Factors Related to Hospitalization of Elderly in Intensive Care Units

ORIGINAL

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Abstract

Objective: To analyze the factors related to hospitalization of elderly in Intensive Care Unit.

Method: Integrative literature review performed in BDENF, Medline and ScienceDirect databases. We selected 11 articles published from 2008 to 2015 that met the inclusion criteria. Data were processed in IRAMUTEC software.

Results: Results are presented in 05 classes, as follows: Class 1: Use of systems to assess the level of severity for ICU patients; Class 2: Length of stay of elderly in ICUs; Class 3: Old age and underlying diseases in patients treated in ICUs; Class 4: The main clinical outcomes of admission of elderly in ICU; Class 5: The care provided to elderly in the ICU.

Conclusion: The *Simplified Acute Physiology Score* (SAPS II) model was the most used in elderly patients admitted to intensive care units, the prolonged length of stay is associated with worse prognosis, especially in patients with underlying diseases, and the postoperative period is the main cause of admission.

Introduction

The Brazilian elderly population, represented by people over 60 years, has grown significantly in recent decades, mainly due to the increase in life expectancy linked to lower mortality rate. This scenario entails major implications for social policies, representing one of the greatest challenges of contemporary public health. In this perspective, it is estimated that in 2025 there will be an exponential growth of 32

million people aged over 60 years, with Brazil accounting for the sixth largest population of elderly in the world. [1]

The growth reaches the elderly with advanced age, since the expectation is that, in 2050, people aged at 80 years or older represent 9.6% of the population in Europe, 9% in North America, 6.5% in Oceania, 5.5% in Latin America and the Caribbean, 4.4% in Asia and 1.1% in Africa. [2-3]

This increase is also seen in health services. The number of hospitalizations among the elderly in public hospitals is growing in all hospital sectors, especially in Intensive Care Units (ICUs), where elderly patients 60 years or more represent between 42% and 52% of hospitalizations and have a poor prognosis compared to younger patients. [4]

In Australia and New Zealand, it is estimated that the rate of people aged at 80 or older admitted to ICUs increase by 72% in 2050. This growth imposes major implications on health resources, the need for expansion of ICU capacity and the need to care for this population. [3]

Aging produces changes in various aspects such as in physiological and morphological variables, with consequence to many organic functions of the individual. For this reason, it is extremely important to know the profile of the elderly, the underlying diseases and other risk factors. Also, knowing the factors associated with admission and discharge of elderly in Intensive Care Units is essential to direct and give focus to health actions. [4]

Thus, this paper studied the factors associated with admission and discharge of elderly patients 60 years or more in intensive care units and has the objective to analyze which factors are associated with admission and discharge of elderly patients in these units.

Methods

This is an integrative literature review (ILR) that followed the steps: identification of the theme and selection of the research question; establishment of inclusion and exclusion criteria; identification of pre-screened and selected studies; categorization of the selected studies; analysis and interpretation of results and presentation of review/synthesis of the knowledge acquired. [5]

To conduct the ILR, the guiding question was elaborated by the PICO strategy (P: Patient I: Intervention, C: Comparison and O: outcome): What are the clinical, epidemiological and assistance factors related to the hospitalization of elderly in intensive care units? [5]

A search in the Nursing Database (BDENF) *Medical Literature Analysis and Retrieval System Online* (Medline) and *Web of Sience* was carried out using the combination of controlled descriptors, those structured and organized and registered in the Medical Subject Headings (MeSH): *hospitalization* [*and*] *elderly; elderly* [*and*] *Intensive Care Unit; Intensive Care Unit* [*and*] *hospitalization*.

Inclusion criteria were: primary studies of patients elderly 60 years or more admitted to intensive care units; articles available in full length electronically and free of charge, published between 2008 and 2015. As exclusion criteria, articles that were repeated in databases and articles of opinion, reflection, review and editorials were not used.
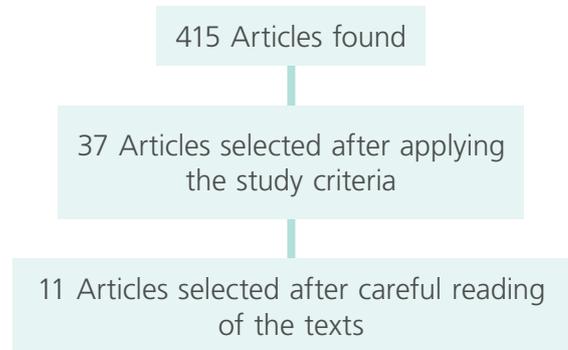
In the next step, studies were evaluated for the year, language, methodology, applicability of the results in practice, methodological precision, the measured interventions and the results found, as well as the type of study and the level of evidence, considering: 1: systematic reviews or meta-analysis of relevant clinical trials; 2: evidence of at least one randomized, controlled and well defined clinical trial; 3: well-designed clinical trials without randomization; 4: well-designed cohort and case-control studies ; 5: systematic review of descriptive and qualitative studies; 6: evidence derived from a single descriptive or qualitative study; 7: Opinion of authorities or expert committees, including interpretations of information not based on researches. [6]

For processing and analyzing data, we used the software *IRAMUTEQ* (*R interface pour les Analyses Multidimensionnelles of Textes et Questionnaires*) [7] which enables different types of analysis, including the Descending Hierarchical Classification. The software to perform classical lexical analysis identifies and reformats the text units, transforming them from Initial Context Units (ICU) to Elementary Context Units (ECU). The number of words, the average frequency and the number of hapax (words with frequency of one occurrence) are also identified.

In the method of Descending Hierarchical Classification (DHC), texts are classified according to their vocabularies and the set of texts is divided by the frequency of the reduced forms. We also used the method of word Cloud, which clusters words and organize them graphically according to their frequency. It is a simple but graphically interesting lexical analysis. [7]

Four hundred and fifteen articles were located: 244 in BDENF, 101 in *Medline* and 70 in *Web of Sience*. After applying the exclusion criteria, we selected 11 that met exactly the proposed objectives and inclusion criteria **(Figure 1)**.

Figure 1: Mapping the identification, analysis and selection of results. Teresina, 2016.

415 Articles found

37 Articles selected after applying the study criteria

11 Articles selected after careful reading of the texts

Results

The articles analyzed were available in Portuguese, English, Turkish and Spanish. Theirs goals, in general, sought to identify factors associated with admission and discharge of elderly patients to intensive care units.

Eleven studies described in **Table 1**, according to the most relevant information, composed the review.

Table 1. Selected studies according to title, year, and database. Teresina, 2016.

Title	Year	Database	Type of Research	Level of Evidence	Authors	Objectives
Clinic evolution of adults, elderly and very elderly patients admitted to Intensive Care Uni	2011	Bdenf	Retrospective Study	6	Oliveira VCR, Nogueira LS, Andolhe R, Padilha KG, Sousa RMC	To compare the clinical evolution in adults, elderly and very elderly patients in the Intensive Care Units
Characteristics and Prognostic Factors of Elderly Patients in Intensive Care Unit	2015	Medline	Cohort Study	6	Pedrosa IL, Farias MCAD, Silva FA, Cavalcante VRB, Gadelha CS, Schneider RH	To describe the characteristics and prognostic factors of elderly in ICU.
Increased intensity of treatment and decreased mortality in elderly patients in an intensive care unit over a decade	2010	Medline	Cohort Study	6	Lerolle N, Trinquart L, Bornstain C, Tadie JM, Imbert A, Diehl JL, et al	To determine whether the care in intensive care unit and survival had evolved from the 1990s to the 2000s.
Effectiveness of Long-term Acute Care Hospitalization in Elderly Patients With Chronic Critical Illness	2013	Medline	Cohort Study	6	Kahn JM, Werner RM, David G, Have TRT, Benson NM, Asch DA	To examine the effectiveness of LTAC transfer in patients with chronic critical illness.

Title	Year	Database	Type of Research	Level of Evidence	Authors	Objectives
Long-term survival and quality of life after intensive care for Patients 80 years of age or older	2015	Medline	Retrospective Study	6	Andersen FH, Flaatten H, Klepstad P, Romild U, Kvåle R	Comparison between the survival and quality of life in a mixed population of ICU patients aged at 80 years or older and the general population.
Clinical characteristics and outcome of very elderly patients ≥90 years in intensive care: a retrospective observational study	2015	Medline	Retrospective Study	6	Becker S, Müller J, Heer G, Braune S, Fuhrmann V, Kluge S	To analyze the clinical characteristics and evolution of very elderly patients (≥90 years) admitted to the ICU.
Dahiliye yoğun bakımdaki yaşlı ve çok yaşlı hastaların klinik özelliklerinin karşılaştırılması	2015	Medline	Retrospective Study	6	Mehmet Köş, Hafize T, Birgül Ö, Tuba S, Ali K, Yusuf A, Leyla K	To analyze laboratory and clinical data of ICU patients aged at 65 years and older.
Determinants of outcome in elderly patients admitted to the intensive care unit	2015	Web Of Sience	Cohort Study	6	Vosylius S, Sipylaite J, Ivaskevicius J	To compare the clinical characteristics of patients with ≥ 65 years of age admitted to the ICU with characteristics of younger patients and to identify risk factors that could independently predict mortality in patients aged ≥ 75 years of age.
ICU admission characteristics and mortality rates among elderly and very elderly patients	2012	Web Of Sience	Cohort Study	6	Fuchs L, Chronaki CE, Park S, Novack V, Baumfeld Y, Scottl D, et al	To analyze the effect of age and severity of acute and chronic diseases in the long-term survival of elderly patients admitted to the ICU.
Variability of Intensive Care Admission Decisions for the Very Elderly	2012	Web Of Sience	Cohort Study	6	Boumendil A, Angus D, Guitonneau AL, Menn AM, Ginsburg C, Takun K, et al	Examine the inter-hospital variability of admission rates of elderly aged over 80 years in the ICU and its association with the outcomes.
Features and prognostic of elderly patients with very long stay in Intensive Care Unit	2008	Web Of Sience	Retrospective Study	6	Cabrera LS, Sánchez-Palacios M, Medina EH, Robaina PE, Hernández ÁV	To describe the characteristics and prognostic factors of elderly patients admitted to an ICU

The classes and their descriptions

In the description of the results presented by IRAMUTEQ, the main analysis of the characteristics to be considered are as follows:

- Number of texts (nombre de textes) = 11 (the program recognizes the separation of the corpus into 11 initial text units).

- Number of segments of texts (nombre de segments de textes) = 188 (the program divide into 188 segments of text)
- Number of different forms (nombre de formes) = 1307.
- Number of occurrences (nombre d'occurrences) = 6701

- Average frequency of forms (moyenne d'occurrences pair form) = 35.643617
- Number of classes (classes nombre) = 5
- Retention of text segments: 122 segments out of 188 (64.89%)

By DHC, five semantic classes were identified in the analyzed material and the association of the fixed variables of the study: database, journal and year of publication, which represented 100% of the material to be analyzed.

The corpus analyzed in this study consists of 11 initial context units (ICU) and was divided into 122 elementary context units (ECU). We sought to identify and analyze the textual domains and interpret the meanings naming them with their respective senses in classes.

Through Descending Hierarchical Classification, the IRAMUTEQ presented the dendrogram of classes derived from the corpus. For construction of the dendrogram **(Figure 2)**, which illustrates the partitions that were made in the corpus, until it reached the final classes.

Figure 2: Descending Hierarchical Classification -Dendogram- Factors related to hospitalization of the elderly in Intensive Care Units. Teresina-PI; 2016.

Classe 5	16.4 %
Classe 3	21.1 %
Classe 4	18.9 %
Classe 2	24.5 %
Classe 1	17.2 %
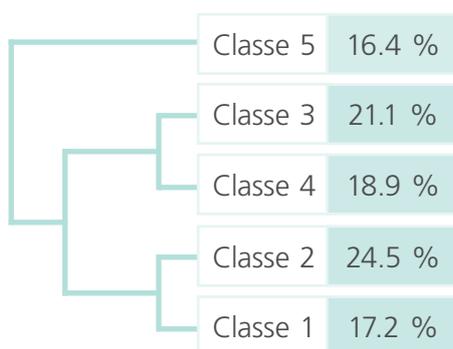
Class 1. Use of systems to assess the level of severity for ICU patients

There is a range of systems that evaluate the severity of patients used in an Intensive Care Unit, in order to contribute to the care of patients. There were two main prognostic scores reported. First, the model *Simplified Acute Physiology Score* (SAPS II) the principal and the most cited, it expresses the severity based on physiological conditions, besides being a simplified version easier to be applied. Second, the *Acute Physiology and Chronic Health Evaluation Score* (APACHE II), that enables the calculation of the score and the probability of hospital death and the severity of patients, as well as indicates potential criteria for screening patients for ICU and proposes operational and equipment improvements.

Class 2. Length of stay of elderly in ICUs

There is no consensus in the literature on the influence of prolonged length of stay in Intensive Care Unit (ICU) and the elderly. However, studies show that older people tend to have shorter stay, due to the high proportions of non-survivors. Those who survive, and usually stay in hospital for longer, tend to develop disorders resulting from the hospitalization and from the health care itself such as hospital infections and decubitus ulcers.

Class 3. Old age and underlying diseases in patients treated in ICUs

The more frequent chronic diseases in patients treated in ICUs were diabetes mellitus and hypertension. It is believed that these underlying diseases interfere directly in the patient's prognosis, increasing the days of hospitalization, and are considered risk factors for emergence of other diseases.

Class 4. The main clinical outcomes of admission of elderly in ICU

The literature suggests that the primary endpoint for admission of patients in ICUs was the postoperative situation, particularly abdomen surgeries and also trauma. Mechanical ventilation was the procedure most often cited by the authors especially due to respiratory failure.

Class 5. The care provided to elderly in the ICU

Elderly in intensive care require a series of reflections about the care to be provided. Appropriate assistance should consider the physiological organic changes typical of the aging process, as well as the psychological and social changes and their repercussions. This scenario is revealed in a favorable field to the avant-garde of nursing, professional class responsible for the holistic care and in all its interfaces.

Discussion

Brazil has registered a remarkable increase in the elderly population in recent decades, including in intensive care units. The growth of chronic diseases such as strokes, heart disease, hypertension, diabetes mellitus, chronic lung diseases, osteoarticular diseases and dementias associated with the aging population has not only changed the epidemiological profile of the most prevalent diseases in the population, as well as has led to a greater number of patients hospitalized because of these diseases. [8, 10, 19]

In general, these diseases cause limitations that compromise the quality of life of the elderly, need longer hospitalization stay, lead to more or less complex surgeries and, generally, may bring sequelae. These patients deserve attention because of their susceptibility pathologies whose worsening exacerbates diseases that require complicated treatments, leading to the need to use more and more beds of these units. [16, 18]

The prolonged stay of patients admitted to these units interferes with the prognosis of these patients. One of the identified grievances are health care-acquired infections (HCAI), which have a direct relationship with the length of stay, and increased exposure to invasive procedures and prolonged intravenous medication. These factors associated with or arising from an extended stay of critically ill patients drive to a higher rate of hospital mortality. [9, 20]

Old age seems to be linked to a worse prognosis. However, this is not an isolated variable, and can not be understood as such. Other factors such as the severity of the acute illness, comorbidities and functional status can also be associated with a worse prognosis. [8, 12, 14, 17]

Clinical outcomes most often reported in literature were postoperative situation, especially abdomen and acute respiratory failure. Mortality rates in patients undergoing planned surgeries were low, in contrast with unplanned surgeries. [9, 13, 17]

The use of invasive procedures was often reported to both therapeutic as well as diagnostic procedures. Mechanical ventilation was the most referred procedure, favoring the onset of other diseases with infections related to HCAI and increasing the likelihood of a patient stay longer in this unit. HCAI linked to extended stay predispose to high levels of mortality. [11, 20]

Aging brings with it a decrease in lung capacity, leading to changes in respiratory function. Especially the presence of acute diseases may lead to respiratory failure. The central nervous system dysfunction can also interfere with the working capacity of the upper airways, which can extend the need for mechanical ventilation and further increase the risk of hospital infection. [9, 15]

Premature deaths related chronic diseases such as diabetes and decompensated hypertension are present within ICUs and can be avoided with preventive measures relating to the knowledge and treatment of these diseases within the primary care services. [9, 14]

It is a major challenge for health professionals to identify strategies that address this impasse. It is pertinent to highlight the importance of raising awareness among professionals about appropriate care toward this audience in order to prevent exacerbations of chronic acute diseases, as one disease may conceal the manifestation of others.

Conclusion

The growing number of elderly (aged at 60 years and over) as well as the life expectancy, translates into an increase in admissions of these people in ICUs. Thus, the associated comorbidities, the cognitive function and the functional status become important components that guide care aiming at a better clinical outcomes. It is pertinent to note the importance of the detailed evaluation of these variables associated with other clinical variables in order to minimize deaths and improve the prognosis of patients in this hospital environment, which may be reflected in the costs and occupation, among others.

In addition, the relationship between the presence of acute illnesses, sudden decline of organ or function and other variables associated with age need a more detailed investigation. Moreover, the evaluation of symptoms in the elderly, not attributed to aging, by validated scales proves to be important.

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