

## IMPROVEMENT IN THE QUALITY OF PRESSURE INJURY PREVENTION IN AN INTENSIVE CARE UNIT


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### ABSTRACT

**Objective:** to assess the effect of implementing a quality improvement project on the process of pressure injury prevention in an adult Intensive Care Unit.

**Method:** a quality improvement project for the pressure injury prevention process was carried out in an adult Intensive Care Unit of a public hospital from November 2022 to July 2023. It was developed following the steps of an improvement cycle. The quality level of pressure injury prevention was measured before and after the interventions, using six quality criteria. Data collection for the first assessment was conducted in March 2023, retrospectively, referring to November and December 2022 and January 2023. Quality reassessment occurred in July 2023, also retrospectively, referring to April, May, and June 2023. Interventions included changes in records related to assistance in pressure injury prevention and education/awareness of the team on pressure injury prevention.

**Results:** the initial quality assessment showed that the compliance level of pressure injury prevention was low, with virtually all criteria showing rates below 50%. After the interventions, there was an increase in compliance with almost all criteria.

**Conclusion:** the use of a quality improvement project enabled the improvement of the pressure injury prevention process and contributed to the scientific community by corroborating the effectiveness of these projects in implementing pressure injury prevention programs, as well as prompting reflection on the multifactorial nature involved in this preventive process.

**DESCRIPTORS:** Pressure injury. Quality improvement. Patient safety. Intensive Care Units.

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# MELHORIA DA QUALIDADE DA PREVENÇÃO DE LESÃO POR PRESSÃO EM UMA UNIDADE DE TERAPIA INTENSIVA

## RESUMO

**Objetivo:** Avaliar o efeito da implementação de um projeto de melhoria da qualidade no processo de prevenção de lesão por pressão numa Unidade de Terapia Intensiva adulto.

**Método:** Projeto de melhoria da qualidade do processo de prevenção de lesão por pressão, realizado em uma Unidade de Terapia Intensiva adulto, de um hospital público, no período de novembro/2022 a julho/2023. Foi desenvolvido seguindo as etapas de um ciclo de melhoria. O nível de qualidade da prevenção de lesão por pressão foi medido antes e depois das intervenções, utilizando seis critérios de qualidade. A coleta de dados da primeira avaliação foi realizada em março/2023, de forma retrospectiva, referente aos meses de novembro e dezembro/2022 e janeiro/2023. A reavaliação de qualidade ocorreu em julho de 2023, também de forma retrospectiva, referente aos meses de abril, maio e junho/2023. As intervenções incluíram mudanças nos registros relacionados à assistência na prevenção de LP e educação/sensibilização da equipe sobre prevenção de lesão por pressão.

**Resultados:** A avaliação inicial da qualidade mostrou que o nível de conformidade de prevenção de lesão por pressão era baixo, com praticamente todos os critérios apresentando taxas inferiores a 50%. Após as intervenções, houve aumento na conformidade de quase todos os critérios.

**Conclusão:** A utilização de um projeto de melhoria de qualidade possibilitou a melhora do processo de prevenção de lesão por pressão e contribuiu com a comunidade científica, ao corroborar a eficácia destes projetos na implementação de programas de prevenção lesão por pressão, bem como incitou a reflexão acerca da multifatorialidade envolvida neste processo preventivo.

**DESCRITORES:** Lesão por pressão. Melhoria de qualidade. Segurança do paciente. Unidades de Terapia Intensiva.

# MEJORA DE LA CALIDAD DE LA PREVENCIÓN DE LESIONES POR PRESIÓN EN UNA UNIDAD DE CUIDADOS INTENSIVOS

## RESUMEN

**Objetivo:** evaluar el efecto de la implementación de un proyecto de mejora de la calidad en el proceso de prevención de lesiones por presión en una Unidad de Cuidados Intensivos para adultos.

**Método:** se llevó a cabo un proyecto de mejora de la calidad del proceso de prevención de lesiones por presión en una Unidad de Cuidados Intensivos para adultos de un hospital público, entre noviembre de 2022 y julio de 2023. Este proyecto se desarrolló siguiendo las etapas de un ciclo de mejora. El nivel de calidad en la prevención de lesiones por presión se midió antes y después de las intervenciones, utilizando seis criterios de calidad. La recopilación de datos para la primera evaluación se realizó en marzo de 2023, retrospectivamente, para los meses de noviembre y diciembre de 2022 y enero de 2023. La reevaluación de la calidad se llevó a cabo en julio de 2023, también retrospectivamente, para los meses de abril, mayo y junio de 2023. Las intervenciones incluyeron cambios en los registros relacionados con la asistencia en la prevención de lesiones por presión y la educación/concientización del equipo sobre la prevención de lesiones por presión.

**Resultados:** la evaluación inicial de la calidad mostró que el nivel de conformidad en la prevención de lesiones por presión era bajo, con casi todos los criterios presentando tasas inferiores al 50%. Después de las intervenciones, hubo un aumento en la conformidad en casi todos los criterios.

**Conclusión:** el uso de un proyecto de mejora de la calidad permitió mejorar el proceso de prevención de lesiones por presión y contribuyó con la comunidad científica, al corroborar la eficacia de estos proyectos en la implementación de programas de prevención de lesiones por presión, así como para promover la reflexión sobre los múltiples factores involucrados en este proceso preventivo.

**DESCRITORES:** Lesión por presión. Mejora de la calidad. Seguridad del paciente. Unidades de Cuidados Intensivos.

## INTRODUCTION

Pressure injury (PI) is localized damage to the skin or underlying tissue, often over a bony prominence, resulting from intense or prolonged pressure exerted by external forces such as body weight or medical devices, in addition to factors like shear, friction, and microclimate<sup>1-2</sup>. Although pressure is the primary cause, various factors such as age, malnutrition, and sensory alterations increase the risk of developing these injuries<sup>2</sup>.

Pressure injury is a common adverse event in healthcare settings, with a significant incidence rate in hospitalized patients, especially those in Intensive Care Units (ICUs) due to additional risk factors<sup>3-5</sup>. One study found that incidence rates were 10 times higher in ICU patients than in other care settings<sup>6</sup>.

In Brazil, PI is the second most reported adverse event, with approximately 60,000 cases recorded in a report by the National Health Surveillance Agency<sup>7</sup>. In the United States, it is estimated that about 60,000 patients die annually due to PI, with annual treatment costs of approximately 11.6 billion dollars<sup>2</sup>.

These injuries have serious impacts, causing pain, emotional suffering, increased hospital costs, morbidity and mortality, and lengthened hospital stays<sup>2,8-10</sup>. Despite the negative impact, 95% of PIs are preventable with quality healthcare services and a focus on prevention<sup>8-9,11</sup>. Therefore, prevention is crucial from patient admission, extending throughout hospitalization, aiming to reduce PI occurrence, save resources, and save lives<sup>11-12</sup>.

Global concern about PI prevention has led to the production of guidelines by international organizations such as the European Pressure Ulcer Advisory Panel (EPUAP), National Pressure Injury Advisory Panel (NPIAP), and Pan Pacific Pressure Injury Alliance (PPPIA), which seek to standardize prevention and treatment care for PI. The most recent guideline, published in 2019, emphasizes the importance of preventive care such as PI risk assessment, skin assessment, preventive skin care, nutritional assessment and treatment, repositioning and early mobilization, use of support surfaces, heel care, medical device care, and recommendations for special populations<sup>2,13-15</sup>.

In Brazil, PI prevention was incorporated as a goal of the National Patient Safety Program in 2013, aiming to implement preventive measures in all healthcare facilities<sup>11</sup>. Despite guidelines for PI prevention existing for over three decades, their implementation in healthcare services is complex and requires multiple strategies, considering existing barriers and facilitating elements<sup>16</sup>. In this context, quality improvement projects, which use techniques adapted from industry, oriented towards a specific and practical goal, have been highlighted worldwide as a tool for implementing effective PI prevention programs<sup>14,17</sup>. Accordingly, this study aimed to assess the effect of implementing a quality improvement project on the process of PI prevention in an adult ICU.

## METHOD

This quality improvement project was defined as an intervention study aimed at positive change in a specific context<sup>17</sup>, with analyses before and after the intervention. It was conducted through the implementation of a quality improvement cycle in an adult ICU of a public hospital in the city of Currais Novos, Rio Grande do Norte, Brazil, from November 2022 to July 2023.

The study was described according to the guidelines of the Standards for Quality Improvement Reporting Excellence 2.0, which apply to reports of studies seeking to improve the quality, safety, and value of healthcare and establish the association between observed outcomes and interventions<sup>18-19</sup>.

The study's stages were developed based on a quality improvement cycle model proposed by the Master's Degree in Quality Management in Health Services program at the Federal University of Rio Grande do Norte (UFRN). The model consists of six stages: Identification and prioritization of improvement opportunities; Analysis of problem causes; Development of quality criteria; Quality assessment; Planning and implementation of interventions for quality improvement; and Quality reassessment<sup>20</sup>.

To identify and prioritize improvement opportunities, the aim was to understand the problems present in the context studied that could be improved. For this purpose, a small improvement team was created, responsible for conducting the project, composed of the researcher and two clinical nurses from the adult ICU, one of whom was also the nursing coordinator of the sector. The team invited healthcare providers from the adult ICU and institution managers to a meeting and used brainstorming techniques to identify the most relevant problems in the sector. Next, the nominal group technique<sup>20</sup> was applied, in which each participant selected five of these relevant problems, prioritizing them, considering feasibility, costs, severity, and occurrence criteria. In this scenario, inadequate prevention of pressure injuries was identified as the most relevant improvement opportunity to be addressed, due to its frequent occurrence and the absence of systematization of preventive measures in the location studied.

The causes of the problems were analyzed with the adult ICU professionals using the Ishikawa Diagram<sup>20</sup>, which generated a list of causal factors, with the deficit of healthcare providers' knowledge, insufficient material resources, and poorly adjusted work processes being the most emphasized. Next, quality criteria were developed, which are metrics used to assess the chosen problem and its improvement after the intervention<sup>20</sup>. For this construction, the causes identified in the Ishikawa Diagram were considered, and guidelines from EPUAP, NPIAP, PPIAP<sup>2</sup>, the Registered Nurses Association of Ontario<sup>15</sup>, the PI prevention training program of the Agency for Healthcare Research and Quality (AHRQ)<sup>21</sup>, and information from scientific articles published in the Virtual Health Library (VHL) database were used as the foundations. In discussion with the improvement team, six valid, reliable, realistic, and measurable quality criteria were defined, one structural (criterion 1) and five procedural (criteria 2 to 6), namely: C1 – Healthcare providers must regularly participate in PI prevention training; C2 – Admitted patients must have their PI risk assessed within 24 hours of admission; C3 – Inpatient PI risk must be reassessed; C4 – Admitted patients must have their skin assessed within 24 hours of admission; C5 – Inpatients must have their skin reassessed; C6 – Patients with a Braden scale score below 15 must be repositioned in bed with a maximum time interval of 2 hours.

After developing the quality criteria, the first quality assessment of the PI prevention process in the ICU was conducted. This assessment was conducted in March 2023, retrospectively, referring to November and December 2022 and January 2023. The criteria were measured as dichotomous variables: compliance or non-compliance, with situations that were in accordance with the established criteria considered as compliance. The level of compliance with each criterion was estimated, using a 95% confidence interval, in the assessment.

For the verification of criterion 1, all healthcare providers (nurses, physicians, physiotherapists, and nursing technicians) assigned to the adult ICU in the studied months participated in the survey, after signing the consent form, totaling 66 participants. Providers on leave or vacation were excluded. This criterion was considered fulfilled when providers proved their participation in training activities in the studied months. Regarding the verification of criteria 2 to 6, 60 patient records admitted to the adult

ICU in the months studied, selected by simple random sampling, were analyzed. This quantity was chosen based on the recommendations of one of the studies analyzed, which stated that a sample of 50 to 60 cases is sufficient for quality improvement projects, provided they are selected randomly and with a high level of confidence<sup>20</sup>. For the verification of criterion 2, compliance was considered when the patient's record contained PI risk assessment, through the final Braden scale score or its classification. For the verification of criterion 3, compliance was considered when there were at least two records of risk assessments in the patient's record, one at admission and another on the 4<sup>th</sup> day of hospitalization or on the day of discharge (in cases where the hospitalization time was shorter than the recommended time for the second assessment). Concerning criterion 4, compliance was considered when there was a record of skin assessment within 24 hours of admission in the patient's record. For criterion 5, compliance was considered when there were at least two records of skin assessments in the patient's record, one at admission and another on the 4<sup>th</sup> day of hospitalization or on the day of discharge (in cases where the hospitalization time was shorter than the recommended time for the second assessment). Lastly, criterion 6 was considered fulfilled when there were records of bed repositioning, with maximum intervals of 2 hours, between 7 am and 7 pm, on the day following admission.

After the initial quality assessment, interventions were planned and executed to improve the evaluated criteria. In this phase, greater availability of time from the improvement team was required to carry out the interventions, necessitating a modification in the team. Two nurses from the Patient Safety Center (PSC) were included, who already had time set aside in their routine for conducting educational activities in the institution. The interventions were grouped into two strategic lines, which occurred almost simultaneously. The first line was the change in records related to PI prevention care (PI risk assessment, skin assessment, and bed repositioning), while the second line was healthcare provider education and awareness. Regarding the interventions in the first strategic line, a new form was developed, referred to by the team as a bedside placard, which consisted of an A4-sized laminated paper, attached to the outside of the patient's bed, containing daily information about the patient's PI risk and the repositioning performed, to facilitate the identification of patients at higher risk and implement appropriate preventive measures. On this form, the nurse was responsible for the daily recording of each patient's risk classification, in addition to indicating this risk with colors. For the classification, there was a blank circle that had to be filled in according to the risk. If the patient had no risk, the circle was left blank; with low risk, the circle should be painted blue; with very high, high, and moderate risk, it should be painted red. The multidisciplinary team was responsible for recording the repositioning of the patient.

Regarding the patient's repositioning in the bed, a specific location for this registration was also organized in the patient's medical record. However, aiming not to further increase the amount of paperwork that the team already used daily and to facilitate the acceptance of healthcare providers, the vital signs form already used in the department was utilized, and a specific space for recording bed repositioning was included. Regarding changes in the records, an update of the admission and daily progress forms of the patients, used by the nurse to record the Nursing Process, was carried out. These forms were already in checklist format and had items for recording the PI risk classification and skin assessment, however, they were incomplete. Therefore, necessary items were added for skin assessment (integrity, coloration, and moisture) and for detailing the six dimensions of the Braden Scale (sensory perception, moisture, activity, mobility, nutrition, and friction/shear).

The interventions of the second strategic line, education and sensitization of the healthcare providers, were based on studies by the EPUAP, NPIAP, and PPIAP<sup>2</sup>, and by the AHRQ<sup>21</sup>. It is important to emphasize that the institution studied did not have a protocol on the subject; however, during the development of this study, the institution's patient safety center (PSC) elaborated the PI prevention protocol, which was also used as one of the bases for the education actions of the ICU healthcare providers. In addition, the PSC started to measure monthly indicators related to PI, such as its incidence and prevalence in the hospital, which contributed to the sensitization of the professionals by presenting the local reality.

For this study, an educational program was developed, aimed at nurses, nursing technicians, physiotherapists, and physicians. In this program, activities were divided into two groups. Initially with educational activities exclusive to nurses. Virtual and face-to-face meetings were held on PI prevention care, with emphasis on skin assessment and PI risk assessment using the Braden scale. At this point, the new forms that would be used in the adult ICU were also presented. Seven meetings were necessary, two virtual and five face-to-face, to train most of the nurses. Of the 13 nurses in the department, only one did not participate. At the end of the training actions for the nurses, all new forms were made available to the department. Immediately afterward, educational activities for the entire multidisciplinary team began. There were four virtual meetings, addressing PI preventive measures and the impact of PI, and presenting institutional indicators on PI incidence and prevalence.

At the end of the interventions, a new quality assessment was carried out to verify the effect of these on the PI prevention process. The reassessment was done in July 2023, also retrospectively, referring to April, May, and June 2023, using the same parameters as the initial assessment, with 60 medical records and 59 healthcare providers evaluated. In addition to the level of compliance with each criterion, an estimate of improvement between reassessment and initial assessment was made, considering the absolute and relative improvements of each criterion. The data were tabulated in a Microsoft Excel spreadsheet and later analyzed through simple descriptive statistics. To prove the statistical significance of the improvement, a one-sided hypothesis test was applied by calculating the Z-value, considering the null hypothesis of no improvement, rejected when the  $p$ -value  $< .05$ .

The study followed the ethical procedures required by Resolution No. 466/12, having been submitted and approved by the Research Ethics Committee of UFRN, Onofre Lopes University Hospital.

## RESULTS

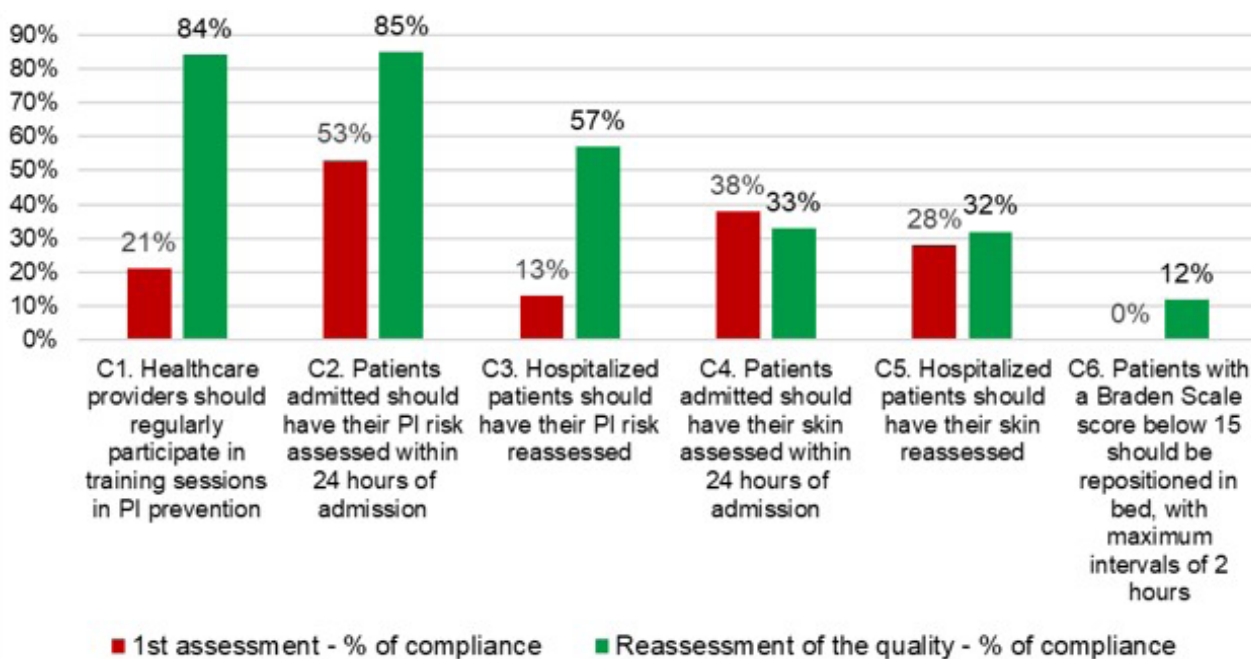
The first quality assessment identified that nearly all criteria analyzed had a low compliance rate, below 50%. Therefore, the interventions aimed to increase the compliance level of the analyzed criteria. Interventions related to changes in records, PI risk assessment, skin assessment, and bed repositioning were developed without major difficulties. The prototypes of the new documents were developed by the improvement team and presented to the nursing coordination of the ICU and some healthcare providers from this sector, so they could provide their contributions before arriving at the final models. The main challenge in this stage was the production of the bedside placards, which was funded by the improvement team since the institution lacked the financial resources for this type of action.



However, the interventions related to education and awareness-raising of the healthcare providers in the ICU faced difficulty in engaging multidisciplinary team members in the proposed activities. In the first virtual meeting with nurses, there was low participation, with only 20% of nurses attending. Therefore, aiming to increase the category's participation, it was decided to hold face-to-face meetings in the workplace sector, with the professionals on duty at that time. These face-to-face meetings followed the same methodology as the virtual meetings, with an addition: in some meetings, it was possible to practice risk and skin assessments on patients who were hospitalized at the time.

For meetings with the multidisciplinary team, even with the risk of repeating the situation of low nurse participation, the online format was chosen again due to a much larger number of professionals, as virtual meetings are a strategy that facilitates the attendance of a greater number of people. In the first meeting, participation was also low. Therefore, it was decided to change the way of inviting the team. Initially, the invitation was made through a WhatsApp group from the sector, which included all healthcare providers. Then, each professional was individually invited, either in person or through their personal WhatsApp, and asked to respond confirming their participation. As a result, there was an increase in participation.

After the interventions were completed, a quality reassessment was conducted to verify whether there was any improvement in this PI prevention process. Virtually all criteria showed improvement, as shown in Figure 1.



**Figure 1** – Comparison of the assessment of pressure injury prevention quality before and after the interventions. Currais Novos/RN, Brazil, 2023.

The absolute and relative improvement of each criterion and the statistical significance were also evaluated, as can be seen in Table 1.

**Table 1** – Estimates of improvement in pressure injury prevention quality after the interventions. Currais Novos/RN, Brazil, 2023.

Criteria	Absolute Improvement	Relative Improvement	p-value*
C1. Healthcare providers should regularly participate in training sessions on PI prevention.	63%	80%	<.001
C2. Admitted patients should have their PI risk assessed within 24 hours of admission.	32%	68%	<.001
C3. Inpatients should have their PI risk reassessed.	43%	50%	<.001
C4. Admitted patients should have their skin evaluated within 24 hours of admission.	-5%	-	<.001
C5. Inpatients should have their skin reassessed.	3%	5%	NS
C6. Patients with a Braden Scale score below 15 should be repositioned in bed, with a maximum interval of 2 hours.	12%	12%	<.05

Several contextual factors may have influenced the study's outcome. Negative aspects include the weak safety culture in the institution, the absence of institutional senior management involvement in the project, the lack of institutional processes or policies focused on PI prevention, financial resource scarcity, difficulties in engaging the multidisciplinary team in the project, and in forming and maintaining the improvement team.

As positive aspects, there was an improvement team with knowledge of the process chosen in the study, as well as the support and involvement of the ICU nursing coordination, the PSC, and the institution's Skin Working Group.

As an unexpected consequence, conducting this study motivated the PSC to develop actions focused on PI prevention, such as drafting the prevention protocol and instituting the monthly collection of indicators. Additionally, at the end of this study, the PSC started conducting daily monitoring and feedback with the multidisciplinary team regarding the indicators contained on the bedside placard (which was one of the interventions of this project).

## DISCUSSION

This study aimed to evaluate the effect of implementing a quality improvement project on the process of preventing PI in an adult ICU. Some aspects of the PI preventive process in the studied context were identified, and educational actions based on scientific evidence were carried out with healthcare providers to serve as a guide in clinical practice and reduce care variability. Institutional process changes, such as modifications in the assessment sheets for risk of injury and skin evaluation, were also implemented to facilitate and enhance the quality of these records.

Following the interventions, improvements in the compliance of most criteria were observed, except for the initial skin assessment, which showed a slight reduction. Skin reassessment had a slight increase but lacked statistical significance, indicating that it was not influenced by the interventions.



Initially, the study evaluated the participation of healthcare providers in PI prevention training activities, finding that only 21% of the professionals had been trained. After the interventions, this percentage increased to 84%, indicating a crucial improvement in healthcare provider education, considered one of the pillars of the preventive process<sup>2</sup>. Knowledge level assessment is also considered an essential aspect of healthcare provider education<sup>2,15</sup>. A multicenter study conducted in Belgium with 474 nursing care providers identified the need to incorporate education on this topic into nursing curricula<sup>23</sup>. Additionally, other studies indicate a knowledge deficit on the topic and the need to invest in the training process and healthcare provider capacity building<sup>24,25</sup>.

Another aspect measured was the PI risk assessment, which is the initial step in the preventive process<sup>2</sup>. Initially, this study found a median compliance rate of 53%. With the intervention activities, compliance increased to 85%, a significant improvement nearing the 100% goal advocated by the EPUAP, NPIAP, and PPPIA<sup>2</sup>. Another study found a risk assessment rate of 89.9% within 24 hours after admission<sup>8</sup>, a value very close to that found in this study after the interventions.

In the PI risk reassessment, a very low percentage of only 13% was found in this study. This continuous risk assessment is as important as the initial assessment since it helps identify new or unresolved risk factors, and allows adjustment of the preventive strategies<sup>15</sup>. With the intervention activities, compliance increased to 57%. Despite representing a significant improvement, it is still a percentage far from the recommended. In the literature, a study with high compliance rates for PI risk reassessment, measured before and after an improvement project, found 79% compliance in the initial assessment and 97% in the reassessment<sup>26</sup>.

Another key component in the PI prevention process is the assessment of skin and soft tissues<sup>2</sup>. In this study, a low percentage was identified in the initial assessment, with 38% compliance. This was the only criterion that worsened after the interventions, dropping to 33%. The possible causes for this decline could not be identified. It is believed that it may have occurred by chance, unrelated to the research. In a Brazilian study, the rate of patients undergoing skin assessment within 2 hours of admission increased from 57% to 80% after improvement interventions<sup>5</sup>. In another study, also in Brazil, the percentage of skin assessment after admission increased from 42.6% to 51.0% after educational activities<sup>27</sup>.

In the reassessment of skin, a low compliance rate of 28% was also identified in the initial assessment of this study. After the interventions, there was a slight increase, reaching 32% compliance. Studies with higher rates are also found in the literature. An observational study conducted in the United States between 2018 and 2019 found adherence rates to daily skin assessment of 86% in patients without PI<sup>28</sup>. Another study, which implemented a best practice implementation project for PI prevention in a Brazilian hospital, found adherence of 29% before interventions and 50% after interventions<sup>5</sup>. The low compliance rates of skin assessment and reassessment deserve attention because the absence of skin assessment may contribute to patients with early signs of injury not being identified and not receiving the care necessary to prevent the progression of injuries, indicating low-quality care that may have legal implications.

Another aspect measured in this study was patient repositioning in bed, which is considered one of the pillars in the PI prevention process<sup>2</sup>. Studies recommend that all patients at risk of PI should be repositioned frequently, according to an individual assessment<sup>2</sup>. Although there is currently no consensus on the ideal frequency of patient repositioning in bed<sup>2</sup>, in this study, the percentage of bed repositioning every 2 hours was measured because this temporal pattern was already routinely used in the institution studied. In the initial quality assessment, a compliance rate of 0% was found for this repositioning criterion. This result was alarming. However, it should be emphasized that, in

addition to indicating low adherence, there also seems to be a problem with the records made by the healthcare providers. Several medical records analyzed in the study had no data recorded on preventive measures. Therefore, in the study interventions, in addition to offering knowledge, changes were also included in the registration forms and reminders for repositioning, aiming to facilitate this registration and improve the quality of care provided. However, after the interventions, there was only a slight increase in compliance, from 0% to 12%. Therefore, even after training the team and facilitating the registration instruments, no significant improvement was observed in this process. This may indicate that the causes of non-compliance may be more complex, requiring deeper changes at the system and organizational levels. Studies measuring the rate of patients repositioned every 2 hours are scarce. Only three studies were found measuring this criterion, and all highlighted deficiencies in this care: the first found that practices were not performed respecting the correct periods<sup>22</sup>, the second study obtained a compliance rate of 50%<sup>29</sup>, and in the third, the rate increased from 37% to 58% after interventions of an improvement project<sup>5</sup>.

Overall, the results of this research show similarities with other studies that highlight the importance of improvement projects for PI prevention. However, despite the positive results, no studies were identified that achieved 100% compliance with PI prevention measures. Accordingly, for preventive guidelines to lead to positive changes in clinical practice, it is also necessary to identify and overcome barriers in the system and institutional organization<sup>30-32</sup>. Some aspects that may contribute to the success of implementing these guidelines are institutional support, strong leadership, teamwork, and integration of clinical, educational, and management aspects<sup>11,15</sup>.

During this study, some barriers in the system and organization were identified, such as an incipient safety culture, the lack of prioritization of PI prevention in institutional policy, and limitations of human and material resources that could not be addressed in this study, as their improvements exceeded the researchers' resolution capacity.

The study has limitations, as the quality criteria measured did not cover some relevant aspects of PI prevention, such as nutritional assessment and specific care, due to the lack of these records in patient medical records. In addition, the generalization of results to other realities should be carried out with caution due to the multifactorial complexity of the PI prevention process.

## CONCLUSION

In this study, it was possible to improve the quality of the PI prevention process using a quality improvement project, despite contextual factors that interacted to hinder its implementation. However, the results indicate that there was still room for further improvement, especially in bed repositioning and skin assessment and reassessment, as well as the inclusion of other preventive aspects not addressed in this study. Therefore, monitoring of the process is necessary, with the implementation of new improvement cycles to expand and sustain its results.

The study also allowed healthcare providers and managers to access quality management tools used in improvement projects, which can be applied in various healthcare settings. Therefore, this study contributed to the scientific community by confirming the effectiveness of improvement projects for implementing PI prevention programs, and it prompted reflection on the multifactorial nature involved in this preventive process. Furthermore, the development of randomized controlled studies that incorporate new knowledge about strategies for PI prevention is suggested.

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## NOTES

### ORIGIN OF THE ARTICLE

Extracted from the dissertation – Melhoria da qualidade da prevenção de lesão por pressão em uma unidade de terapia intensiva, presented to the *Programa de Pós-Graduação em Gestão da Qualidade em Serviços de Saúde, Universidade Federal do Rio Grande do Norte*, in 2023.

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Discussion of results: Martins SLLA, Cabral MAL, Fernandes FCGM, Policarpo HSPA, Fonseca JF, Leal NTB, Dantas DV, Dantas RAN.

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### APPROVAL OF ETHICS COMMITTEE IN RESEARCH

Approved by the Ethics Committee in Research of the *Universidade Federal do Rio Grande do Norte, Hospital Universitário Onofre Lopes*, under authorization No. 5.924.150., Certificate of Presentation for Ethical Appreciation 65025422.5.0000.5292.

### CONFLICT OF INTEREST

There is no conflict of interest.

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