RBE Revista Baiana de Enfermagem
Original Article
DOI 10.18471/rbe.v39.65224

INDICATOR OF PRESSURE INJURY DUE TO SURGICAL POSITIONING IN THE PERIOPERATIVE PERIOD

INDICADOR DE LESÃO POR PRESSÃO DECORRENTE DO POSICIONAMENTO CIRÚRGICO NO PERÍODO PERIOPERATÓRIO

INDICADOR DE LESIÓN POR PRESIÓN DERIVADA DEL POSICIONAMIENTO QUIRÚRGICO EN EL PERÍODO PERIOPERATORIO

Cristiane Dias Espindola[1]
Luiza Carraco Palos[2]
Leticia Costa Rinaldi[3]
Renata Peixoto Correa[4]
Evelyn Scarpioni Kageyama[5]
Cristina Silva Sousa[6]

How yo cite this article: Espindola CD, Palos LC, Rinaldi LC, Correa RP, Kageyama ES, Sousa CS. Indicator of pressure injury due to surgical positioning in the perioperative period. Rev baiana enferm. 2025;39:e65224.

Objective: to analyze the indicator of pressure injury resulting from surgical positioning based on the records of adverse event notifications. Method: observational, descriptive and retrospective study using data from adverse event notifications between January and December 2022. The research was carried out in a large hospital, philanthropic, located in the city of São Paulo. Results: during the data collection period, 395 notifications of adverse events were recorded, corresponding to 17,941 surgical procedures performed. Among these notifications, 128 (2.16%) were associated with pressure injuries, resulting in an annual rate of 0.70%. Conclusion: the indicator of pressure injuries due to surgical positioning presented a relatively low number of occurrences, which may reflect the adoption of good positioning practices and effective implementation of the institutional protocol. This result also suggests a solid safety culture, evidenced by the systematic reporting of adverse events.

Descriptors: Pressure Ulcer. Patient Positioning. Perioperative Care. Perioperative Nursing. Health Status Indicators.

Objetivo: analisar o indicador de lesão por pressão decorrente do posicionamento cirúrgico com base nos registros de notificações de eventos adversos. Método: estudo observacional, descritivo e retrospectivo, utilizando dados de notificações de eventos adversos ocorridos entre janeiro e dezembro de 2022. A pesquisa foi realizada em um hospital

Corresponding author: Cristiane Dias Espindola, cris.d.espindola@gmail.com

[1] Hospital Sírio-Libanês. São Paulo, SP, Brazil. https://orcid.org/0009-0001-3789-2677.
[2] Hospital Sírio-Libanês. São Paulo, SP, Brazil. https://orcid.org/0009-0006-1062-760X.
[3] Hospital Sírio-Libanês. São Paulo, SP, Brazil. https://orcid.org/0000-0003-1205-8739.
[4] Hospital Sírio-Libanês. São Paulo, SP, Brazil. https://orcid.org/0009-0006-1397-4842.
[5] Hospital Sírio-Libanês. São Paulo, SP, Brazil. https://orcid.org/0009-0004-6505-5499.
[6] Hospital Sírio-Libanês. São Paulo, SP, Brazil. https://orcid.org/0000-0001-5135-7163.

de grande porte, filantrópico, localizado no município de São Paulo. Resultados: durante o período de coleta de dados, foram registradas 395 notificações de eventos adversos, correspondentes a 17.941 procedimentos cirúrgicos realizados. Dentre essas notificações, 128 (2,16%) estavam associadas a lesões por pressão, resultando em uma taxa anual de 0,70%. Conclusão: o indicador de lesões por pressão decorrentes do posicionamento cirúrgico apresentou um número relativamente baixo de ocorrências, o que pode refletir a adoção de boas práticas de posicionamento e a implementação eficaz do protocolo institucional. Esse resultado também sugere uma sólida cultura de segurança, evidenciada pela sistemática notificação dos eventos adversos.

Descritores: Úlcera por pressão. Posicionamento do paciente. Assistência perioperatória. Enfermagem perioperatória. Indicadores Básicos de Saúde.

Objetivo: analizar el indicador de lesión por presión derivada del posicionamiento quirúrgico en base a los registros de notificaciones de eventos adversos. Método: estudio observacional, descriptivo y retrospectivo, utilizando datos de notificaciones de eventos adversos ocurridos entre enero y diciembre de 2022. La investigación fue realizada en un hospital de gran tamaño, filantrópico, localizado en el municipio de São Paulo. Resultados: durante el período de recolección de datos se registraron 395 notificaciones de eventos adversos, correspondientes a 17.941 procedimientos quirúrgicos realizados. De estas notificaciones, 128 (2,16%) se asociaron a lesiones por presión, lo que resulta en una tasa anual del 0,70%. Conclusión: el indicador de lesiones por presión derivadas del posicionamiento quirúrgico presentó un número relativamente bajo de ocurrencias, lo que puede reflejar la adopción de buenas prácticas de posicionamiento y la implementación eficaz del protocolo institucional. Este resultado también sugiere una sólida cultura de seguridad, evidenciada por la notificación sistemática de los eventos adversos.

Descriptores: Úlcera por Presión. Posicionamiento del Paciente. Atención Perioperativa. Enfermería Perioperatoria. Indicadores de Salud.

Introduction

Patients undergoing surgery are at risk of injuries related to surgical positioning. These lesions may be caused by factors such as stretching or compression of tissues, leading to reduced blood flow and ischemia, shear friction or prolonged pressure, which can result in skin rupture[1].

Pressure injury (PI), as defined by the National Pressure Ulcer Advisory Panel (NPUAP) may occur in underlying soft tissue, most commonly in bone prominences, or be associated with medical devices, resulting in intense or prolonged pressure in combination with shear[2].

These lesions are classified according to their staging, namely: Stage 1 – Skin intact with erythema that does not whiten; Stage 2 – Loss of skin in its partial thickness with dermis exposure; Stage 3 – Loss of skin in its total thickness; Stage 4 – Loss of the skin in its total thickness and tissue loss; Non-classifiable pressure injury; Deep tissue pressure injury; Medical device-related pressure injury; Pressure injury in membranes and mucous membranes[2].

The incidence of perioperative pressure injuries varies significantly globally. In Brazil, incidence rates can range from 5.47% to 77%, depending on the population studied and the risk assessment method adopted[3-5]. In the safety context, pressure injuries are among the most frequently reported by nurses from safety centers[6]. The incidence and prevalence of these injuries are a reflection of the quality of care provided in health institutions, since most of them can be avoided through the implementation of appropriate preventive measures.

Among the best practices for the prevention of pressure injuries in surgical positioning, risk assessment, the use of appropriate support surfaces, adhesive dressings in areas susceptible to higher pressure and safe patient positioning stand out[7].

In 2022, the Munro[8] scale was implemented at the institution that is the object of this research. During this period, nurses received specific training on the application of the scale in different units, such as preoperative units, surgical center and post-anesthetic recovery, as well as units that refer patients to the surgical center[9]. A protocol was also established with guidelines on proper positioning and recommended support surfaces.

After this time, the measurement of the pressure injury indicator in the surgical center began.

The constant discussion about errors and failures in patient care aims to improve the quality of service provided by health institutions. According to the World Health Organization (WHO)[10] an adverse event is an incident that affects the patient, resulting in damage or injury and may present temporary or permanent disabilities, or even result in death.

The voluntary notification of these events is essential for risk and patient safety managers to implement actions based on institutional learning from errors and incidents, in order to ensure quality care[11]. In this context, adverse event reports are an essential tool to identify lesions and guide the implementation of improvements in care processes.

Although many institutions monitor the occurrence of lesions in the surgical center sector, few segregate these lesions by category, especially those directly related to surgical positioning. Therefore, this study aims to analyze the indicator of pressure injury due to surgical positioning, based on the records of adverse event notifications.

Method

This is an observational, descriptive and retrospective study with the objective of building an indicator of perioperative pressure injury related to surgical positioning. The research was conducted based on reports of adverse events reported between January and December 2022, supplemented with electronic medical records in a large philanthropic hospital located in the city of São Paulo. The institution has a surgical center composed of 25 operating rooms and 30 beds for anesthetic recovery, performing surgical procedures of low, medium and high complexity, with monthly average of 1,600 surgeries and annual assistance of approximately 20,000 surgical patients.

The data extracted from the electronic chart covered the following variables: surgical specialty, age group, sex, surgical time and risk score for pressure injury, measured by the Munro Scale, in order to identify possible associations with the occurrence of positioning injuries.

The study was approved by the Research Ethics Committee of the institution, under Opinion n. 7.294.756, in December 2024. The institution adopts as a consolidated practice the notification of any skin injury through an electronic system of adverse events, accessed via intranet. This practice is incorporated into the organizational culture, being carried out by health professionals regardless of the patient's unit of occurrence or admission.

The study sample consisted of all records of pressure injuries reported in the period in question. Complete notifications recorded in the electronic system of adverse events were included, and those with incomplete data were excluded. Data collection consisted of the export of notifications to Microsoft Excel® spreadsheet, followed by descriptive analysis and categorization of lesions, and subsequent reading of patients' medical records with positioning injury.

Each notification included registration number, date, attendance number, reporting unit, occurrence unit, professional category responsible for the notification, description of the event and classification of the injury. Initially, the records were evaluated by an information analyst for maintenance of the sector database. Subsequently, they were reviewed by a perioperative nurse, who performed the classification of the lesions in categories: mucosal lesions, adhesive lesions, injuries related to devices and equipment, skin tears, pre-injury, pressure injuries resulting from surgical positioning and injuries associated with positioning devices.

The lesions related to surgical positioning were classified based on the site of the lesion, correlating them to the pressure point generated by the position adopted during the procedure. The lesions associated with positioning devices are directly related to the support surfaces used to ensure proper immobilization of the patient during surgery.

For the calculation of the pressure injury indicator related to surgical positioning, the used formula was:

Pressure Injury Indicator = (Number of injuries by positioning) x 100 Total number of surgeries

The total number of monthly surgeries was obtained by consulting the institutional electronic system, allowing the quantitative analysis of the indicator over the period investigated.

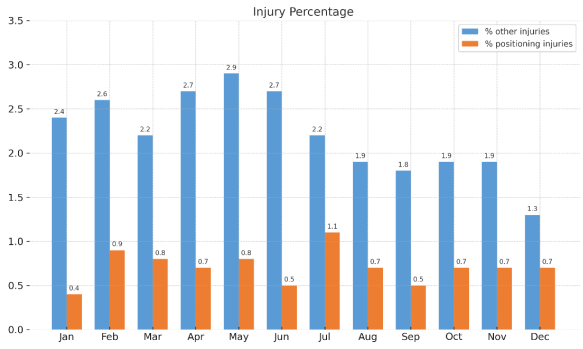
Results

In 2022, during the data collection period, 395 occurrences of adverse events were reported, totaling 414 lesions related to 17,941 surgical procedures performed. Among these, 128 lesions (2.16%) were classified as pressure injuries due to surgical positioning, representing an annual rate of 0.70%, as illustrated in Graph 1.

Among the 128 cases of injury associated with surgical positioning, there was a predominance of males, with 59% (n=75), while females represented 41% (n=53). The age distribution of affected patients included five pediatric individuals (under 18 years old), 65 adults up to 65 years old and 58 elderly people, 16 of whom were over 80 years old. The surgical specialty with the highest incidence of injuries was orthopedics and traumatology, with 44% (n=56) of cases, followed by neurosurgery with 27% (n=34) and plastic surgery with 9% (n=11).

In relation to the surgical time, the mean surgical time for patients with lesion was 415.2 minutes, with a median of 390 minutes. The standard deviation was 162.2 minutes, indicating a considerable variation in surgical times among patients. The surgical time ranged from a minimum of 115 minutes to a maximum of 925 minutes. The risk assessment for positioning-related injuries was recorded in 66% of cases, with a predominance of moderate to high risk classification by the Munro scale.

Graph 1 – Percentage of general injuries and positioning injuries. Sao Paulo, Sao Paulo, Brazil – 2022



Source: Created by the authors.

After the reclassification of the lesions in the notifications by the perioperative nurse, a margin of injuries that were documented by the surgical center sector was observed that are not characteristic of lesions developed in the sector, such as previous Dermatitis associated with incontinence, skin tears and refusal of the team to use skin protectors. Duplicate and incorrect records were identified, such as allergic responses, incorrect patient and reactive hyperemia (not considered a pressure injury).

Other lesions related to patches, devices, mucosa, technical failure, skin tears were reported in the notification system and resulted in 286 (2.20%) injuries. The injury indicator in the surgical center showed low percentages as

to literature. The lesions according to the new classification are presented in Table 1.

Table 1 – Classification of types of injuries recorded in adverse event reports. São Paulo, São Paulo, Brazil – 2022. (N=414)

Injuries	n	%
Adhesive	76	0.42
Incontinence-related dermatitis	1	0.01
Equipment device	1	0.01
Decoration device	1	0.01
Degerming device	1	0.01
Equipment device	25	0.14
Technical failure device	1	0.01
Instrumental device	6	0.03
Monitoring device	8	0.04
Positioning device	17	0.09
Device? (not sure of the cause)	2	0.01
Duplicated	14	0.08
Technical failure	11	0.06
Phlebitis	1	0.01
Incorrect (allergy)	3	0.02
Incorrect (not from this patient)	2	0.01
Mayfield	1	0.01
Mucous membrane	53	0.30
Not an injury	39	0.22
Unidentifiable	1	0.01
Positioning	128	0.71
Positioning? (not sure of the cause)	1	0.01
Previous	16	0.09
Team refusal	1	0.01
Skin tears	4	0.02
Total	414	2.31

Source: Created by the authors.

Adhesive injuries are made up of adhesive tapes used in the fixation of devices, adhesive dressings, scalpel plates and surgical fields. The decoration device refers to the patient with alliance and withdrawal attempts by the surgical team that caused injury.

Among the devices, the equipment is characterized by monitoring apparatus, pneumatic garrote, oxygen catheter and field equipment failure during intraoperative period. The devices related to instrumental are due to manipulations by the surgical team with causing laceration of the skin or mucosa. The ones described as monitoring come from the neurophysiology electrodes, and the positioning ones are from the surgical table positioners.

The technical failures refer to improper handling of devices, instruments and a withdrawal of acne by the anesthesiologist. Mucosal lesions are of lips and occurred during the intubation process.

The positioning lesions are characterized by pressure-related lesions that may be of skin, organs or mucosa, with greater incidence in facial region 50% (n=64.0), thoracic 25% (n=19.5), iliac 13.2% (n=17), calcaneus 9.3% (n=12), knees 5.4% (n=7), ocular 4.6% (n=6), sacral 3.9% (n=5), gluteus and trochanter 4.0% (n=3.13), dorsum of foot and hand 2.3% (n=3), occipital and elbow 1.5% (n=2) and dorsal, genital, lumbar, shoulder and ear 0.78% (n=1). The occurrence of injuries in relation to surgical positions were more

incident in prone position, followed by supine and lateral.

Discussion

The results of this study revealed a rate of 0.70% of pressure injuries related to surgical positioning, considered relatively low in comparison with data reported in the literature, which present rates ranging between 5,37% and 77%, depending on the methodologies used and institutional contexts analyzed[3-5]. This finding also contrasts with national studies that identified rates of 5.8% and 5.47%, respectively[4,12], but it is similar to a US study that, after the implementation of an intensive care bundle, achieved the reduction of the injury rate to 0%[13]

The discrepancies between the results can be attributed to multiple factors, including the characteristics of the studied population, the type of surgery, the duration of the procedures, as well as the adoption of structured preventive measures. The use of the Munro Scale for risk assessment, combined with continuous training of nursing staff, may have contributed significantly to the low incidence observed in this study.

The methodology adopted, based on retrospective analysis of adverse event notification records, allowed a detailed assessment of the cases of positioning injury. However, it should be noted that the reliability of these records may be affected by the adherence of professionals to the notification system and by the maturity of the institutional safety culture. During the data screening, notifications of lesions not directly associated with surgical positioning were identified, such as dermatitis, previous injuries and technical failures, which reinforces the importance of strict categorization to ensure the accuracy of the indicator.

Another relevant aspect is the association between surgical time and injury occurrence. The mean time of 415.2 minutes among patients with lesions indicates a possible correlation between the prolonged duration of surgery and the increased risk for developing pressure injuries, corroborating the literature that points to time under pressure as a significant risk factor[6]. The wide variation observed in surgical times (115 to 925 minutes) reinforces the need for special attention to this factor in prevention protocols.

The implementation of the Munro Scale in 2022 was decisive for the early identification of patients with high risk. The classification of moderate to high risk in 66% of cases shows the effectiveness of the tool in risk stratification. The integration of the scale with the institutional positioning protocol, which contemplates the appropriate choice of support surfaces and auxiliary devices, probably contributed to the good results observed.

Unlike other scales, the Munro scale offers a more comprehensive assessment, incorporating variables such as surgical time, type of anesthesia, comorbidities and surgical position. The success of its application, however, depends on the effectiveness of interventions at different moments of perioperative care, which includes regular training and strengthening the safety culture among professionals. Evidence suggests that surgical centers with strong investment in training and well-defined protocols have better outcomes related to injury prevention[3,8,14].

Despite prevention efforts, injuries associated with patches and medical devices still pose challenges. In the present study, 76 cases (0.42%) involved this type of injury, often linked to the fixation of surgical fields and electric scalpel plates. These lesions reinforce the need for continuous training for proper use of these devices, as well as strict monitoring of skin integrity during the surgical procedure.

Positioning-related injuries, which corresponded to 128 cases (2.16% of the total number of notifications), occurred predominantly in facial and thoracic regions, with a higher incidence in patients in prone position, followed by supine and lateral positions. This pattern is consistent with studies that indicate greater vulnerability of these regions due to prolonged pressure[15-16]. The correlation between type of positioning and lesion topography reinforces the

importance of using pressure relief devices and specific positioning techniques for each case.

Previous studies show that lesions located in the sacrum and calcaneus are more frequent in patients positioned in dorsal decubitus[3,16], which differs from the findings of this study, in which lesions predominated in the facial region, thoracic and iliac – probably influenced by the high frequency of surgeries in prone position, such as arthrodesis. In surgeries performed in a supine position, the greater incidence of injuries occurred in the calcaneus, as expected.

Concerning adhesive injuries, there was a lack of specific studies in the perioperative period. The literature on Medical Adhesive-Related Skin Injuries (MARSI) indicates that factors such as inadequate application and removal, fragile skin, excessive moisture, recurrent use of adhesives, and clinical comorbidities may increase the risk of injury[17]. These data show the need for more in-depth investigations in the surgical area.

Medical device injuries are also poorly explored in the surgical literature, with most studies focusing on critical patients in intensive care units[18]. Still, similar preventive measures such as frequent skin inspection, proper device placement and continuous risk assessment may be effective in the perioperative environment.

There was an increase in notifications from one year to the next, which can be attributed to the intensification of training for nurses and nursing technicians. This training reinforced knowledge about the institutional protocol, encouraged the reporting of adverse events and strengthened the safety culture, as pointed out in other studies[14,19].

Although the incidence of pressure injury is low in this study, its consequences for the patient are significant, including pain, risk of infection, delayed recovery and prolonged hospitalization, as well as increased care costs. This reinforces the importance of quality care throughout the surgical journey, with increased attention to the intraoperative moment.

Although the findings of this study are promising, it is essential that the institution maintains investments in professional training, updating protocols and incorporation of assistive technologies. The customization of preventive strategies, based on the characteristics of the patient and the procedure, can enhance results and contribute to the continuous reduction of lesions.

Among the limitations of the study, there is the retrospective collection of data and the dependence on reported records, which may be influenced by underreporting or filling failures. Such limitations make more robust comparisons with other studies difficult. The absence of data on postoperative follow-up also restricts the analysis of the effectiveness of long-term preventive measures.

The measurement of the pressure injury indicator resulting from surgical positioning is a relevant strategy to subsidize the improvement of preventive measures adopted in the perioperative context. This study highlights the relevance of accurate categorization of reported adverse events, contributing to strengthening the patient safety culture and qualification of clinical and managerial decision-making based on structured care data.

Conclusion

The study revealed low occurrence of pressure injuries due to surgical positioning, a result that reflects adherence to good prevention practices, application of institutional protocol and strengthening of safety culture among health professionals. The implementation of measures, such as the use of the Munro scale for risk assessment, specific training with the nursing team and standardization of care in perioperative phases, contributed significantly to the reduction of these adverse events.

Additionally, the systematic analysis of adverse event records allowed to identify critical risk factors and promote continuous improvement actions, highlighting the relevance of structured notification as a strategic tool for the qualification of assistance. These findings reinforce the importance of organizational initiatives aimed at the prevention and monitoring of injuries related

to surgical positioning, aiming to provide safer, more effective and patient-centered care in the perioperative context.

Collaborations:

1 – conception and planning of the project: Cristiane Dias Espindola, Luiza Carraco Palos, Leticia Costa Rinaldi, Renata Peixoto Correa and Evelyn Scarpioni Kageyama;

2 – analysis and interpretation of data: Cristina Silva Sousa;

3 – writing and/or critical review: Cristiane Dias Espindola, Luiza Carraco Palos and Evelyn Scarpioni Kageyama;

4 – approval of the final version: Cristina Silva Sousa.

Competing interests:

There are no competing interests.

Data Availability Statement

The data that support the findings of this study are available in the article itself.

References

1. Speth J. Guidelines in Practice: Positioning the Patient. AORN J. 2023;117(6):384-90. DOI: 10.1002/aorn.13929
2. European Pressure Ulcer Advisory Panel, National Pressure Injury Panel, Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline. The International Guideline [Internet]. Emily Haesler, editor. London: EPUAP/NPIAP/PPPIA; 2019 [cited 2023 Mar 10]. Available from: https://static1.squarespace.com/static/6479484083027f25a6246fcb/t/6553d3440e18d57a550c4e7e/1699992399539/CPG2019edition-digital-Nov2023version.pdf
3. Buso FDS, Ferreira MBG, Felix MMS, Galvão CM, Barichello E, Barbosa MH. Lesão por pressão decorrente do posicionamento cirúrgico e fatores associados. Acta Paul Enferm. 2021;34:eAPE00642. DOI: 10.37689/acta-ape/2021AO00642
4. Federico WA, Moraes CM, Carvalho R. Lesões por pressão decorrentes do posicionamento cirúrgico: ocorrência e fatores de risco. Rev SOBECC. 2024;29. DOI: https://doi.org/10.5327/Z1414-4425202429943
5. Peixoto CA, Ferreira MBG, Feliz MMS, Pires OS, Barichello E, Barbosa MH. Risk assessment for perioperative pressure injuries. Rev Lat-Am Enfermagem. 2019;27:e3117. DOI: 10.1590/1518-8345.2677-3117
6. Ribas MA, Almeida PHRF, Chaves GA, Lemos GS. Adverse events and technical complaints notified to a patient safety core. Rev Aten Saúde. 2019;17(62):71-80. DOI: DOI: https://doi.org/10.13037/ras.vol17n62.6184
7. Spruce L. Positioning the Patient. AORN J. 2021;114(1):75-84. DOI: 10.1002/aorn.13442
8. Sousa CS. Tradução, adaptação cultural e validação da Munro Scale para português do Brasil. REME. 2021;25:e1404. DOI: 10.5935/1415-2762-20210052
9. Sousa CS, Acuna AA. Implantação da escala Munro de avaliação de risco de lesão por pressão no perioperatório. Rev SOBECC. 2022;27:2227784. DOI:10.5327/Z1414-4425202227784
10. World Health Organization. World alliance for patient safety, taxonomy: the conceptual framework for the international classification for patient safety: final technical report [Internet]. Geneva (CH); 2009 [cited 2024 Jan 10]. Available from: https://www.who.int/publications/i/item/WHO-IER-PSP-2010.2
11. Siman AG, Cunha SGS, Brito MJM. The practice of reporting adverse events in a teaching hospital. Rev Esc Enferm USP. 2017;51:e03243. DOI: 10.1590/S1980-220X2016045503243
12. Savcı A, Karacabay K, Aydın E. Incidence and risk factors of operating room-acquired pressure injury: a cross-sectional study. Wound Manag Prev. 2024;70(2). DOI: 10.25270/wmp.23037
13. Acero L, Spitzer M. The Acero perioperative skin bundle: An Intuitive perioperative pressure injury prevention bundle. Perioper Care Oper Room Manag. 2024;37:100436. DOI: https://doi.org/10.1016/j.pcorm.2024.100436
14. Cebeci F, Çelik SŞ. Knowledge and practices of operating room nurses in the prevention of pressure injuries. J Tissue Viability. 2022;31(1):38-45. DOI: 10.1016/j.jtv.2021.07.007

15. Bezerra MBG, Galvão MCB, Vieira JCM, Lopes MGS, Cavalcanti ATA, Gomes ET. Fatores associados a lesão de pele decorrentes do período intraoperatório. Rev SOBECC. 2019;24(2):76-84. DOI: https://doi.org/10.5327/Z1414-4425201900020005

16. Engels D, Austin M, McNichol L, Fencl J, Gupta S, Kazi H. Pressure Ulcers: Factors Contributing to Their Development in the OR. AORN J. 2016;103(3):271-81. DOI: 10.1016/j.aorn.2016.01.008

17. Zhang Y, Wang S, Zhang X, Zhang W, Wang X. Incidence and Influencing Factors of Medical Adhesive-Related Skin Injury in Critically Ill Patients. Adv Skin Wound Care. 2020;33(5):260-6. DOI: 10.1097/01.asw.0000658584.09988.fa

18. Galetto SGS, Nascimento ERP, Herminda PMV, Busanello J, Malfussi LBH, Lazzari. Lesões por pressão relacionadas a dispositivos médicos em pacientes críticos: a prevalência e fatores associados. Rev Esc Enfermagem USP. 2021;55:e20200397. DOI: 10.1590/1980-220X-REEUSP-2020-0397

19. Nazário SS, Cruz EDA, Paes RG, Mantovani MF, Seiffert LS. Fatores facilitadores e dificultadores da notificação de eventos adversos: uma revisão integrativa. Acta paul enferm. 2021;34:eAPE001245. DOI: https://doi.og/10.37689/acta-ape/2021AR01245

Received: December 30, 2024

Approved: June 10, 2025

Published: August 19, 2025