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ANALYSIS OF DEATHS OF ELDERLY PATIENTS TREATED AT A BRAZILIAN REFERENCE HOSPITAL IN TRAUMATOLOGY

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ABSTRACT

In Brazil, the elderly population (over 60 years old) is growing rapidly, projected to reach 2 billion by 2050, according to the WHO. Increased longevity brings benefits, but also challenges, such as greater susceptibility to trauma and chronic diseases, influenced by habits throughout life. Studies highlight the need for public policies to address global aging and its impacts, such as accidents and frailty. This study analyzed the incidence of trauma in the elderly at Hospital João XXIII in 2022, reviewing deaths and associated factors. The results aim to propose interventions to reduce morbidity and mortality in this age group.

Keywords: Population aging. Trauma in the elderly.

INTRODUCTION

In Brazil, individuals aged 60 and over are considered elderly, and this is the age group that has grown the most proportionally in the country, exhibiting one of the fastest growth rates in the world. Estimates show that from 1970 to 2000, the population aging rate in developed countries was 54%, while in developing countries this rate reached 123% (Daniel, Antunes & Amaral, 2015).

According to data from the World Health Organization (WHO, 2017), the projection is that by 2050 the elderly population will reach the 2 billion mark, contrasting with the 900 million registered in 2015. The expansion of longevity brings with it not only significant opportunities for the elderly, their families and society in general, but also highlights the crucial influence of technology and the promotion of healthy habits, factors that contribute to the continued growth in the number of elderly people.

However, as life expectancy has increased, recent studies have begun to establish links between the declines associated with old age and the standards of living, habits, and behaviors adopted throughout life (Faller, Teston & Marcon, 2015). Aging has emerged as a highly relevant topic for research, aiming to contribute to the formulation and implementation of public policies, given its global nature. Throughout the course of life, there is a constant adaptation, marked by

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the balance between gains and losses, with decreases in physical and cognitive capacities tending to increase with advancing age (Jung et al., 2019).

Despite the opportunity for a longer life, the aging process brings with it very important reflections: Death from accidents is a serious global health problem and the elderly are more susceptible to suffering them. (Yadav et al., 2023) In addition, chronic diseases of the elderly and their greater fragility can reduce their ability to resist even minor traumas. With technological advances and improvements in quality of life, the elderly become more exposed to the risk of suffering accidents. With the current aging of the world's population, the number of people over 60 years of age has been increasing significantly. (Kwon et al., 2020) In this scenario, there is a need to expand scientific studies, considering that trauma in the elderly causes intense suffering to victims and their families, in addition to entailing high costs for the global economy. (Eckhardt et al., 2020).

OBJECTIVE

The main objective of this study was to conduct a data survey on the epidemiological incidence of trauma in the elderly in a Brazilian public hospital and to review the scientific literature regarding interventions that could be adopted to minimize morbidity and mortality in these cases. (Jang et al., 2021)

METHODOLOGY

A statistical survey was carried out on the total number of deaths of elderly patients admitted in 2022 to Hospital João XXIII, victims of trauma or clinical causes, on an urgent or emergency basis. We evaluated how many arrived in CPA (cardiorespiratory arrest) upon admission and were successfully resuscitated, what the incidences were by sex and age of the patients, what the trauma mechanisms or causes of care were, whether the patients were taken to the hospital by rescue teams or their own means, what traumatic diseases or main traumas occurred, which medical specialties participated in the care of the patients, whether they underwent surgical treatment, which surgeries were performed, how many died in an intensive care unit, what the patient's classification according to the Manchester protocol in hospital triage was, in addition to collecting data on the average hospital stay until the date of death and on how many patients died due to infectious complications acquired after hospital admission.

Statistical analysis was performed using Microsoft Excel, which ensured that the data was consolidated in an organized manner. Microsoft Excel 2017 aggregated the researched articles

in spreadsheet format, allowing the extraction of research information and the creation of graphs to display the results.

DEVELOPMENT

The medical records of 264 elderly patients over 60 years of age, victims of trauma or with serious clinical conditions, who died in 2022, were evaluated. All medical records of inpatients and all outpatient care records of patients admitted to Hospital João XXIII who died this year were reviewed. Inpatients are understood to be those patients who had an inpatient medical record prepared by the attending physician. Outpatients are those patients for whom no inpatient medical record was prepared; the documentation of the clinical case is limited to the outpatient care record, as the patients died immediately upon hospital admission. The data were entered and analyzed by the WHO EPIINFO program.

INCIDENCE BY SEX AND AGE

There were 264 consultations during the period from January 1, 2022 to December 2022, of which 62.12% were male (n=164) and 37.88% were female (n=100) (Graph 1). The average age was 66.51 years, as shown in Table 1.

Graph 1 – Sex of Research Participants

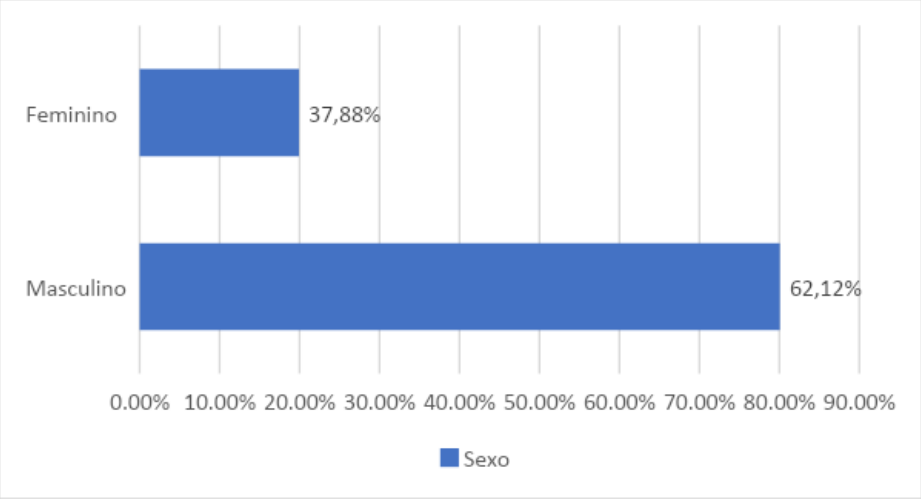


Table 1 - Age of Research Participants

Age	Female	Male
Mean - 66.51 Median - 67 Minimum value - 60 Maximum value - 89 25% percentile - 62 75% percentile - 74	Mean- 69.49 Median-69 Minimum value- 60 Maximum value-89 25% percentile- 65 75% percentile- 72	Mean- 65.62 Median-66 Minimum value-60 Maximum value-88 25% percentile-63 75% percentile-73

MAIN MECHANISMS OF TRAUMA

The main causes of care were falls, responsible for 120 care (n=120), followed by run over (n=21); burns (n=11); car accident (n=8), assault (n=4), attempted suicide (n=4), motorcycle accidents (n=3), cycling accident (n=1) and exogenous poisoning (n=1) as shown in Table 2.

It is worth mentioning that 85 patients were treated for clinical conditions, such as decompensated heart disease (n=13), acute respiratory failure (n=9), non-traumatic acute abdomen (n=10), stroke (n=10), infectious conditions: urinary tract infection and pneumonia (n=7), post-cardiorespiratory arrest (n=2) and hospitalized for propaedeutics, without diagnosis on admission (n=34). Six patients with complications after trauma were treated: surgical wound infection (n=2) and sepsis (n=4).

Of the 264 patients, 100 (37.87%) were taken to the hospital by SAMU/rescue and 5 (1.76%) by air transport.

Table 2 - Reason for service

Fall from own height Fall from stairs Fall from height Non-specific fall Fall from bed Falls – Total	86 8 15 2 9 120
Clinical causes	85
Hit and run Burn Car accident	21 11 8
Trauma complications	6
Self-extermination	4
Assault/bladed weapon Motorcycle accident	3/1 3
Cycling accident	1
Exogenous intoxication	1
Total	264

The most common traumatic disease associated with the cause of care was traumatic brain injury (n=89), as shown in Table 3, followed by upper and lower limb injuries (n=23), burns (n=13), spinal cord injury (n=8), pelvic trauma (n=6), thoracoabdominal trauma (n=5), isolated thoracic trauma (n=3), isolated abdominal trauma (n=3), exogenous poisoning (n=3), and facial trauma (n=1).

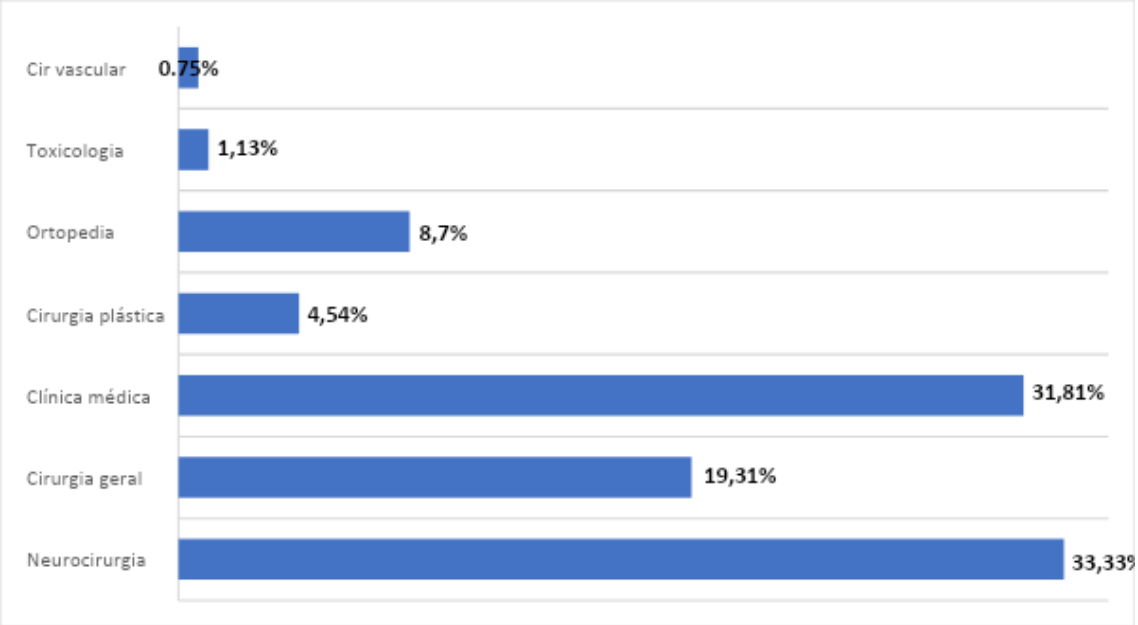
Corroborating this data, it is possible to see that neurosurgery was the main clinic involved in the care of these patients (n=89), followed by internal medicine (n=84); general

surgery (n=51); orthopedics (n=23), plastic surgery (n=12), toxicology (n=3) and vascular surgery (n=2) (Graph 2).

Table 3 - Traumatological Disease

Major trauma	Number of patients
TBI/facial trauma	89/1
Burn	13
TRM	8
Exogenous Intoxication	3
Thoracic Trauma	3
Lower limb trauma	23
Trauma Abdominal	3
Thoraco-abdominal trauma	5
Pelvis trauma	6

Chart 2 – Main Clinic Involved in Patient Care



In this context, 195 surgical procedures were performed. The main ones were: Craniotomy and Decompressive Craniectomy, with intracranial pressure monitoring, tracheostomy, laparotomy, debridement of extensive wounds, treatment of closed and exposed limb fractures, spinal arthrodesis, thoracic drainage, limb amputation and others (vascular surgeries, gastrostomy, ventriculoperitoneal shunt, pelvic fracture fixation, installation of hemodialysis catheter, performance of upper digestive endoscopy) as shown in Table 4.

Table 4 - Surgeries performed

Surgery	Number of patients
TQT	29
Laparotomy	25
Decompressive Craniectomy	13
Craniotomia	40
Debridement of extensive wounds	24
Spinal arthrodesis	12
Chest drainage/thoracotomy	9/1
Limb amputation	4
Closed and exposed limb fractures	16/3
Vascular surgeries	3
Others	16
Total	195

FACTORS RELATED TO DEATH AND PROGNOSIS

Regarding deaths, it was found that the majority occurred in the hospital's intensive care unit - ICU (n=136), followed by the ward (n=77), emergency rooms (n=45) and surgical block respectively (n=6) (Graph 3).

The Manchester Protocol was used as a triage method to classify risks and define which patients required priority care upon hospital admission, using colored bracelets: Red, 90 patients at risk of death or in extremely serious conditions who required immediate care; orange, 118 patients in urgent cases, with a waiting time of no more than 10 minutes; yellow, 40 patients who could be at risk, but not immediately, with an average waiting time of up to 1 hour (graph 4). 16 patients were not classified upon hospital admission.

Graph 3 – Place of death

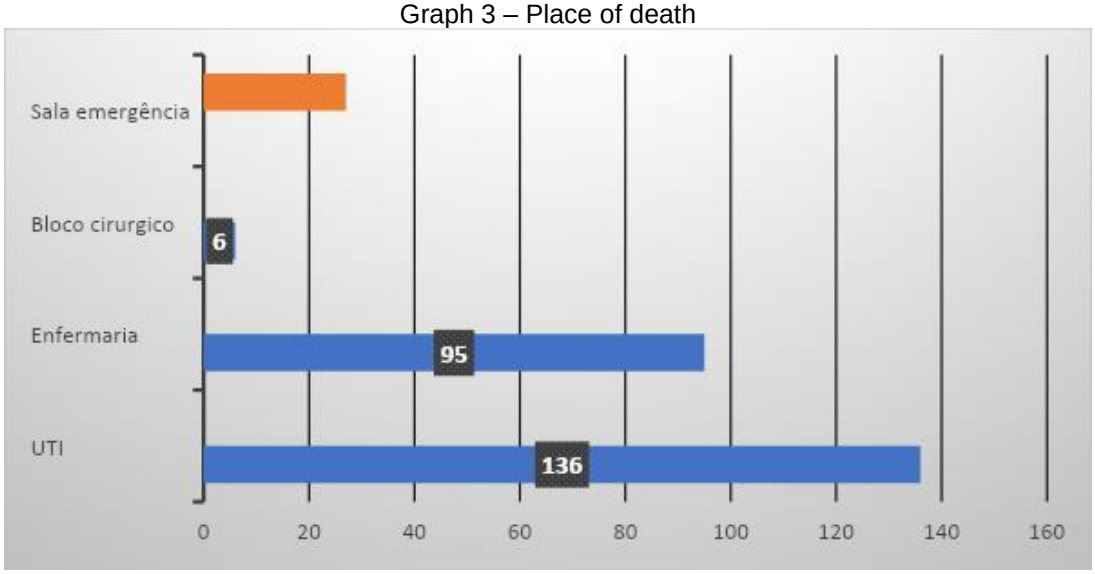
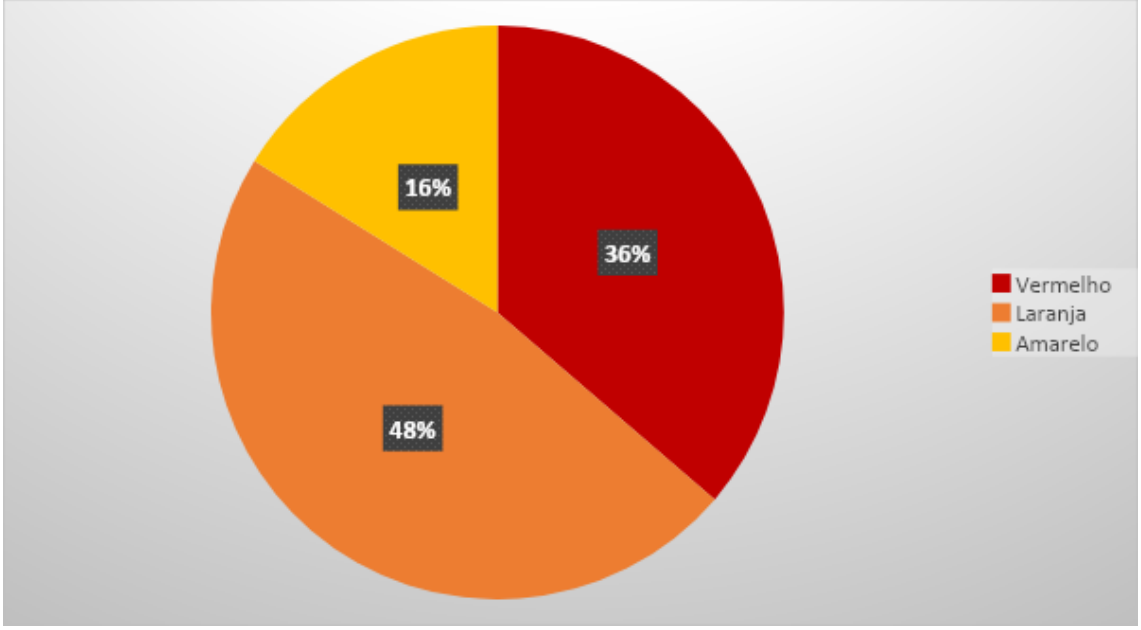


Chart 4 – Manchester Classification



Regarding hospital stay until death, the average was 11.07 days. Only 6.38% of cases died after 30 days of hospitalization.

The resuscitation room at Hospital João XXIII is connected to an alarm system called “red wave”. This system refers to an institutional protocol for the care of patients at imminent risk of death, involving the work of a multidisciplinary team and synchronization between different sectors of the emergency unit, such as the resuscitation room, helipad, surgical block and other hospital units.

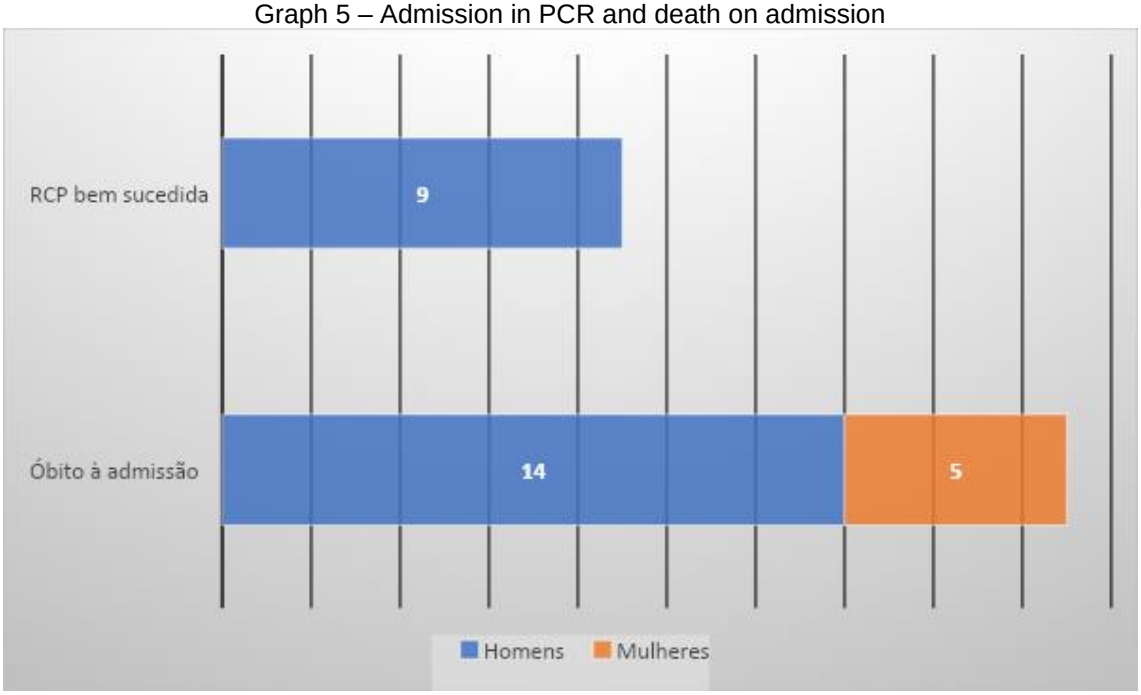
The “red wave” is activated when a patient arrives in extremely serious condition and requires urgent referral to the surgical block. This activation is done by means of a signal, similar to a police car radar. The signal is transmitted to the blood bank, which prepares to send O- (O negative) blood to the surgical block. The surgical block, in turn, has a specific room for the “red wave”, ensuring effective coordination between the sectors.

Conceptually, the “red wave” represents a set of tactical medical and administrative actions aimed at surgically approaching patients at imminent risk of death. This approach occurs in a properly prepared and trained surgical center, instead of the polytrauma care room. The protocol allows for immediate care with blood products and the provision of a room in the surgical center equipped with the necessary materials for urgent surgical procedures.

The “red wave” is considered a successful experience in the institution, standing out for the adherence of professionals to the protocol, for the recognition of its importance and, mainly, for the improvement in the quality of care for patients at imminent risk of death. There was only 1

case of “red wave” in this series and the patient underwent thoracotomy, but evolved to death in the surgical block sector.

Graph 5 – Admission in PCR and death on admission



23 patients were admitted in cardiorespiratory arrest and of these, 14 died upon hospital admission (Graph 5).

Another important fact is that 100 (37.87%) of the patients with or without serious illnesses died due to infectious complications acquired after hospital admission. Sepsis and severe TBI also stand out as causes of death, as recorded in Table 5.

The most frequent brain injuries were acute subdural hematoma (n=31), traumatic subarachnoid hemorrhage (n=21), cerebral contusion (n=15), cerebral intraparenchymal hematoma (n=7), followed by chronic subdural hematoma (n=6), skull fractures (n=4), intraventricular hemorrhage (n=3) and acute extradural hematoma (n=2).

Table 5 - Causes of death

Cause of death	Number of patients
Sepse	84
Pneumonia/bronchoaspiration	12
Cardiogenic shock	13
Severe TBI	55
Hypovolemic shock	24
TRM	4
Thoracoabdominal trauma	9/1
Acute respiratory failure	4
Acute abdomen	16
AVE	3
Others	40
Total	264

This study found that falls were a relevant mechanism of trauma, being the main cause of accidents among elderly people admitted to hospital. Falls in elderly people are a major public health problem because the prevalence of falls is high among the elderly and the consequences are serious. Approximately 95% of all hip fractures each year are attributed to falls, and 20% to 30% of those who fall and suffer a hip fracture die within 1 year. The rapid growth in the number of elderly people associated with the high costs arising from falls, even if non-fatal, requires that effective fall prevention strategies be identified and tested. In this sense, the study by Ruge et al. (2020) corroborates this research, as it demonstrated that mortality is high among elderly patients with traumatic brain injury (TBI).

In the study by Amorim et al. (2017), the authors found that the main causes of trauma in emergencies are: falls, traffic accidents, assault and injuries caused by sharp weapons or firearms. Such data are similar to ours, which demonstrated that of the 264 patients taken to the hospital by SAMU/rescue and air transport, 120 suffered falls.

In this sense, traumatic brain injury was identified as the main trauma associated with the patients studied. Head injuries are classified by the nature of the force that causes the injury and the severity of the injury. The forces that cause head trauma are called impact or inertial forces. Impact forces result from the impact of the head on a surface or from a moving object striking the head; these forces usually cause skull fractures, focal brain injuries, and subdural or epidural hematomas. Inertial forces are typically the result of the rapid acceleration and deceleration of the brain within the skull, resulting in shearing or rupture of brain tissue and nerve fibers (Miranda, 2017).

Most traumatic brain injuries are the result of both types of forces. The severity of the head injury can range from a concussion (mild diffuse axonal injury) to a more severe injury.

Damage to the nervous system tissue occurs both at the time of impact or penetration, and through secondary damage (Miranda, 2017).

Corroborating this information, neurosurgery was the clinical specialty most involved in the care of most patients. Regarding deaths, it was found that the majority occurred in the intensive care unit (ICU), a hospital sector focused on intensive care, where specialized treatment and continuous monitoring of patients are provided. Patients admitted to the ICU are more susceptible to contracting more severe and frequent infections. These factors associated with preexisting physical and systemic impairment can predispose to death in many cases (Galhardo et al., 2020). In agreement with the literature, 37.87% of patients with severe or non-severe diseases died due to infectious complications acquired after hospital admission.

Healthcare-associated infections are increasingly in the spotlight of patients, insurers, governments, and regulators. This is due not only to the severity of the problem in terms of morbidity, mortality, and associated treatment costs, but also to the growing recognition that the majority of these infections are preventable. The medical community is witnessing simultaneous and unprecedented advances in understanding the pathophysiology of infectious diseases and the global spread of multidrug-resistant infections in healthcare settings (Graveto et al., 2018).

These challenges, compounded by the scarcity of new antimicrobials, have prompted a rethink of the role of basic infection prevention practices in modern healthcare. There is now overwhelming evidence that rigorous adherence to hand hygiene effectively reduces the risk of cross-transmission of infections. Hand hygiene is described by many healthcare professionals as the single most important tool in preventing the spread of healthcare-associated infections between patients (Tarso et al., 2017).

In addition to this factor, 14 of the 23 patients admitted in cardiorespiratory arrest died upon hospital admission, but 9 survived, demonstrating the importance of this first qualified care in the institution.

It is also worth noting that for patients admitted to traumatology, triage must be performed based on symptoms and recommended waiting time. Patients are assigned a color according to the severity of the situation. The most serious pathologies are designated with the color red, indicating the need for immediate care; very urgent cases are designated with the color orange, with a recommended waiting time of ten minutes; urgent cases are identified with the color yellow, and the recommended waiting time is 60 minutes. Patients classified with green and blue are less severe, being considered little or non-urgent, and must be seen within four hours. The triage system also considers the possibility of the patient's health situation worsening while waiting for medical care, allowing for a change through a second evaluation. The classification is

performed by a professional with a higher education level, usually a nurse, who must have communication skills, agility, ethics and good clinical knowledge (Franco, Bueno & Merhy, 2019).

In this study, the Manchester classification for patients was: 90 red; 118 orange; 40 yellow, demonstrating the severity of the cases, while hospital admission is considered a factor of worse prognosis, associated with higher mortality. According to Franco, Bueno and Merhy (2019), the purpose of the Manchester classification is to humanize care through qualified listening to clients seeking emergency services. This approach involves classifying, through a protocol, the complaints of users seeking emergency services, with the aim of identifying those who require immediate or intermediate medical care. In addition, the aim is to take advantage of this encounter with the citizen as an opportunity to educate them about emergency care and develop care flows in this context, taking into account the network of health care services.

FINAL CONSIDERATIONS

Old age can bring about significant and negative physical, cognitive, emotional and social changes that cause dependence and a lack of autonomy in the elderly, causing them to lose their freedom, with damage to their memory, and causing them to distance themselves from family, friends, loved ones and social relationships. Human beings fear losses that cause suffering. Experiencing losses can lead to situations of abandonment, with progressive damage.

In this context, falls are a relevant public health problem and cause high rates of morbidity and mortality in the elderly. In this sense, public health and management actions should include measures aimed at improving the functional and psychosocial capacity of the elderly, consequently increasing the well-being and general health of the elderly, preventing diseases and accidents. Measures to improve accessibility to all places frequented by the elderly population stand out.

Infections associated with hospital care should be avoided by simply washing hands when dealing with patients. In addition, care should be taken with strict antisepsis and asepsis when handling venous access, bladder catheters, orotracheal tubes and tracheostomy tubes.

It is essential to invest in improving patient care in a welcoming and individualized manner, understanding their family context, assessing the global scope of their illnesses and comorbidities, and respecting their physical and mental needs. In this context, the use of the Manchester risk classification during emergency care stands out, ensuring efficient and effective care, understanding and prioritizing the complaint and current physical condition of patients.

It is up to the team, with the support of the institutions, to be trained and qualified to provide highly technical care and deal with chaotic situations. This preparation will enable the efficiency and effectiveness of the maneuvers required to care for accident victims and in serious, urgent or emergency situations. Successful patient care is possible through the combined efforts of trained and qualified teams, with the involvement and interest of each professional, counting on the unrestricted logistical, financial and administrative support of managers and health institutions.

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