RESEARCH | PESQUISA

# Nursing actions before and after a protocol for preventing pressure injury in intensive care[a]

## *Ações de enfermagem antes e após um protocolo de prevenção de lesões por pressão em terapia intensiva*

## *Acciones de enfermería antes y después protocolo preventivo de lesiones por presión en terapia intensiva*

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## Abstract

**Objective:** To evaluate the actions of nursing professionals before and after using a protocol for preventing pressure injuries in an intensive care unit. **Methods:** An observational, prospective, before and after comparative study, using a quantitative approach, was carried out in a teaching hospital in Paraíba. Nursing actions were observed during 38 bed baths before the protocol and 44 afterwards. **Results:** After using the protocol, a greater frequency of actions was noted: assessment of risk for pressure injuries on days following admission ($p < 0.001$), observation of bony prominences ($p < 0.001$) and application of moisturizer in all body regions ($p < 0.001$), lifting the patient from the bed during repositioning ($p < 0.001$), protection of knee bone prominences ($p = 0.015$), and elevation of the calcaneus ($p < 0.005$). **Conclusion:** The higher frequency of preventive actions after using the protocol demonstrates the importance of this tool in the adoption of evidence-based recommendations by professionals.

**Keywords:** Pressure Ulcers; Nursing Care; Intensive Care Units; Patient Safety.

## Resumo

**Objetivo:** Avaliar as ações dos profissionais de enfermagem, antes e após utilização de protocolo de prevenção de lesões por pressão, em Unidade de Terapia Intensiva. **Métodos:** Estudo observacional, prospectivo, comparativo, do tipo antes e depois, com abordagem quantitativa, realizado em hospital de ensino, na Paraíba. Foram observadas as ações de enfermagem durante 38 banhos no leito antes e 44 depois do protocolo. **Resultados:** Após uso do protocolo, observou-se maior frequência das ações: avaliação do risco para lesões por pressão nos dias subsequentes à admissão ($p < 0,001$), observação de proeminências ósseas ($p < 0,001$) e aplicação de hidratante ($p < 0,001$), em todas as regiões corporais, elevação do paciente do leito na movimentação ($p < 0,001$), proteção de proeminências ósseas do joelho ($p = 0,015$) e elevação do calcâneo ($p < 0,005$). **Conclusão:** A maior frequência de ações preventivas após uso do protocolo demonstra a importância dessa ferramenta na adoção das recomendações baseadas em evidências científicas pelos profissionais.

**Palavras-chave:** Lesão por Pressão; Assistência de Enfermagem; Unidades de Terapia Intensiva; Segurança do Paciente.

## Resumen

**Objetivo:** Evaluar las acciones de profesionales de enfermería antes y después de utilización de protocolo preventivo de lesiones por presión, en Unidad de Terapia Intensiva. **Métodos:** Estudio observacional, prospectivo, comparativo, tipo antes y después, de abordaje cuantitativo, realizado en hospital de enseñanza de Paraíba. Se observaron acciones de enfermería durante 38 baños en lecho antes y 44 después del protocolo. **Resultados:** Después de aplicarse el protocolo, se observó mayor frecuencia de acciones: evaluación del riesgo de lesiones por presión en días siguientes a admisión ($p < 0,001$), observación de prominencias óseas ($p < 0,001$) y aplicación de hidratante ($p < 0,001$) en todas las regiones corporales, elevación del paciente del lecho en el movimiento ($p < 0,001$), protección de prominencias óseas de rodilla ($p = 0,015$) y elevación del talón ($p < 0,005$). **Conclusión:** La mayor frecuencia de acciones preventivas posteriores a uso del protocolo demuestra la importancia de la herramienta para que los profesionales adopten recomendaciones basadas en evidencias.

**Palabras clave:** Lesión por Presión; Atención de Enfermería; Unidades de Cuidados Intensivos; Seguridad del Paciente.

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## INTRODUCTION

In recent years, a discussion has risen worldwide about patient safety, and striving for quality when providing health care has received special attention. In 2009, the World Health Organization defined patient safety as the reduction of risk of unnecessary harm associated with healthcare to an acceptable minimum.[1] In this conception, pressure injuries (PI) become an important challenge since they are recognized as an adverse event if they occur after the individual's admission into the health care facility, and because they are one of the five most common causes of harm to patients.[2]

A PI is defined as a localized damage to the skin and/or underlying soft tissue usually over a bony prominence or related to a medical or another device. The injury can present as intact skin or an open ulcer and may be painful, and occurs as a result of intense and/or prolonged pressure or pressure in combination with shear. The tolerance of soft tissue for pressure and shear may also be affected by microclimate, nutrition, perfusion, co-morbidities and condition of the soft tissue.[3]

This is a frequent problem in intensive care units (ICUs) where patients have higher vulnerability, mainly due to an altered level of consciousness, use of sedatives, ventilatory support, and vasoactive drugs, as well as due to the restrictions of movement for a prolonged period of time and hemodynamic instability.[4]

In these units, international studies show that a PI can occur within 72 hours after admission[5] and that in the hospital settings incidence and prevalence rates remain high compared to global rates.[6] In Brazil, studies show that the prevalence of PI in ICUs ranged between 35.2%[7] and 63.6%[8] and the incidence between 11.1%[9] and 64.3%.[10] In teaching hospitals, the incidence of PI ranged from 23.1%[8] to 62.5%.[4]

Since the 1990s, it has been recognized that the incidence of PI is a quality indicator of healthcare services at the international[11] and national[12] levels. In Brazil, ICUs are considered a reference unit for measuring the incidence of PI in the hospital setting.

Considering the magnitude of the problem with PI, prevention has been identified as the best way to minimize this event with a focus on using clinical guidelines and protocols. The guidelines are statements that are systematically developed from best practices in a specific clinical area designed to provide guidance for professionals in their practice based on current evidence and aimed, among other aspects, to reduce variability in care, promote safe care and free of harm, and to reduce costs.[13] The protocols, in turn, must be built based on the recommendations of the clinical guidelines to be instruments that make it possible to establish a diagnostic and therapeutic approach in an intersectoral and interdisciplinary perspective.[14] Moreover, they should provide a favorable situation for data collection in management of care, thus reducing the burden with medical and nursing documentation.[14]

Studies published in Brazil have shown the medical practice of professionals and the incidence of PI in various contexts of the hospital environment, but few[8,15] have investigated the use of interventions recommended in the guidelines and presented the impact of using prevention protocols.

Authors argue that the implementation of recommendations from guidelines for clinical practice is recognized as a significant process of change for an organization, especially when the practices of professionals differ from what is recommended.[16] They emphasize that the adoption of new practices is more likely to occur with the active involvement of the participants and the integration of the recommendations in the process of care. They also say that the assessment of changes in an institution and the impact achieved after the implementation of a protocol can be based on the process, which makes it possible to examine whether the recommended practice is being used and how it is being done. The evaluation can also be based on an outcome focus that shows if there is adherence to the recommended actions by measuring the incidence of the indicator.[16]

Recent literature[17] points out that the prevention of PI requires that certain activities be carried out by all the individuals who make up the team in an interdisciplinary approach for developing and implementing the care plan. The operationalization of vision requires an organizational culture that values prevention, strategies that promote teamwork and communication, and individuals with expertise in this theme. Therefore, a study was conducted to investigate whether a protocol for preventing PI, based on guidelines for clinical practice and built by the researcher with the collaboration of professionals from an ICU, would produce changes in clinical practice and in outcomes of care.[18]

This article presents the results regarding the aspects of care focused on the process, considering the assessment of the patients' risk for PI and the use of prevention measures during a bed bath. The research question was: Will the actions of ICU nursing staff to prevent PI be modified when a protocol is built and implemented in a collaborative partnership between the researcher and health team professionals?

Considering this query, the study was carried out with the objective of evaluating the actions of nursing professionals before and after using a protocol for preventing pressure ulcers in an intensive care unit.

## METHODS

An observational, prospective, before and after comparative study, using a quantitative approach, was carried out between September 2011 and March 2013 at the general adult ICU of a teaching hospital in João Pessoa, Paraíba. The research project was approved by the institution's research ethics committee under decision no. 451/11.

The study was conducted in two stages: before (pre-protocol phase) and after (post-protocol phase) the intervention for building and implementing a protocol for the prevention of PI in the ICU. The study's outcome (dependent variable) were actions performed by nursing professionals for PI prevention, and the intervention (independent variable) was the prevention protocol that was implemented between the two phases.

The building and implementation of the PI prevention protocol occurred over a period of five months.[18] In order to build the protocol, the focus group strategy was used, in a process of interaction and partnership among the researcher and 55 health professionals from different specialties who worked in the ICU. Initially, the results obtained in the pre-protocol phase were shared with the professionals in order to make them aware of the practice problems and persuade them about the need for change. Next, the actions to prevent PI proposed in the guidelines of the European Pressure Ulcer Advisory Panel/National Pressure Ulcer Advisory Panel[19] and the Wound, Ostomy and Continence Nurses Society[20] were presented to the professionals gathered in small groups. Together with this presentation, a discussion was raised about the appropriateness of the actions to the needs of the patients and to the service reality. After the discussions, a synthesis was drawn up regarding the recommendations that would make up the protocol to be used in the ICU, which was submitted to all professionals for agreement, obtaining high acceptance rates (minimum: 87.3%; maximum: 100%).

The final model of the protocol contains 74 recommendations that include actions to: assess the risk for PI (4), assess the skin (8), control humidity (5), optimize the nutritional and hydration status (6), minimize the impairment of sensory perception, mobility, and activity (15), minimize friction and shear (4), educate and supervise (11), document the actions (5), and guide the team's work process (16).[18]

In order to implement the protocol,[18] educational activities were developed, including a course that addressed the pathophysiology, risk factors, classification of PI, and measures recommended for their prevention. Furthermore, the slides of the course were made available on ICU's computers, an instructional guide about PI prevention was distributed, the prevention algorithm was placed on the walls next to the patients' units, and the researcher worked in the ICU for two weeks to monitor the early operationalization of the protocol. At the end of the educational activities, the researcher stayed away from the field for a period of three weeks and then returned to collect the data for the post-protocol phase.

To collect the data, the actions of the nurses and nursing technicians were observed during 38 bed bath procedures before the intervention and 44 after, along with checking the information from the notes on patients' records. The sample was decided based on convenience, adopting as a criterion that the bed bath procedure was the first one performed on the patients within a maximum period of 24 hours after their ICU admission.

An instrument that had been validated[15] and adapted for the study was used as a guide for collecting and recording information that included variables related to the actions recommended for preventing PI.[19,20] The following information was collected from the medical records: information registered about assessment of patients' risk for PI upon admission and on the days subsequent to hospitalization, use of the Braden scale, and about skin inspection at admission. The observation of the bed bath evaluated, during the procedure, whether or not actions were carried out for hygiene and hydration of the skin on the different body segments, the inspection of the skin's conditions, along with a set of actions for repositioning and mobilizing the patient. Most of these actions to prevent PI should be done during the bed bath, therefore, this was considered as the best moment to collect data due to the possibility to observe the behavior of the professionals during the steps of this procedure.

The first phase of the research, pre-protocol, made it possible to learn the reality related to preventive measures for PI adopted by the nursing professionals before the intervention for building and implementing the protocol in the ICU. The second phase, post-protocol, made it possible to verify the changes in the actions of the professionals after using the protocol.

The software used to analyze the data was SPSS (Statistical Package for the Social Sciences), version 16.0. Initially, a descriptive analysis was undertaken to determine the frequencies and percentages. Subsequently, the chi-square test or Fisher's exact test was used to investigate if the difference in the frequency of actions performed before and after the intervention was statistically significant. The statistical significance level adopted was 5% ($p < 0.05$).

## RESULTS

By analyzing the patient's charts, it was identified that the risk assessment for PI at admission was recorded for 22 (57.9%) of the 38 patients in the phase before the protocol and for 34 (77.3%) of the 44 at this phase after the protocol ($p = 0.06$). The Braden Scale was used for all the evaluations. Considering the days after admission, the data obtained from the charts showed that the risk assessment was not recorded for any patient in the phase before the protocol, but, at the phase after, it was recorded for 28 (63.6%), showing a statistically significant difference ($p < 0.001$) in the adoption of the recommendation by the nurses. As for the action of the nurses to assess skin conditions, records were identified in 32 (84.2%) charts in the phase before and in 37 (84.1%) after the protocol.

Table 1 shows the results considering the actions taken by the professionals during the bed bath for hygiene, skin hydration, and inspection of bony prominences in the regions of the head, anterior trunk, and posterior trunk. The results show that in the

**Table 1.** Distribution of patients according to frequency of hygiene, skin hydration, and inspection on bony prominences in the head, anterior trunk, and posterior trunk during the bed bath and phases of the research. João Pessoa, Paraíba, Brazil, 2013

| Body region | Pre-protocol (n = 38) | | Post-protocol (n = 44) | | *p*-value* |
|---|---|---|---|---|---|
| | n | % | n | % | |
| **Head** | | | | | |
| Hygiene | | | | | |
| Yes | 20 | 52.6 | 20 | 45.5 | $p = 0.517$ |
| No | 18 | 47.4 | 24 | 54.5 | |
| Observes bony prominences | | | | | |
| Yes | 1 | 2.6 | 18 | 40.9 | $p < 0.001$ |
| No | 37 | 97.4 | 26 | 59.1 | |
| **Anterior trunk** | | | | | |
| Hygiene | | | | | |
| Yes | 37 | 97.4 | 44 | 100.0 | $p = 0.463$ |
| No | 1 | 2.6 | - | - | |
| Applies moisturizer | | | | | |
| Yes | 7 | 18.4 | 35 | 79.5 | |
| No | 31 | 81.6 | 8 | 18.2 | $p < 0.001$ |
| Not applicable (skin lesions) | - | - | 1 | 2.3 | |
| Observes bony prominences | | | | | |
| Yes | 2 | 5.3 | 38 | 86.4 | $p < 0.001$ |
| No | 36 | 94.7 | 6 | 13.6 | |
| **Posterior trunk** | | | | | |
| Hygiene | | | | | |
| Yes | 36 | 94.7 | 44 | 100.0 | $p = 0.212$ |
| No | 2 | 5.3 | - | - | |
| Applies moisturizer | | | | | |
| Yes | 10 | 26.3 | 41 | 93.2 | |
| No | 28 | 73.7 | 2 | 4.5 | $p < 0.001$ |
| Not applicable (skin lesions) | - | - | 1 | 2.3 | |
| Observes bony prominences | | | | | |
| Yes | 21 | 55.3 | 44 | 100.0 | $p < 0.001$ |
| No | 17 | 44.7 | - | - | |

Source: Research data. * To calculate the association tests, the values for the item that does not apply were not considered.

post-protocol phase there was a decrease in the adoption of the conduct of head hygiene and a statistically significant increase ($p < 0.001$) in the inspection of the skin on the bony prominences of this region. Concerning the anterior and posterior trunk, there was greater adherence to the conduct of hygiene and a statistically significant change in the use of moisturizer ($p < 0.001$) and observation of bony prominences ($p < 0.001$).

Table 2 presents the actions taken during the bath on the upper and lower limbs.

The data from Table 2 shows an increase in the number of preventive actions in the post-protocol phase in all the variables observed. Statistically significant differences were found in the use of moisturizer ($p < 0.001$) and the observation of bony prominences ($p < 0.001$) in the upper and lower limbs. There was

**Table 2.** Distribution of patients according to frequency of hygiene, skin hydration, and inspection of bony prominences on the upper and lower limbs during the bed bath and phases of the research. João Pessoa, Paraíba, Brazil, 2013

| Body region | Pre-protocol (n = 38) | | Post-protocol (n = 44) | | *p*-value* |
|---|---|---|---|---|---|
| | n | % | n | % | |
| **Upper limbs** | | | | | |
| Hygiene front part | | | | | |
| Yes | 34 | 89.5 | 43 | 97.7 | |
| No | 3 | 7.9 | 1 | 2.3 | $p = 0.327$ |
| Not applicable (skin lesions with bandaged member) | 1 | 2.6 | - | - | |
| Hygiene back part | | | | | |
| Yes | 24 | 63.2 | 36 | 81.8 | |
| No | 13 | 34.2 | 8 | 18.2 | $p = 0.083$ |
| Not applicable (skin lesions with bandaged member) | 1 | 2.6 | - | - | |
| Applies moisturizer | | | | | |
| Yes | 7 | 18.4 | 30 | 68.2 | |
| No | 30 | 78.9 | 13 | 29.5 | $p < 0.001$ |
| Not applicable (skin lesions) | 1 | 2.6 | 1 | 2.3 | |
| Observes bony prominences | | | | | |
| Yes | 2 | 5.3 | 21 | 47.7 | $p < 0.001$ |
| No | 36 | 94.7 | 23 | 52.3 | |
| **Lower limbs** | | | | | |
| Hygiene front part | | | | | |
| Yes | 34 | 89.5 | 44 | 100.0 | $p = 0.042$ |
| No | 4 | 10.5 | - | - | |
| Hygiene back part | | | | | |
| Yes | 25 | 65.8 | 42 | 95.5 | $p = 0.001$ |
| No | 13 | 34.2 | 2 | 4.5 | |
| Applies moisturizer | | | | | |
| Yes | 6 | 15.8 | 35 | 79.5 | |
| No | 31 | 81.6 | 6 | 13.6 | $p < 0.001$ |
| Not applicable (skin lesions) | 1 | 2.6 | 3 | 6.8 | |
| Observes bony prominences | | | | | |
| Yes | 5 | 13.2 | 42 | 95.5 | $p < 0.001$ |
| No | 33 | 86.8 | 2 | 4.5 | |

Source: Research data. * To calculate the association tests, the values for the item that does not apply were not considered.

an increase in the frequency of hygiene of the back part of the upper and lower limbs, but the statistically significant difference was only in relation to the lower limbs ($p = 0.042$).

Also observed was the body position at the end of the bath. It was noticed that in the two phases of the research, most of the patients were kept in the same supine position they were in at the beginning of the procedure. Body repositioning after the bath was done for 5 (13.1%) patients in the phase before and for 19 (43.2%) in the phase after the protocol, and the difference between them was statistically significant ($p < 0.001$).

Table 3 shows the results for other measures for positioning and mobilization done by the professionals during the bath.

Considering the data given, a change can be observed in the behavior of the professionals in all the variables studied with a statistically significant difference as to the use of the recommendations for lifting the patient from the bed during the movement ($p < 0.001$), protection of bone prominences/knee ($p = 0.015$), and elevation of the calcaneus ($p = 0.005$).

## DISCUSSION

While recognizing that PI have multiple causes and that there is a need for a multidisciplinary approach, it is still a fact that the nursing staff is responsible for the direct and continuous care of patients, which gives them an important role in preventing this problem. Thus, based on current knowledge, there is a clear need for an evidence-based practice in order to ensure quality patient care.

Literature points out that the systematic implementation of the best practices recommended in the guidelines for clinical practice has been a challenge for many institutions.[21] To address the problem, rather than implementing actions for the prevention or recommendations in isolation, institutions have established prevention programs by grouping several recommendations and then presenting them as a "package".[21] The application of this set of actions or set of best practices in combination shows more positive results than the isolated implementation of one of them.

In this study, it was found that the construction and implementation of a protocol with a set of recommendations for the prevention of PI influenced the practice of the ICU nursing staff since, at the phase after the use of the protocol, the preventive actions were performed more frequently. Changes were observed in the behavior of the nursing professionals both

**Table 3.** Distribution of patients according to the use of preventive measures for positioning and mobilization during the bed bath procedure, and the phases of the research. João Pessoa, Paraíba, Brazil, 2013

| Patient's positioning and mobilization | Pre-protocol (n = 38) | | Post-protocol (n = 44) | | *p*-value* |
|---|---|---|---|---|---|
| | n | % | n | % | |
| Head of the bed positioned at an angle of 30° or less | | | | | |
| Yes | 27 | 71.1 | 36 | 81.8 | |
| No | 10 | 26.3 | 8 | 18.2 | $p = 0.340$ |
| Not applicable (patient in Fowler's position due to clinical condition) | 1 | 2.6 | - | - | |
| Lifting patient from bed during movement | | | | | |
| Yes | 18 | 47.4 | 38 | 86.4 | |
| No | 16 | 42.1 | 3 | 6.8 | $p < 0.001$ |
| Not applicable (patient assisted in movement) | 4 | 10.5 | 3 | 6.8 | |
| Body's lateralization at a 30° angle | | | | | |
| Yes | 4 | 10.5 | 12 | 27.3 | |
| No | 1 | 2.6 | - | - | $p = 0.294$ |
| Not applicable (patient in supine position) | 33 | 86.8 | 32 | 72.7 | |
| Use of support to reduce pressure on the dorsal region | | | | | |
| Yes | 4 | 10.5 | 12 | 27.3 | |
| No | 1 | 2.6 | - | - | $p = 0.294$ |
| Not applicable (patient in supine position) | 33 | 86.8 | 32 | 72.7 | |
| Protection of bone prominences - knee | | | | | |
| Yes | 2 | 5.3 | 12 | 27.3 | |
| No | 3 | 7.9 | - | - | $p = 0.015$ |
| Not applicable (patient in supine position) | 33 | 86.8 | 32 | 72.7 | |
| Elevation of the calcaneus | | | | | |
| Yes | - | - | 7 | 15.9 | |
| No | 33 | 86.8 | 25 | 56.8 | $p = 0.005$ |
| Not applicable (patient in lateral decubitus) | 5 | 13.2 | 12 | 27.3 | |

Source: Research data. * To calculate the association tests, the values for the item that does not apply were not considered.

in practices related to assessing the patients as well as to the risk and skin integrity conditions such as in the interventions during the bed bath, as recommended for controlling the risk factors.

Regarding the risk assessment for the development of PI, although a change was found in the behavior of the professionals, most often in relation to the records in the charts in the post-protocol phase, a need was identified to improve the adoption of this practice both on the day of the patient's admission and on the following days. Based on this early and frequent assessment is that nurses, through clinical reasoning, can establish measures to individualize the care, with the help of the patient, their family, and healthcare professionals.[22]

Scales for PI risk assessment combined with clinical reasoning can help professionals establish the most appropriate interventions for patients.[5,19,20,22] For ICU patients, the assessment should be performed upon admission, as soon as possible, and then repeated with alteration in health status or if the patient's health condition deteriorates.[19,20] The Braden Scale is one of the most commonly used scales in the world and has been validated in Brazil for the Portuguese language and its use is common in contexts of practice[1,8,9] and research.[8,9,15]

In this study, it was found that the records on patients' chart about skin conditions assessment upon admission were already done before the intervention and the same percentage was maintained after its implementation. This finding may be a result of the fact that this assessment was already part of the nursing interventions established by the institution in the nursing history, using a checklist form. However, the lack of this record in 15% of the charts in each phase of the study not only can hinder communication among team members about the patients' condition in relation to their skin integrity, but it can also bring ethical and legal implications for professionals and for the institution.[23]

The moment of hygiene of critically ill patients is presented as a good opportunity for the systematic examination of their skin conditions and for providing essential care to prevent PI. The gaps identified in this study in relation to actions for hygiene and observing the areas of bony prominences on the head of the patients were also found in the study cited above carried out at the ICU of a teaching hospital in São Paulo, before and after the educational interventions.[15] However, the lack of this assessment is a barrier for identifying PI in the occipital region that occur in patients maintained at rest in the supine or sitting position.[19,20]

The application of body moisturizer to the different body regions was more frequent at the phase after using the protocol, thus demonstrating that the professionals modified their practice related to patients' skin care. The use of a moisturizer is recommended after the bath and when the patient's skin is dry.[20] Although the most suitable substance has not yet been found, promising results have been reached in relation to hyperoxygenated fatty acids.[19]

The recommendations of the guidelines regarding the mobilization and frequent repositioning of patients at risk for PI are based on theories that explain the mechanism of how the injury is formed and the role played by the intensity and duration of the pressure in the development of tissue ischemia, as well as in the controlled and randomized clinical trials performed in long-stay institutions for the elderly.[19] Thus, to reduce the occurrence of PI it is necessary to reduce the time and the amount of pressure that patients are exposed with changes of position at scheduled times for individuals who are bedridden or kept seated on chairs. However, the frequency must take into account the patients' condition (tissue tolerance, level of activity and mobility, general medical condition, overall objectives of the treatment, and assessments of the conditions of the skin) as well as the surface of the support being used.[19,20]

The findings from this study indicated that the repositioning of the patients' body, in most cases, was not done at the end of the bed bath procedure, which is similar to the findings of the study cited above.[15] The reason given by the professionals to not change the patients' position is that, due to the complexity of the clinical status and the hemodynamic instability to movement, repositioning can cause complications to the patients.[15,18]

On this point, the authors of a recent literature review[24] found studies that contradict this concern of professionals about the risk of hemodynamic changes and complications related to movement, repositioning, or progressive mobility of critically ill patients. As for the changes in oxygen saturation in venous blood and heart rate after moving to lateral decubitus in ICU patients, these studies found that it was temporary and anticipated by nurses and that most patients returned to their baseline parameters within five minutes after being moved. In another study, it was found that the perception of professionals about the hemodynamic instability of critically ill patients may be an important barrier to the onset or progression of a mobilization protocol.

All the measures recommended in the guidelines for preventing PI, repositioning patients, and for reducing the effect of pressure and shearing forces, as established in the protocol implemented in the ICU, were performed more frequently by the professionals in the post-protocol phase. However, the actions performed less frequently can be understood and analyzed more broadly, using the paradigm of evidence-based practice and patient safety. For example, the recommendation to position the head of the bed at an angle of 30 degrees or less needs to be assessed if the patient is at risk for ventilator-associated pneumonia. To prevent this problem, it is recommended that the head of the bed should be maintained between 30 and 45 degrees.[25] Nurses should, along with other members of the multidisciplinary team, establish the most appropriate conduct in relation to the height of the head of the bed and use other prevention measures.

## FINAL CONSIDERATIONS

The results of this study showed that the intervention for building and implementing a protocol to prevent PI, in partnership with the researcher and professionals, influenced the performance of nursing professionals with an increase in the adoption of evidence-based recommendations in the studied ICU.

Despite the positive results found in the research, they need to be interpreted with caution. Initially, in observational studies with a before and after design, in which there is neither a randomization of the intervention nor a control group, the strength of evidence obtained is weak. However, this type of study is the most frequently used in research studies aimed at promoting institutional improvements, mainly with regard to the quality of care with a focus on changes in processes and outcomes of care.

Another limitation of this study refers to the short interval between the protocol implementation activities and the collection of data in the second phase of the research, which may have influenced the results. Therefore, to identify whether the results found are being maintained, it is recommended that further research be developed in the institution. However, it should be highlighted that, in order to maintain the changes, the institution's management needs to provide support by providing material and human resources, and the health team professionals, especially the nursing staff needs to have an active involvement.

The activities and strategies used in this study to build and implement the PI prevention protocol in the ICU can be adopted as part of initiatives for education and training of professionals in this and other institutions. Therefore, it is suggested that similar initiatives involving faculty members/researchers from higher nursing education institutions and professional from health services be performed in order to contribute to the incorporation of scientific evidence in the setting of practice.

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