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PREVENTION AND CONTROL OF PRESSURE INJURY IN PEOPLE IN CRITICAL CONDITION: WHAT STRATEGIES SHOULD NURSES ADOPT?
A SCOPING REVIEW

PREVENÇÃO E CONTROLO DE LESÕES POR PRESSÃO NA PESSOA EM SITUAÇÃO CRÍTICA: QUAIS AS ESTRATÉGIAS QUE OS ENFERMEIROS DEVEM ADOTAR?
UMA SCOPING REVIEW

PREVENCIÓN Y CONTROL DE LAS LESIONES POR PRESIÓN EN PERSONAS EN SITUACIÓN CRÍTICA: ¿QUÉ ESTRATEGIAS DEBEN ADOPTAR LOS ENFERMEROS?
LA SCOPING REVIEW

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Abstract

Introduction: Pressure Injuries (PI) are a public health problem, a potentially preventable adverse event, with an incidence of 16.4% in 2023, according to the National Health System[8]. Nurses play a central role in the management of this care, and this area is therefore very sensitive to nursing care, where nurses have a great deal of autonomy.
Strategies for the prevention and control of PI in HSP are a guideline, according to current scientific evidence, on which nurses should base their practice, guaranteeing the quality and excellence of care. **Objective:** To identify effective strategies for the prevention and control of PI in the critically ill person. **Methodology:** A scoping review was carried out to answer the question: 'What strategies should nurses adopt to prevent and control PI in SCA?'. The search on the EBSCOHost® platform, used health descriptors and Boolean operators. **Results:** Of the 150 articles analysed, only 5 met the inclusion criteria. The findings highlight alternating decubitus and daily skin assessment as the Gold Standard for preventing PI over bony prominences. For PI associated with medical devices, the most effective strategies include proper device handling, skin protection and frequent repositioning. **Conclusion:** PI is a preventable health problem and its prevention depends on an approach based on continuous assessment, implementation of individualised measures and device management. The continuous training of nurses and the implementation of protocols based on scientific evidence guarantee quality and safety in the care provided.

Keywords: Critically Ill Patient; Nurse; Pressure Injuries; Prevention.

Resumo

Introdução: As Lesões por Pressão (LPP) são um problema de saúde pública, um evento adverso potencialmente evitável, com uma incidência de 16,4% em 2023, de acordo com o Sistema Nacional de Saúde[8]. O enfermeiro desempenha um papel central na gestão destes cuidados, sendo, portanto, esta área muito sensível aos cuidados de enfermagem, onde o enfermeiro é dotado de grande autonomia. As estratégias de prevenção e controlo de LPP na PSC, constituem uma linha orientadora, de acordo com a evidência científica atual, na qual os enfermeiros devem basear a sua *práxis*, garantindo a qualidade e a excelência dos cuidados. **Objetivo:** Identificar estratégias eficazes para a prevenção e controlo de LPP na Pessoa em Situação Crítica (PSC). **Metodologia:** Foi realizada uma *Scoping Review* para responder à questão: "Quais estratégias os enfermeiros devem adotar para prevenir e controlar LPP na PSC?". A pesquisa na plataforma EBSCOHost®, utilizou descritores em saúde e operadores booleanos. **Resultados:** Dos 150 artigos analisados, apenas 5 cumpriram os critérios de inclusão. Os achados destacam a alternância de decúbito e a avaliação diária da pele como *Gold Standard* na prevenção de LPP sobre proeminências ósseas. Para LPP associadas a dispositivos médicos, as estratégias mais eficazes incluem a manipulação adequada dos dispositivos, proteção da pele e reposicionamento frequente. **Conclusão:** As LPP são um problema de saúde evitável e sua prevenção depende de uma abordagem baseada numa avaliação contínua, implementação de medidas individualizadas e gestão de dispositivos. A formação contínua dos enfermeiros e a implementação de protocolos baseados em evidência científica garantem qualidade e segurança nos cuidados prestados.

Palavras-chave: Doente crítico; Enfermeiro; Lesões por Pressão; Prevenção.

Resumen

Introducción: Las Lesiones por Presión (IP) son un problema de salud pública, un evento adverso potencialmente prevenible, con una incidencia del 16,4% en 2023, según el Sistema Nacional de Salud[8]. Las enfermeras desempeñan un papel central en la gestión de estos cuidados, por lo que esta área es muy sensible a los cuidados de enfermería, donde las enfermeras tienen una gran autonomía. Las estrategias para la prevención y control de la IP en la PSH son una pauta, según la evidencia científica actual, en la que las enfermeras deben basar su praxis, garantizando la calidad y excelencia de los cuidados. **Objetivo:** Identificar estrategias eficaces para la prevención y control de la IP en el enfermo crítico. **Metodología:** Se realizó una revisión de alcance para responder a la pregunta: «¿Qué estrategias deben adoptar las enfermeras para prevenir y controlar la IP en el SCA?». La búsqueda en la plataforma EBSCOHost®, utilizó descriptores de salud y operadores booleanos. **Resultados:** De los 150 artículos analizados, sólo 5 cumplieron los criterios de inclusión. Los resultados destacan el decúbito alternante y la evaluación diaria de la piel como el patrón oro para prevenir la IP sobre prominencias óseas. En el caso de la IP asociada a dispositivos médicos, las estrategias más eficaces incluyen la manipulación adecuada del dispositivo, la protección de la piel y el reposicionamiento frecuente. **Conclusión:** La IP es un problema de salud evitable y su prevención depende de un enfoque basado en la evaluación continua, la aplicación de medidas individualizadas y el manejo de los dispositivos. La formación continuada del personal de enfermería y la implantación de protocolos basados en la evidencia científica garantizan la calidad y seguridad en los cuidados prestados.

Descriptores: Enfermería; Lesiones por Presión; Paciente Crítico; Prevención.

Introduction

Among the areas of health, nursing is on the front line in relation to people's safety, entailing responsibility for its maintenance, as a result of its involvement in the care it provides. Therefore, there is a large investment in the practice of quality care, with ethical, moral and social commitment from those involved[1].

The evaluation of the quality of services, the improvement of safety and the safety culture of CIPs, are structural and indispensable components for the improvement of safe care practices in health services, which requires a coordinated and persistent effort from all stakeholders and a systemic, continuous and promoting approach to safety and safety culture, based on a non-punitive logic and continuous improvement[2,3].

The Ministry of Health in dispatch no. 5613/2015[4] defines quality in health as "the provision of accessible and equitable care, with an optimal professional level, which takes into account the available resources and achieves the adherence and satisfaction of the citizen, presupposes the adequacy of care to the needs and expectations of the citizen."[1]. Corroborating this, the World Health Organization in 2020[5] states that high-quality care must "(...) be safe, effective, patient-centered, timely, efficient and equitable."[2].

In this line of thought, the quality of care provided has deserved the best attention from the Unified Health System[3], which over the years has implemented national strategies for quality in health, with its mission being "(...) to plan and program the national policy for quality in the health system and, as attributions, the promotion of activities and programs for patient safety and continuous improvement of the clinical and organizational quality of health units."[3].

Based on the success of previously implemented strategies, the National Plan for Patient Safety 2021-2026[3] was issued by the General Directorate of Health in 2021, registered in Dispatch 9390/2021, aligned with the WHO Global Action Plan for Patient Safety 2021-2030, and has as its main objective "(..) to consolidate and promote safety in the provision of health care, including in the specific contexts of modern health systems, (...) without neglecting the principles that support the area of patient safety, such as safety culture, communication, and the continued implementation of safe practices in increasingly complex environments."[4] and is based on 5 pillars, which are: safety culture; leadership and governance; communication; prevention and management of patient safety incidents; and safe practices in safe environments[3].

Deeply related to the quality and safety of CIP, there is the problem associated with PIs and the importance of their prevention and control, which constitutes a fundamental pillar and, consequently, the nurse's interventions play a crucial role, not only providing comfort and support to the person, but also being essential to ensure that they receive quality care.

PIs are defined by EPUAP *et al*[6] as "(...) localized damage to the skin and/or underlying tissue as a result of pressure or pressure in combination with shear. PIs usually occur over a bony prominence, but may also be related to a medical device or other object."[5].

In addition to the negative impact on quality of life, PIs result in an increase in hospital stays and hospital readmissions, an increase in the prevalence of infections and, consequently, an increase in the burden on health services[7].

Based on data provided by the National Health System portal in 2023, it is known that the incidence of PUs in Portugal in 2023 was 16.4%, an increase of 0.2% compared to 2022[8].

When treating CIPs, we immediately understand why the incidence rate of PIs in CIPs is overwhelmingly higher compared to other types of patients, due to the high level of disease/disease burden, hemodynamic instability requiring the use of vasopressor drugs, poor tissue perfusion and oxygenation, coagulopathy and repeated confrontations with multiple concomitant risk factors, which contribute to skin failure and enhance the development of PIs and, often, make the implementation of preventive measures a complex or even contraindicated task[6].

However, the General Directorate of Health states that around 95% of PIs are preventable through early identification of the degree of risk and of these, around

60% can be reduced through the implementation of a prevention program[9,10].

The nurse, not only due to their proximity to the CIPs but also due to their knowledge and advanced training in skin care, wound treatment and tissue viability, plays a fundamental role within the multidisciplinary team, assuming the management of care related to the treatment of PI, therefore this area is very sensitive to nursing care, in which the nurse is endowed with great autonomy[7].

The strategies for preventing and controlling PI in CIP, not only associated with pressure and shear forces on bony prominences but also associated with the presence of medical devices, constitute a guideline, according to current scientific evidence, on which nurses should base their practice, ensuring the quality and excellence of care, which will translate into positive outcomes for CIPs.

Methods

The present study is a Scoping review, which is defined as a research method that allows "(...) to synthesize evidence of broad research questions in a systematic way, with transparency and reliability of its data, which allows the replication of the method by other authors in different scenarios"[6] and its main aim is to identify the strategies that nurses should adopt in order to databases prevent and control PI in CIP[11].

This document was prepared in light of the recommendations of the Joanna Briggs Institute (JBI)[12], having as a starting point a research question, which was structured using the mnemonic PCC (Population, Concept, Context), where P – Nurses, C – Strategies to prevent and control PI and C – Person in Critical Situation. Thus, the following research question was formulated: *What strategies should nurses adopt to prevent and control PI in CIP?*

After formulating the research question, research began in online scientific databases, between May and June 2024. To conduct this research, descriptors duly validated in the Medical Subject Headings (MeSH)[13] and Health Sciences Descriptors (DeCS) vocabulary were used, and the following were identified: "pressure ulcer", "nursing", "prevention" and "Critically ill person". The Boolean operators AND and NOT were used, combined with the descriptors in the following search formula: "pressure ulcer" AND "nursing" AND "prevention" AND "Critically ill person" NOT "Pediatrics". The descriptor pediatrics was selected with the aim of including only adults in the study.

The inclusion criteria were peer-reviewed studies with full text and bibliographic references available with a time window between 2020 and 2024, whose participants were adults (over 18 years old), and the exclusion criteria were all studies whose results did not respond to the research question, namely, studies related to COVID-19, in palliative and pediatric patients. Figure 1 shows the PRISMA diagram, with the diagram identifying the studies extracted from the consulted databases.

Results

Through the research carried out on the EBSCOhost® online platform, namely in the CINHAL® and MEDLINE® databases, the Health Sciences Descriptors were applied with the aforementioned Boolean operators, and a total of 2560 studies were obtained.

Two independent reviewers analyzed the title and abstract of all articles listed in the databases, allowing the selection of the most relevant ones for this review. The full text of all selected articles was extracted. From there, two reviewers examined the studies according to the defined inclusion and exclusion criteria, in order to obtain a final list of articles for analysis.

In this way, 1774 duplicate articles were excluded, and with the application of the inclusion and exclusion criteria, as well as the time limit of 2020-2024, 636 articles were excluded.

After reading the title and abstract, 134 were excluded, and after reading the articles in full, 10 were excluded, as they did not answer the research question or did not demonstrate scientific methodology.

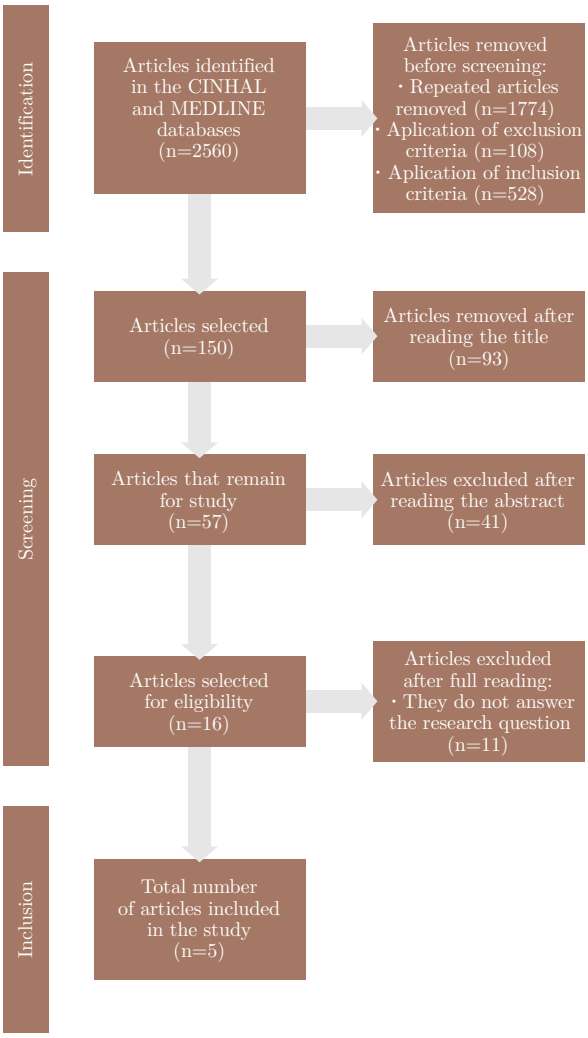

Figure 1: Flow Diagram (adapted from PRISMA Statement)[14].

At the end of the entire process of analysis of the articles, as represented in the Flow diagram in Figure 1 (adapted from PRISMA Statement[14]), 5 articles were included for this study.

Although only 5 studies were included in this review, this number reflects the scarcity of relevant publications that meet the previously established inclusion and exclusion criteria, after a systematic and comprehensive search in the selected databases. However, it is important to note that the included studies demonstrated adequate methodological quality and relevant contributions to the topic under analysis, allowing the identification of gaps in the literature and guiding future lines of research.

In order to summarize the information obtained from the selected articles, a data extraction table was created for each scientific article (Table 1) in accordance with JBI recommendations, which presents the title of the study, identification of the authors and year of the study, country of origin, type of study, objectives and main results.

Considering that this is a Scoping Review and that, therefore, there is no imperative need to analyze the methodological quality of the selected studies, this article integrates several types of studies: 2 integrative reviews, 1 systematic review and 2 qualitative studies, which allow for enriching the content and responding to the proposed objectives, since they evaluate the scientific evidence related to specific topics, and which answer the guiding question of this study.

Results Discussion

The analysis of the articles allowed us to answer the research question which guided the study and, consequently, the description and discussion of the results related to the prevention of PI in CIP.

EPUAP *et al*[6] describes PI as "(...) localized damage to the skin and/or underlying tissue as a result of pressure or pressure in combination with shear. PI usually occurs over a bony prominence, but may also be related to a medical device or other object."[8]. Based on the definition presented, we know that PIs can occur under a bony prominence, as well as being associated with the use of medical devices. Therefore, and in order to organize the discussion of results in this study, firstly, we will approach PIs under bony prominences, and then we will approach PIs associated with the use of medical devices.

Pressure injuries under bone prominences

Providing quality care to people with PIs continues to be a priority for nurses. To ensure clinical practice aligned with the best and most current scientific evidence, nurses who provide care to CIP must invest in and ensure the management of PIs in a conscious manner, acting in their prevention, ensuring effective responses according to the inherent complexity.

Table 1: Data extraction.

Research	Title	Authors/Year	Country	Type of study	Aims	Results
E1[16]	Nursing strategies aimed at preventing pressure injuries in the hospital environment.	Júnior, B., Lima, S., Brandão, B., Ramos, V. & Vasconcelos, E. (2024).	Brazil	Integrative Review.	To describe nursing strategies for preventing PI in the hospital environment.	The study allowed us to summarize the main strategies for promoting and preventing PI in a hospital environment. The most frequently encountered strategies are daily skin assessment and changing position. Less frequently, they present as strategies educational intervention and team training, nutritional assessment, hydration and skin maintenance, elevation of the head of the bed, application of transparent polyurethane on bony prominences, use of alternating pressure surfaces and application of the Braden scale. These activities for the promotion and prevention of PI corroborate the planning, implementation and evaluation of preventive actions for PU. In addition, they contribute to the development of prevention protocols and the applicability of risk prediction scales as tools that assist the preventive process. Regarding educational activities, they can be considered crucial for the entire process to occur, as this axis provides support for management and the feasibility of preventive actions.
E2[17]	Nursing actions in the prevention and treatment of pressure injuries in intensive care units.	Jesus, D., Rodrigues, A., Neves, K., Santos, L., Ribeiro, W., Fassarella, B., Souza, L., Silva, T. & Araújo, G. (2023).	Brazil	Qualitative literature review.	To describe, in light of the literature, nursing actions regarding the prevention and treatment of pressure injuries in intensive care units.	Patients admitted to the ICU present greater complexity due to several risk factors, which is why they are more vulnerable to the development of LPP, therefore it is up to the nurse to implement a care plan for the prevention of PI. The present study demonstrates that the most commonly used preventive measure is changing the position, which was cited in most of the articles studied. The following highlights the use of the Braden scale, daily skin assessment, hydration, use of pillows for better positioning when alternating positions, use of alternating pressure mattresses, application of hydrocolloid dressings and polyurethane foam on bony prominences, nutritional support and elevation of the head of the bed. Despite the above, the need for constant training of professionals, preparation of protocols for recording and evaluating PIs is still evident.
E3[18]	Pressure injury prevention scales in intensive care units: an integrative review.	Almeida, I.; Garcês, T.; Oliveira, G. & Moreira, T. (2020).	Brazil	Integrative review.	To describe the constituent elements of nursing care present in the PI risk assessment scales used in intensive care units.	The study recommends the following measures for preventing PI: avoid positioning over areas of the body that are red, keep the skin clean and dry, avoid massaging red areas, create personalized care plans for patients with sphincter incontinence, protect the skin from moisture through barrier products and consider using emollients for hydration. Nutrition was also highlighted as being of great importance, which is why a nutritional screening should be carried out, and if necessary the patient should be referred to a nutritionist. The Gold Standard is alternating lying. However, it is necessary to take into account the patient's hemodynamic stability. In addition to this alternation of positions, a suitable support surface can be added, such as a gel mattress or an alternating pressure mattress, in which case the alveoli must be at least 10 cm in diameter. Among the scales analyzed, the most used was the Braden scale. Prevention of PI is closely related to nursing care, so health professionals must demonstrate interest in seeking scientific evidence, as well as training.
E4[19]	Medical device-related pressure injury prevention in critically ill patients: nursing care.	Galetto, S., Nascimento, E., Hermida, P., Busanello, J., Malfussi, L. & Lazzari, D. (2020).	Brazil	Descriptive and Qualitative.	To know the care implemented by the nursing team to prevent pressure injuries related to medical devices in people in critical condition.	The study refers to nursing care aimed at preventing pressure injuries associated with the presence of medical devices, namely in the use of devices/strategies to protect against injuries, which are: nursing care in fixing the device; Frequent repositioning; Protection and padding of body areas in contact; Replacement of rigid devices with more flexible devices, when available; Nurses' concern that the devices do not impede the person's movements; Early evaluation and removal of the device, when clinically possible.
E5[20]	Summary of best evidence for prevention and control of pressure ulcer on support surfaces.	Huang, L., Yan, Y., Huang, Y., Liao, Y., Li, W., Gu, C., Lu, X., Li, Y. & Li C. (2023).	China	Research Systematic review.	To describe the most current scientific evidence on the choice of support surfaces according to the location and category of pressure injury.	This study refers to 4 key ideas related to support surfaces in order to prevent and control PI. They are: • Patients are at high risk of developing PI due to prolonged restriction of movement during transport to hospital. The incidence of PI in patients with suspected cervical spine injury who remain on a hard plane for 4 hours is 28%. Therefore, it is recommended that the hard plane be removed as soon as possible; • This article recommends the use of an alternating pressure mattress in people at high risk of PI, for patients for whom traditional positioning is not possible at the appropriate interval; • The use of static air mattresses as having the best effect in preventing and controlling PI than conventional mattresses, since they have a moderate softness that allows the body pressure to be dispersed across the mattress, reducing the friction and shear forces generated in traditional positioning, making it possible to extend the time between positionings, which increases the comfort and rest of the person as well as the workload of the nursing team; • The study also states that in relation to the prevention and control of PUs at the heel, the best strategy is elevation and avoidance of contact with surfaces.

Studies E1[15], E2[16], E3[17], E4[18], E5[19] define that the Gold Standard strategies for preventing and controlling PI are positioning the CIP in alternating decubitus positions and daily skin assessment.

E3[17] states that alternating decubitus is an important factor for preventing PU and should be the focus of the nursing team, as it is a low-cost technique that requires little knowledge and is effective in relieving pressure, an aspect directly related to the genesis of PI.

However, we know that alternating decubitus may not be tolerated or may be contraindicated in unstable people. In this sense, study E3[17] proposes that the technique used by nurses is a rotation of 10 degrees every 10 minutes, with the possibility of adding another 10 degrees, depending on tolerance. Corroborating this strategy, EPUAP *et al*[6] adds that in case of intolerance or contraindication of the traditional alternating positions, small weight changes can be implemented every 30 minutes, as well as elevation of the extremities, occipital region and hips every hour.

Associated with alternating decubitus positions, the use of support surfaces is also described as a valid measure for preventing and controlling PI. In E5[19], the author refers to different types of support surfaces. However, it recommends the use of a static air mattress, describing it as the one that has the best effect in preventing PI, as it has a moderate softness, ideal for dispersing the body's pressure on the mattress, thus reducing friction and shear forces caused by alternating positions. It also adds that the use of this mattress can extend the time of alternating decubitus without harm to the person, thus reducing the discomfort caused by alternating decubitus, respecting their rest and reducing the hours of contact with the nursing team.

In E2[16], the author mentions that the use of support surfaces constitutes an important strategy in preventing PI, considering the static air mattress as the most suitable.

E3[17] adds that the choice of support surface should focus on the specifications of each person, considering their needs. It should also be noted that alternating pressure air mattresses with cells with a diameter of less than 10 cm should not be used, as given their reduced diameter they may not be able to inflate and deflate effectively to prevent PI.

EPUAP *et al*[6] states that the effectiveness of the alternating pressure air mattress compared to other types of mattress is controversial and generates some conflicts; however, it recommends the use of this type of mattress when alternating decubitus cannot be performed or is contraindicated. It also emphasizes that a specific assessment must be carried out on a case-by-case basis.

According to E1[15], E2[16], E3[17], daily skin assessment and assessment of nutritional/hydration status remain the most important strategies. Daily skin assessment should be performed upon admission, whenever the clinical condition changes and upon discharge.

In E3[17] it is mentioned that the daily assessment of the person's skin is directly related to the quality of the physical examination performed by the nurse. This physical examination becomes essential for searching for signs and symptoms on the skin, allowing for the rapid and timely recognition of risk situations. Therefore, in this study, the following basic preventive measures are suggested: avoiding positioning on areas of the body that are red, keeping the skin clean and dry, and using hygiene products and creams with a balanced pH. This study recommends avoiding massage on areas of the body that are red/hyperemic, as this can cause tissue damage by rupturing vessels in the underlying tissues, and recommends the use of hyperoxygenated fatty acids, indicated for the protection and hydration of the epidermis.

In E2[16] it is mentioned that the assessment of nutritional status is a determining factor, and the person lacks an adequate nutritional prescription to meet their daily needs, which ensures not only the ideal maintenance of the organism but also the tissue integrity of the skin, favoring regeneration and healing.

Dias *et al*[20] corroborates, adding that a nutritional deficit reduces tissue tolerance, which can increase the probability of developing a PI by up to 2 times, caused by the reduction in fibroblast proliferation, collagen synthesis and angiogenesis responsible for

tissue maintenance. EPUAP *et al*[6] also contributes, corroborating what has been described, and adds that a comprehensive nutritional assessment should be carried out for adults at risk of PIs who have been assessed as malnourished and for all adults with PI, as well as the implementation of an individualized nutritional care plan.

Studies E1[15], E2[16], E3[17] report that the use of the Braden scale to assess the risk of PI was found to be the most reliable and safest, compared to the Norton, Waterlow or Gosnell scale, as they state that the nurse must be able to recognize the risk factors related to the development of PI, such as mobility in bed, perfusion and oxygenation, nutritional status, exposure to humidity and friction and shear forces, included in the Braden scale. Accordingly, in Portugal, the General Directorate of Health in its Standard 017/2011[9], defines that the risk of developing PI must be assessed in all care contexts, regardless of the clinical diagnosis, within the first six hours after the person's admission, using the Braden Scale, with its reassessment being recommended every 24 hours in patients in the ER and ICU.

Care planning in order to provide excellent nursing care, as well as the use of strategies to prevent PI, becomes the ultimate priority for nurses. Thus, and in order to standardize care, E1[15] describes a tool used for planning nursing care when there is a risk of developing PI, which should be instituted when the person presents a risk of PI equal to or less than 18 points on the Braden scale.

Pressure injuries associated with medical devices

The prevention and control of PI in CIP does not only involve PI under bony prominences. PI associated with the use of medical devices should not be overlooked. Considering that a person experiencing complex disease processes is exposed to a range of devices for treatment and monitoring, often presenting impaired sensory perception due to the use of sedatives, immobility, capillary fragility and prolonged hospitalizations, which can culminate in the development of PI. Since it is not possible to remove the source causing pressure due to necessity, it is therefore essential to institute preventive measures[6,18].

In CIP, the nurse provides care uninterruptedly, and is therefore able to identify its progression early, adopt preventive measures and ensure the person's safety. Calvancanti & Kamada[21] report in their study that the nose and cervical region are the sites where PI most frequently occur, and state that devices such as non-invasive ventilation masks, orotracheal tubes, nasogastric tubes, cervical collars, catheters and immobilizing splints are the main causes of PI. In E4[18], interventions for the prevention and control of PI of this etiology are identified, including care with the fixation of devices, the frequency of their repositioning, the protection of adjacent skin and their early removal.

In the study by Yalçin & Günes[22], it is reported that most PI associated with medical devices occur in the mucosa, and that this finding demonstrates the need to perform an assessment of the mucous membrane together with the assessment of the skin. Next, lesions at the level of the nose and lips stand out, severely related to the use of devices such as nasal cannulas, endotracheal tubes and non-invasive ventilation masks. It also states that the most common category of PI is category II.

As preventive measures, in E4[18], the following are identified: proper handling of devices, choice of appropriate size, protection of the underlying skin, avoidance of placement of devices under areas with previously healed PI, early assessment and removal of the device as soon as possible, replacement with flexible devices, when available, and frequent repositioning of the device.

E5[19] adds that the risk of developing PI due to prolonged restriction of movement with a hard plane during emergency transport or during stay in the emergency department increases by approximately 28.3% in a period of 4 hours.

The prevention and control of PI is a fundamental practice in nursing, and up-to-date knowledge of techniques based on recent scientific evidence is the cornerstone to ensure quality care. The literature demonstrates a direct link between the level of knowledge of nurses about PI and the quality of care provided to the person. The implementation of preven-

tive measures for PI results in better clinical outcomes, and the continuous training of nursing professionals, promoted by health institutions through continuing education programs, is a key factor in improving care[22].

Study E1[15] and E3[17] highlight that training in hospital settings should be a growing concern for health authorities, since the incidence of PI is often used as an indicator of the quality of care provided. Training the nursing team is crucial to reducing the number of PIs, since nurses play a central role in the prevention, treatment and control of these injuries, which, in turn, contributes both to the clinical evolution of the person and to the economy of health institutions.

Conclusion

PIs represent a significant problem in healthcare, negatively affecting a person's quality of life, both physically and emotionally. These injuries, widely recognized as preventable, are a crucial indicator of the quality of care provided and, therefore, their prevention is a priority in clinical settings worldwide. In this context, the role of the nurse is essential and irreplaceable.

Early identification of the risk of PIs involves a continuous and systematic assessment of the person, based on the use of standardized assessment tools that allow for accurate detection of specific risk factors. In addition, the implementation of preventive measures requires the development of an individualized care plan, promoting a holistic approach based on the specific needs of the patient. Alternating position is documented as the Gold Standard strategy in the prevention of PIs and should be rigorously documented and performed at optimized time intervals to minimize prolonged pressure on vulnerable areas. The use of support surfaces, also considered a valid preventive measure, should be adapted and managed according to the person's needs. Described as crucial, continuous assessment of skin integrity should be carried out at a frequency that allows for early detection of any changes, enabling rapid interventions. Last but not least, the nutritional status of the person, often compromised in CIP, should be strictly monitored and corrected when necessary, since inadequate nutrition can exacerbate the risk of developing PI.

The presence of medical devices is severely associated with the development of PI in CIP. The presence of medical devices such as nasal goggles, catheters, probes, orotracheal tubes and non-invasive ventilation masks are essential in the treatment of CIP, therefore, regular assessment of the areas of contact between the devices and the skin, the use of appropriate protective materials and frequent repositioning of the devices are fundamental strategies to reduce pressure and friction, thus preventing the development of PI. The combination of all these practices must be accompanied by careful documentation and effective communication between all members of the healthcare team, ensuring that the care plan is continually adjusted and improved based on the person's progress and the latest scientific evidence.

In addition to these fundamental practices, the provision of specialized care to CIPs requires the adaptation of nursing care based on rigorous quality standards, aimed at the safety, effectiveness and humanization of care. These standards involve the implementation of protocols based on updated scientific evidence, which requires ongoing and specialized training of nurses, not only to update their knowledge, but also to develop specific skills for managing critical and complex situations.

The quality of care provided to CIPs is determined by the ability of nurses to perform accurate assessments and timely interventions. In this sense, ongoing training should include the improvement of clinical reasoning skills and the ability to make quick and informed decisions. Nurses must be able to recognize early signs of deterioration in the patient's condition and intervene appropriately to prevent further complications, such as PI.

Therefore, a continued commitment to the education and training of nurses is imperative, reinforcing the importance of a proactive approach to PI prevention, which should be systematically integrated into healthcare institutions' care protocols.

These protocols should be aligned with international quality standards, ensuring that all aspects of care, from initial assessment to implementation of interventions, are carried out with the highest level of competence and dedication.

Strict implementation of these quality standards not only promotes the patient's safety and well-being, but also enhances the quality of care provided in critical settings, directly reflecting in the reduction of PI incidence and overall improvement in health outcomes.

References

1. Melo, C., Rached, C. Cuidados de enfermagem e segurança do paciente: reflexão sobre o tema e suas dimensões no ambiente de unidade de terapia intensiva. 2018. Available from: https://ijhmreview.org/ijhmreview/article/view/142/80

2. Siman, A., Braga, L., Amaro, M. et al. Desafios da prática na segurança do paciente. Revista Brasileira de Enfermagem. 2019 November-December;72(6):1581-1588. Available from: https://doi.org/10.1590/0034-7167-2018-0441

3. Ministério de Saúde. Despacho n.º 9390/2021. Aprova o Plano Nacional para a Segurança dos Doentes 2021-2026 (PNSD 2021-2026). Diário da República, 2.ª Série, n.º 187: 96-103. Available from: https://diariodarepublica.pt/dr/detalhe/despacho/9390-2021-171891094

4. Ministério da Saúde. Despacho n.º 5613/2015. Aprova a Estratégia Nacional para a Qualidade na Saúde 2015-2020. Diário da República, 2.ª Série, n.º 102:13550-13553. Available from: https://diariodarepublica.pt/dr/detalhe/despacho/5613-2015-67324029

5. Organização Mundial da Saúde. Manual de políticas e estratégias para a qualidade dos cuidados de saúde: uma abordagem prática para formular políticas e estratégias destinadas a melhorar a qualidade dos cuidados de saúde. 2020. Available from: https://apps.who.int/iris/bitstream/handle/10665/272357/9789240005709-por.pdf

6. European Pressure Ulcer Advisory Panel, National Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevenção e tratamento de lesões / úlceras por pressão. Guía de consulta rápida. (edição Portuguesa). Emily Haesler (Ed.). 2019.

7. Dealey, C. Tratamento de Feridas: guia para enfermeiros. Lisboa, Climepsi Editores, 2006. ISBN: 972-796-204-1. 2016.

8. Sistema Nacional de Saúde. Prevalência de Quedas e Incidências de Úlceras de pressão. 2023. Available from: https://transparencia.sns.gov.pt/explore/dataset/prevalencia-de-quedas-e-incidencias-de-ulceras-de-pressao/table/?flg=pt-pt&disjunctive.semestre_ano&disjunctive.regiao&sort=tempo&refine.semestre_ano=Ano+2023 .

9. Direção Geral de Saúde. Escala de Braden: Versão Adulto e Pediátrica. Orientação n.º 17/2011. Lisboa, Portugal: Direção Geral da Saúde. 2011. Available from: https://www.dgs.pt/departamento-da-qualidade-na-saude/ficheiros-anexos/orientacao_ulceraspdf-pdf.aspx

10. Mostardinha, A., Quitério, C., Sousa, D. et al. Caracterização da pessoa que desenvolve Úlcera por Pressão em Contexto de Internamento Hospitalar. Revista de Enfermagem do Centro Hospitalar de Setúbal. 2022. Available from: https://comum.rcaap.pt/bitstream/10400.26/43616/1/Pr%c3%a9Publica%c3%a7%c3%a3o_Caracteriza%c3%a7%c3%a3o%20da%20pessoa%20que%20desenvolve%20%c3%9alcera%20por%20Press%c3%a3o%20em%20Contexto%20de%20Internamento%20%281%29.pdf

11. Salvador, P., Alves, K., Costa, T. et al. Contribuições da scoping review na produção da área da saúde: reflexões e perspetivas. Revista Enfermagem Digital Cuidado e Promoção Da Saúde. 2021 September; (6):1-8. Available from: http://www.dx.doi.org/10.5935/2446-5682.20210058

12. Aromataris M. Joanna Briggs Institute Reviewer's Manual. Adelaide: The Joanna Briggs Institute; 2017.

13. U.S. National Library of Medicine. MeSH: EBSCOhost. Philadelphia: NLM. 2021.

14. Salameh, J., Bossuyt, P., McGrath, T., et al. Preferred reporting items for systematic review and meta-analysis of diagnostic test accuracy studies (PRISMA-DTA). The BMJ. 2020 August;370(12). Available from: https://doi.org/10.1136/bmj.m2632

15. Júnior, B., Lima, S., Brandão, B., et al. Estratégias de enfermagem voltadas à prevenção de lesão por pressão no ambiente hospitalar. Revista Enfermagem Atual In Derm. 2024 January, February and March;98(1):1-13. Available from: https://doi.org/10.31011/reaid-2024-v.98-n.1-art.2029

16. Jesus, D., Rodrigues, A., Neves, K., et al. Ações da enfermagem na prevenção e tratamento de lesão por pressão em unidade de terapia intensiva. Research, Society and Development. 2023 January;12(1). Available from: http://dx.doi.org/10.33448/rsd-v12i1.39331

17. Almeida, I.; Garcês, T.; Oliveira, G. et al. Pressure injury prevention scales in intensive care units: an integrative review. Revista Rene. 2020 February;20. Available from: https://doi.org/10.15253/2175-6783.20202142053

18. Galleto, S., Hermida, P., Busanello, J. et al. Medical device-related pressure injury prevention in critically ill patients: nursing care. Revista Brasileira Enfermagem. 2020 March; 74(2). Available from: https://doi.org/https://doi.org/10.1590/0034-7167-2020-0062

19. Huang, L., Yan, Y., Huang, Y. et al. Summary of best evidence for prevention and control of pressure ulcer on support surfaces. Wiley online Library. 2023 August;20(6):2276-2285. Available from: https://pubmed.ncbi.nlm.nih.gov/36891753/

20. Dias, A., Araújo, S., Silva, R. et al. A importância da enfermagem no gerenciamento do cuidado e prevenção de lesão por pressão em UTI Revista científica eletrónica da faculdade de Piracanjuba. 2021 August-December;1(1): 81-88. Available from: https://eadfap.com/revista/index.php/vl1/article/view/12/12

21. Cavalcanti C., Kamada I. Medical-device-related pressure injury on adults: an integrative review. Texto & Contexto Enfermagem. 2020;29. Available from: http://dx.doi.org/10.1590/1980-265X-TCE-2018-0371

22. Yalçin, M., Günes, Ü. A point prevalence study of medical device-associated pressure injuries: A cross-sectional study. Journal of clinical nursing Wiley. 2023 October;32(19-20): 7618-7625. Available from: https://doi.org/10.1111/jocn.16831.

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MC: Study design, collection, storage, data analysis, review and discussion of results.
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