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RESEARCH ARTICLE

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## PRESSURE INJURY'S INDEXES OF PATIENTS INTERNED IN INTENSIVE CARE UNITS AT BRAZILIAN UNIVERSITY HOSPITALS BETWEEN 2015-2020

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### ABSTRACT

**Introduction:** Pressure injury is a lesion located on the skin, usually on a bony prominence, resulting from pressure alone or combined with friction. These injuries have a high incidence and prevalence in Intensive Care Units (ICUs) and constitute a significant cause of morbidity and mortality. **Objective:** To evaluate pressure injury indexes in patients admitted to the ICUs of Brazilian University Hospitals between the years 2015 and 2020. **Materials and Methods:** Bibliographic review of 20 studies, collected from the SciELO, Lilacs, PubMed and BvSalud databases. **Results:** The 20 studies analyzed showed an average incidence of pressure injury of 35.5%. The region most affected was the sacral area. Regarding risk factors, hospitalization for more than 10 days, comorbidities and low scores on the Braden Scale stood out. Significant death rates resulting from complications of pressure injuries were found in five studies with rates of 80%, 61.4%, 53.85%, 52.94% and 39%. **Discussion:** Between the years 2015 and 2020, pressure injury's rates were high in patients hospitalized in Brazilian ICUs. Therefore, risk classification, early mobilization in bed and team training are essential since the prevention of these injuries reduces the risk of death.

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## INTRODUCTION

Pressure ulceration (PU) is a skin ulcer resulting from prolonged pressure exerted on the skin and/or subcutaneous tissue, originating from the weight of the body on a bony prominence (Diccini, Camaduro, & Iida, 2009). The action of this force for a long period of immobility or by friction results in tissue hypoxia by interrupting the local blood flow, which leads to necrosis of the cells of the epidermis and dermis and the appearance of the ulcerated lesion (Mervis, & Phillips, 2019). In addition to pressure by stagnation and/or friction, other factors may contribute to the manifestation of LPP, such as systemic arterial hypertension (SAH) and diabetes mellitus (DM), which accelerate the process of tissue destruction from the release of inflammatory mediators and hinder the healing process (Diccini, et al., 2009). These lesions have a high incidence and prevalence in Intensive Care Units (ICUs) and are a significant cause of morbidity and mortality, since the discontinuity of the skin, promotes the colonization of pathogenic microorganisms (transient microbiota) and, consequently, the installation of serious infections, which delays the recovery of the hospitalized patient and can lead to death (Sales, Borges, & Donoso, 2010). These outcomes highlight the importance of preventing LLP, which can be done using the American Braden Scale, which covers the domains of activity, wetness, mobility, sensory perception, nutrition, friction, and shear. The first five domains of this scale range from 1 to 4, and the last ones from 1 to 3,

with a total score of 6 to 23 points. Thus, the lower the score, the higher the risk for developing LLP. This classification allows for greater attention and care to the specific risk factor(s) that the patient presents, which helps prevent the onset or worsening of these lesions (Rogenski, & Kurgant, 2012). In addition to the use of the Braden Scale for prevention, the staging of deep skin lesions from I to IV, described by the National Pressure Ulcer Advisory Panel (NPUAP) in 2007, contributes to a faster recognition of PML and therefore delays or prevents its evolution. In this classification, stage I indicates a persistent erythematous lesion over a bony prominence, stage II represents lesion with damage to the dermis, stage III affects the entire epidermis and dermis, and stage IV exposes bone, muscle, and tendon (Rogenski, & Kurgant, 2012). The association of LPP staging, application of the Braden Scale, control of the variation in bed decubitus and proper care of the patient's skin ensures the quantitative reduction of these lesions (Silva et al., 2019). Because ICU patients remain immobile for a prolonged time, they are constantly affected, which increases the length of stay of these patients and the risk of death (Dantas, Ferreira, Diniz, Medeiros, & Lira, 2014).

**Objectives:** To evaluate the rates of pressure injuries in patients admitted to the ICUs of Brazilian University Hospitals (HU) between the years 2015 to 2020.

## MATERIALS AND METHODS

A qualitative and quantitative literature review was conducted considering articles with an epidemiological profile of PUs in patients admitted to Brazilian ICUs between 2015 and 2020.

The bibliographies were collected from the *Scientific Electronic Library Online* (SciELO), Latin American and Caribbean Literature on Health Sciences (Lilacs), PubMed, and BvSalud databases, using the descriptors: PUs, pressure ulcers, university hospital, intensive care unit. The inclusion criteria were: prevalence and incidence of PUs in ICUs of Brazilian HUs in the period from 2015 to 2020.

**Table 1. Main results of the 20 studies, according to the respective author, location, year, and study sample**

Author	Location	Year	Study Sample	Main Results
Brito(2017)	RR	2017	59	<ul style="list-style-type: none"> <li>62,7% - Incidence</li> <li>64,5% - Sacral region</li> <li>&gt; 10 days of hospitalization</li> <li>37,8% - Deaths</li> </ul>
Candaten et al (2019)	RS	2017	39	<ul style="list-style-type: none"> <li>6,19% - Incidence</li> <li>48,7% - HAS and 35,9% - DM</li> <li>71,8% - Sacral region</li> <li>43,87 days of hospitalization</li> <li>53,85% - Deaths</li> </ul>
Cascão et al (2019)	RJ	2017	75	<ul style="list-style-type: none"> <li>28% - Incidence</li> <li>47,61% - Sacral region</li> <li>71,42% - HAS and 47,61% - DM</li> <li>11 to 20 days of hospitalization</li> </ul>
Cerrutti et al (2017)	SC	2016/2017	139	<ul style="list-style-type: none"> <li>30,2% - Incidence</li> <li>Inadequate nutrition*</li> <li>53,8% - High risk on the Braden Scale</li> </ul>
Farias et al (2019)	PB	2015	17	<ul style="list-style-type: none"> <li>58,82% - Incidence</li> <li>47,06% - HAS and 11,76% - DM</li> <li>62,5% - Sacral region</li> <li>52,94% - Deaths</li> <li>17,4 days of hospitalization</li> </ul>
Ferrão et al (2018)	DF	2015	40 Deaths (other reasons)	<ul style="list-style-type: none"> <li>27,5% - Prevalence</li> <li>20% - Sacral region</li> </ul>
Gama et al (2020)	PE	2015/2016	566	<ul style="list-style-type: none"> <li>19% - Incidence</li> <li>96,3% - Friction/ Shear</li> <li>81,9% - Immobility</li> <li>55,2% - Moderate risk on the Braden Scale</li> <li>≥ 10 days of hospitalization</li> </ul>
Macena et al (2017)	Northeast Region	2015	78 with LPP	<ul style="list-style-type: none"> <li>67% - High risk on the Braden Scale</li> <li>17,2 days of hospitalization</li> </ul>
Martins et al (2020)	AM	2018	36	<ul style="list-style-type: none"> <li>44,44% - Incidence</li> </ul>
Medeiros et al (2017)	RN	2015	37	<ul style="list-style-type: none"> <li>69% - Incidence</li> <li>42,9% - Calcaneal region</li> <li>1 a 15 days of hospitalization</li> </ul>
Mendonça et al (2018)	MS	2016	104	<ul style="list-style-type: none"> <li>49% - Incidence</li> <li>87,5% - Gluteal region</li> <li>48,72% - Change in BMI</li> <li>38,55% - Moderate risk on the Braden Scale</li> </ul>
Otto et al (2019)	SC	2015	59	<ul style="list-style-type: none"> <li>49,2% - Incidence</li> <li>30,9% - Sacral region</li> <li>21,8% - Occipital region</li> <li>75,9% - High risk on the Braden Scale</li> <li>2,7 days of hospitalization</li> </ul>
Pacha et al (2018)	SP	2015	189 with LPP	<ul style="list-style-type: none"> <li>≥ 31 days of hospitalizations</li> <li>61,4% - De</li> </ul>
Pereira et al (2018)	DF	2015	193	<ul style="list-style-type: none"> <li>22,7% - Incidence</li> <li>13,2% - Sacral region</li> </ul>
Snaches et al (2018)	SP	2017	945	<ul style="list-style-type: none"> <li>5,29% - Incidence</li> </ul>
Santos et al (2020)	PE	2018	90	<ul style="list-style-type: none"> <li>5,6% - Incidence</li> <li>80% - Deaths</li> </ul>
Santos et al (2020)	MG	2015/2017	3113	<ul style="list-style-type: none"> <li>2,12% - Incidence</li> <li>40,9% - Sacral region</li> <li>34,84% - Gluteal region</li> </ul>
Silva et al (2018)	BA	2017	83	<ul style="list-style-type: none"> <li>47% - Incidence</li> <li>44% - Calcaneal region</li> <li>5,87 days of hospitalization</li> <li>2,56% - Deaths</li> </ul>
Silva et al (2019)	PR	2016	658	<ul style="list-style-type: none"> <li>13,8% - Incidence</li> <li>79,2% - Local pressure</li> <li>31,2% - Edema</li> <li>30,4% - Inadequate Nutrition</li> <li>17,9 days of hospitalization</li> </ul>
Tauffer et al (2019)	PR	2016/2018	227 with LPP	<ul style="list-style-type: none"> <li>47,14% - Sacral region</li> <li>91% - Comorbidities not specified</li> <li>18 days of hospitalization</li> <li>39% - Deaths</li> </ul>

Source: Prepared by the author (2020), based on references: Brito (2017), Candaten et al (2019), Cascão et al (2019), Cerrutti et al (2017), Farias et al (2019), Ferrão et al (2018), Gama et al (2020), Macena et al (2017), Martins et al (2020), Medeiros et al (2017), Mendonça et al (2018), Otto et al (2019), Pacha et al (2018), Pereira et al (2018), Snaches et al (2018), Santos et al (2020), Santos (2020), Silva et al (2018), Silva et al (2019), Tauffer et al (2019).

\*Numerical data not mentioned in the study.

The exclusion criteria were: articles that dealt with studies conducted before 2015, patients admitted to ICUs not belonging to Brazilian HUs, and patients with PUs hospitalized inwards, day hospital, complementary and observation beds.

## RESULTS

The results of the 20 studies analyzed showed a mean PPL incidence of 35.5%. Regarding the most affected region of the body, the sacrococcygeal region had the highest prevalence. The most prevalent chronic diseases in the patients affected by these lesions were HBP and DM. In addition to comorbidity, hospitalization time greater than 10 days were observed as an important predisposing factor. In the studies by Silva et al (2019) and Cerrutti et al (2017), inadequate nutrition was included among the main risk factors and Mendonça et al (2018) reported that 48.72% of patients with PML had changes in Body Mass Index (BMI). According to Santos (2020), the incidence of PML, although still high, decreased between the years 2015, 2016, and 2017 (3.61%, 1.71%, and 1.28%, respectively), as a consequence of investments in pneumatic mattresses, bedside decubitus change, daily skin hydration, use of hydrocolloid plate and transparent film, and increased staff training.

Although the study by Brito (2017) showed a higher prevalence of death among patients without LPP when compared to affected patients (59% and 37.8%, respectively), Santos et al (2020), Pacha et al (2018), Candaten et al (2019), Farias et al (2019), and Tauffer et al (2019) found significant rates of deaths from complications of these lesions. In this order: 80%, 61.4%, 53.85%, 52.94%, and 39%, which ratifies the relationship of higher morbidity and mortality of affected patients. Uniquely, Pacha et al (2018) described septic shock as the main consequence of LPP that led to death. Regarding the Braden Scale, Gama et al (2020) and Mendonça et al (2018) demonstrated the prevalence of the moderate risk classification, with the rates of 55.2% and 38.55%, in contrast to the studies of Cerrutti et al (2017), Macena et al (2017) and Otto et al (2019), which showed that more than 50% of patients with LPP had high risk. Table 1 presents the main results of the 20 studies analyzed, comprising the incidence and prevalence rates of the injuries in a total of ICU patients. The main risk factors present in the affected patients, the most affected body region(s), the average length of stay of the patients who developed PML, and deaths from complications of these injuries.

## DISCUSSION

In the last five years, the prevalence and incidence of PML were higher in patients hospitalized in the ICUs of Brazilian University Hospitals since most patients have been hospitalized for a long time. Regarding risk factors, the development of these lesions was predominantly in patients with nutritional alterations, carriers of previous comorbidities, low Braden Scale scores and hospitalization longer than 10 days. Moreover, it was also observed the impact of increased investment in pneumatic mattresses, training of health professionals, change of bed position, daily skin hydration, use of hydrocolloid plate and transparent film in reducing the incidence rates of these lesions. Therefore, it is essential to use the Braden Scale in hospitalized patients to prevent the development of CLP, by applying the correct preventive measures according to the patient's risk. In addition to inhibiting the appearance of these lesions, the use of this classification contributes to the interruption of the progression of LPP already installed. Therefore, the coexistence of patient's skin care, such as hydration and daily verification of initial lesions, the use of pneumatic mattresses, the early change of decubitus in bed, and the health team's greater attention to patients hospitalized for a long period of time contribute to the reduction of the rates of these lesions, better recovery of the underlying disease, shorter hospital stays, and reduced risk of death from complications.

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