

CONSIDERATIONS ABOUT PRESSURE INJURIES: AN INTEGRATIVE REVIEW OF THE LITERATURE

Julia Paiva Lounine

<http://lattes.cnpq.br/0877132631355922>

Luiza Melgaço Martins

<https://orcid.org/0009-0002-0069-9176>

Michael Deslandes Bicalho Silva Araújo

<https://orcid.org/0009-0002-0794-6950>

Milena Figueiredo Campos

<https://orcid.org/0009-0006-5628-2205>

Maria Júlia Cardoso de Melo

<https://orcid.org/0009-0000-7230-5135>

Júlia Alvim Aguiar

<https://orcid.org/0009-0002-1028-4409>

Pedro Luccas Leal Contini Sanches

<https://orcid.org/0009-0007-6392-527X>

Mariana Reis Rodrigues dos Santos

<https://orcid.org/0000-0002-5363-3413>

Nathalia Nascimento Consorte

<https://orcid.org/0000-0003-4932-6530>

Sofia Garcia de Luca

<https://orcid.org/0009-0007-2442-1861>

Giulia Costa Val Camarano

<https://orcid.org/0009-0003-2239-918X>

Anderson Henrique do Couto Filho

<https://orcid.org/0009-0009-3490-4861>

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Abstract: Introduction: One of the main consequences of hospital stays, especially those that last for a long time, are pressure injuries (PPLs). LPPs are characterized by restricted damage to the skin and its underlying tissues, usually present on a bony prominence or related to the use of medical devices or artifacts. **Objective:** A bibliographical review was carried out on pressure injuries, highlighting their epidemiological, clinical, pathophysiological and therapeutic aspects collected in field research. **Materials and methods:** To compose the Integrative Literature Review, data from the Virtual Health Library (VHL), Scientific Electronic Library Online (SciELO) and National Library of Medicine (PubMed) databases were used, from the crossing of the descriptors “pressure injuries”, “epidemiology”, and “therapeutics”, in order to answer the question formulated through the PICO strategy. **Results and Discussion:** The patient’s positioning, locations of bone prominence and conditions related to the ICU are risk factors for LPPs, and these injuries can be classified into six stages. Infections and osteomyelitis can be possible complications of LPPs. Continuous pressure relief and the use of pressure distribution devices are important prevention factors, in addition to evaluation by a multidisciplinary team. **Conclusion:** Prolonged hospitalization is an important risk factor for LPPs, with stages varying in severity. Treatment involves daily assessment, nutrition and prevention. More multidisciplinary research and prospective and epidemiological studies are necessary for a better understanding, treatment, prevention and comprehensive care of these patients.

Keywords: Pressure Injuries; Risk factors; Epidemiology.

INTRODUCTION

When considering the entire context of hospital admission, it is clear that it is a significant event for the patient and their family, not only because of the illness, but also because of all the risks involved during this period. There are several points that impact this scenario, such as fragility, the need for intensive care, carrying out procedures that require a certain invasion and even the use of accessory devices, making this situation generate discomfort and concern for all involved. In this context, when faced with patients who find themselves in this situation, care must be humanized and based on the principles of good medical practice, in addition to integration with the multidisciplinary team, with the aim of offering qualified care to the patient (Rodrigues et al, 2021).

One of the main consequences of hospital stays, especially those that last for a long time, are pressure injuries (PPLs). In 2016, the National Pressure Ulcer Advisory (NPUAP) announced the change in the terminology “Pressure Ulcer” to LPP, considering that this expression better describes both intact and ulcerated skin. As a definition, LPPs are characterized by restricted damage to the skin and its underlying tissues, usually present on a bony prominence or related to the use of medical devices or artifacts. Furthermore, the appearance of these injuries is associated with intense and prolonged pressure, in combination with friction and shear (Teixeira et al., 2022).

Epidemiologically, several authors have attempted to outline the occurrence profile of PPI. A group of researchers found a prevalence of 8.9% in a group of 887 hospitals in the USA, with greater severity in intensive care units (ICUs). When analyzing the Brazilian epidemiological scenario, it was found that LPPs were in 3rd position among the most reported incidents in 2018.

Furthermore, another study reported that the incidence of LPPs varies significantly according to the clinical environment and patient characteristics and, in addition, they discussed American data that indicated an annual incidence of 1 to 3 million of these cases, with more than 60 thousand deaths resulting from complications secondary to the condition (Moraes et al., 2016; Soares et al., 2022).

In a complementary way, in the context of the pandemic caused by Sars-CoV-2, the use of personal protective equipment (PPE) was mandatory and necessary, meaning that health professionals also suffered from LPP resulting from the continuous use of protective equipment. protection (Ramalho et al., 2020).

In this context, several strategies have been developed for the management of LPPs, including by the Ministry of Health (MS), focusing on their prevention. The MS protocol encompasses some steps, which begin with the assessment of all at-risk patients, with the aim of identifying LPPs. In addition, daily reassessment and application of skin care continue the protocol, which is completed with strategies to reduce pressure on bony prominences. Therefore, it is clear that LPPs are a public health problem worldwide, requiring better investigation of cases and the development of new forms of management (Gomes et al., 2018; Sumarno, 2019).

From this perspective, the objective of this study is to carry out a bibliographical review on pressure injuries, highlighting their epidemiological, clinical, pathophysiological and therapeutic aspects, with the aim of providing an update on the contemporary medical approach to the disease.

MATERIALS AND METHODS

The present study consists of an integrative exploratory literature review. The integrative review was carried out in six stages: 1) identification of the topic and selection of the guiding research question; 2) establishment of criteria for inclusion and exclusion of studies and literature search; 3) definition of the information to be extracted from the selected studies; 4) categorization of studies; 5) evaluation of studies included in the integrative review and interpretation and 6) presentation of the review (De Souza, 2010).

In the initial stage, to define the research question, the PICO strategy (Acromion for Patient, Intervention, Comparison and Outcome) was used. Thus, the following central question was defined that guided the study: “How is the approach to chondromalacia patellar currently carried out, considering its epidemiological, clinical, pathophysiological and therapeutic aspects, and what can be done for the patient?” In it, the P: “Approach to pressure injuries”; I: “It is currently carried out”; C: “Considering its epidemiological, clinical, pathophysiological and therapeutic aspects?”; O: “What can be done for the patient?”

To answer this question, a search was carried out for articles involving the intended outcome using the terminologies registered in the Health Sciences Descriptors (DeCs) created by the Virtual Health Library developed from the Medical Subject Headings of the U.S. National Library of Medicine, which allows the use of common terminology in Portuguese, English and Spanish. The descriptors used were: pressure injuries; epidemiology; therapy. To cross the key words, the Boolean operators “and”, “or”, “not”, “e”, “ou”, “não”, “y”, “o bien” and “no” were used.

A bibliographic survey was carried out through electronic searches in the following databases: Virtual Health Library (VHL),

Scientific Electronic Library Online (SciELO), Google Scholar and National Library of Medicine (PubMed).

The search was carried out during the months of August and October of the year 2023. As inclusion criteria, it was limited to articles written in English, Spanish and Portuguese, published in the years 2010 to 2023, that addressed the topic researched and that were available electronically in their full format. As an exclusion criterion, those articles that were not in Portuguese, Spanish or English, that were not subject to peer review, that did not focus on pressure injuries, especially in relation to clinical and prognostic aspects, were therefore excluded due to did not meet the criteria.

After the publication survey stage, 378 articles were found, which were analyzed after reading the title and summary of the publications considering the previously defined inclusion and exclusion criteria. Following the selection process, 45 articles were selected. Then, the publications were read in full, paying attention once again to the inclusion and exclusion criteria, with 24 articles not being used because they met the exclusion criteria. 20 articles were selected for final analysis and construction of this review. After selecting the articles, a record of the selected works was carried out in order to select the best information for data collection.

Next, figure 1 outlines the methodology used in preparing this review, highlighting the steps that were taken to achieve the proposed objective.

RESULTS AND DISCUSION

Table 1 summarizes the main articles that were used in this literature review, containing relevant information, such as the authors of the study, the year of publication, the title and methodology of the study carried out.

The present study evaluated 20 studies

on pressure injuries, which highlighted pathophysiological and clinical aspects of the disease, as well as reporting cases that were studied and used as a theoretical basis for the construction of medical knowledge. Furthermore, the combination of theoretical characteristics and case reports is fundamental to fully understanding the natural history of this disease and providing the basis for new investigations. Thus, the discussion of clinical reports makes it possible to consolidate medical knowledge and allows better care to be offered to future patients.

RISK FACTORS AND PATHOPHYSIOLOGY

Pressure Injuries (PPIs) are considered a major public health problem worldwide, occurring at different levels of health care and assistance, especially in the hospital environment, compromising the quality of life and safety of hospitalized patients. These injuries, in turn, are responsible for numerous consequences for individuals, mainly due to the greater risk of complications and increased costs and length of hospital stay, resulting in physical and mental suffering for the patient and their family (Correia et al., 2019).

The locations affected by LPPs are varied, with a predominance in regions of bony prominences, such as the sacrum and heels. This predilection is justified by the pathophysiological mechanism, which is due to continuous pressure, associated with friction and shear, in a certain location. In addition to this basic principle of etiopathogenesis, tissue tolerance is influenced by factors extrinsic to the organism, such as the microclimate of the body region, and intrinsic factors, such as tissue perfusion and comorbidities that the patient has (Galleto et al., 2018; Jesus et al., 2020).

In this sense, today there is a vast literature that correlates LPPs with the patient's

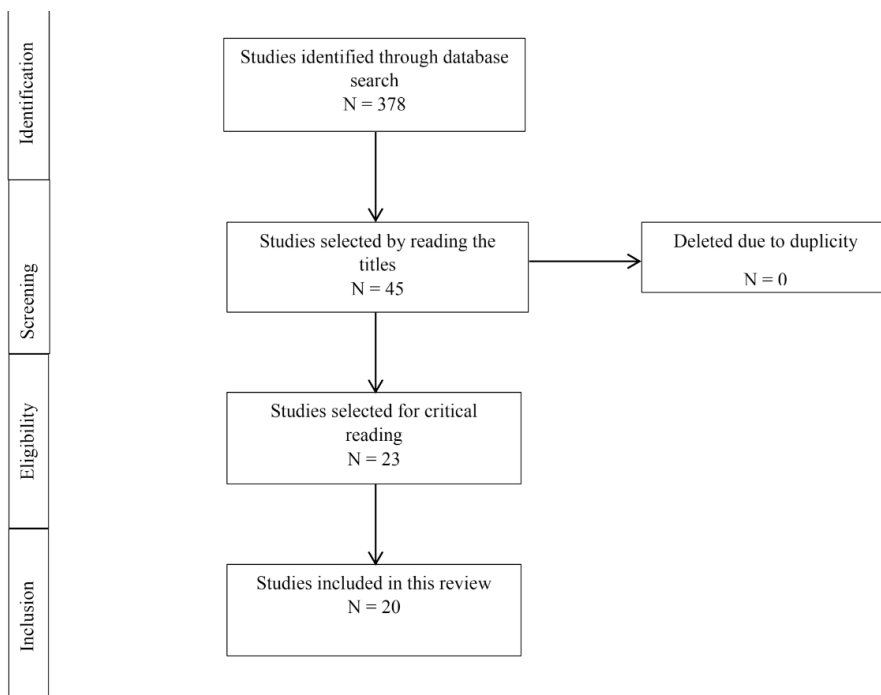


Figure 1: Organization and selection of documents for this review

Source: Survey Data, 2023.

| Study | Title | Study Methodology |
|------------------------|---|----------------------|
| Rodrigues et al., 2021 | Incidence and Factors Related to the Appearance of Pressure Injuries in the Intensive Care Unit | Observational Study |
| Teixeira et al., 2022 | Factors associated with the incidence of pressure injuries in critically ill patients: cohort study | Retrospective Cohort |
| Soares et al., 2023 | Risk prediction instruments for pressure injuries in critically ill patients | Retrospective Cohort |
| Moraes et al., 2016 | Concept and Classification of Pressure Injury: National Update Pressure Ulcer Advisory Panel | Theoretical Essay |
| Ramalho et al., 2020 | Pressure injuries related to medical devices in healthcare professionals during a pandemic | Editorial |
| Gomes et al., 2018 | Pressure Injury Prevention: Patient Safety in Health Care by the Nursing Team | Retrospective Cohort |
| Sumarno, 2019 | Pressure ulcers: the core, care and cure approach | Literature review |
| Correia et al., 2019 | Pressure Injury: Therapeutic Measures Used by Nursing Professionals | Retrospective Cohort |
| Galleto et al., 2018 | Medical Device Related Pressure Injuries: integrative literature review | Literature review |
| Jesus et al., 2020 | Incidence of Pressure Injury in Patients Hospitalized Patients and Associated Risk Factors | Retrospective Cohort |
| Soares et al., 2022 | Development of Pressure Injury and Care Complexity in Patients in an Emergency Service | Retrospective Cohort |
| Otto et al., 2019 | Risk Factors for the Development of Pressure Injuries in Critically Ill Patients | Retrospective Cohort |
| Mervis et al., 2018 | Pressure ulcers: Prevention and management | Literature review |
| Luz et al., 2010 | Pressure ulcers | Literature review |

| | | |
|-------------------------|--|--|
| Crespo et al., 2020 | Incidence of Osteomyelitis in Sacral Decubitus Ulcers and Recommendations for Management | Retrospective Cohort and Literature Review |
| Oliveira et al., 2018 | Nutritional therapy in pressure injuries: systematic review | Literature review |
| Buso et al., 2020 | Pressure injury resulting from surgical positioning and associated factors | Retrospective Cohort |
| Kottner et al., 2020 | Pressure ulcer/injury classification today: An international perspective | Literature review |
| Zimmermann et al., 2018 | Pressure Injury Risk Prediction in Intensive Care Unit Patients: Integrative Review | Literature review |
| Silva et al., 2019 | Prevalence of Pressure Ulcers in Patients Admitted to an Intensive Care Center of a Hospital in Minas Gerais | Retrospective Cohort |

Table 1: Overview of studies included in this systematic review on pressure injuries

Source: Survey Data, 2023.

positioning during hospital admission. Therefore, the individual remaining in decubitus positions, especially supine, is one of the biggest risk factors for the development of this condition. Other locations, even considered atypical, such as the urethra, mouth and ear, can be affected by the use of medical devices, such as probes and catheters being the main ones reported (Andrade et al., 2022).

Finally, other conditions that predispose the development of LPPs during hospitalization in intensive care units (ICUs) were mentioned. The authors correlated the pathogenesis with the reduction in blood pressure resulting from cardiovascular complications, with the occurrence of systemic inflammatory response syndrome (SIRS), with septic and hemorrhagic shock, and with the use of drugs. Thus, it is clear that susceptibility to LPPs is influenced by numerous factors, and it is up to health professionals to analyze and propose individualized care, with the aim of reducing the incidence of this condition (Otto et al., 2019).

CLASSIFICATION AND STAGING

When evaluating pressure injuries, it is possible to classify them according to the layer of tissue affected, allowing the degree of severity and staging to be established. In this sense, the 2016 NPUAP update describes the stages of LPPs as shown in the table below:

| Steps | Characteristics of the Injury |
|--------------------------------|---|
| Step 1 | Intact skin with non-whitening erythema |
| Step 2 | Partial thickness skin loss with exposure of the dermis |
| Step 3 | Full thickness skin loss |
| Step 4 | Full thickness skin loss and tissue loss |
| Unclassifiable Pressure Injury | Full-thickness skin loss and non-visible tissue loss |
| Deep Tissue Pressure Injury | Dark red, brown, or purple discoloration that is persistent and does not whiten |

Table 01: Correlation between the stages of LPPs and the characteristics of the injury

Source: Adapted from Kottner et al. (2020)

COMPLICATIONS

Due to the pathophysiological characteristics of LPPs, patients are susceptible to a wide range of infections, which are the main type of complication. The breakdown of the integrity of the skin barrier, in association with edema, tissue damage and the inflammatory process, constitutes the best explanation for the development of infectious conditions. Furthermore, hospitalized

patients often become the target of infections due to contiguity, given the presence of comorbidities and diagnoses that influence this issue, such as urinary tract infections (UTIs) and pneumonia (Mervis et al, 2019).

As reported, the clinical presentation of infections associated with LPPs is characterized by local heat, erythema, purulent secretion and foul odor. In addition to this, when analyzing the bacteriology of infections, there is a high incidence of *Enterobacter* spp., *Staphylococcus* spp. and *Enterococcus faecalis*. In this sense, antibiotic therapy is considered one of the pillars of the treatment of complications, and is preferably started after cultures. Other measures include drainage of possible abscesses, surgical debridement, obliteration of dead spaces and protection of the lesions to prevent worsening (Luz et al., 2010).

A serious example of a complication is osteomyelitis caused by pressure injuries resulting from non-treatment. Patients often require surgical debridement and subsequent plastic reconstruction, in addition to well-structured antibiotic therapy, given that there are reports in the literature of conditions caused even by species of methicillin-resistant *Staphylococcus* (MRSA) (Crespo et al., 2020).

TREATMENT AND PROGNOSIS

The treatment of LPPs involves some steps that are recommended to be followed for a better prognosis for patients. Initially, the clinical conditions of individuals and injuries must be assessed, preferably every day, to establish an updated and regular profile of information. Parameters such as stage, dimensions, presence of exudate, fistulas and necrosis must be observed, as well as a description of comorbidities and causes of hospitalization. Furthermore, nutritional status is of great relevance, given that the supply of nutrients is fundamental for the

recovery of the general condition and the healing of injuries (Luz et al., 2010; Oliveira et al., 2017).

Subsequently, the lesions must be cleaned with saline solution and appropriate sterilization techniques and, after this procedure, an appropriate dressing must be applied, considering the characteristics of the LPP at that time. If there is necrotic tissue, it must be debrided, which will allow for better recovery and also prevent secondary infections (Zimmermann et al., 2018).

Epidemiologically, most studies say that LPPs evolve well with conservative treatment, taking an average of 1 to 2 months for complete healing, with only a few cases requiring surgical intervention to close the lesion. In these situations, grafts, skin or musculocutaneous flaps emerge as the best options, and it is up to the surgeon to choose according to the patient's unique characteristics and their own experience in relation to the surgical technique (Buso et al., 2020; Soares et al, 2022).

PREVENTION

When thinking about preventing LPPs, the plan must begin with the identification of factors that make the patient susceptible, with the aim of preventing the emergence of injuries and the worsening of those that may already exist. In this context, the participation of a multidisciplinary team is of great value, since these patients need to be assisted with great care, highlighting here the work of nurses who, many times, are in direct contact with these individuals (Silva et al., 2019).

According to the pathophysiological mechanism already described, the main prevention strategy is to relieve the continuous pressure exerted on the tissues. This can be done by properly positioning the patient in bed, especially with regard to changing position every two hours, maintaining

adequate postural alignment and appropriate weight distribution. If it is a possibility, the incorporation of the lateral decubitus position must be incorporated into the care routine (Rodrigues et al., 2021).

An alternative that has proven to be very effective is the use of devices that redistribute pressure, mainly in reducing extrinsic factors that cause injury. As options, the authors mention self-adjusting cushions and seats, as well as mattresses with surfaces designed for this use. Therefore, the choice and decision to use these preventive methods must take into consideration, the characteristics of the equipment itself, such as cost and ease of use, as well as its acceptability and ability to be used by the patient (Luz et al., 2010).

CONCLUSION

It is therefore clear that one of the consequences of prolonged hospitalization is the development of pressure injuries. These are caused when the skin and underlying tissues suffer constant friction with the support surface, in association with shear forces, mainly in areas of bony prominence, such as the sacral region and the heel region. With regard to staging, 4 stages are proposed, in which there is an increase in severity with the increase in the degree of the injury.

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The treatment of LPPs must be sequenced, starting with daily assessment of the lesions, with subsequent cleaning and debridement, if necessary. The patient's nutritional status directly influences the prognosis and recovery from injuries, being a parameter that must be monitored and adjusted according to the individual's demands. Furthermore, injury prevention constitutes an essential pillar in the management of these patients, and it is essential to establish protocols in institutions to reduce the incidence of these cases.

This work also highlights that research of high scientific value on pressure ulcers is necessary, prioritizing the analysis of a more multidisciplinary and comprehensive spectrum. Furthermore, the investigation of the anatomical, pathophysiological mechanisms and treatment aspects involved is of utmost importance, given that they are crucial for understanding the cases.

In the future, so that similar scenarios can be tackled with excellence, prospective studies and epidemiological analyzes must be carried out, evaluating, more precisely, the results and their different contexts of approach, considering ways to approach pressure injuries, with the aim of offering comprehensive, resolute and humanized care for these individuals.

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