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CLINICAL PROFILE AND ASSESSMENT OF FUNCTIONALITY AFTER DISCHARGE FROM THE INTENSIVE CARE UNIT OF A PHILANTHROPIC HOSPITAL

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ABSTRACT

Introduction: The Intensive Care Unit is a place intended for the treatment of critical and recoverable patients. Studies show that there is some change in the functionality of individuals each day of hospitalization, caused by immobility. However, this condition can be reversible with care appropriate to the condition and needs of each patient, and early mobilization is important. Objectives: To describe the clinical profile and functionality of patients after discharge from the adult ICU of HSCMV. Methods: This was a descriptive cross-sectional study conducted in the wards of the HSCMV with a convenience sample, where data related to the clinical profile were collected using a form with an emphasis on clinical diagnosis and length of stay in the ICU in days. Considering that they have several instruments that help in the assessment of the functionality of critically ill patients, the Physical Function in Intensive Care (PFIT), Medical Research Council (MRC) and Berg Balance Scale (BBE) scales were selected for functional assessment. Results: A total of 87 participants were included in the study, 51.7% of whom were female, and the most frequent clinical conditions were related to the circulatory system. In the evaluations, most individuals presented altered functionality; On the other hand, most of the sample showed normal strength and good balance. Conclusion: Based on the results found in this study, it was observed that the patients evaluated had reduced functionality, maintaining muscle strength and balance.

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INTRODUCTION

It is understood that the Intensive Care Unit (ICU) is a place with specialized infrastructure, with assiduous assistance from health professionals and state-of-the-art technology that assists in urgent and emergency interventions for patients in critical and recoverable condition in need of continuous assistance (OLIVEIRA, 2018). A prolonged hospital stay can result in impacts on both functionality and the practice of activities of daily living (ADLs), caused by decreased muscle strength, as well as decreased endurance, muscle coordination, and balance (VESZ *et al.*, 2018).

Data obtained by the Espírito Santo State Department of Health-SESA (2020), reveal that hospital admissions between January and November 2019 increased by 20.51% compared to the same period in 2018, a total of 22,249 thousand more hospitalizations. The variation in relation to the number of patients (day) also increased (15.56%), as well as the hospital occupancy rate (9.28%). However, the average length of hospital stay (days) reached a reduction in the change of -7.02%, where in 2018 it was 10.51 days, changing to 9.82 days in 2019. These data may be indicative of an improvement in the efficiency of the Espírito Santo hospital network along with the quality of care, and the significant decrease in hospital infections (-29.91%) and infections from invasive devices (-24.86%).

According to Schujmann *et al.* (2021), the consequences of these hospitalizations can be reduced in the midst of a more prepared environment, with specialized care, in addition to physical therapy interventions such as early mobilization. This is what is established in Resolution No. 2,271, of February 14, 2020 (2020), which refers to the high complexity care environment, and must comply with the standards of environment and physical structure, in addition to having a medical team with specialized and continuous professional attention, with specific materials and technologies necessary for diagnosis, monitoring and therapy. But to have good results, it is necessary to have an adequate multiprofessional team, which involves a full-time, intense and daytime work of doctors, nurses and physiotherapists, and other professionals must be accessible when necessary.

Functionality is related to body function, activity, and participation, which, together with disability, interact dynamically between health conditions such as diseases, traumas, injuries, or disorders and contextual factors such as personal and environmental factors (SAMPAIO; LUZ, 2009). The critically ill patient must be looked at as a whole, having a biopsychosocial approach, in order to ensure the state of complete physical, mental and social well-being, and not just the absence of disease. Thus, it is important to understand the short- and long-term physical and functional impairment caused by the length of hospital stay, which, consequently, leads to decreased functionality, muscle strength and

endurance, and greater functional dependence, which directly affects quality of life. Drawing attention to the adequate care of these patients during hospitalization seeks to improve their functionality at discharge, which, consequently, will contribute to maintaining quality of life, reducing long-term complications.

In view of the above, considering that the clinical profile is directly related to the functionality of patients after discharge from the ICU, the present study aimed to describe the clinical profile and functionality of patients after discharge from the Adult Intensive Care Unit of the Hospital Santa Casa de Misericórdia de Vitória/ES.

METHODS

This is a descriptive study, with a cross-sectional design carried out in the wards of the Hospital Santa Casa de Misericórdia de Vitória. With a convenience sample, consisting of patients who were hospitalized in the ICU of the HSCMV, and referred to the wards of the respective hospital.

The criteria included in the study were adult patients of both genders, aged 18 years or older, who underwent intensive care and had a hospital stay equal to or greater than 24 hours. Participants who did not sign the Informed Consent Form (ICF), patients with neuromuscular diseases or functional impairment prior to hospitalization, and patients with cognitive impairment were excluded.

The present study was part of an umbrella project entitled "Evaluation of the functionality of patients in the adult ICU of a Philanthropic Hospital in the City of Vitória", carried out by the same researchers and approved by the ethics committee of the School of Sciences of Santa Casa de Misericórdia de Vitória – EMESCAM, under number 5.151.907, in which the standards established in resolution 466/12 were respected.

The data collection protocol was carried out by EMESCAM physiotherapy undergraduate students through the approach and evaluation of patients in the wards after discharge from the ICU of HSCMV. The list of patients who were discharged from the ICU to the wards was obtained weekly through communication with the Internal Regulation Center of the HSCMV. In possession of the list, through the electronic medical record accessed through the *SoulMV* platform, the patients in the wards and their respective beds were verified.

Each patient identified in the medical record was approached and invited to participate, and the objectives and procedures were explained, as well as the benefits of the research. Upon acceptance, the ICF was delivered, which, after reading and signing in two copies, one intended for the researcher and the other for the patient, followed with the

identification, characterizing them with clinical diagnosis and the time they were hospitalized in the ICU. After interviewing the patient or his/her guardian, the clinical data collected were displayed on a form, containing the name, age, gender, clinical diagnosis, and length of stay in the ICU in days.

After characterizing the clinical profile, the *Physical Function In Intensive Care* (PFIT), *Medical Research Council* (MRC) and *Berg Balance Scale* (BBS) scales were applied to assess functionality, strength, muscular endurance and balance.

The PFIT was applied to assess the mobility status of the patients, in order to provide information about the functional abilities of the patients after hospitalization, indicating the degree of functionality and independence through the analysis of activities such as sitting with or without assistance, static gait in number of steps, in addition to the strength of shoulder flexors and knee extensors, each item was graded from 0 to 3, and those who obtained a score lower than 12 points were added at the end, resulting in altered functionality.

Muscle strength was measured using the MRC scale, which bilaterally evaluates shoulder abduction strength, elbow flexion, wrist extension, hip flexion, knee extension, and ankle dorsiflexion, graded from 0 to 5, with 0 for complete paralysis and 5 for normal strength. Then, the scores were summed and classified into complete tetraparesis (0), severe weakness (1-36), significant weakness (37-49), and normal strength (above 49).

And BBS, applied in order to assess static and dynamic balance through 14 specific items scored from 0 to 4, with 0 representing inability to complete the task and 4 with independent ability to complete it. The maximum possible score is 56 points, with 0 to 20 impaired balance, 21 to 40 acceptable balance and 41 to 56 good balance.

Data analysis was descriptive for qualitative variables, analyzed by frequencies and percentages, and quantitative variables by means of data summary measures such as mean, standard deviation, median, and interquartile range. The data obtained were tabulated in a *Microsoft Excel spreadsheet*.

RESULTS

During the period from February 2022 to March 2023, 155 patients were approached in the HSCMV wards. Of these, 34 refused to participate, 16 were excluded, 6 could not perform at the time of the approach – a reason for discharge at the time of the assessment or due to illiteracy and/or without a companion, and another 12 were cut off for not having performed the balance scale, as it was added after the beginning of the collection, given the need to assess balance. Therefore, 87 patients were included in the final sample.

Table 1 shows the characterization of the sample in relation to the clinical profile, in which there was a small predominance of females (51.7%), with a mean age of 58.8 years. The average length of stay in the ICU was 5 days, with health conditions related to the circulatory system (28.7%), followed by the immune system (20.7%) and the digestive system (19.5%) as the main reason for hospitalization.

Table 1. Clinical Profile.

Variable	n=87
Age (in years)	58.8 ± 16.4th
ICU length of stay (in days)	5 ± 3.6th
Gender, n (%)	
Female	45 (51,7)
Male	42 (48,3)
Category Diagnosis, n (%)	
Circulatory	25 (28,7)
Immune	18 (20,7)
Digestive	17 (19,5)
Respiratory	8 (9,2)
Player	3 (3,4)
Skeletal	2 (2,3)
Nervous	4 (4,6)
Integumentary	2 (2,3)

Mean ± Standard Deviation[a]

Functionality assessed with the *Physical Function Intensive Care* (PFIT) scale, shown in Table 2, showed functional alteration in most of those evaluated (75.9%).

Table 2. Classification of the Physical Function Intensive Care scale.

Variable	n=87
PFIT Total	8.6 ± 3.2th
PFIT Classification n (%)	
Changed functionality	66 (75,9)
Normal Functionality	21 (24,1)

Mean ± Standard Deviation[a]

Table 3 shows the result of muscle strength assessed with the *Medical Research Council* (MRC) scale, in which most of those evaluated presented Normal Strength (51.7%); followed by Significant Weakness (31%) and Severe Weakness (17.2%).

Table 3. Classification of the *Medical Research Council scale.*

Variable	n=87
MRC Total	50.3 ± 9.2nd
Peripheral muscle strength rating n (%)	
Complete tetraparesia	0 (0)
Severe Weakness	15 (17,2)
Significant Weakness	27 (31)
Normal Strength	45 (51,7)

Mean ± Standard Deviation[a]

Table 4 shows the classification of the *Berg Balance Scale* (BBS), in which it demonstrates Good Balance in most of the evaluated (65.5%).

Table 4. Berg *Balance Scale Rating*

Variable	n=87
BBS Total	40 ± 18.4th
Berg n Classification (%)	
Impaired balance.	14 (16,1)
Acceptable balance	16 (18,4)
Good balance.	57 (65,5)

Mean ± Standard Deviation[a]

DISCUSSION

The present study identified the clinical profile, characterizing them in relation to gender, diagnosis and length of stay, and evaluated the functionality of patients who were hospitalized in the ICU of a philanthropic hospital in Greater Vitória. The main findings present a well-divided sample between the two genders, which together reached a mean age of 58.8 years. The main reason for ICU admission was related to the circulatory system, and the mean time was 5 days. The functionality of most patients was altered, which could be seen negatively, since it is directly related to early mobilization in the functional preservation of patients.

The mean age of the patients in this study was within the literature, which shows a predominance of patients over 50 years of age. In addition, most ICU beds are occupied by elderly people over 65 years of age, and this can be associated with a longer hospitalization and mortality time (AGUIAR *et al*., 2021). Another factor influencing these findings is that the cause of hospitalization is mainly related to dysfunctions of the circulatory system, in which cardiovascular diseases are the main cause of hospitalization (SILVA *et al*., 2022), as well as the study by Oliveira *et al.* (2020), which presents important data on circulatory system dysfunctions, showing that they are the main causes responsible for morbidity and mortality in Brazil and with a high percentage of deaths in the country among Chronic Non-Communicable Diseases.

Using the widely used PFIT scale, this study demonstrated that after discharge from the ICU there was an alteration in the functionality of most patients. The evaluation of muscle strength and balance was added to the participants' function. However, with the International Classification of Functioning, Disability and Health (ICF) we can define functionality as a set of all the individual's bodily functions, activity and participation, as well as relate the interaction of these aspects to environmental factors, being able to predict whether such an individual is able to perform the tasks he or she needs to be considered functional (GALAVERNA; OAK; DORNELAS, 2020).

Silva and Santos (2019) in their prospective cohort, compared functionality before and after the ICU in relation to a walking speed of 10m, where they found that patients with less hospitalization time had less impairment in walking speed. And when comparing the mean age of the study, of 57.1 years, the result of the prospective cohort indicated impairment in functionality. Aglawe, Agarwal, and Sawant (2022) assessed the functional level of patients during ICU stay and after ICU discharge until hospital discharge, using the *Functional Status Score for the Intensive Care* (FSS-ICU), PFIT, and *Functional Independence Measure* (FIM) scales, and even though the study showed gradual improvement, functional deficits were observed in each outcome measure, where the FSS-ICU and PFIT scales were more sensitive in identifying points in which patients presented functional limitations during hospitalization, showing similar results to each other.

Intensive patients may present a reduction in their strength and muscle mass due to multiple factors, as well as length of hospitalization, age, and clinical diagnosis. This research did not aim to correlate strength with other variables, however, studies indicate that this reduction in strength often appears as a disorder secondary to some condition (VANHOREBEEK; LATRONIC; BERGHE, 2020). After a week in the ICU, the patient already begins to exhibit a decline in his strength and muscle mass, according to the study by Doiron, Hoffmann and Beller (2018), and this loss occurs early and quickly in the first week in those patients affected by a critical condition (MCWILLIAMS *et al.*, 2018). However, there was a preponderance of patients with normal strength in the present study, which may be an indication that muscle weakness is not an issue that frequently occurs in the ICU of the hospital where the study was conducted. In addition, the intervention and union of the multiprofessional team may be effective within the critical sector.

The Berg scale used to assess patients' balance is a scale of high validity and reliability. Some factors can interfere with balance deficit, in the intensive sector one of these factors can be muscle strength. In this study, strength and balance showed similar values, with a higher percentage of preservation. According to Miranda-Cantellops and Tiu (2023), having a good balance contributes not only to the ability to move and move physically well, but to the performance of activities of daily living efficiently and satisfactorily, that is, damage to balance consequently leads to a loss in quality of life, as well as the risk of falls.

It is important to consider functionality beyond physical strength and balance, although these are contributing factors, as functional status encompasses a wide range of capacities and abilities in carrying out daily and individual tasks.

The ICF was developed by the World Health Organization (WHO) with the aim of providing a unified and standardized language to describe the health status and functionality of individuals. This classification is an important tool to functionally characterize patients in the intensive care unit. This population often suffers from large deficits due to the severity of the clinical condition and invasive treatments. In addition to identifying, understanding the impacts of functional changes in different areas of the patient's life can contribute to the development of appropriate and individualized treatment plans, aiming at their recovery in order to reestablish normal functional status, or as close as possible, at the time of hospital discharge. Thus, the ICF provides a more comprehensive and comprehensive view of the individual, considering not only the clinical condition, but also the psychological, social and environmental aspects, which can influence functionality (DANTAS *et al.*, 2020). According to the study by Potter, Miller, and Newman (2021), with the ICF domains, it was possible to observe the degree of patient involvement in early mobilization and how personal factors can influence. In other words, the ICF can help identify the factors that affect the patient's capacity and involvement during care, showing that those who are more motivated and in better physical and contextual conditions better accept the early approach.

The present study seeks to highlight the importance of early mobilization in critically ill patients, taking into account that strength and balance are included among the determinant aspects for functionality after discharge from the ICU, which consequently contributes to a good quality of life. According to Fuke *et al.* (2018), performing early rehabilitation in the ICU significantly improves the physical function of critically ill patients. Hodgson *et al.* (2021) also highlights international guidelines that recommend early mobilization and rehabilitation in the ICU. The study by Aquim *et al.* (2019) addresses important issues regarding early mobilization, where in addition to recommending the type and resource, such as the ergometer cycle, it says that adverse events are not frequent and serious, and it is safe to perform as long as it respects the existing contraindications. In addition, early mobilization is associated with good functional outcomes and reduced mortality.

Among the limitations of this study, it is worth highlighting the impossibility of establishing a causal relationship, as it was a cross-sectional study; and another limiting factor was that the evaluations were carried out by three different evaluators.

CONCLUSION

Based on the findings of this study, we observed that the patients evaluated had reduced functionality, but significantly maintained muscle strength and balance, which may indicate that other areas of functionality may have been affected. Therefore, we can predict about other scales, classifications and/or questionnaires, because the ability to perform functional activities is the result of combinations such as strength, endurance, flexibility, coordination, physical conditioning, in addition to the psychosocial factor.

It is suggested that the assessment of functionality encompasses the impacts on daily activities, social participation and, consequently, quality of life. And through this perspective, emphasize early mobilization as an important strategy to achieve the objectives and reduce complications related to prolonged immobility.

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