RESEARCH ARTICLE (ORIGINAL)

Promotion of self-care in the person hospitalized with COVID-19: Rehabilitation nursing interventions

Promoção do autocuidado na pessoa com COVID-19 hospitalizada: Intervenções de enfermagem de reabilitação

Promoción del autocuidado en pacientes hospitalizados con COVID-19: Intervenciones de enfermería de rehabilitación

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Abstract

Background: COVID-19 appears to have an impact on the functionality and dependence of the infected person, with health and socio-economic consequences.

Objective: Highlight the impact that COVID-19 has on the functionality of the basic activities of daily living of the sample and to highlight the results that rehabilitation nursing interventions have on the restoration of the functionality.

Methodology: Quantitative and retrospective cohort study through the application of a data collection form to 27 people who underwent the rehabilitation nursing program with periodic evaluation of evolution using the modified Katz index and Borg scale.

Results: It was found that COVID-19 generated/aggravated dependence in 96% of the sample and had a significant impact on activity intolerance. After the rehabilitation nursing interventions, there was an improvement in functional status in 93% of the sample and for 96% there was improved activity intolerance, both resulting in an increase in capacity for self-care.

Conclusion: Rehabilitation interventions have had a positive impact on the recovery of functionality, emerging as an asset today.

Keywords: COVID-19; self-care; rehabilitation nursing; health promotion; activities of daily living

Resumo

Enquadramento: A COVID-19 aparenta ter impacto na funcionalidade e dependência da pessoa infetada, com consequências a nível da saúde e socioeconómicas.

Objetivos: Realçar o impacto que a COVID-19 apresenta na funcionalidade das atividades básicas de vida diária da amostra e evidenciar os resultados que as intervenções de enfermagem de reabilitação têm na restauração da mesma.

Metodologia: Estudo quantitativo e retrospetivo de coorte através da aplicação de um formulário de recolha de dados a 27 pessoas que realizaram o programa de enfermagem de reabilitação com avaliação periódica da evolução utilizando o índice de Katz e escala de Borg, modificados.

Resultados: Verificou-se que a COVID-19 gerou/agravou a dependência em 96% da amostra, tendo também um impacto significativo na intolerância à atividade. Após as intervenções de enfermagem de reabilitação constatou-se melhoria do estado funcional em 93% da amostra e 96% melhoraram a intolerância à atividade, traduzindo ambos um aumento da capacidade para o autocuidado.

Conclusão: As intervenções de reabilitação tiveram impacto positivo na recuperação da funcionalidade, surgindo como uma mais-valia atualmente.

Palavras-chave: COVID-19; autocuidado; enfermagem em reabilitação; promoção da saúde; atividades de vida diária

Resumen

Marco contextual: La COVID-19 parece repercutir en la funcionalidad y la dependencia de la persona infectada, con consecuencias sanitarias y socioeconómicas.

Objetivos: Destacar el impacto que presenta la COVID-19 en la funcionalidad de las actividades básicas de la vida diaria de la muestra y resaltar los resultados que las intervenciones de enfermería de rehabilitación tienen en la recuperación de la misma.

Metodología: Estudio de cohorte cuantitativa y retrospectiva mediante la aplicación de un formulario de recogida de datos a 27 personas que se sometieron al programa de enfermería de rehabilitación, con valoración periódica de la evolución mediante el índice de Katz y la escala de Borg modificados.

Resultados: Se comprobó que la COVID-19 generó/agravó la dependencia en el 96% de la muestra y que tuvo también un impacto significativo en la intolerancia a la actividad. Después de las intervenciones de enfermería de rehabilitación, encontramos una mejora del estado funcional en el 93% de la muestra y el 96% mejoró la intolerancia a la actividad, lo que se tradujo en ambos casos en un aumento de la capacidad de autocuidado.

Conclusión: Las intervenciones de rehabilitación tuvieron un impacto positivo en la recuperación de la funcionalidad, por lo que se consideran como un valor añadido en la actualidad.

Palabra clave: COVID-19; autocuidado; enfermería en rehabilitación; promoción de la salud; actividades de la vida diária

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Introduction

The SARS-CoV-2 virus appeared in December 2019 in China, with COVID-19 being the name of the disease caused by the virus (Thomas et al., 2020). SARS-CoV-2 is highly contagious and has an incubation period of 1 to 14 days (Agostini et al., 2021). The degree of severity varies between mild disease, moderate disease (pneumonia without hemodynamic instability), severe pneumonia disease, signs of respiratory distress and hemodynamic instability, and critical disease presenting septic shock or acute respiratory distress syndrome (Direção-Geral da Saúde [DGS], 2020). The clinical manifestations of people with COVID-19 are varied, but most are similar to other pathologies of the respiratory tract, such as fever (89%), dry cough (68%), fatigue/tiredness (38%), expectoration (34%) and dyspnea (20-40%; Thomas et al., 2020). Recently, other symptoms such as anosmia, ageusia, headache and myalgias have been noted (Agostini et al., 2021). Huang et al. (2021) conducted a study with 1,733 people after 6 months of SARS-CoV-2 infection, which revealed that the majority (76%) reported the permanence of at least one of the symptoms: muscle weakness (63%); sleep difficulties (26%), and anxiety and depression (23%). Other studies highlight the persistence of fatigue and shortness of breath in the performance of activities of daily living (ADL) 2 months after hospital discharge and a high rate of readmission in hospital services (Ayoubkhani et al., 2021).

It is not yet possible to estimate, with rigor, the long-term extension of local, systemic comorbidities and sequelae and mainly in the functionality of those who survive after hospitalization. It is known, however, that after the SARS-CoV-1 pandemic in 2002, several biopsychological changes were identified with a negative influence on the functionality and performance of ADL and, consequently, a reduction of quality of life (Glöckl et al., 2020). It is urgent, therefore, to find strategies to minimize the impact that COVID-19 can have on society. The aim of this study is to highlight the impact that COVID-19 has on functionality in basic activities of daily living (BADL), in the person hospitalized with COVID-19, and to highlight the results of rehabilitation nursing interventions that promote self-care, with a view to restoring quality of life.

Background

In view of the current situation, areas of fundamental care to the populations stand out, highlighting, in this context, self-care, understood as the set of actions that the individual himself takes to maintain the functionality of individual basic needs, the goals of which are the preservation of life and personal well-being (Katz & Akpom, 1976). Functional capacity for self-care has been shown to be an indicator of fundamental morbidity, as it underlines the impact of disease/disability on the family, the health system and quality of life (Li et al., 2020). In 2016, WHO announced functionality as the third indicator of clinical outcome, in addition to cure and death indicators. This concept appeared in the context that all diseases accompanied by dysfunction may not be fully cured, with the risk of permanent sequelae, as may be the case with COVID-19 (Zeng et al., 2020).

The term ADL is closely related to self-care, referring to activities performed by the person independently, related to the maintenance of the functions and structures of the organism in a routine way. Within the scope of ADL, this study focuses on BADL: bathing, dressing/undressing, toileting, transferring, controlling sphincters and feeding. These six BADL are hierarchically related to each other and are fundamental to life (Katz & Akpom, 1976).

Current evidence shows that COVID-19 can have a very significant impact on self-care performance, especially in the elderly and people with potentially disabling chronic diseases (Pan American Health Organization [PAHO], 2020; Zeng et al., 2020). Several entities have published recommendations on the clinical approach and therapeutic strategies with a better impact on the person hospitalized with COVID-19, emphasizing that rehabilitation nursing interventions are fundamental in the evolution of health status and should be adjusted to the clinical condition and require a need for constant multidimensional evaluation by professionals with experience in the area (Agostini et al., 2021; Glöckl et al., 2020; PAHO, 2020; Chinese Association of Rehabilitation Medicine, Respiratory Rehabilitation Committee of Chinese Association of Rehabilitation Medicine, Cardiopulmonary Rehabilitation Group of Chinese Society of Physical Medicine and Rehabilitation, 2020; Simpson & Robinson, 2020; Zeng et al., 2020).

The early intervention of rehabilitation nurses can minimize psychological (depression, anxiety, fear) and physiological (pulmonary, musculoskeletal and neurological manifestations) phenomena, as well as the risks associated with immobility in the person with COVID-19, which facilitate phenomena of states of dependence (Agostini et al., 2021; Chinese Association of Rehabilitation Medicine, Respiratory Rehabilitation Committee of Chinese Association of Rehabilitation Medicine, Cardiopulmonary Rehabilitation Group of Chinese Society of Physical Medicine and Rehabilitation, 2020; Thomas et al., 2020; Zeng et al., 2020).

Various studies emphasize that rehabilitation interventions, in addition to improving the quality of life, facilitate early hospital discharge, which is fundamental, given the scarcity of hospital beds, promoting the return to participation in family, social and work life.

At a time battered by the economic crisis, it should also be stressed that this intervention reduces the level of dependency, which also has a very positive impact on the reduction of health costs (Agostini et al., 2021; PAHO, 2020; Simpson & Robinson, 2020; Zeng et al., 2020). Of the published articles, in addition to the epidemiological, economic, and social nature, there are few that reflect on the intervention of rehabilitation nurses and the impact on BADL, which promoted the carrying out of this investigation.

Research question

What is the impact of rehabilitation nursing interventions on the promotion of self-care (in BADL) in the person with COVID-19 hospitalized in the ward?

Methodology

A quantitative and retrospective cohort study, conducted in an internal medicine service dedicated to the care of the person infected by SARS-CoV-2, in a public hospital in Lisbon, Portugal. Data from the sample involved in the study was guaranteed protection and approval was requested from the Direction of the Department of Medicine, the Nursing Department, and the Hospital Ethics Committee (Reference No. 68/21).

The inclusion criteria were people whose functionality, before the symptomatology, allowed them to perform the BADL independently or with slight dependence; participants who had experienced at least three sessions of rehabilitation nursing interventions. Exclusion criteria: confusional state; moderate or total dependence prior to symptom onset; inability to perform rehabilitation interventions independently.

The functionality of the sample (N = 27) was evaluated by the Katz index modified by Sequeira (2010), in the six BADL, including four levels of functionality scored from 0 to 3. This evaluation was performed for three distinct points in time: the basal functional state of the person, described by the person; the functional status at the beginning of hospitalization (initial), and the functional status at the date of discharge (final), which were evaluated by the researchers.

Rehabilitation nursing interventions took place from November 20, 2020, to January 31, 2021. They included a multidisciplinary evaluation and teaching, instruction, and training of the following breathing exercises: control and dissociation of respiratory times; diaphragmatic reeducation (anterior, right and left hemidiaphragm; global) and costal reeducation (global and selective: anterior part; posterior; upper and lower and costal opening). Energy conservation techniques and ventilation optimization were also performed through lateral recumbent/prone positioning and the training and performance of each BADL. All intervention sessions were initially performed once a day, then five times a week, for maximum periods of 30 to 45 min, with intervals.

The progression of the exercises was based on a rigorous monitoring of each individual session, considering the evaluation of vital parameters, including peripheral oxygen saturation (SpO2), before, during and after exercise; evaluation of complementary imaging and clinical imaging tests; anamnesis and physical examination; evaluation of pulmonary function; evaluation of activity intolerance using the Borg scale (applied to the BADL going to the WC); evaluation of functionality in the self-care of BADL through the modified Katz Index and the perception of the person's health status.

Although other parameters are included in the multidimensional evaluation, such as the evaluation of muscle strength through the Medical Research of Council Scale, for this work, only the essential ones for the topic will be reported. Prerequisites were also defined for the performance and suspension of each session, based on hemodynamic stability and symptomatology reported by the person.

After obtaining the respective authorizations, data was collected from July 20, 2021, to July 23, 2021, through the research and analysis of health data in clinical processes. The form for data collection and treatment included three main domains: sociodemographic characteristics and health history; health data from hospitalization; rehabilitation nursing interventions. Data analysis was performed by statistical treatment through a computer program (Excel V 2016) for classification, cross-referencing and data assessment.

The results found in the study are presented in the form of graphs and tables, to elucidate the evolution during hospitalization.

Results

The study population consisted of 27 people, 74% (n = 20) were male and 26% (n = 7) female. Ages ranged from 29 to 82 years old, with 70% aged 50-79. The severity of clinical presentation ranged from 7% moderate to 74% severe and 19% critical. The medical conditions most commonly found in their personal histories were arterial hypertension - HTA (63%); obesity (37%); chronic respiratory disease (33%) and type 2 diabetes mellitus - DM2 (30%). In 59% of the subjects, there were two or more of the above conditions, and 11% refused to give their personal history. In the sample, 78% reported exposure to pollutants: 52% were exposed to tobacco smoke; 11% handled and cut wood, stone, or other similar materials; 7% were exposed to harmful chemicals (such as cleaning agents) and 7% reported frequent exposure to paper handling/cellulose.

At admission, 89% of the sample was under oxygen therapy, and this need was evidenced by the initial normal blood pressure (PaO_2): 81% (n = 23) had values below 70mmHg with an average SpO_2 of 92%. At the end of participation in the program, 78% of the sample no longer needed oxygen therapy, and were discharged with an average PaO_2 of 78.4mmHg and SpO_2 averaging 96%. There were no complications during hospitalization for 63% (n = 17) of the sample, but 15% required medication in SOS once, 7% required SOS therapy two or three times, 11% required high-flow oxygen therapy by nasal cannula (HFNO) and 4% were transferred to intensive care unit (ICU).

Length of hospitalization of the sample ranged from 4 to 17 days, with an average of 9.7 days. None of the subjects in the sample needed rehospitalization, which is considered to be within 10 days of discharge by the institution where the study took place.

Between 3 and 12 sessions of rehabilitation were given to the sample during hospitalization, with a mean number of five sessions per person. Those having more sessions were hospitalized for longer times due to complications associated with COVID-19 or acute chronic diseases.

The diaphragmatic and costal re-education exercises were performed progressively, and the majority of the sample (82%) performed two sets with 12 to 15 repetitions of each exercise. Of the subjects that made up the initial

sample (*n* = 27), there was one person who refused to perform the ventilation optimization intervention in the prone/lateral recumbent position. The others performed this exercise from two to seven times a day, for an average of four times a day. The length of stay in the lateral recumbent position varied between 30 and 90 minutes, with an average of 55 minutes. It was found that the prone position was tolerated by only one person. The remaining subjects tolerated the right and left lateral recumbent positioning.

To monitor the perception of activity intolerance, the modified Borg scale was applied in relation to "toileting" at two points in time (at the beginning of hospitalization - considering the first 24 h - and at the end). At the beginning of hospitalization, the mean activity intolerance was classified by the sample with a score of 7 (very difficult), varying more frequently between 6 (difficult) and 8 (very difficult), corresponding to 86%. At the end of hospitalization, the mean self-perceived value for their intolerance for the same life activity was 3 (mild), varying more frequently between the values of 2 (easy) and 3 (mild), corresponding to 81%.

Regarding dyspnea self-perception, 89% of the sample denied feeling short of breath, as well as its adjacent negative symptoms, while 11% of the population reported dyspnea as a symptom experienced at the beginning of hospitalization. However, during hospitalization, 30% of the people presented episodes of dyspnea: 22% reported one episode, 4% reported two episodes and 4% three episodes.

The following tables (1, 2 and 3) display the functionality of the sample in the BADL, at the three occasions of monitoring and the mean values of dependence.

Table 1

Characterization of the basal functional status of the sample in the BADL, according to the modified Katz index

BADL (*score*)	Basal functional status				Mean of dependence
	Independent (0)	Slight dependence (1)	Moderate dependence (2)	Total dependence (3)	
Bathing	74% (*n* = 20)	22% (*n* = 6)	4% (*n* = 1)	-	0.29
Dress/undress	81% (*n* = 22)	15% (*n* = 4)	4% (*n* = 1)	-	0.20
Toileting	74% (*n* = 20)	19% (*n* = 5)	7% (*n* = 2)	-	0.33
Transferring	70% (*n* = 19)	30% (*n* = 8)	-	-	0.30
Sphincter control	85% (*n* = 23)	11% (*n* = 3)	4% (*n* = 1)	-	0.18
Eating	100% (*n* = 27)	-	-	-	0.00

Table 2

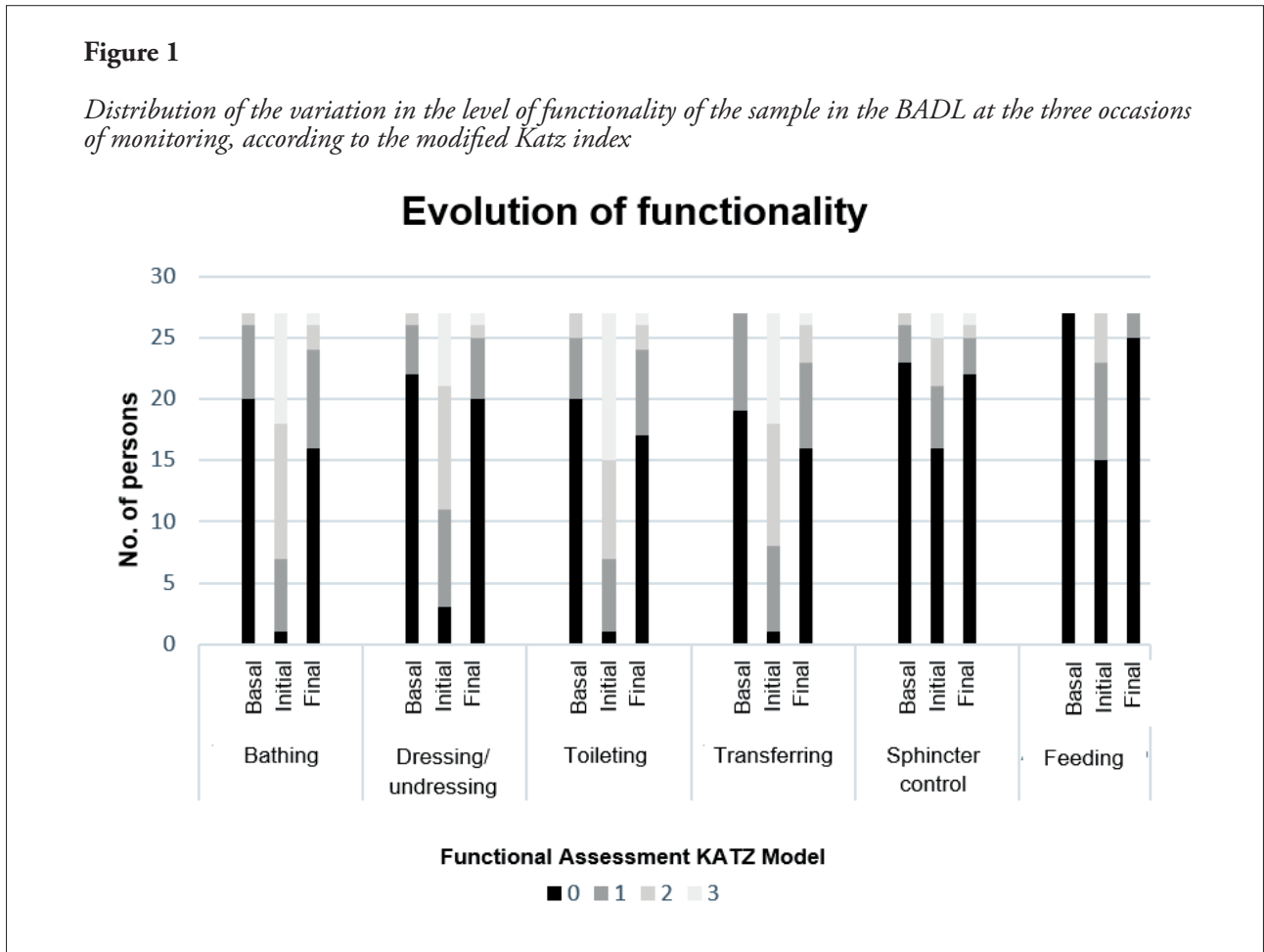*Characterization of the initial functional status of the sample in the BADL, according to the modified Katz index*

BADL (*score*)	Initial functional status				Mean of dependence
	Independent (0)	Slight dependence (1)	Moderate dependence (2)	Total dependence (3)	
Bathing	4% (*n* = 1)	22% (*n* = 6)	41% (*n* = 11)	33% (*n* = 9)	2.03
Dress/undress	11% (*n* = 3)	30% (*n* = 8)	37% (*n* = 10)	22% (*n* = 6)	1.70
Toileting	4% (*n* = 1)	22% (*n* = 6)	30% (*n* = 8)	44% (*n* = 12)	2.15
Transferring	4% (*n* = 1)	26% (*n* = 7)	37% (*n* = 10)	33% (*n* = 9)	2.00
Sphincter control	59% (*n* = 16)	19% (*n* = 5)	15% (*n* = 4)	7% (*n* = 2)	0.70
Eating	56% (*n* = 15)	30% (*n* = 8)	14% (*n* = 4)	-	0.59

Table 3

Characterization of the final functional status of the sample in the BADL, according to the modified Katz index

BADL (*score*)	Final functional status				Mean of dependence
	Independent (0)	Slight dependence (1)	Moderate dependence (2)	Total dependence (3)	
Bathing	59% (*n* = 16)	30% (*n* = 8)	7% (*n* = 2)	4% (*n* = 1)	0.56
Dress/undress	74% (*n* = 20)	26% (*n* = 7)	-	-	0.37
Toileting	63% (*n* = 17)	26% (*n* = 7)	7% (*n* = 2)	4% (*n* = 1)	0.52
Transferring	63% (*n* = 17)	22% (*n* = 6)	11% (*n* = 3)	4% (*n* = 1)	0.59
Sphincter control	81% (*n* = 22)	11% (*n* = 3)	4% (*n* = 1)	4% (*n* = 1)	0.30
Eating	93% (*n* = 25)	7% (*n* = 2)	-	-	0.07

In turn, Figure 1 summarizes the respective evolution of the functionality of the sample at the three occasions of the evaluation and for each ADL, showing for each one the corresponding degree of dependence.

Figure 1

Distribution of the variation in the level of functionality of the sample in the BADL at the three occasions of monitoring, according to the modified Katz index

Discussion

The majority of the sample (74%) was male and over 60 years old, which is in line with the current evidence, underscoring the fact that COVID-19 may be more severe in men and people over 65 years of age, increasing their risk of hospitalization and mortality (Jin et al., 2020; Sanyaolu et al., 2020; PAHO, 2020; Thomas et al., 2020). As for prior conditions, 89% of the subjects had at least one of the comorbidities (HTA, DM2 and obesity),

which the literature indicates has a higher potential for severe cases of COVID-19. The comorbidities are directly related to the severity of the disease and the prediction of its evolution, increasing the risk of mortality (Agostini et al., 2021; Sanyaolu et al., 2020).

Furthermore, 70% of the sample presented at least one of the comorbidities with higher risk of severity simultaneously with exposure to pollutants. Chronic exposure to pollutants has a negative impact on respiratory function, promoting chronic inflammation, reducing resistance to infections, and altering the permeability of the pulmonary parenchyma (Hopkinson et al., 2021). This association (comorbidities and exposure to pollutants) increases the risk of severity of COVID-19, leading to greater vulnerability to dependence.

People who have suffered complications during hospitalization (37%) have in common a personal history of HTA, exposure to pollutants, and a status of severe or critical severity. The mean number of days of hospitalization of these patients was 12.7 days. The mean length of hospital stay of the total sample was 9.7 days, which was lower than that of other studies, in which the average number of days varied between 14 and 17 days (Huang et al., 2021; Li et al., 2020; Rees et al., 2020).

The 11% requiring 10 or more sessions of the intervention program had a longer hospital stay, the severity of their health status was critical, and they presented comorbidities of HTA, DM2, and chronic exposure to pollutants. The complications throughout the hospitalization resulted in a prolonged bedrest, and the rehabilitation interventions also made it possible to prevent complications associated with immobility and prepare the body for the restoration of functionality.

In the optimization of ventilation through the positioning technique, the intolerance of the subjects in relation to the prone position was investigated. The justifications ranged from fear, a sensation of suffocation, anxiety, muscular-articular pain in the shoulder and cervical region, increased abdominal volume and morphological changes in the aging process. Therefore, it was essential to have a holistic approach (promoting the feeling of physical well-being, demystifying false notions associated with prone positioning, explaining the procedure, providing emotional support), so that the person feels comfortable and can benefit from the therapeutic effect of positioning, and it was important to explain the procedure to the person and stay close by at the beginning of the intervention, stimulating the therapeutic relationship and confidence in adherence to this strategy (Rees et al., 2020; Zeng et al., 2020). The lateral recumbent position (left or right) of the subject was confirmed in the ward to be an effective alternative to the prone position (Zhu et al., 2020). The mean data of the sample regarding the frequency of positions in the lateral recumbent position (four times a day) and length of stay in this position (55 minutes) follow the recommendations of the literature. Although there is no ideal value, it is recommended that this intervention be performed in the ward at least three times a day, for minimum periods of 30 minutes, so that there is a physiological benefit with clinical translation, reducing the work of respiratory muscles and maximizing areas less ventilated by postural therapy (Chinese Association of Rehabilitation Medicine, Rehabilitation Respiratory Committee of Chinese Association of Rehabilitation Medicine, Cardiopulmonary Rehabilitation Group of Chinese Society of Physical Medicine and Rehabilitation, 2020; Portuguese Society of Intensive Care, 2020; Zeng et al., 2020).

There was an improvement in the sensation of intolerance to the "toileting" activity in 96% of the sample, and the difference between the average score of the input and that of the output represented a reduction of over one half (from 7 to 3). The 4% of the sample that maintained the same level of activity intolerance were transferred to the ICU during hospitalization. This final value is in line with recent research conducted by the Chinese Association of Physical Medicine and Rehabilitation (Chinese Association of Rehabilitation Medicine, Respiratory Rehabilitation Committee of Chinese Association of Rehabilitation Medicine, Cardiopulmonary Rehabilitation Group of Chinese Society of Physical Medicine and Rehabilitation, 2020), in which 58% of people hospitalized with COVID-19 had a slight intolerance (level 3) to activity on the Borg scale.

Most of those with dyspnea are male, elderly and suffer from various complications (DM2, HTA, coronary heart disease, respiratory disease, and obesity), conditions that are more likely to grow worse for them (Agostini et al., 2021; Thomas et al., 2020).

Data analysis shows us that the impact of COVID-19 on the functionality of the hospitalized person is high, as evidenced by the drop in mean functional levels in the BADL, between the values of the basal functional state of the sample and the values of their initial functional state at hospitalization. The functionality was lower in at least four self-care activities (bathing, transferring, toileting, and dressing/undressing) in 96% of the sample. According to Guarda (2010), these four BADL are complex activities, which require greater metabolic expenditure from the body, that is, for their execution it is necessary to mobilize several large muscles of the organism, especially in the three ADL with higher incidence of dependence (toileting, bathing, and transferring). The exponential increase in the percentage of dependence, especially in these BADL, shows that COVID-19 has a profound impact on the maintenance of self-care, particularly in people who initially presented themselves as independent or with a mild degree of dependence.

These results are in line with the literature, as they refer to the existence of a hierarchy of motor losses, starting with the loss of functional capacity in more complex activities, while pointing out that the comorbidities also have a major influence on the transition of functionality (Katz & Akbom, 1976; Sequeira, 2010). Added to this is the vulnerability to dependence in this population, due to the immobility that the pathology induces in the person with COVID-19: a prolonged bedrest and the disease process lead to diaphragmatic dysfunction and the weakness of the other respiratory muscles (Li et al., 2020).

In 93% of the sample, there was an improvement in their functional status, in all the BADL during the hospitalization process, given the difference between the mean of the beginning of hospitalization and the mean of the final evaluation. This average difference allows us to conclude that nursing

or drug therapies, in conjunction, positively affected the functionality of the person hospitalized with COVID-19, restoring it to levels close to baseline.

On the other hand, analyzing the difference between the mean of each BADL in the basal functional state and at the date of discharge, the high impact that the COVID-19 disease process has on the hospitalized person is clear. There was a more evident functional decline in "bathing", "toileting", and "transferring". This analysis shows us that the person with COVID-19 in need of hospitalization has an elevated risk of dependence, especially in activities with greater neuromuscular complexity and energy recruitment (Guarda, 2010).

We noted that the recovery of the functionality went through three stages: first, in less complex activities such as "feeding" and "sphincter control"; then in "dress/undress"; lastly, in "toileting", "bathing" and "transferring". These observations allow us to infer a similarity with child development, already defended by Katz and Akpom (1976), who argued for the existence of an ordered regression as part of the physiological aging process, influenced by the comorbidities, with the loss of functionality evolving from the most complex to the most basic functions, which could be retained for a longer time. In BADL, such as "feeding", "sphincter control" and "dressing/undressing", it was possible to restore functionality to levels within the baseline in 93% ($n = 25$) of the subjects, and 7% had higher levels of dependence at output, compared to the baseline. These BADL are activities of less complexity of coordination and neuromotor control, as well as requiring less muscle recruitment compared to the others (Guarda, 2010).

Corroborating these facts, it was determined that, of the 10 people who at the time of discharge from hospitalization had higher levels of functional dependence than the baseline, nine had common characteristics: they had complications during hospitalization; most reported exposure to pollutants; and they had at least one episode of dyspnea related to the worsening of chronic diseases, evidencing the correlation between the impact of COVID-19 and functionality.

For the authors, it is important to note that the mean values presented reflect three distinct monitoring moments (basal functionality, disease onset and discharge date) and that, because it is a study with human subjects, and accordingly has a changeable and unique sample, there will have been a daily variation in the process of evolution of each person, during the development of the disease and the applied therapies. The authors point out that they recognize the limitations of the study: the size of the sample and the fact that there is no control population for a more reliable comparison and due to the complexity of controlling the variables, which enable highlighting further the results obtained.

Conclusion

With this study, it was found that COVID-19 caused a transient dependence, with an impact on the performance of BADL and on the reduction of people's quality of life, with a higher incidence in those who are elderly, have comorbidities, and have been exposed to pollutants. In this sense, knowing that the increased incidence of chronic degenerative diseases, as well as financial expenses for health and social services associated with aging, have an impact on the quality of life of the person and increase the risk of mortality, all interventions facilitating the restoration of independence and reduction of hospitalization time should be studied and applied to improve the quality of life of the person with COVID-19.

The implemented nursing interventions specifically integrated the teaching, instruction and training of respiratory exercises, energy conservation techniques, ventilation optimization through lateral recumbent positioning and training and exercising of each BADL. There was an improvement of functional status in all BADL, with frank expression in relation to the initial level evaluated. Thus, it is seen that the rehabilitation nursing intervention program implemented presented positive impacts on the recovery of the functionality of the sample, as well as in the level of respiratory and motor functions and the duration of hospitalization, with the consequent gains in health that this implies, emerging as an added value in the context of the current pandemic.

Future follow-up work on home nursing is suggested in order to evaluate the ability to restore functionality and to monitor the impact on the performance of the social, family and work roles of the sample.

Author contributions

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Visualization: Pedrosa, P., Silva, I.
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Writing - review & editing: Pedrosa, P., Silva, I.

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