

## Factors associated with pressure injury and preventive measures in an intensive care unit

## Fatores associados à lesão por pressão e medidas preventivas em unidade de terapia intensiva

## Factores asociados con lesiones por presión y medidas preventivas en una unidad de cuidados intensivos

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**Keywords—** Pressure Injury,  
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**Abstract—** Pressure injury is a localized damage to the underlying skin and / or soft tissue, usually on a bony prominence or related to the use of a medical device or other artifact. The lesion can appear on intact skin or as an open ulcer and can be painful. The injury occurs as a result of intense and / or prolonged pressure in combination with shear. Tolerance of soft tissue to pressure and shear can also be affected by microclimate, nutrition, perfusion, comorbidities and their condition. The objective of identifying the associated factors and preventive measures for pressure injuries in an intensive care unit, in order to support the professional in decision making to improve the care provided to these patients. The methodology is a narrative review study with an exploratory, observational, retrospective study approached in 07 articles in the databases (PUBMED, LILACS, BVS, SciELO, REBEN) between 2008 to 2016. During the review, it was found that most pressure injuries could be avoided by taking simple actions such as changing the position, using pressure relief devices in areas of bone prominence, careful observation of the skin and greater knowledge by health professionals, making it necessary to qualify health professionals with regard to the main characteristics of patients who develop pressure injuries and risk assessment scales such as the Braden scale, with the possibility of making prognoses and, thus, prevent them. It is concluded that the majority

of pressure injuries could be avoided, through the identification of risk and the implementation of a care plan, preventing this condition that brings so much discomfort to the client and his family. From some simple actions such as changing the position every two hours.

**Resumo** - Lesão por pressão é um dano localizado na pele e/ou tecidos moles subjacentes, geralmente sobre uma proeminência óssea ou relacionada ao uso de dispositivo médico ou a outro artefato. A lesão pode se apresentar em pele íntegra ou como úlcera aberta e pode ser dolorosa. A lesão ocorre como resultado da pressão intensa e/ou prolongada em combinação com o cisalhamento. A tolerância do tecido mole à pressão e ao cisalhamento pode também ser afetada pelo microclima, nutrição, perfusão, comorbidades e pela sua condição. O objetivo de identificar os fatores associados e medidas preventivas para lesão por pressão em unidade de terapia intensiva, a fim de subsidiar o profissional na tomada de decisão para a melhoria da assistência prestada a esses pacientes. A metodologia trata-se de um estudo de revisão narrativa com abordagem de estudos exploratórios, observacionais, retrospectivos pesquisados em 07 artigos nas bases (PUBMED, LILACS, BVS, SciELO, REBEN) entre 2008 a 2016. Durante revisão, verificou-se que a maioria das lesões por pressão poderiam ser evitadas a partir de algumas ações simples como realizar mudança de decúbito, o uso de dispositivos para alívio da pressão em áreas de proeminência óssea, observação criteriosa da pele e maior conhecimento por parte dos profissionais de saúde, tornando-se necessário qualificar os profissionais de saúde no que diz respeito às características principais dos pacientes que desenvolvem lesão por pressão e das escalas de avaliação de risco como a escala de Braden, com a possibilidade de realizar prognósticos e, assim, preveni-las. Conclui-se que a maioria das lesões por pressão poderiam ser evitadas, através da identificação de risco e implantação de um plano de cuidados, previne essa afecção que traz tantos desconfortos para o cliente e seus familiares. A partir de algumas ações simples como realizar mudança de decúbito a cada duas horas.

**Keywords**— Lesão por Pressão; Fatores Associados; Medidas Preventivas.

**Resume** - La lesión por presión es un daño localizado en la piel subyacente y / o tejido blando, generalmente en una prominencia ósea o relacionado con el uso de un dispositivo médico u otro artefacto. La lesión puede aparecer en piel intacta o como una úlcera abierta y puede ser dolorosa. La lesión ocurre como resultado de una presión intensa y / o prolongada en combinación con cizallamiento. La tolerancia de los tejidos blandos a la presión y el cizallamiento también puede verse afectada por el microclima, la nutrición, la perfusión, las comorbilidades y su condición. El objetivo de identificar los factores asociados y las medidas preventivas de las lesiones por presión en una unidad de cuidados intensivos, con el fin de apoyar al profesional en la toma de decisiones para mejorar la atención brindada a estos pacientes. La metodología es un estudio de revisión narrativa con un estudio exploratorio, observacional, retrospectivo abordado en 07 artículos en las bases de datos (PUBMED, LILACS, BVS, SciELO, REBEN) entre 2008 y 2016. Durante la revisión, se encontró que la mayoría de las lesiones por presión podrían evitarse tomando acciones simples como cambiar la posición, usar dispositivos de alivio de presión en áreas de prominencia ósea, observación juiciosa de la piel y un mayor conocimiento por parte de profesionales de la salud, por lo que es necesario capacitar a los profesionales de la salud en cuanto a las principales características de los pacientes que desarrollan lesiones por presión y escalas de valoración del riesgo como la escala de Braden, con posibilidad de hacer pronósticos y, así prevenirlos. Se concluye que la mayoría de las lesiones por presión podrían evitarse, mediante la identificación de riesgo y la implementación de un plan de cuidados, previniendo esta condición que tanto malestar trae al cliente y su familia. Desde algunas acciones sencillas como cambiar de posición cada dos horas.

**Palabra Clave** - Lesão por Pressão; Fatores Associados; Medidas Preventivas.

## I. INTRODUCTION

According to the National Pressure Ulcer Advisory Group (NPUAP), pressure injuries are local damage to the underlying skin and / or soft tissues, usually in bone protrusions or related to the use of medical equipment or

other artifacts. The lesions can appear on the skin intact or as open ulcers and can be painful. High pressure and / or prolonged pressure combined with shear force can cause injury. Soft tissue tolerance to pressure and shear can also

be affected by microclimate, nutrition, perfusion, comorbidities and conditions (CALIRI et al., 2016).

In addition to prolonging hospital stay and increasing mortality, crushing also increases the cost of treatment, which results in an increase in the workload of nursing professionals and physical and emotional pain for patients and their families (PACHA et al., 2018). In view of this series of problems, in addition to providing care, the nursing team must also be aware of preventive measures and related factors, essential for the control / minimization of pressure injuries (OLIVEIRA et al., 2014).

With the participation of the top management of the organization and its employees, more and more initiatives are being promoted globally to improve health, safety and quality. Therefore, the quality objectives of the various services provided to society mean the optimization of results. These standards were established to promote specific improvements in areas of care that are considered problematic and have specific measurement elements that are evaluated regardless of the following criteria: correct patient identification; improve the efficiency of communication between health professionals; increase use Drug safety risks; eliminate the wrong aspects, wrong patients, wrong procedures; reduce the risk of infection; reduce the risk of injury / fall victims (VARGAS & LUZ, 2010; ROQUE & MELO, 2014).

As a reason, pressure injury is an unpleasant and painful complication that can affect bedridden patients in the intensive care unit. To determine the risk factors and preventive measures, the knowledge of the professionals of the nursing team who provide assistance is extremely important. to the patient. . This is a study on stress injuries in an intensive care unit, with the objective of identifying relevant factors and preventive measures for solving problems, assisting professionals in making decisions to improve the care provided to these patients, important for the control / minimum It is very important to change the patient's condition. Stress injury in the intensive care unit.

Therefore, as pressure injuries represent a threat related to bedridden patients, prolong hospital stay, make recovery difficult and increase the risk of other complications (such as infection), we proposed this topic.

The aim of the study is to determine the relevant factors and preventive measures for stress injuries in the intensive care unit, in order to support professionals in decision-making to improve the care provided to these patients, revealing the relevant factors and preventive measures stress injuries.

## II. MATERIALS AND METHODS

The present work is a narrative review of the literature carried out through a bibliographic review focused on describing the factors associated with pressure injuries and preventive measures in an intensive care unit.

The bibliographic research had the following question: What are the factors associated with pressure injuries and preventive measures in the intensive care unit? Articles that sought to explain the factors associated with pressure injuries and preventive measures in an intensive care unit were selected from scientific articles, in Portuguese, English and Spanish.

The organization of this review took place between the months of June and December 2020, thus providing guidance for researchers in relation to the subject addressed, so that they can formulate hypotheses in an attempt to solve frequent problems related to the assistance provided in previous studies.

For data collection, the bases (PUBMED, LILACS, BVS, SciELO, REBEN) were used, searching for keywords such as: Pressure Injury; Associated Factors; Preventive measures. 15 scientific articles containing publications between the years 2008 and 2020, which dealt with the chosen theme, were analyzed.

## III. RESULTS AND DISCUSSION

The skin is a component of the epidermal system, responsible for 16% of body weight, and is the largest organ in the human body, whose main functions are: organic defense, thermal regulation, coverage, prevention of various environmental factors and sensory functions. The skin is divided into three layers: epidermis, dermis and subcutaneous tissue (RODRIGUES, SOUZA & SILVA, 2008).

Compared with the dermis and subcutaneous tissue, the epidermis is the thinnest and most external. The dermis is composed of fibers, blood vessels and nerve endings, which provide support, resistance, blood and oxygen to the skin. The subcutaneous tissue is called subcutaneous tissue and is the deepest layer, basically formed by fat cells, which function as a calorie deposit and maintain body temperature (RODRIGUES, SOUZA & SILVA, 2008).

The National Pressure Ulcer Advisory Group (NPUAP) announced a term change on April 13, 2016. The term "pressure injury" has replaced "pressure ulcer". The term change more accurately describes intact skin ulcers and pressure cutaneous ulcers. In addition to changing the terminology, Arabic numerals are now used instead of Roman numerals in the step names. The term "suspect" has been removed from the diagnostic label for

deep injury. Other definitions of pressure injury agreed at the meeting include pressure injury related to medical equipment and pressure injury to the mucous membrane (CALIRI et al., 2016).

According to the National Pressure Ulcer Advisory Group (NPUAP), pressure injuries are local damage to the underlying skin and / or soft tissues, usually in bone protrusions or related to the use of medical equipment or other artifacts. The lesions can appear on the skin intact or as open ulcers and can be painful. High pressure and / or prolonged pressure combined with shear force can cause injury. Soft tissue tolerance to pressure and shear can also be affected by microclimate, nutrition, perfusion, comorbidities and conditions (CALIRI et al., 2016).

The causes of stress injuries are varied, involving external and internal issues. External factors are related to the injury mechanism, as they hinder the effective circulation of nutrition and oxygenation of the skin. They are: pressure, shear, friction. Internal factors are related to the client's health and affect the structure and integrity of their skin. However, the main factor that causes pressure damage is the pressure exerted on the capillary between the bone structure and the surface, which leads to tissue necrosis (GOMES et al., 2010).

Severely ill patients tend to cause pressure damage due to sedation, altered levels of consciousness, ventilatory support, use of vasoactive drugs, limitation of long-term exercise and hemodynamic instability, depending on the nurse to protect the patient from any related risks. (PESTANA and VIEIRA, 2012).

According to the classification of the National Pressure Ulcer Advisory Group (NPUAP), the pressure injury is divided into the following stages: pressure injury stage 1: skin erythema does not turn white; stage 2 pressure injury: skin loss due to exposure of the dermis; Stage 3 pressure injury: full-thickness skin peeling; pressure injury stage 4: loss of full thickness skin and loss of tissue. There are also injuries caused by unclassified pressure: loss of skin in all thickness and loss of invisible tissue, and injuries caused by pressure of deep tissue: discoloration, deep red, brown or purple, persistent and will not turn white (CALIRI et al. 2016).

The National Pressure Ulcer Advisory Group (NPUAP) also has two additional definitions, such as: medical device-related pressure injury, which describes the cause of the injury. Pressure injuries associated with medical equipment are caused by the use of equipment created and used for diagnostic and therapeutic purposes. The resulting pressure injury usually has the pattern or shape of the device. The pressure injury and mucosal pressure pressure classification system should be used to

classify this type of injury, which is discovered when the damaged area has a history of using medical equipment. Due to the anatomical structure of the tissue, these lesions cannot be classified (CALIRI et al., 2016).

In addition to prolonging hospital stay and increasing mortality, stress injuries also increase treatment costs and, therefore, increase the workload of nursing professionals and the physical and mental pain of the patient and his family, involving pain and severe skin changes. In adult hospitalized patients, the prevalence of pressure ulcers can vary from 3% to 14% (PESTANA & VIEIRA, 2012).

The intensive care unit is a complex ward designed to serve critically ill patients who need specific physical space, professional human resources and advanced technical means. Critically ill patients are those who have severe clinical illnesses or who need strict control. Due to sedation, changes in the level of consciousness, ventilatory support, vasoactive drugs, restricted movement and hemodynamic instability, this patient is subject to pressure injury (ARAÚJO, MOREIRA, CAETANO, 2011).

The reasons for the development of pressure injuries are many, which can involve the environment (pressure, shear and friction) and external factors within the body (age, morbidity, urinary and fecal incontinence, nutritional status, hydration, weight, vascular disease ), infection, activity status and level of consciousness). It is developed based on the individual illness of each client, and these factors are considered integrally in the care provided to them, leading to the worsening of stress, which is considered a serious problem, especially in the elderly and people with chronic diseases. In patients with degenerative diseases (ARAÚJO and SANTOS, 2016).

As for external factors, they are related to the injury mechanism, as they prevent the full circulation of nutrition and oxygenation of the skin. Body pressure is the most important factor that causes pressure injury. When the soft tissue is compressed between the bone protrusion and the hard surface, a pressure occurs that prevents blood flow, leading to tissue hypoxia and death. Shear occurs when the client is lying in bed while the skin layer moves. Friction occurs when two surfaces rub against each other (RODRIGUES, SOUZA and SILVA, 2008).

Internal factors concern the health of the client, which means the structure and integrity of the skin. People affected by acute illnesses are more susceptible to stress injuries and have the following predisposing factors: pain, hypotension, heart failure, vasomotor failure, shock-induced peripheral vasoconstriction, etc. Customers with serious and unstable employees (with possible system failures) are also the most vulnerable to this situation. The decrease in tissue perfusion also increases the risk of



diseases, which can affect patients with diabetes, obesity and edema (RODRIGUES, SOUZA and SILVA, 2008).

The reduction in hemoglobin levels, due to the inefficiency of blood to carry out transport and maintain adequate tissue oxygenation, presents a risk of injury to clients (RODRIGUES, SOUZA and SILVA, 2008). Nutritional deficiencies, such as dehydration, anemia and weight loss, can reduce skin elasticity, reduce oxygen content in tissues and prevent healing. Nutrients (such as vitamin C) are essential for the maintenance and repair of tissues (RODRIGUES, SOUZA and SILVA, 2008).

When the sensory perception is impaired or disappears, the client changes the sensitivity to pain and discomfort, not being able to identify the parts of the body that need to relieve stress (DA SILVA, RIBEIRO-FILHO & PINTO, 2011). Due to the inconvenience, the client has reduced the frequency of changing positions and, therefore, is unable to relieve pressure alone (RODRIGUES, SOUZA and SILVA, 2008).

This humidity usually occurs when the client suffers from urine, fecal incontinence or excessive sweat (SILVA et al., 2020). Excessive contact with water can cause skin maceration, which reacts with corrosive substances in the excrement and becomes inflamed, becoming more susceptible to pressure rupture and, in case of rupture, the lesion ends up being affected. Microorganisms invade and cause infection and moisture also increases the friction effect, which favors the appearance of lesions (RODRIGUES, SOUZA and SILVA, 2008).

Skin thickness and tissue perfusion in the elderly are reduced. The skin becomes dry and the sebaceous and sweat glands are less active. Muscle atrophy and bone structure become more prominent (LEITE et al., 2012). The decrease in sensory perception and the difficulty of reallocation lead to prolonged pressure on the same body area. These changes make the elderly more vulnerable to stress injuries (BRITO, 2017).

Studies show that the incidence of these changes in the elderly in this age group is between 10% and 20% and the annual mortality is 70%. Approximately 20% of these elderly people suffer tissue damage in grades III and IV (SAKASHITA and NASCIMENTO, 2011). Other factors may also be related to the development of pressure injury, that is, changes in BMI, as low weight and prominent bones increase the risk of pressure injury, but overweight people are also susceptible to these injuries due to the poor vascularization of the adipose tissue. It is inelastic and easy to break (QUIRINO et al., 2014).

The development of stress injuries can be affected by smoking, length of hospital stay, as with hospitalization, advanced age, urinary or fecal incontinence, weakness,

paralysis and loss of consciousness, the prevalence of pressure ulcers will increase. Patients suffering from neurological or cardiovascular diseases, dehydration or malnutrition, anemia, hypotension, increased skin and changes in skin elasticity are vulnerable to stress injuries (GOMES et al., 2010).

Sepsis patients are very likely to develop pressure injury, as they have the following clinical manifestations: fever or hypothermia, tachycardia, shortness of breath and respiratory alkalosis, high oxygen consumption, systemic hypoperfusion and metabolic acid Poisoning and high dynamic circulatory status are factors that cause stress damage (GOMES et al., 2010; (ROHR, NICODEM & CASTRO, 2018).

Prevention is defined as a future-oriented strategy, the result of which will be to improve quality, guide analysis and take actions to correct the nursing production process. Preventive measures are designed to prevent individuals from being affected by disease. Prevention has the means to reduce morbidity and mortality (RODRIGUES, SOUZA and SILVA, 2008).

Research shows that preventing stress injuries is not a priority for nursing professionals. However, as the condition brings inconvenience to clients, family members and medical institutions, nurses must be aware of the importance of the intervention (SOARES & HEIDEMANN, 2018). For this type of care, the professional must understand the mechanism of development of the pressure injury and the real situation of the institution where he works (RODRIGUES, SOUZA and SILVA, 2008).

The development of prevention of stress injuries is essentially a task for higher education professionals, who are the best candidates to solve this problem. When formulating a nursing plan, in order to reduce development risks, the nurse must not only understand the client's general body, but also include the body, mind and spirit, as well as the client who is affected by the environment, needing comprehensive help. However, to avoid bodily injury, it is necessary to touch the client's body to maintain the emotional state of the body. Determine the ease of trusting relationships with customers (RODRIGUES, SOUZA and SILVA, 2008).

The knowledge of nursing professionals who are responsible for taking care of clients is essential, because if the nursing team involved is unable to adequately perform their skills and knowledge and is not committed to understanding and preventing stress injuries, then care is provided. nursing to prevent stress injuries Quality may be compromised. Understand what pressure injuries are, risk

factors and preventive measures (PESTANA & VIEIRA, 2012).

The prevention of stress injuries is performed through nursing methods. Nursing methods are used by nurses with some elements. These elements apply technical and scientific knowledge in practice to the client in order to benefit them, determine the characteristics of their professional practice and determine their role (FAVRETO et al., 2017). On the contrary, this process is not passive, on the contrary, the nurse who participates in the personalized nursing process must continuously reflect on his behavior in a dynamic and participatory way (FAVRETO et al., 2017).

In assistance aimed at preventing stress injuries, she went through the following stages: nursing history, nursing diagnosis, nursing plan and nursing development (ALMEIDA et al., 2019).

Through the nursing history, information about the client's health status, skin integrity and the degree of risk of crushing can be obtained. All important information must be collected at the time of admission (SANTOS, 2017). The nurse should investigate the following information: age, underlying disease, nutritional status, anemia, use of medications, past history of loss of skin integrity, presence of edema and / or infection, methamphetamine in protruding bones, increased skin, sensitivity and motor skills, Urinary incontinence and fecal incontinence (ARCO et al., 2018).

Through historical records, the nursing diagnosis can be determined. In this stage of the systematization of care, a care plan can be developed and is the basis for the prevention of stress injuries (SANTOS, VEIGA and ANDRADE, 2011).

The prevention of stress injuries is an issue that needs to be evaluated, because most injuries can be avoided by identifying patients at risk and implementing a care plan. The complexity of patients admitted to the intensive care unit requires daily reassessment (ARAÚJO & SANTOS, 2016).

Currently, there are about 40 pressure injury risk assessment scales, we can take as an example the Braden scale, created by nurse Bárbara Braden to estimate the risk of developing pressure injury. The Braden scale assesses sensory perception, humidity, activity, mobility, nutrition and friction / shear (JANSEN, SILVA & MOURA, 2020).

The development of pressure injuries in hospitalized patients has become one of the indicators of the poor quality of care provided by the nursing team, therefore, the prevention of pressure injuries is very important, and

certain measures can be effective in preventing pressure injuries (ARA (JO & SANTOS, 2016).

Some simple actions, like changing a posture every two hours, lifting the patient instead of dragging him, watching for signs of congestion, congestion and raw collisions, using a decompression device on the protruding area of the bone, watching the skin carefully, and maintaining the skin Integrity, keeping clean, free from moisture, hydration with natural oils, and more knowledge from the medical professional, it is necessary to qualify the medical professional on the main characteristics of the skin. Patients with pressure injuries and risk assessment scales (such as the Braden scale) can have a prognosis and prevent it (ROCKENBACH et al., 2012).

#### IV. CONCLUSION

Ao pesquisar artigos científicos relacionados, constata-se que é muito importante para o enfermeiro compreender sua classificação, escala, fatores de risco e tomar medidas preventivas.

Para prestar um atendimento de qualidade, é necessário conhecimento técnico-científico. O conhecimento dos profissionais de enfermagem que são responsáveis pelo cuidado ao cliente é essencial, pois se a equipe de enfermagem envolvida não consegue realizar adequadamente suas habilidades e conhecimentos e não está comprometida com a compreensão e prevenção das lesões por estresse, então o cuidado de enfermagem é prestado para prevenir lesões por estresse. A qualidade pode estar comprometida. Entenda o que é lesão por estresse, fatores de risco e medidas preventivas.

Durante o processo de revisão, descobriu-se que a maioria das lesões por estresse pode ser evitada identificando riscos e implementando um plano de cuidados, e essa situação pode causar grande desconforto ao cliente e sua família.

Por meio de algumas ações simples, como mudança de postura a cada duas horas, uso de dispositivo de alívio de pressão na área óssea protuberante, observação cuidadosa da pele e mais conhecimento do profissional médico, é necessário qualificar o paciente. A equipe médica deve lidar com as principais características e escalas de avaliação de risco de pacientes que desenvolvem lesões por pressão (como a escala de Braden), e pode fazer prognósticos e preveni-los de acordo.

A lesão por pressão tornou-se um indicador da qualidade da assistência prestada, por isso o enfermeiro deve estar atento à importância da qualidade da sua assistência, e abordar os fatores de risco e as medidas preventivas para essa situação. O enfermeiro deve

compreender também o cliente como um todo, não só o corpo, mas também a mente e o espírito, assim como as pessoas afetadas pelo meio ambiente, que precisam de ajuda geral.

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