

# Profile of elderly people treated in a trauma emergency room and physiotherapeutic approach

## *Perfil das pessoas idosas atendidas em um pronto socorro de trauma e abordagem fisioterapêutica*

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### Abstract

**Background:** Emergency rooms are reference points for immediate care and operate with a multidisciplinary team, including physiotherapists. These places receive a variety of patients; however, in recent years, there has been an increase in the number of elderly people. **Aim:** To evaluate the profile of elderly people treated by physiotherapy in a trauma emergency room and to identify the physiotherapeutic procedures provided. **Methods:** This is a descriptive observational study, carried out in the polytrauma hospital ward of Hospital João XXIII, in Belo Horizonte, between January and December 2022. The diagnoses, procedures and number of physiotherapy treatments were analyzed, in addition to age, gender, race, city of origin, trauma mechanism, admission airway, complications, length of stay and patient outcomes. To verify the association between trauma mechanism and age, univariate logistic regression analysis was used. **Results:** In the period under study, 171 patients were treated, 66% of whom were male, with a mean age of 74 years. The majority had suffered only one trauma (75.4%), while the others suffered multiple traumas (24.6%). Of the total, 42 were admitted intubated, and the main diagnoses were associated with neurological traumatic conditions (73%) and thoracic trauma (15.2%), mainly triggered by falls. The most implemented physiotherapeutic procedures in this context were: continuous surveillance (100%), respiratory physiotherapy maneuvers (93%) and oxygen therapy (71%). **Conclusion:** Among the elderly victims of trauma, the main diagnoses were neurological traumatic conditions and thoracic trauma. Based on the clinical-functional demands that the patients presented, the physiotherapeutic procedures were mainly continuous surveillance and respiratory procedures.

**Keywords:** Physical Therapy; Emergencies; Multiple Trauma; Elderly.

### Resumo

**Introdução:** Os prontos-socorros são locais de referência no atendimento imediato, funcionam com equipe multiprofissional, incluindo fisioterapeutas. Esses locais recebem variados pacientes, contudo, têm se notado nos últimos anos um aumento no atendimento de pessoas idosas. **Objetivo:** Avaliar o perfil das pessoas idosas atendidas pela Fisioterapia em um pronto-socorro de trauma e identificar as condutas fisioterapêuticas prestadas. **Métodos:** Trata-se de um estudo observacional descritivo, realizado na sala de politrauma do Hospital João XXIII, em Belo Horizonte, entre janeiro e dezembro de 2022. Foram analisados os diagnósticos, as condutas e o número de atendimentos fisioterapêuticos, além da idade, gênero, raça, cidade de origem, mecanismo do trauma, via aérea de admissão, complicações, tempo de permanência e desfechos dos pacientes. Para verificar a associação entre mecanismo de trauma e idade utilizou-se a análise de regressão logística univariada. **Resultados:** Neste período foram atendidos 171 pacientes, sendo 66% do gênero masculino com média de idade de 74 anos. A maioria sofreu apenas um trauma (75,4%), enquanto os demais sofreram politraumas (24,6%). Do total, 42 foram admitidos intubados, e os principais diagnósticos estavam associados às condições traumáticas neurológicas (73%) e ao trauma torácico (15,2%), desencadeadas principalmente por quedas. As condutas fisioterapêuticas mais implementadas nesse contexto foram: vigilância contínua (100%), manobras de Fisioterapia respiratória (93%) e oxigenoterapia (71%). **Conclusão:** Dentre as pessoas idosas vítimas de traumas, os principais diagnósticos foram as condições traumáticas neurológicas e o trauma torácico. Baseado nas demandas clínico-funcionais que os pacientes

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apresentaram, as condutas fisioterapêuticas foram principalmente vigilância contínua e condutas respiratórias.

**Palavras-chave:** Fisioterapia; Emergências; Traumatismo Múltiplo; Pessoa idosa.

## INTRODUCTION

The Brazilian health system is structured around different levels of care, aiming at meeting the demands of the population<sup>1</sup>. Among the institutions that are considered to be the gateway to the health system, emergency care units (ECU) play an important role in health care<sup>2</sup>.

These centres are a point of reference for people with life-threatening conditions who require rapid care<sup>3</sup>. The epidemiology of care in the ECU can vary according to region, age and the ECU's referral speciality, which is why the literature emphasises the importance of a multidisciplinary team working in these sectors<sup>3</sup>. Multidisciplinary care has shown better outcomes, especially in polytraumatised patients<sup>4,5</sup>.

Among the professionals who make up the teams in the ECU, the inclusion of physiotherapists stands out<sup>6</sup>. With comprehensive training in respiratory and ventilatory management, they are able to work in rapid response teams, which is supported by the American Heart Association (AHA) and the Federal Council of Physiotherapy and Occupational Therapy (*Conselho Federal de Fisioterapia e Terapia Ocupacional* - COFFITO)<sup>7-9</sup>.

In these spaces, physiotherapists have the expertise to help with clinical decision-making and the implementation of procedures for patients in critical situations<sup>10</sup>. Physiotherapists contribute to the management of people with cardiorespiratory conditions, the care of polytraumatised patients and the care of patients with musculoskeletal disorders<sup>10-12</sup>.

Although the profile of users varies, there has been an increase in the number of elderly people who have sought care in ECU<sup>13</sup>. This can be explained by the process of population ageing, which has created challenges for the health system<sup>13</sup>. This age group is prone to one or more chronic non-communicable diseases, which can have a direct impact on their health and functionality<sup>14-16</sup>.

In this context, considering the inclusion of physiotherapists in emergency departments, the ageing population, the growing demand for elderly people in these units and the functional and organic vulnerability that this group tends to have, it is important to study the variables involved in the causes and outcomes related to physiotherapeutic care for elderly people in trauma emergencies. Therefore, this study aims to assess the profile of elderly people treated by physiotherapy in a trauma emergency department, as well as to identify the physiotherapeutic procedures provided.

## METHODS

This is a descriptive observational study carried out in the "red" trauma center at the João XXIII Hospital in the city

of Belo Horizonte, Minas Gerais state. This trauma center admits trauma and polytrauma patients who have some clinical instability that requires continuous monitoring and assistance.

The study included people aged 60 or over who were admitted between 1 January and 31 December 2022 and who received care from the physiotherapy team in the polytrauma center. Patients with insufficient or incomplete data recorded in their medical records were excluded. This study used a convenience sample, *i.e.*, all patients admitted to the hospital ward, and no sample calculation was carried out.

The research was approved by the Research Ethics Committee of the Hospital Foundation of the State of Minas Gerais - FHEMIG: (CAAE: 70254323.7.0000.5119). The need for a Free and Informed Consent Form (FICF) was waived. Throughout this study, all the principles of Resolution 466/12, which regulate research with living beings, were respected.

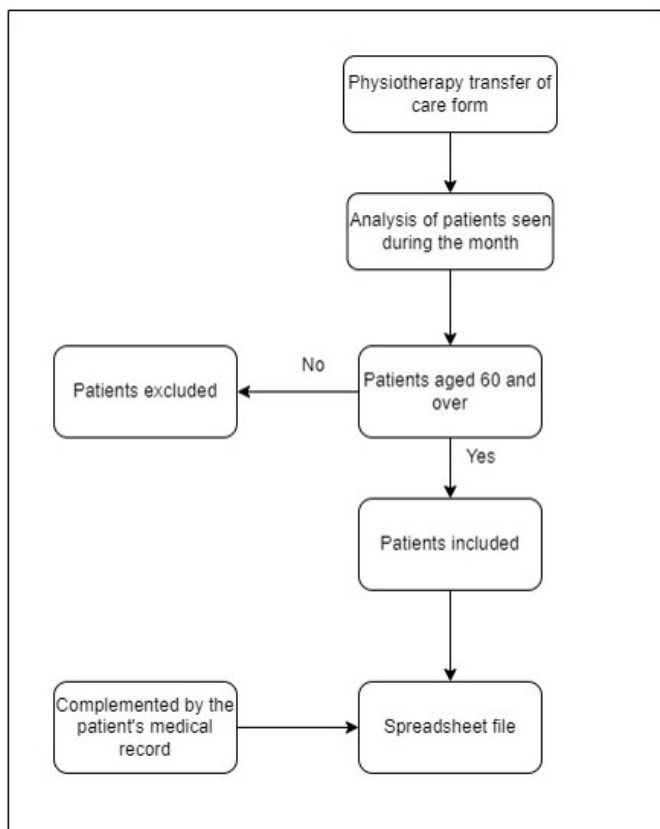
The primary outcomes of this study were the diagnoses at admission and the physiotherapy procedures provided. Secondary outcomes were: age, gender, race/colour, city of origin, trauma mechanism, airway management, complications, length of stay in the ECU, number of physiotherapy visits and patient outcomes.

The researchers collected the data on the transfer of care form from the sector's physiotherapy team. Additional information was searched for in the patient's electronic medical record. The results were tabulated in an Excel spreadsheet (Figure 1).

The Statistical Package for the Social Sciences software (SPSS Statistics, version 22.0, IBM, Armonk, NY, USA) was used for the statistical analyses. Data normality was checked using the Kolmogorov-Smirnov test. Descriptive analysis was expressed as mean and standard deviation or median and 95% interval (continuous variables) and absolute number and percentage (categorical variables). The chi-squared test was used to verify the relationship between trauma mechanism and age. The significance level adopted was 5%.

## RESULTS

In the period under study, the physiotherapy team in the polytrauma hospital ward of the João XXIII hospital admitted 180 elderly people. Of these, nine were excluded due to lack of information. Of the 171 patients included, the majority were male (66%). The age of the patients ranged from 60 to 103 years, with an average of 74.27 years, most of whom were in the 60-69 age group. Of the patients seen,



**Figure 1.** Flowchart for attracting patients.

57% were from Belo Horizonte, brown (56%) and married (41%) (Table 1).

Of the 171 people admitted, some were victims of polytrauma, so 129 had only one diagnosis on admission, 40 had two diagnoses and two patients had three concomitant diagnoses on admission. In total, 126 patients were admitted without an artificial airway, 42 were admitted intubated, two of them were tracheostomised and one patient was admitted with a cricothyroidotomy.

The causes of these patients' admissions were diverse, with neurological traumatic conditions being very prevalent (125 patients), especially traumatic brain injury (TBI) comprising 110 cases (64.3%) and spinal cord injury (SCI) with 24 cases (14%); however, nine patients had both diagnoses. Thoracic trauma (TT) was also a condition that had a significant number of patients, comprising 26 cases (15%); followed by clinical alterations to the respiratory system, with 19 cases (11.1%) and non-traumatic neurological alterations, with 15 cases (8.7%), it is worth noting that some patients were categorised under more than one diagnosis, as they had suffered multiple traumatic injuries. There were six deaths, of which five were diagnosed with TBI and one patient was already in palliative care due to a previous degenerative condition.

Among the mechanisms of injury that most led elderly people to seek out this unit, the following stand out: falling from their own height (38.5%), falling from a height above the ground (22.2%), traffic accidents involving motorbikes

**Table 1.** Epidemiological information.

Features	n. (%)
<b>Gender</b>	
Male	114 (66.6%)
Female	57 (33.4%)
<b>Age group</b>	
60-69 years	68 (39.8%)
70-79 years	48 (28%)
80-89 years	40 (23.4%)
90 years or older	15 (8.8%)
<b>City of origin</b>	
Belo Horizonte	99 (57.9%)
Other cities	72 (42.1%)
<b>Race / Colour</b>	
Brown	96 (56.2%)
White	54 (31.6%)
Black	18 (10.5%)
Not reported	3 (1.7%)
<b>Marital status</b>	
Married	71 (41.5%)
Single	31 (18.1%)
Widowed	17 (10%)
Divorced	11 (6.4%)
Stable union	4 (2.3%)
Not informed	37 (21.7%)

Absolute number (n); percentage (%).

and/or cars (18.7%), medical conditions (14%) and other situations (6.6%). According to the polytraumatised patients, the majority of them were victims of falls from their own height. And the majority of falls, both from their own height and from a height above the ground, occurred in men.

Of the diagnoses of these traumatic conditions, falls, whether from their own height or from above the ground, were the main injury mechanisms (Table 2). And among the patients who suffered TBI, it was noted that as age increased, falls from their own height became the main cause, and this finding was statistically significant, as demonstrated by the univariate logistic regression analysis ( $B= 0.89, p=0.000$ ). However, falling from their own height in very elderly patients ( $>80$  years) did not increase the chances of complications in the emergency department (OR 0.77, 95% CI 0.34 - 1.74,  $p=0.53$ ).

The median length of stay in the emergency department was three days (1 - 19 days). The patients' main destinations

**Table 2.** Association between diagnosis and trauma mechanisms.

Diagnosis	Trauma mechanism	n (%)
Traumatic Brain Injury (TBI) (110)	1. Fall from own height	55 (50%)
	2. Fall from height above the ground	26 (23.6%)
	3. Car accident	13 (11.8%)
	4. Motorbike accident	9 (8.2%)
	5. Physical assault	4 (3.6%)
	6. Other	3 (2.8%)
Thoracic trauma (TT) (26)	1. Fall from height above the ground	8 (30.8%)
	2. Fall from own height	7 (27%)
	3. Car accident	6 (23%)
	4. Motorbike accident	3 (11.5%)
	5. Other	2 (7.7%)
Spinal cord injury (SCI) (24)	1. Fall from height above the ground	11 (45.8%)
	2. Fall from own height	7 (29%)
	3. Car accident	4 (17%)
	4. Motorbike accident	1 (4.1%)
	5. Other	1 (4.1%)
Respiratory Diseases (19)	1. Clinical cause	8 (42.3%)
	2. Fall from own height	4 (21%)
	3. Fall from height above the ground	4 (21%)
	4. Car accident	2 (10.5%)
	5. Motorbike accident	1 (5.2%)
Non-traumatic neurological diseases (15)	1. Clinical cause	15 (100%)
Fractures of the limbs (7)	1. Fall from own height	5 (71.4%)
	2. Motorbike accident	2 (28.6%)
Gastrointestinal diseases (4)	1. Clinical cause	4 (100%)
Cardiovascular diseases (4)	1. Clinical cause	4 (100%)
Self-extirpation attempt (3)	1. Drug poisoning	3 (100%)
Burns (2)	1. Direct flame accident	2 (100%)

Absolute number (n); percentage (%).

were the Intensive Care Unit (ICU) (52.6%), Inpatient Unit (IU) (24%) and discharge to home (10.5%) and other locations (12.9%). Of the patients who were transferred to the ICU, most were diagnosed with neurological diseases secondary to trauma (Table 3). While they were in the emergency department, each patient received an average of 4.3 physiotherapy sessions, ranging from 1 to 26 sessions. However, the patients who had any complications received significantly more care.

Among the procedures carried out by physiotherapists, the following stand out: respiratory and neurological monitoring and surveillance (100% of patients); manual and instrumental respiratory physiotherapy exercises and manoeuvres (92% of patients); Oxygen Therapy Titration (OTT) (71% of patients); Airway Clearance Therapy (ACT) (54% of patients); Invasive Mechanical Ventilation (IMV) (43% of patients); assistance with complications such as: intubations and cardiorespiratory arrest (21%); functional rehabilitation (12.2%); extubation (5.2% of patients) and Non-Invasive Mechanical Ventilation (NIV) (3.5%) (Figure 2).

## DISCUSSION

The results of this study showed that of the elderly people treated by physiotherapy in the polytrauma hospital ward, the majority were male, brown and married. As this is a referral unit for polytraumatised patients, many had more than one diagnosis at the time of admission. The majority of patients remained in the emergency department for between one and 19 days. The main physiotherapy procedures carried out were: neurological and respiratory monitoring, and respiratory physiotherapy manoeuvres.

Considering the profile of care offered by the unit, the literature justifies the high number of patients admitted with some type of advanced airway (AA). Given that traumatic injuries can lead to altered airway patency and oxygenation failure, setting up an AA can improve patient outcomes<sup>17</sup>.

As well as in other studies, the results of this study show similar data when pointing out the main diagnoses associated with trauma, with neurological traumatic conditions and chest trauma being common diagnoses in trauma patients<sup>18,19</sup>. These findings also corroborate the literature, which points to TBI as one of the main causes of death in elderly trauma victims<sup>20</sup>.

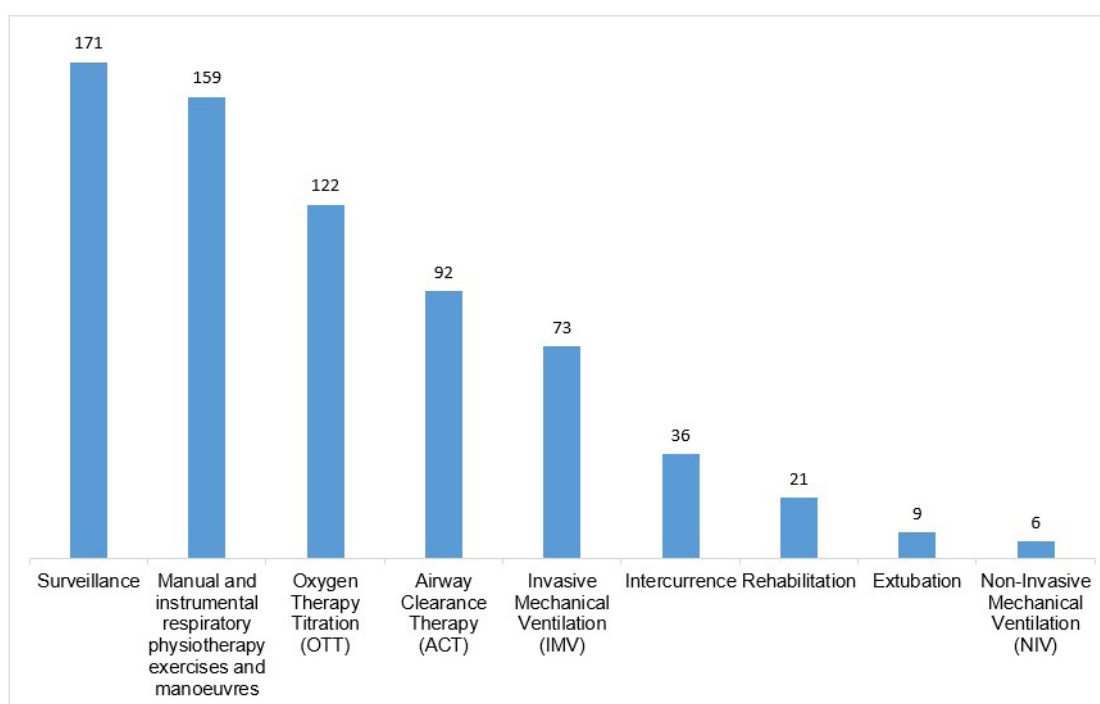
With regard to the mechanisms of injury, other evidence has also had similar findings, pointing to falls, whether from their own height or from heights above the ground, as one of the main causative agents of trauma and polytrauma in elderly people, especially males<sup>21</sup>. The literature associates the high incidence of falls in this population with functional impairment and the presence of comorbidities<sup>22,23</sup>. Alongside falls, road traffic accidents are mechanisms that occur frequently in older people and are associated with high morbidity and mortality<sup>20</sup>.



**Table 3.** Association between diagnosis and patient destination.

Diagnosis (n)	Patient Destination n(%)						
	Discharge to Home	OR	ICU	HU	IHT	Death	Other
Traumatic brain injury (TBI) (110)	8 (7%)	3 (2.7%)	69 (63%)	23 (21%)	1 (0.9%)	5 (4.5%)	1 (0.9%)
Thoracic trauma (TT) (26)	6 (23%)	1 (4%)	11 (42%)	7 (27%)	1 (4%)	0 (0.0%)	0 (0.0%)
Spinal cord injury (SCI) (24)	2 (8.1%)	5 (21%)	7 (29.2%)	9 (37.5%)	1 (4.2%)	0 (0.0%)	0 (0.0%)
Respiratory diseases (19)	3 (15.8%)	1 (5.2%)	8 (42.2%)	6 (31.6%)	0 (0.0%)	0 (0.0%)	1 (5.2%)
Non-traumatic neurological diseases (15)	2 (13.4%)	0 (0.0%)	5 (33.3%)	2 (13.4%)	5 (33.3%)	1 (6.6%)	0 (0.0%)
Orthopaedic trauma (7)	0 (0.0%)	0 (0.0%)	4 (57.2%)	2 (28.5%)	1 (14.3%)	0 (0.0%)	0 (0.0%)
Gastrointestinal diseases (4)	1 (25%)	0 (0.0%)	2 (50%)	1 (25%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Cardiovascular diseases (4)	0 (0.0%)	0 (0.0%)	4 (100%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Poisoning (2)	0 (0.0%)	0 (0.0%)	1 (50%)	1 (50%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Burns (2)	0 (0.0%)	1 (50%)	0 (0.0%)	1 (50%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

Subtitles: Operating room (OR); Intensive Care Unit (ICU); Hospitalisation Unit (HU); Inter-hospital transfer (IHT); Absolute number (n); percentage (%).



**Figure 2.** Physiotherapy procedures in a trauma emergency center.

Manoeuvres in Respiratory Physiotherapy (MRP); Airway Clearance Therapy (ACT), Invasive Mechanical Ventilation (IMV); Non-Invasive Mechanical Ventilation (NIV).

Among the factors that can worsen morbidity indicators, prolonged hospitalisation in the emergency room, as observed in some patients in this study, can contribute negatively to the patient's evolution, since this environment facilitates functional decline and predisposes factors to delirium<sup>24,25</sup>.

Although the need to reduce the length of stay in emergencies is a well-established issue, evidence points to the challenge for health systems to transfer patients

to appropriate hospitalisation sectors, due to hospital overcrowding, a scenario close to the one found in this study<sup>26</sup>. And when it comes to trauma patients, many require ICU admission, especially elderly victims of neurological injuries, which can increase waiting times in the emergency room even more<sup>27,28</sup>.

In the resuscitation and stabilisation phase, these patients often require multi-professional assistance and surveillance due to the complexity of their condition<sup>4</sup>.



Considering that many patients have already arrived with an AA or require an AA in the acute phase, studies and guidelines such as COFFITO's and the AHA's report that physiotherapists are professionals who are able to help the team manage the airway and make appropriate adjustments to mechanical ventilation, whether invasive or non-invasive, from its establishment until it is properly weaned<sup>7-10</sup>.

In addition to ventilatory support, the main procedures routinely required by trauma and polytrauma patients and offered by physiotherapists at this institution are those recommended by various guidelines and based on evidence<sup>7,10,29</sup>. And in order to offer a more comprehensive approach, continuous monitoring and early rehabilitation have been constantly offered to these patients, in line with the sixth link in the AHA's chain of survival, which refers to recovery<sup>30</sup>.

## CONCLUSION

This study found that the majority of elderly trauma victims were male and had fallen from their own height. The main diagnoses were neurological and chest traumas. Based on the clinical-functional demands that the patients presented, the physiotherapeutic procedures were mainly: surveillance, respiratory physiotherapy manoeuvres, OTT, ACT and ventilatory management.

The results of this study could help managers and professionals who work in a PS that is a reference in the care of trauma victims, organising services and improving care for the elderly.

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Nothing to declare.

## CONFLICT OF INTEREST

Nothing to declare

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