão da análise multidimensional cuidadosa, realizada por terapeutas ocupacionais para efetuar o treino de AVDs com pacientes diagnosticados com Covid-19, internados em enfermarias. Ademais, trouxe resultados importantes relacionados ao perfil dos pacientes atendidos, às proporções das intervenções voltadas ao treino de AVDs e aos elementos que nortearam essa prática.

Palavras-chave: Covid-19, Atividades Cotidianas, Reabilitação, Registros Pessoais de Saúde, Serviço Hospitalar de Terapia Ocupacional.

Introduction

Coronaviruses can cause multisystem involvement in different species of animals, however, some subgenera affect humans with varied symptoms, from common colds to more critical cases, such as Severe Acute Respiratory Syndrome (SARS). At the end of 2019, a pneumonia of unknown etiology was detected in China, originating from the Sars-CoV-2 virus, called Covid-19 (Cascella et al., 2022).

The transmissibility of the disease occurs mainly through contact with people who are symptomatic or asymptomatic with Covid-19 or with contaminated surfaces, and through exposure to procedures that generate aerosols that contain the virus (Cascella et al., 2022).

The main clinical manifestations developed by people diagnosed with Covid-19 include: cough, malaise, myalgia, fatigue, dyspnea, nasal congestion, headache, anosmia, ageusia, sore throat, nausea or vomiting, and gastrointestinal symptoms – such as diarrhea (World Health Organization, 2020).

Some risk factors are: elderly aged 60 years or older; children under 5 years old; pregnant women; indigenous population with difficulty accessing the health network; people with previous comorbidities — pulmonary, renal, hematological, cardiovascular,

hepatic diseases; metabolic disorders; neurological disorders; and people with immunosuppression associated with neoplasms, HIV/AIDS and the use of medications (Brasil, 2020).

The stages of the disease are classified according to severity: asymptomatic infection, mild, moderate, severe, or critical illness. In a study carried out by Stokes et al. (2020), the incidence of hospitalization is associated with people with preexisting health conditions, such as cardiopulmonary diseases and diabetes. For Cascella et al. (2022), individuals who have moderate to critical symptoms of Covid-19 need to be hospitalized for continuous monitoring and treatment.

Patients with Covid-19 who require hospitalization experience different levels of functional disability. Sales et al. (2020) found that damage to the cardiopulmonary system interferes with clinical severity, impairing lung function and structures, which causes exacerbation of symptoms and difficulties in performing Activities of Daily Living (ADLs) and performing physical exercises. Postigo-Martin et al. (2021) stated that there is also impairment of the cardiovascular, neuromuscular, and mental health of individuals. In addition, the authors emphasized that hospitalization, admission to an Intensive Care Unit (ICU), the use of mechanical ventilation and sedative medications can contribute to the functional impairment caused by Covid-19.

Thus, bearing in mind that hospitalization - mainly as a result of Covid-19 - causes disruption of everyday life, distancing from culture and the family context and leads to physical, cognitive, psychological, emotional and social impacts, and considering the implications of disease in occupational performance, that is, in carrying out desired occupations for individuals, at the beginning of the pandemic, it was observed the need to compose a multidisciplinary team to act on the front line of Covid-19, in order to provide comprehensive care to hospitalized patients. Among the professionals, the occupational therapist was included (Associação Americana de Terapia Ocupacional, 2020, 2020; Silva Cunha et al., 2020; Maia et al., 2022).

In the hospital environment, occupational therapists can work in different contexts with individuals with Covid-19: ICU, wards and post-Covid outpatient clinic. This professional uses their skills to favor the rehabilitation process, modifying, adapting, and grading activities, taking into account occupational performance, roles, performance skills, contexts and environments, as well as the patient's interests (Carmo et al., 2020; Gonçalo et al., 2020).

Studies have shown that there is a need for an individualized and early rehabilitation program, with specific interventions to favor engagement in ADLs. These interventions cannot be supporting, which confirms the need for an occupational therapist (Tiantian et al., 2020; De Biase et al., 2020). In a randomized controlled study that sought to investigate the effects of six-week respiratory rehabilitation on various functions in elderly patients with Covid-19, it was found that there was no significant improvement in the performance of ADLs in the intervention group compared to the control group (Liu et al., 2020).

Furthermore, limitations in the performance of ADLs remain, in many cases, when the disease is no longer active (Spruit et al., 2020), with few studies focusing on this approach being found in the literature, making it essential to develop new research to enable the rehabilitation process in patients with Covid-19 more effectively.

Among the interventions carried out by occupational therapists, ADL training stands out. According to the American Occupational Therapy Association (Associação Americana de Terapia Ocupacional, 2020), the term ADLs refers to activities aimed at caring for the individual with his own body and are essential for survival. It should be noted that, according to Resolution No. 316/2006 (Brasil, 2006) of the Federal Council of Physical Therapy and Occupational Therapy (Coffito), it is exclusively up to the occupational therapist to assess performance skills, prepare the occupational therapeutic plan and analyze, execute, grade, guide, and train ADLs.

By considering the impact that Covid-19 causes on the performance of ADLs in hospitalized patients, as well as the importance of the occupational therapist in this process, this article has the general objective of analyzing the proportion of ADL training and the main activities that were trained with patients with Covid-19 in wards. The specific ones are: 1) discussing guiding elements of the occupational therapist's work with this public at the time of screening and initial assessment; 2) calculate the prevalence of patients assisted by the occupational therapy team; 3) identify the clinical and functional profile of these patients; 4) analyze the main ADLs that were trained with patients with Covid-19 and what were the guiding elements for training.

Method

This is a documentary, descriptive and exploratory study, with a quantitative and qualitative approach, developed in a university hospital. Documental research goes through the collection of data from primary sources, belonging to public archives; private files of institutions and households, and statistical sources (Marconi & Lakatos, 2017).

The documents analyzed were the records of occupational therapists in the electronic medical record of patients hospitalized in Covid-19 wards, carried out in the period between June 2020 and January 2021. The minutes of the weekly meetings and the notes taken in this interim by occupational therapists about the actions taken and the crossings identified.

The university hospital, site of this research, is a care space of a federal university in the Southeast Region of the country, which acts as a reference in the treatment of several highly complex diseases, such as Covid-19. At the beginning of the pandemic, a crisis office was formed in order to coordinate, direct and analyze actions aimed at this public. In March 2021, one year after the confirmation of the first suspected case, the hospital had 54 beds qualified for these patients, 32 in the ICU and 22 in the ward, according to the COVID-19 panel made available during this period (Hospital Universitário Clementino Fraga Filho, 2021).

Hospitalized patients were assisted by a team of physicians, nurses, occupational therapists, social workers, psychologists, speech therapists, physiotherapists, and nutritionists. Occupational therapy consultations took place through inter-consultation or through active search – when occupational therapists started the follow-up after screening the patients in the sector, based on the reading of the medical records.

The inclusion criteria were: electronic medical records of patients diagnosed with Covid-19, who had received at least one occupational therapy session in the isolation wards due to Covid-19 in the aforementioned period. Exclusion criteria were: records with insufficient data and patients located in other sectors of the hospital, such as the

ICU and emergency room. This research was approved by the Ethics Committee for Research in Human Beings, according to Resolution N. 466/2012 of the National Health Council (CNS), under the number: 35794920.1.0000.5257.

Data collection

A survey was carried out of the records of all hospitalizations in Covid-19 wards in the hospital's electronic system. The observed variables were: gender; age; hospitalization period; readmission (yes/no); outcome (discharge or death); comorbidities (yes/no); occupational therapy assessment; eligibility for follow-up; number of occupational therapy appointments; amount and types of invasive devices used; use of supplemental oxygen; supplemental oxygen flow in the assessment of occupational therapy; restriction to bed due to bodily functions (yes/no). It was verified, through the records in the medical records, whether the patient was being followed by other specialties (speech therapy, physiotherapy, and psychology), in addition to nursing and medicine.

Data were extracted from the medical record on the general condition of the patient, vital signs, and the conduct of professionals. Regarding occupational therapeutic behaviors, the information recorded were: interventions carried out, monitoring of vital signs, outcome of the activity and the presence of intercurrences.

It was verified, in the records, the presence of environmental barriers for the performance of ADLs, such as the positioning of the meal table far from the bed (yes/no), distance from the bed to the bathroom (yes/no) and the presence of an extender of oxygen longer than three meters for patients with ventilatory support (yes/no).

In addition to the aforementioned information, the results of the evaluations used to analyze the patients' ADLs were searched in the records. The evaluations used were the Barthel Index and the Functional Independence Measure (FIM). Barthel Index scores range from 0 to 100 in five-point intervals, with higher scores indicating greater independence. A score of 100 points indicates that the person is completely independent and, below 50 points, severe dependence (Barros et al., 2009). The records made based on the FIM were used for planning interventions aimed at ADLs.

FIM is divided into two parts. In the first, in the motor aspect, eating activities, personal hygiene (oral hygiene, washing hands and face, shaving or makeup), bathing, dressing the upper and lower half, using the toilet, controlling urine, controlling stool, transfers (bed to chair or wheelchair and vice versa), transfer to toilet, transfer to bathtub or shower, locomotion, and going up and down stairs. In the second part, the cognitive assessment considers the following aspects: comprehension, expression, social interaction, problem solving and memory (Riberto et al., 2004; Ryomoto et al., 2017).

With regard to the information contained in the minutes of the weekly meetings and in the notes taken by the occupational therapists, the situational diagnosis was collected as a tool for planning and organizing the occupational therapy work process, as well as the reasoning used to guide the assessment, interventions and records in medical records in the care of patients with Covid-19.

For the evaluation of the documents used in this research, the critical analysis of the document was used – the organization, description, and characterization of the material,

as well as the filing, survey of recurrent information and categorization (Moreira, 2008). All stages were developed through successive and systematic readings in which we sought to identify and contextualize guiding elements for occupational therapeutic practice and the main interventions carried out. In addition to this step, the information related to the interventions was categorized and recorded in a database in an Excel® spreadsheet with double entry of the categories.

The database was imported into the Statistical Package for The Social Sciences – SPSS software, version 21.0. Finally, data were submitted to descriptive analysis (absolute and percentage frequencies), and, for categorical variables, bivariate analysis was performed, using Pearson's chi-square (X)2 test. The variables "functional disability for ADLs", "age" and "hospitalization time" were considered numeric, calculating the average and applying Student's t test for comparison between groups (occurrence or not of therapeutic care occupational). This study considered a 95% confidence interval and a significance level of $p < 0.05$.

Results

Guiding elements of the occupational therapist's performance at the time of screening and initial assessment

In May 2020, occupational therapists gathered to present a proposal for action on the front lines of the pandemic and ratify its importance to the community. The gap between the declaration of a state of Public Health emergency of national relevance by the Ministry of Health and the entry of occupational therapy in the ward and Covid-19 ICU sectors of the aforementioned hospital was one month.

Initially, the hospital's priority was to establish emergency measures and a minimum team that was capable of treating patients with Covid-19. In addition, there was a delay in the release of Personal Protective Equipment (PPE) for the occupational therapy team, mainly due to the shortage experienced in the pandemic period.

While the team was waiting for the release, the situational diagnosis was carried out. It was observed that the 22 beds in the Covid-19 wards were occupied, resulting in a high workload for nursing, especially with patients who needed full assistance for ADLs — which brought the constant demand for PPE to be dressed and undressed.

In the preliminary actions, as described in Figure 1, a thorough reading of the clinical condition of patients with Covid-19 was carried out: personal and clinical history, state of cardiovascular, respiratory, neurological and musculoskeletal functions, as well as associated mental health problems to isolation; presence of ventilatory support, level of consciousness, vital signs, test results and diagnoses from other professionals on the team.

As part of this work, a table was built to facilitate the understanding of barriers and facilitators for occupational performance, and the definition of interventions to be implemented, as described below, in Table 1.

Table 1. Questions to direct clinical reasoning and therapeutic planning.

1. What is the reason for hospitalization?
2. Is the patient hemodynamically stable?
3. Regarding the clinical picture, does the patient have a mild, severe or moderate illness?
4. Does the patient have any comorbidities? If so, which ones?
5. Was the patient referred to the emergency ward or the ICU? If referred to the ICU, how long was the stay?
6. Did the patient need mechanical ventilation? Did they use medication for sedation?
7. Regarding the level of consciousness, patient is sedated, stuporous or drowsy, alert, and calm or agitated?
8. With regard to the ventilatory situation, does the patient need oxygen support? If so, which device was used? Is the patient dependent on low, moderate or high flow oxygen?
9. What symptoms are present at the moment?
10. Have there been any complications in the last 24 hours?
11. Which medications is the patient using?
12. What devices are being used (venous access, urinary catheter, infusion pump, nasogastric/enteric tube (NGT/ENT), electrode for monitoring, tracheostomy, mechanical containment, nasal catheter or oxygen reservoir mask)?
13. Regarding the type of nutrition, is the patient receiving oral, enteral, or parenteral nutrition?
14. Is the patient bedridden?
15. Does the patient have clinical stability to be at the bedside and/or engage in an out-of-bed activity?
16. Wha tis the peripheral oxygen saturation and the values resulting from Arterial Gasometry?
17. Does the patient have any changes in laboratory tests, for example: blood count (Rate of platelets, leukocytes, hemoglobin, d-dimer) and arterial gasometry?
18. Which specialties are monitoring the patient?

Source: Elaborated by the authors, 2022.

In the second stage, "actions with the patient", as described in Figure 1, the occupational therapists created an evaluation script in order to facilitate this process. In the clinical examination, vital signs, signs, and symptoms were evaluated: Heart Rate (HR), SpO2, Respiratory Rate (RR), Blood Pressure, pain (location, characteristic and intensity), fatigue, malaise, dyspnea, anxiety and somnolence. Other aspects evaluated were mobility in and out of bed, cardiopulmonary resistance to start and complete an activity without a significant decrease in SpO2, level of assistance for ADLs and the patient's physical capacity through the Metabolic Equivalent of Task (MET). The MET measures the amount of energy required, based on rest, to perform a given task (Colombini et al., 2017).

In assessing the occupational history, the necessary information included biographical data, occupational roles, desires, interests, and priorities in relation to treatment. In this assessment script, the team also included the need to register about body functions and structures, performance skills (motor, procedural and social interaction), physical and social environments in the performance of activities, in order to identify the reasons for occupational restriction, and access to resources needed to perform ADLs – materials for bathing and personal hygiene, for example.

In addition, the recording of environmental barriers and facilitators to favor safe performance and engagement in ADLs. There was a need to indicate the distance between the bed and the bathroom, the risks, the positioning of the feeding table, the

length of the oxygen catheter extender so that it would be possible — in case of clinical stability — to carry out ADLs outside from the bed.

To complement the information on occupational performance, two validated instruments were used, the Barthel Index and the FIM. The first was chosen because its application is quick and easy for the patient to understand. On the other hand, it provides less detailed information about the level of independence, like FIM. Therefore, occupational therapists began to use FIM in a complementary way, in order to favor the planning of interventions.

In addition to the cited instruments, it was verified, still in this second stage "actions with the patient", the need to use other standardized measures, in order to measure aspects that interfered in the occupational performance. To screen cognitive functions and delirium, when necessary, they used the Mini Mental State Examination - Meem (Terazawa et al., 2018) and Confusion Assessment Method - CAM (Fabbri et al., 2001) instruments, respectively. The identification of symptoms and their intensity were recorded using the Edmonton Symptom Assessment Scale – ESAS-r (McKenzie et al., 2020). In assessing the level of pain intensity, the Numeric Verbal Scale - VNS (Martinez et al., 2011) was used. The Borg Scale – Modified evaluated the subjective perception of effort while performing an activity (Marques Júnior, 2013). In addition, for functional stratification of patients in Palliative Care, the Palliative Performance Scale - PPS (Fiorentino et al., 2020) was used. Occupational therapists underwent training to apply these instruments.

In short, the occupational therapists considered in the evaluation process: the general clinical examination, the profile evaluation, and the occupational performance. It should be noted that the assessment script was created based on the Structure of Occupational Therapy Practice: Domain and Process (Associação Americana de Terapia Ocupacional, 2020).

It was part of the last stage "actions after evaluation", Figure 1, carrying out the occupational therapeutic diagnosis. After a thorough analysis of the collected information, the diagnoses were composed with the following structure: description of the restrictions in the areas of performance, presence of limitations in the motor skills, process and social interaction, limitations in the performance functions and, finally, when pertinent, of the limitations in body structures and contextual barriers. Below is an example of an occupational therapeutic diagnosis described in a medical record.

> Needs total assistance for Activities of Daily Living. In addition, presents a decrease in saturation and fatigue during the performance of activities with low energy expenditure, even with assistance. Presents limitation of motor skills and social interaction, impoverished routine, focusing on clinical issues, decreased volition to engage in occupations, and impoverishment of everyday life. The organization of care and the physical environment act, at times, as barriers to occupational performance. The patient brought as a priority talking to the family daily and performing oral and personal hygiene independently. (Excerpt extracted from the medical record, page 02).

In order to facilitate the planning of occupational therapy interventions and the records in the medical records, the professionals established an action plan, according to Figure 1.

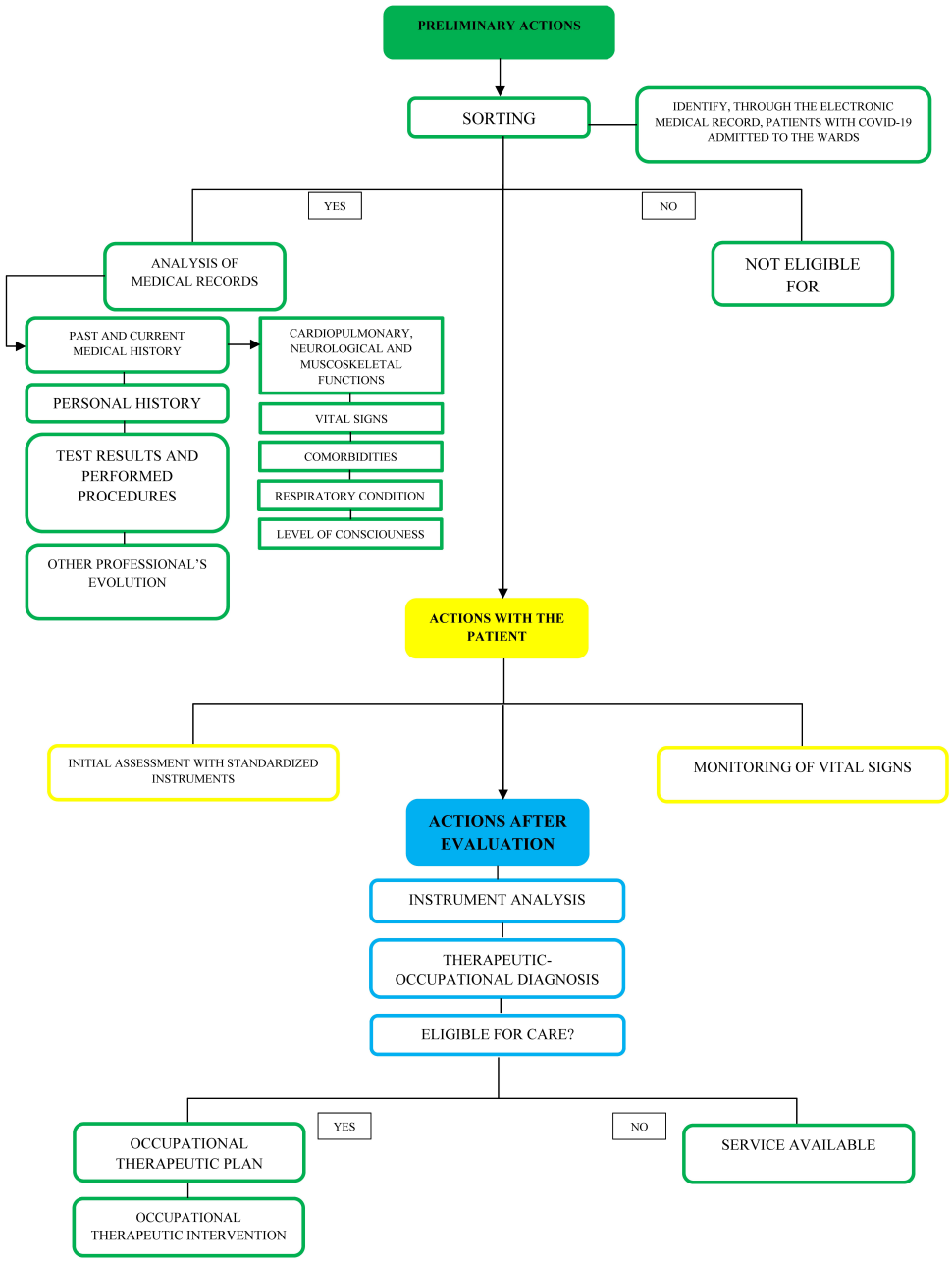

Figure 1. Plan of action.
Source: Elaborated by the authors, 2022.

Prevalence of patients assisted by occupational therapy ancd the clinical and functional characterization of these patients

The prevalence of occupational therapeutic care was 53.1%, that is, of the 243 patients hospitalized in the meantime, 129 received occupational therapeutic care. In all, 413 consultations were carried out, with an average of three per patient, a minimum

of one and a maximum of 15. Patients with Covid-19 were assisted by four occupational therapists, who were divided up to attend to this public on a daily basis. In all, there were 22 beds in the ward (Hospital Universitário Clementino Fraga Filho, 2021).

Most patients treated were female (55.0%), with a mean age of 62 years, with a minimum age of 20 and a maximum age of 96 years. With regard to the devices used, 21.6% of the patients used an indwelling urinary catheter, 3.7% used a tracheostomy, 2.4% used different types of drains, 8.2% used a double-lumen catheter, 13, 5% needed SNG/NET, 95.5% had peripheral venous access and 77.6% used oxygen therapy. The average hospitalization time was 36 days.

The mean previous functional capacity (78 points) of the patients who received care from the team was higher than that measured at the time of the assessment (50 points) ($p > 0.001$). The main outcome was hospital discharge, with 86.4%. Of these, 13.6% needed to be readmitted. In addition to occupational therapeutic care, 20% of the patients were monitored by the speech therapy team, 13.9% by psychology and 75% by physiotherapy.

Comparing the groups (patients who received occupational therapeutic care and those who did not), the highest proportions of patients who received care were bedridden ($p < 0.001$); were female ($p = 0.010$); were more dependent on ADLs ($p < 0.001$) and stayed longer in hospital ($p < 0.001$), as shown in Table 2.

Table 2. Frequency distribution of clinical and functional variables, according to the occurrence of occupational therapy sessions, 2020 (n = 243).

Variables	Occupational therapeutic service		*p**
	Yes	No	
	n (%)	n (%)	
Sex			
Male	43 (37.7)	71 (62.3)	0.010
Female	71 (55.0)	58 (45.0)	
Age (in years) (mean ± SD)	64 ± 15.7	59 ± 17.0	0.156
Hospitalization time (mean±SD)	35.54 ± 15.5	12.45±9.9	< 0.001
Bedridden			
Yes	104 (80.6)	25 (19.4)	< 0.001
No	26 (22.8)	88 (77.2)	
Barthel index in the assessment of ADLs (total score) (mean±SD)	29.30 ± 20.5	69.0 ± 15.5	< 0.001
Total and severe dependence of ADLs (≤ 50 points) in the assessment			
Yes	97 (75.2)	32 (24.8)	< 0.001
No	9 (7.9)	105(92.1)	

SD: Standard deviation; ADLs: Activities of Daily Living. **p-value*.

Proportion of ADL training, as part of occupational therapeutic intervention, with patients with Covid-19

The proportion of ADL training was 76.9%. The environmental barriers that hindered the performance of ADLs were identified: positioning the meal table far from

the bed (63.5%), distance from the bed to the bathroom (55.0%), and the absence of an oxygen extender greater than 3 meters for those patients in need of ventilatory support (43.2%).

As for modifiable factors, the occupational therapy team advised the other professionals on the importance of keeping the table and hygiene and food objects close to the bed and on the most functional side for the patient, favoring reach and use. This information was also recorded in the medical record. To facilitate access to the bathroom for patients who walked around safely and did not present a risk of desaturation on exertion and falls, but who were using continuous supplemental oxygen that restricted them to the bed, an attempt was made to articulate with the team the change of bed for more next to that space.

The most trained activities were eating (96.8%), personal hygiene (93.9%) and functional mobility (59.8%). Training focused on bathing (40.8%), using the toilet (26.2%) and dressing/undressing (0.6%) were also carried out.

Regarding energy expenditure, occupational therapists highlighted bathing in the medical records as the activity with the highest energy expenditure and risk of adverse events, followed by functional mobility. For this reason, the ability to safely perform activities with a lower MET was first certified before progressing to activities with higher oxygen consumption.

It is noteworthy that 42.4% of patients needed to conserve energy during trained ADLs. The main techniques adopted were: facilitating the demand for physical and procedural skills; eliminate steps; offer more assistance (physical and/or verbal); modify and adapt the environment, favoring the reach and manipulation of objects; minimize movement of unsupported upper limbs; guide more suitable and less expensive positions; and the use of AT resources available, if necessary, such as: a toilet chair for bathing and thickeners for toothbrushes and cutlery, for example.

The organization of the routine was also addressed, considering the energy expenditure of each activity, in order to minimize the exacerbation of symptoms and the worsening of the disease. In this sense, a break between one activity and another was prioritized, respecting the recovery time to the patient's baseline and resting state.

With regard to the occupational goals indicated by the patient, the occupational therapists recorded in the medical records: eating, performing oral hygiene, taking a shower in the bathroom, using the toilet, performing perineal hygiene independently, and in cases of restriction in bed, training the use of the collector to carry out vesico-intestinal eliminations without the need for a professional.

Guiding elements of the occupational therapist's performance during ADL training

Occupational restrictions experienced during hospitalization due to Covid-19 include the presence of symptoms, cardiovascular changes, and preexisting health conditions; the use of devices; and the environmental barriers faced in the hospital context.

Therefore, the team formulated key questions to benefit clinical reasoning before starting ADL training, as shown in Table 3.

Table 3. Key questions to help build clinical reasoning and multidimensional analysis.

1. Is oxygen therapy necessary? Which is the device and stream?
2. What is the SpO2 at rest?
3. What is the target SpO2 for this patient?
4. Is the patient able to maintain supplementation in light activities without O2?
5. Does the patient perform ADLs out of bed (walk to the bathroom; sit/get up from the toilet; take a shower) without the need for ventilatory support?
6. Is the bed close or far from the bathroom?
7. In case of use of nasal catheter, is there an extender to allow the performance of activities outside the bed?
8. Need to increase oxygen supply before/during performance of activities with higher energy expenditure?
9. Are there risks while carrying out the activities?

Source: Elaborated by the authors, 2022.

The following contraindications for performing ADL training out of bed were considered: low SpO2 values — taking into account the patient's baseline SpO2; high oxygen flow; significant changes in blood pressure; lowering of the level of consciousness; dyspnea; and intense effort — greater than 3, according to the patient's perception, assessed by the Esas-r and the modified Borg Scale, respectively (Associação Americana de Terapia Ocupacional, 2020), pain or other specific clinical restrictions. In these cases, any discomforts were reported to the team and managed.

To guide the training of food and personal hygiene, the most prevalent activities in this study (96.8% and 93.9%, respectively), key questions were created to help decision-making, as shown in Table 4.

Table 4. Key questions and sample answers to help build clinical reasoning during training in feeding and oral hygiene activities.

Key questions	Example of answers
What devices are in use (venous access, bladder catheter, infusion pump, SNG/ENS, monitoring electrodes, tracheostomy, mechanical restraint, nasal catheter or oxygen reservoir mask)?	Eyeglass-type nasal catheter; venous access in dominant limb
Are there changes in vital signs, in the laboratory (example: thrombocytopenia) and presence of symptoms (ex.: productive cough; oral lesions; bleeding)?	Yes/No (patient reports dyspnea on minor exertion)
Is the diet all allowed?	Yes/No
Regarding the type of nutrition, is the patient receiving oral, enteral or parenteral nutrition?	Oral
Is water released? If so, is a thickener needed?	No thickener
Are there signs of dysphagia?	Yes/No
In use of mechanical restraint?	Yes/No
What is the dominant upper limp?	Right/Left
Can the patient sustain attention?	Yes/No
Understands simple commands?	Yes/No
Needs verbal and/or tactile stimulation to perform the activities properly?	Yes/No
Shows motor skills necessary to perform activities?	Yes/No
Shows procedural skills necessary to carry out activities?	Yes/No

Table 4. Continued…

Key questions	Example of answers
Presents functional communication?	Yes/No
Has the necessary objects for these ADLs (for example: toothbrush and toothpaste, glass and water)?	Yes/No
Uses assistive device?	Yes (glasses, cane)
In the ward, is there a tablet o place the objects needed for the activity?	Yes/No
If the activity needs to be performed in bed, are there resources available to enable this training?	Yes/No
Does the patient have the desire to perform oral hygiene/feeding?	Yes/No
Is there exacerbation of symptoms while performing activities? Description; duration; intensity; triggering, concomitant or amelioration factors.	Yes/No (Borg 7/10 and need for breaks during activity)

Source: Elaborated by the authors, 2022.

Based on the questions answered, the training was organized in stages. It was identified that some patients only needed to prepare the environment and the objects necessary to perform the activity (adjust the side rails, bring the table closer to the bed, pick up the necessary objects and open packages, for example), considering that they were restricted to the bed and had adequate motor and procedural skills to perform the other steps independently. Others, who had difficulties in motor and procedural skills, needed training and help from professionals to perform the activity.

As a criterion for food and oral hygiene training, the occupational therapists ensured, through the electronic medical record, about the safety of the oral route evaluated by the speech therapy and medical team.

Discussion

The shortage of professionals and the need for screening for care are reflected in the prevalence of occupational therapeutic care of 53.1% during the research period, in the ward. On the other hand, the same occupational therapists composed the Working Groups on non-oncological palliative care and communication to the family of the patient with Covid-19, dehospitalization projects, Alternative and Expanded Communication in the ICU, other demands in intensive care, in addition to the implementation of the virtual visits project for patients with Covid-19 in conjunction with psychology.

The aforementioned actions were developed by a teacher and an occupational therapist, with the two resident occupational therapists. As the occupational therapy team was not considered part of the minimum team, professionals were not initially hired to work with this public, a challenge present in several institutions. In addition, the need for attire, the limited number of PPE and the reduced number of personnel, therefore, made it difficult to care for all hospitalized patients.

The situational diagnosis made it possible for the team to know the health and risk conditions of a population so that they could later plan and develop more assertive actions in relation to the problems encountered (Silva & Almeida, 2014). It is noteworthy that the practice of the occupational therapist in the hospital context, especially in situations such as a pandemic, requires that they have knowledge that

pervades the physical and material aspects, the main demands of the place, identifying weaknesses and strengths, as well as evaluations and measurements of its performance.

Another fundamental step was the structuring and planning of interventions and records in the medical records. For this step, professionals should consider ethical and legal aspects, quality of care, the need to produce productivity indicators and create robust evidence on occupational therapeutic interventions (Bombarda & Joaquim, 2019). This research, for example, was based on medical records, confirming the importance of this stage in the work of occupational therapists.

Therefore, to favor the construction of documentary research, occupational therapists need to be concerned with structuring information and creating strategies that can strengthen data quality (Buchanan et al., 2016; Bombarda & Joaquim, 2019).

Furthermore, registration in medical records by occupational therapists constitutes a mandatory procedure (Brasil, 2012), confirming the need for professionals to dedicate themselves to structuring and planning this activity.

Based on the results, it was found that most patients who received care were confined to bed, had more functional dependence for ADLs and stayed longer in hospital. It should be noted that patients diagnosed with Covid-19 may experience exacerbation of symptoms, such as fatigue, myalgia, and dyspnea, as well as cardiovascular changes that, together with previous comorbidities, lead to a decrease in occupational performance (Rich et al., 2020). In addition, the use of invasive and monitoring devices contributes to a longer time spent in bed, interfering with the performance of ADLs (Silva et al., 2019).

Another aspect that can contribute to the decrease in functionality is the length of hospitalization, which can increase the duration of restriction or bed rest, causing loss of independence and autonomy of patients. Likewise, prolonged time in ICU can cause multisystemic consequences (motor, cognitive and psychological), due to the development of Post-Intensive Care Syndrome or Post-ICU Syndrome (Rawal et al., 2017). It should be considered that patients hospitalized in this sector usually require ventilatory support (invasive or not) with the use of devices such as a nasal catheter, oxygen mask or mechanical ventilation and the use of medications with a sedative effect, which impairs the performance of ADLs (Pereira et al., 2014; Oliveira et al., 2019; Muñoz-Valverde & Martínez Zujeros, 2020).

Environmental factors can also act as facilitators or barriers to dependence on ADLs, suggesting that their modification can facilitate effective participation in these activities (Organização Mundial da Saúde, 2011; Gomes et al., 2021). In this study, the physical environmental barriers of the wards contributed to occupational restriction.

The aforementioned aspects may have contributed to the high proportion of ADL training as part of occupational therapeutic interventions with this public. According to Kho et al. (2020) and occupational therapy guidelines and recommendations made available by the Saudi Arabian Ministry of Health (Saudi Arabia, 2020), the role of occupational therapists in early rehabilitation for performance in ADLs aimed at patients with Covid-19 encompasses patient education and awareness about the perception of signs and symptoms; adaptation and modification of activities, using energy conservation strategies and Assistive Technology (AT) devices, if necessary; and the gradual return to performing activities, according to the clinical stability and tolerance of each patient, starting with the light ones and gradually increasing the demand.

The activities most trained by occupational therapists were food and oral hygiene. This result can be understood by two factors: the greater proportion of patients attended was restricted to the bed ($p < 0.001$), signaling the need to modify these activities by facilitating the reach of objects and environmental changes, in order to favor performance more autonomous; and the relationship between performing these activities with increased metabolic and ventilatory consumption (Couser Junior et al., 1992; Karagiannis et al., 2020), considering that to perform them, patients need to perform movements with the upper limbs not sustained and against gravity.

In addition, muscles such as the trapezius, pectoralis minor, scalenes and intercostals, necessary for food and personal hygiene, have postural and ventilatory functions (Couser Junior et al., 1992; Karagiannis et al., 2020), which are often compromised in Covid-19, which facilitates the exacerbation of fatigue and dyspnea — justifying the demand for recovery from the aforementioned activities.

It is noteworthy that activities associated with upper limb movements with trunk flexion and rotation increase ventilation and ventilatory demand. The findings of the studies showed that activities that require these movements reach higher values of their metabolic demand and desaturation (Castro et al., 2013; Barusso-Grüninger et al., 2017).

As for functional mobility, the American Association of Occupational Therapy describes this term as the individual's ability to walk effectively, move from one position/place to another and perform transfers (Associação Americana de Terapia Ocupacional, 2020). This ADL was one of the most impacted in patients hospitalized with Covid-19 because it demands more ventilatory and metabolic effort due to the need to mobilize not only the upper limbs, but also the trunk, hips, and lower limbs.

In this sense, it confirms the importance of occupational therapists considering functional mobility as part of their objectives, since it is essential to participate in activities in bed and outside (such as using the bathroom). Training functional mobility favors proper positioning in bed and in a sitting position, contributing to reaching, manipulating, and moving objects into the visual field. It also reduces the need for assistance from the nursing team and prevents complications such as pressure injuries, pain, contractures, and constipation.

Among the main ADLs trained in the study, bathing was the one that consumed the most energy and represented a risk of adverse events in the assessment of occupational therapists because it involves multiple steps: transfers from bed to chair or from bed to orthostatic position; locomotion to the bathroom; get undressed; wash, rinse and dry the body, from the neck to the feet, and the hair; get dressed and return to bed. It is noteworthy that the return of ADLs without guidance can promote an increase in the overload of the cardiovascular and respiratory systems.

Therefore, in order to train this activity with patients who have cardiopulmonary impairment, it is essential to carry out an occupation analysis and use reliable measures to assess patient safety, such as the Borg scale and monitoring of vital signs both at rest and during exercise. effort. In some cases, the patient may have silent hypoxemia and altered perception of exertion, which confirms the importance of evaluating cardiorespiratory parameters, even when the patient does not report or demonstrate discomfort.

The phenomenon described as “silent hypoxemia” associated with Covid-19 occurs when there is a significant drop in SpO2 and changes in other GSA values without patients reporting dyspnea. The absence of this warning sign poses health risks, as

individuals continue to perform daily activities normally, which was found in the study by Tobin et al. (2020), in which, after evaluation, three patients showed changes in GSA values and continued to practice activities, such as communicating with other people, accessing cellphones, and eating, without referring complaints of respiratory distress. In order to consider the feasibility of safely carrying out food training and other ADLs, with the aim of mitigating the exacerbation of symptoms, as well as avoiding the presence of adverse events, occupational therapists evaluated the signs and symptoms using the Esas- r (Monteiro et al., 2013). The reference values for laboratory results (platelet, hemoglobin, leukocyte, and D-dimer rates, for example) discriminated by the Academy of Acute Care Physical Therapy (2019) were also considered, in addition to clinical, cardiovascular, respiratory and neurological parameters, as described by Carmo et al. (2020).

This care is part of the analysis of the occupation in an individualized way, according to the occupational demands, that is, the resources, the physical space, the steps, the necessary performance skills, taking into account, including, the handling of the invasive devices used by the patient. Although the patient's report is of paramount importance for establishing a bond and obtaining information, it is essential to observe the execution of the activity to prevent the risk of adverse events. It should be noted that, unlike other health conditions, the functional decline related to Covid-19 occurs quickly, even in previously healthy subjects (Baker et al., 2021) and, therefore, it is possible that both health professionals and patients underestimate the constraint in performance.

Furthermore, it is important that the demand for more independence in ADLs is shared with the patient, so that it is significant, as suggested by Kamalakannan & Chakraborty (2020).

ADL training, in the Covid-19 ward, followed a gradation based on the MET of each activity. Crepeau & Schell (2011) refer to gradation as the sequential and gradual adaptation of occupational demands in order to stimulate the functionality of patients, taking into account performance difficulties (Colombini et al., 2017).

In this study, 42.2% of patients benefited from energy conservation techniques. The guidelines provided by the occupational therapy team were consistent with those found in the literature (Newton-Wellesley Hospital Department of Rehabilitation Services, 2020).

Incorporating energy conservation techniques into individualized training enabled the engagement of patients with significant pulmonary involvement in their ADLs, as well as educating the subjects about silent hypoxemia and the need for a balance between activity and rest, which has already been observed in previous studies (Mahoney et al., 2020; Rodríguez et al., 2019). Such adaptations, according to the research results, should be gradually reduced to increase the patient's tolerance and return to the highest level of independence in performance, when possible.

Therefore, the results suggest that such techniques should not necessarily be employed in the treatment of all patients with Covid-19. The ability of professionals to indicate the applicability of energy conservation and to differentiate symptoms, such as dyspnea, fatigue and muscle weakness, was essential for the adequate grading of activity and to contribute to timely discharge, by avoiding immobility and other effects of occupational deprivation, in addition to contributing to the rehabilitation of cardiopulmonary dysfunctions — frequency, rhythm, physical resistance, aerobic capacity, vigor and fatigue (Associação Americana de Terapia Ocupacional, 2020).

The progression of the level of independence was made possible, in the sense of greater assistance for less assistance, by modulating the unique demands of each ADL. In practical terms, it was possible to schematize that the stages of remaining in a sitting position or in an orthostatic position, and repetitive movements, such as bringing the spoon to the mouth, brushing the teeth, rubbing and drying oneself, tend to be more exhausting for patients, as evidenced by tachypnea, tachycardia, decreased SpO2, and high blood pressure.

Thus, at first, self-care activities were adapted to be performed with less energy expenditure, that is, in bed, with progressive implementation in the bathroom in a sitting position and, finally, in an orthostatic position. In addition, practicing activities in an orthostatic position can be challenging, depending on the patient's balance functions, cognitive functions and organic deficiencies, which must be carefully evaluated by the occupational therapist.

Final Considerations

For this research to be possible, it was essential for occupational therapists to record all stages of the work process, from situational diagnosis to careful recording of care in the medical record.

The development of this research made it possible to discuss key data regarding the occupational therapeutic process of patients hospitalized with Covid-19, filling an important gap in the scientific literature. There was a high proportion of ADL training as part of occupational therapeutic interventions with patients with Covid-19, with food and oral hygiene being the most trained activities.

The findings of this study also showed the complexity of the analysis carried out by the team before, during and after ADL training, permeating multiple elements, which confirms the importance of the occupational therapist being part of the care team for patients with Covid-19. In view of all this complexity and the professional's expertise in carrying out this analysis, the training of ADLs should be carried out only by this professional, as provided for in the resolution.

All these guiding elements for the occupational therapist's practice were described in detail, in order to improve the practice and the teaching-learning process of other professionals and students in the hospital context. Among the elements, the following stood out: the situational diagnosis; detailed analysis of medical records, seeking information about the patient's personal and clinical history; the evaluation of the impact of organic dimensions, bodily functions and structures, performance skills, contexts and environments on the performance of ADLs; the analysis of each activity to be performed; and indications and contraindications for performing ADL training.

This meticulous and multidimensional analysis allows the occupational therapist to make the best decisions in relation to the public to be prioritized in the consultations, as well as in relation to the training, modification, adaptation and grading of ADLs of patients admitted to the ward due to Covid-19.

In view of the findings, it was verified that the occupational therapist needs to be trained and have access to this type of specific discussions in the hospital context during their training process in undergraduate and postgraduate courses, as well as being able to seek the best evidence to support their interventions.

It should be noted, as a limitation of this study, that the research was carried out based on records, which may be influenced by the social context in which the document was prepared and by its quality.

Despite this, this study is innovative and brings important elements for occupational therapeutic reasoning not only for patients with Covid-19, but also for other diseases with cardiopulmonary involvement. The results of this research will be able to create conditions for occupational therapists to discuss and clarify common problems in this scenario, using an action plan to base operational procedures, in addition to facilitating the obtaining of essential data for the occupational therapeutic diagnosis, the establishment of therapeutic objectives and patient-centered interventions.

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Author's Contributions

Janaína Santos Nascimento and Julliana de Cássia Barros Fonseca: text conception, application of the intervention, organization of sources and/or analyses, writing and revision of the text. Thainá Rodrigues de Melo, Ana Paula Correa Ferreira and Thamires de Matos Ribeiro: application of the intervention, review. All authors approved the final version of the text.

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