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RESEARCH ARTICLE

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## NURSE IN THE PREVENTION OF PUS IN PATIENTS AT THE UTI: INTEGRATIVE REVIEW

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### ABSTRACT

**Objective:** The purpose of this study to know the nurses' actions in preventing pressure ulcer in ICU patients according to the literature. **Methodology:** Integrative Literature Review, conducted during the months of October to December 2020, using the LILACS database and SciELO electronic library and articles published in the last ten years (2010-2020). **Results:** The study showed that it is necessary that nurses use risk prediction scales for PUs, identify and classify patients at risk for LP, and verify the conservation status of mobilization and pressure reduction devices and inform the competent services for repair or replacement. **Conclusion:** Nursing care and assistance are essential in the treatment and recovery of patients with pressure ulcer in the ICU. It is necessary that healthcare institutions develop and implement assessment protocols for effective pressure ulcer prevention, providing quality care, especially through early identification of possible injuries and effective measures such as changes in decubitus, skin hydration, protection of bony prominences and maintenance of patient hygiene.

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## INTRODUCTION

Patients admitted to the Intensive Care Unit (ICU) are at high risk of developing pressure ulcers due to the use of respiratory equipment, urinary catheters, sequential compression devices, multiple intravenous catheters; the infusion of vasoactive drugs (COOPER, 2013), and the reduction of sensory perception caused by sedatives, analgesics and muscle relaxants, leading to a lower reaction to excessive pressure (Moro et al., 2007). According to Vasconcelos and Caliri (2017), the incidence of Pressure Ulcer (PU) in ICU patients is variable, and several factors contribute to the predisposition of this injury, including the characteristics and clinical conditions of patients

such as age, level of consciousness, nutritional and hydration status, among others. PU occurs in the skin and/or underlying soft tissues, usually over a bony prominence or related to the use of a medical device or other artifact. Such a lesion can present itself on intact skin or as an open ulcer and can be painful, resulting from intense and/or prolonged pressure combined with shear. The tolerance of soft tissue to pressure and shear can also be affected by microclimate, nutrition, perfusion, comorbidities and its physical condition (Caliri et al., 2016). In April 2013, the Ministry of Health (MS) released Ordinance 529, which places PU as an adverse event, whose occurrence depends on the assistance provided. After the implementation of the National Patient Safety Program (PNSP), the PU is subject to compulsory notification, in addition to follow-up with monitoring and surveillance

for its occurrence (BRASIL, 2013a). The PU is the third most commonly reported event by the Patient Safety Center (Núcleo de Segurança do Paciente - NSP) of Brazilian hospitals. It is characterized as an indicator of the quality of care, since the higher the occurrence of adverse events, the worse the quality of care provided (Brasil, 2015). In Intensive Care Units (ICU), the incidence of these injuries may be higher due to the patient's clinical conditions, prolonged hospital stay, immobility in bed, loss of muscle mass, among other factors. Furthermore, intrinsic factors to the patient must be considered, such as age, presence of comorbidity, nutritional status, loss of sensitivity, low tissue perfusion, as well as extrinsic factors, among them friction and shear forces, pressure. It is also noteworthy that there are three factors directly linked to the development of PU, which are: the intensity of pressure, the duration of this pressure and the resistance of the tissue that supports this pressure (Sales; Borges; Donoso, 2010). It is essential that every hospitalized patient is assessed for risk of developing PU as a first step to prevention. In this sense, the MH recommends the application of the Braden Scale in hospitalized patients in order to assess sensory perception, mobility ability, exposure to moisture, nutritional intake, the influence of friction and skin shear (Brasil, 2013b). It is noteworthy that the Braden Scale is the most widely used tool for its simplicity and for allowing the assessment of important aspects to ulcer formation, such as sensory perception, skin exposure to moisture, physical activity, mobility and nutrition. After its application, the evaluation results are classified by score, with less than 9 (very high risk), between 10 and 12 (high risk), 13 to 14 (moderate risk) and greater than 16 (minimum risk) (Pereira; Schuster, 2015).

The literature points out that even with the use of the Braden Scale and the consequent implementation of daily care by nurses, the incidence of PU is still significant. From this perspective, the difficulty in detecting the factors is configured by the lack of signaling tools, causing professional inability to identify the real needs (Hanns, 2011). Therefore, it is considered the need for the implementation of the Braden Scale by nurses of the multidisciplinary team in ICUs and health services where there is a large number of bedridden patients, in order to prevent the onset of PUs, reducing the cost with the patient and the length of hospital stay (Pereira *et al.*, 2016). In this context, nurses should acquire knowledge about prevention strategies and treatment options, thus providing the basis for minimizing this damage to the patient. Although the nurse and the nursing team are active agents, the other members of the multidisciplinary team must contribute in caring for these patients (Dantas; Alm, 2019). It is assumed that the occurrence of PUs in the ICU is directly related to preventive care to avoid the development of these lesions. Given the above, the objective of this study was to identify the nurses' actions prescribed for the prevention of PUs in ICU patients.

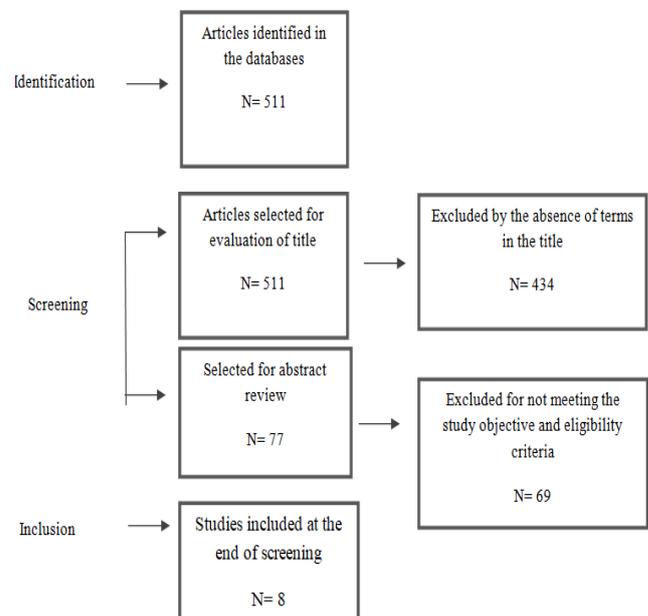
## METHODOLOGY

This study is an Integrative Review, whose methodology consists of the organization, cataloging and synthesis of the results presented in the materials selected for analysis, facilitating the interpretation (BOTELHO *et al.*, 2011). To prepare the research, the following steps were adopted: identification of the theme and formulation of the research question, preparation of the criteria for inclusion and exclusion of articles, construction of an instrument for collecting relevant data from the articles found, evaluation and analysis of the articles selected in the research, interpretation and discussion of the results obtained and presentation of the review (Mendes *et al.*, 2008).

The review was based on the following question: What are the nurses' actions in LP prevention in ICU patients described in the literature?

We included articles written in Portuguese and published in the last ten years (2010-2020) in scientific journals, excluding dissertations, theses and articles that did not fit directly into the chosen theme, and

duplicate articles. The collection of articles occurred in the LILACS electronic database and in the SciELO electronic library, from October to December 2020. For the search of articles, we used descriptors in Portuguese: PU, Intensive Care Unit, PU prevention, nursing care. The initial search of the articles in the databases, with the aforementioned descriptors, located 511 articles. Next, an analysis of the titles was performed, from which 434 articles were excluded, as they did not present terms related to the objective of this review, leaving 77 articles. Soon after, the abstracts of the 77 selected articles were analyzed, and 69 were eliminated because they did not meet the study's objective. In the end, only 8 articles were included because they met all the eligibility criteria (Figure 1). All articles were read in their entirety. Then, a table was prepared containing: article identification number, article title, authors, journal of publication, year of publication, type of article and database and/or electronic library in which it was available. Qualitative Textual Analysis was used to evaluate the studies, which is developed through a process of fragmentation of the material read (MORAES; GALIAZZI, 2016).



Source: Autoral.

## RESULTS AND DISCUSSION

Simply and briefly, Table 1 describes the eight articles selected in the research. It was evidenced that the year with the highest number of articles published was 2016 and 2019 being (two) of each year; in the other years, only one. Two publications were identified in the Nursing magazine, from São Paulo, and most (five) of the articles used the quantitative method.

**Causes and occurrences of PUs in the ICU:** According to Manganelli *et al.* (2019), pressure ulcers (PU) are a challenge for health services, because their occurrence is considered an indicator of the quality of nursing care provided to patients. The onset of PU brings implications both for those who develop it and for the institution where the patient is hospitalized. For these authors, PU causes pain, discomfort, interferes in the recovery process, increases infection rates, prolongs the hospitalization period, generates expenses with treatment, and requires more time from the nursing professional to provide care. According to Silva *et al.* (2016), prolonged hospitalization time is recognized as one of the risk factors for LP. The study by Hyun *et al.* (2014) showed that time longer than 10 days in ICU is a factor strongly associated with the onset of LP. Pacha *et al.* (2018) also showed that increased days of hospitalization was directly related to higher chances of occurrence of PU. Another research conducted in a public ICU in Greece showed that length of stay and increasing age were predictive and significant factors for the development of PU.

**Table 1. Description of the articles included in the integrative review according to title, author, year, journal, methodology and objective Teresina, PI, Brazil (2020)**

TITLE	AUTHOR	YEAR	JOURNAL	METHODOLOGY	OBJECTIVE
ICU pressure ulcer risk assessment and preventive nursing care	BARBOSA <i>et al.</i>	2014	Rev. enferm. UERJ	Cross-sectional.	Identify patients at risk of developing pressure ulcers in an Intensive Care Unit (ICU).
Pressure ulcer in critically ill patients: incidence and associated factors	BORGHAR DT <i>et al.</i>	2016	Rev. bras. enfermagem	Prospective research.	Identify the incidence and describe the factors associated with pressure ulcers in critically ill patients..
Nursing actions before and after a protocol for PU prevention in intensive care	VASCONC ELOS, J. M. B.; CALIRI, M. H. L.	2017	Esc. Anna Nery Rev. Enfermagem	Observational, prospective, comparative, before-and-after study, with a quantitative approach	Evaluate the actions of nursing professionals before and after the use of a protocol for PU prevention in an Intensive Care Unit
Risk prediction of PU risk in intensive care unit patients: integrative review	ZIMMERM ANN <i>et al.</i>	2018	Texto contexto - enfermagem	Integrative review observing the criteria for study selection	Identify the instruments that are used to assess the risk of LLP in adult critically ill ICU patients and to analyze the predictive ability
Occurrence of PUs in a university hospital intensive care unit	FARIAS <i>et al.</i>	2019	Nursing (São Paulo)	Observational Descriptive, longitudinal, quantitative research Observational	Identify the occurrence and characteristics of PUs as well as the profile of the affected patient
Nurses' interventions for PU prevention in an intensive care unit	MANGAN ELLI, <i>et al.</i>	2019	Rev. enferm. UFSM	Descriptive transversal research.	Characterize the study population and describe the nurses' interventions for the prevention of PU
Decubitus change in PU prevention in intensive care unit patients intensiva	GONÇALV E <i>et al.</i>	2020	Nursing (São Paulo)	Bibliographic research	Identify the reasons that may be related to the difficulty of changing the patient's decubitus in intensive care

The study also found that prolonged ICU bed rest, which decreases patients' mobility, increases the risk of the condition (BLACK *et al.*, 2013). In the study by Zimmermann *et al.* (2018) it was evidenced that the occurrence of PU was directly related to the severity and clinical conditions that patients presented added to the length of ICU stay as zero diet, hematological, metabolic profile and comorbidities. According to the authors, the evaluation of intrinsic and extrinsic factors is fundamental for the management of patient care and of the service. Hospital-acquired PU is associated with increased morbidity and mortality, and is considered largely preventable. Its prevalence is considered a marker of healthcare quality (COYER *et al.*, 2017). Thus, it is essential that the nurse performs a strict control of the patient's days in the ICU. As soon as the patient is hemodynamically stabilized, the patient should be changed and removed from bed as soon as possible. It is also necessary to record the appearance of LP and train the professionals involved to act in prevention (JIANG *et al.*, 2014). According to Silva *et al.* (2016), another factor related to the development of PU was hyperthermia. Therefore, microclimate control is critical, as increased body temperature represents a potential impact on the risk of a given individual developing PU (NPUAP, 2014). Strict temperature control of clients in the ICU guides to other clinical reasoning related to therapeutics and disease progression. Borghardt *et al.* (2016) found that the presence of comorbidities such as Hypertension, Diabetes Mellitus, and nephropathies in ICU patients indicated a higher risk of developing PU. These findings were also evidenced in other studies, according to which the LP occurred more frequently in patients with the presence of comorbidities of Arterial Hypertension, Diabetes Mellitus and Heart Failure (Costa *et al.*, 2014). In the study by Sousa Junior *et al.* (2017) it was observed that moisture is one of the factors that can cause PU, in which 90% of patients also presented rarely moist skin

before the appearance of the lesion. On the other hand, the study by Ventura, Moura, and Carvalho (2014) showed that 98.4% of their patients presented with occasionally moist skin. The skin may present moist on occasions that there is urinary or fecal incontinence, sweating, drains or wound secretions, vomiting. Ventura, Moura, Carvalho (2014) also identified the high occurrence of PU in bedridden patients. These high values may be related to the fact that the research was conducted in ICUs. When discussing the subject, Rogenski and Kurcgant (2012) showed that the use of medications, especially continuous use (sedatives) in the ICU also contributed to the development of PUs, since the effects of these drugs leave the patient with reduced mobility.

**Nurses' care in preventing PUs in the ICU:** Fernandes, Torres and Vieira (2008) report that nurses work in PU prevention by adopting measures such as nutritional support, topical treatment, skin moisture control and change of decubitus or decubitus of relatively simple execution. These cares do not imply hospital expenses and it becomes necessary to adopt them as part of the care routine throughout the patient's hospital stay. Also according to the authors, it is essential to change the patient's decubitus with a minimum interval of every two hours. However, they emphasize that in routine care of ICU patients, worsening of hemodynamic stability, mechanical restraint, failure of nursing care, among others, make it difficult to change the patient's decubitus. According to Albuquerque *et al.* (2014), to avoid LP in ICU patients, proper hygiene is essential. It is up to the nurses and their team to keep the patient clean, dry and with hydrated skin, since skin, when moist, is more likely to break and develop lesions. In addition to routine patient hygiene, the change of diapers and sheets should occur whenever necessary, since prolonged moisture promotes skin maceration. Vivacqua (2011) says that in cases of urinary and/or

fecal incontinence and situations in which the individual presents frequent wetness, nurses should investigate and treat the causes or make managements, such as the use of diapers, to minimize and control exposure to moisture, so that the integrity of the skin is preserved in good conditions. With regard to pressure minimization, Barbosa *et al.* (2014) report that strategies should be used such as the use of mattresses that assist in redistributing body weight, as well as protection of bony extremities. The restriction of contact and protection of bony extremities is fundamental and should be more applied, preferably with all available resources, since even with the intense use of this protection, the incidence of PU was high in this study. It is recommended that limbs and places of greater contact with bony prominences are protected from contact with the bed surface, so that it reduces the pressure, occurring through cushions or pillows, so that it redistributes all the weight (BRASIL, 2013b). The nurse and nursing technicians should perform the repositioning in a determined periodicity, aiming at the nutritional recovery of tissues in areas exposed to intense pressure. Ideally, this should occur according to the individual's conditions, such as tissue tolerance capacity, mobility, clinical conditions, and the type of surface on which it rests (BRASIL, 2013b). Fernandes *et al.* (2008), state that another risk factor for PUs in hospitalized patients is nutrition. For an adequate nutritional status, it is important that nurses monitor the intake of liquids, calories and proteins according to individual needs and, when insufficient to supply the individual, nutritional supplementation is recommended. Ideally, individuals at risk for developing PU, as well as those with PU already installed, should receive specific nutritional support, according to the needs and compounds that may favor the prevention and treatment in cases of LP (BRASIL, 2013b). Preventive nursing care, such as keeping the patient's skin hydrated, alternating decubitus, body hygiene, and the use of a pyramidal mattress, are significant interventions in the prevention of PU. Thus In addition, professional training is important as an effective method to reduce the incidence of these lesions (FARIAS *et al.*, 2019). Oliveira (2014) states that nurses have the prominent role in care management, as they are responsible for risk assessment and, from this, establish the preventive measures that should be employed as well as the supervision of the care provided. Therefore, it is necessary that this professional acts in a collaborative way and performs educational actions aimed at the team, the family members, and the community so that they perform the preventive measures correctly. The literature recommends the use of the Braden Scale by nurses at the time of patient admission. It is an important assessment tool that analyzes six factors: sensory perception, humidity, activity, mobility, nutrition, and friction and shear. Although it is useful, training is needed for the correct classification of patient risk, since it can become subjective and interfere with the conduct adopted by nursing professionals (GONÇALVES, 2020). The objective of the scale is to assist the nurse assistant in the clinical evaluation to predict if the patient may develop pressure ulcer and point out the risk factors in evidence. From this, the purpose is to plan effective and individualized prevention strategies based on the risk factors found in patients through the instrument. For the pressure ulcer risk assessment scale to achieve the proposed purpose, it is important that nurses know how to use the instrument and that there is agreement among those who use it. A high agreement indicates a high level of reliability among observers, a necessary condition to obtain valid scores (SIMÃO *et al.*, 2013). According to Jansen *et al.* (2020), in addition to the use of risk prediction scales for PUs as a way to assess patients and understand their needs, nurses also have the following responsibilities: identifying and classifying patients at risk for PUs; verifying the conservation status of mobilization and pressure reduction devices and informing the competent services for repair or replacement; assessing the lesion at each dressing change; performing cleaning and debridement procedures, and applying topical therapy. For Souza *et al.* (2016), the nurse and the nursing team perform actions of prevention, promotion and treatment of PUs, with direct action by the nurse for the effectiveness of preventive treatment, shaping care according to integral and individual factors. The authors conclude that it is very important for the multidisciplinary team to reinforce interventions, interacting in the planning and development of a prevention and treatment program for PUs.

## CONCLUSION

The research showed that nursing assistance and care are essential in the treatment and recovery of patients with PU in the ICU. It is necessary that healthcare institutions develop and implement assessment protocols for effective prevention of PU, providing quality care, mainly through early identification of possible lesions and effective measures such as changes in decubitus, skin hydration, protection of bony prominences and maintenance of the patient's hygiene. It is necessary that both nurses and the multiprofessional team are skilled and trained to identify any risk for PU in ICU patients and make the necessary effective interventions. The approach to patients at risk of PU should be interdisciplinary and require the commitment of different professional categories, following the assistance logic of the Unified Health System.

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