





Application of a risk scale for injuries resulting from surgical positioning: an integrative review

Aplicação de escala de risco para lesões decorrentes do posicionamento cirúrgico: revisão integrativa

How to cite this article:

Souza CR, Mendes KDS, Moraes CM, Galvão CM. Application of a risk scale for injuries resulting from surgical positioning: an integrative review. Rev Rene. 2024;25:e93531. DOI: <https://doi.org/10.15253/2175-6783.20242593531>

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Conflict of interest: the authors have declared that there is no conflict of interest.

EDITOR IN CHIEF: Ana Fatima Carvalho Fernandes
ASSOCIATE EDITOR: Francisca Diana da Silva Negreiros

ABSTRACT

Objective: to analyze the evidence on applying the Risk Assessment Scale for the Development of Injuries Resulting from Surgical Positioning in the perioperative period. **Methods:** an integrative review was conducted by searching four health databases and gray literature. A reference manager was used to import the identified records and remove duplicate publications. The Rayyan web application was used to select primary studies. Data analysis and synthesis were carried out in descriptive form. **Results:** the sample consisted of 17 surveys. In 15, the authors applied the scale in health services to investigate the risk of developing injuries resulting from surgical positioning and the occurrence of injuries; for example, pressure injury. In one study, the scale was adopted to analyze the concurrent validity of the Munro scale and, in another, for the translation and validation of the scale in Turkey. **Conclusion:** the scale was applied mainly to assess the risk of injuries in different surgical environments. **Contributions to practice:** the evidence generated supports the use of the scale in health services and indicates the need to conduct more robust research. **Descriptors:** Pressure Ulcer; Patient Positioning; Perioperative Nursing; Risk Assessment; Review.

RESUMO

Objetivo: analisar as evidências sobre a aplicação da Escala de Avaliação de Risco para o Desenvolvimento de Lesões Decorrentes do Posicionamento Cirúrgico no perioperatório. **Métodos:** revisão integrativa com buscas em quatro bases de dados da saúde e na literatura cinzenta. Um gerenciador de referências foi empregado para importar os registros identificados e a remoção das publicações duplicadas. O aplicativo *web Rayyan* foi utilizado para a seleção dos estudos primários. A análise e a síntese dos dados foram realizadas na forma descritiva. **Resultados:** a amostra foi composta de 17 pesquisas. Em 15, os autores aplicaram a escala nos serviços de saúde para investigar o risco de desenvolvimento de lesões decorrentes do posicionamento cirúrgico e a ocorrência de lesões; por exemplo, a lesão por pressão. Em uma pesquisa, a escala foi adotada para a análise de validade concorrente da escala Munro e, em outra, para a tradução e validação da escala na Turquia. **Conclusão:** a escala foi aplicada, principalmente, para avaliação de risco para lesões em diferentes ambientes cirúrgicos. **Contribuições para a prática:** as evidências geradas oferecem subsídios para o uso da escala nos serviços de saúde, bem como indicam a necessidade de condução de pesquisas mais robustas. **Descritores:** Úlcera por Pressão; Posicionamento do Paciente; Enfermagem Perioperatória; Medição de Risco; Revisão.

Introduction

In the intraoperative period, the main objectives of surgical positioning are to provide adequate exposure to the surgical site; maintain patient privacy and comfort; allow for optimal airway ventilation and access to monitoring devices; promote blood circulation; and protect the integrity of nerves, skin, bones, joints, and vital organs⁽¹⁾.

Surgical positioning requires a collaborative effort from all members of the perioperative team (surgeons, anesthetists, and nursing staff) to maintain patient safety and prevent complications such as musculoskeletal pain, nerve injuries, and skin injuries like pressure injuries. The perioperative team must advocate for the patient during the procedure, as the patient is unable to respond to pain or discomfort due to the effects of sedation or general anesthesia. Any event related to positioning must be reported according to health service policies, with the goal of ensuring patient safety and applying evidence-based positioning principles⁽¹⁾. Therefore, constant monitoring of the patient is necessary, and using a tool to assess the risk of injuries resulting from positioning is a relevant professional practice, especially for the perioperative nurse.

In this context, the Risk Assessment Scale for the Development of Injuries Resulting from Surgical Positioning (ELPO) is a tool validated by Brazilian nurses, which can help prevent complications related to the procedure through effective interventions, such as using an adequate support surface. The scale has seven domains: type of surgical position, surgery time, type of anesthesia, support surface, limb position, comorbidities, and patient age. Each domain includes five subitems. The score ranges from 7 to 35 points, with a higher score indicating a greater risk of developing injuries resulting from positioning⁽²⁾.

In the national context, ELPO is the only valid and reliable scale for assessing the risk of injuries resulting from surgical positioning in adult and elderly patients. However, its application in clinical practice depends on further studies across different health

services. The first article on the construction and validation of the tool was published in 2016⁽²⁾.

Given the above, synthesizing knowledge about the application of the scale can provide evidence to support nurses' decision-making aimed at improving nursing care and surgical patient safety, as well as encourage the development of health technologies in Brazil. Therefore, the objective of this study was to analyze the evidence on applying the Risk Assessment Scale for the Development of Injuries Resulting from Surgical Positioning in the perioperative period.

Methods

This is an integrative review. The steps taken were elaboration of the review question; search in the literature of primary studies; evaluation of primary studies; data analysis; and presentation of the review⁽³⁻⁴⁾. The review protocol was registered on the open platform Open Science Framework (doi: <https://doi.org/10.17605/OSF.IO/UEJH3>).

The question created to conduct the review was: "What evidence is available in the literature on the application of the Risk Assessment Scale for the Development of Injuries Resulting from Surgical Positioning in the perioperative period?". It was formulated considering the acronym PICOT (population, intervention, comparison, outcome, and time), where P = surgical patient (≥ 18 years); I = application of ELPO; C = not applicable; O = risk of injuries resulting from surgical positioning and T = perioperative.

PubMed®, Cumulative Index of Nursing and Allied Health (CINAHL), Latin American and Caribbean Literature in Health Sciences (LILACS), and Scopus were the databases delimited for the search for primary studies. A manual search was also carried out in the SOBECC collection, which is published by the Brazilian Association of Surgical Center Nurses, Anesthetic Recovery and Material and Sterilization Center since the scientific society focuses on knowledge in the field of surgical nursing and related topics. The gray literature search was using Google Scholar.

The controlled descriptors were derived from

Medical Subject Headings (MeSH) in PubMed® and Scopus. In CINAHL, the specific vocabulary used is called CINAHL Headings, while in LILACS, it is referred to as Health Sciences Descriptors (DeCS). For the gray literature search, the acronym 'ELPO' was used.

To identify the largest possible number of publications, different combinations were adopted using controlled descriptors, keywords, and the Boolean operators AND and OR, and in Figure 1, the final strategies are presented.

Database	Search strategy
PubMed®	((("Pressure Ulcer"[Mesh] OR "Pressure Ulcer" OR "Pressure Ulcers" OR "Bedsore" OR "Bedsore" OR "Pressure Sore" OR "Pressure Sores" OR "Bed Sores" OR "Bed Sore" OR "Decubitus Ulcer" OR "Decubitus Ulcers" OR "Injury skin")) AND ((("Risk Assessment"[Mesh] OR "Risk Assessment" OR "Risk Assessments" OR "Risk Analysis" OR "Risk scale" OR "Risk Assessment Scale for the Development of Injuries due to Surgical Positioning" OR "ELPO" OR "Patient Positioning"[Mesh] OR "Patient Positioning" OR "Patient Positionings")))) AND (((("Perioperative Care"[Mesh] OR "Perioperative Care") OR ((("Perioperative Period"[Mesh] OR "Perioperative Period" OR "Perioperative Periods"))))
CINAHL	((("Pressure Ulcer" OR "Pressure Ulcers" OR "Bedsore" OR "Bedsore" OR "Pressure Sore" OR "Pressure Sores" OR "Bed Sores" OR "Bed Sore" OR "Decubitus Ulcer" OR "Decubitus Ulcers" OR "Injury skin") AND ("Risk Assessment" OR "Risk Assessments" OR "Risk Analysis" OR "Risk scale" OR "Risk Assessment Scale for the Development of Injuries due to Surgical Positioning" OR "ELPO" OR "Patient Positioning" OR "Patient Positionings")))) AND ((("Perioperative Care") OR ("Perioperative Period" OR "Perioperative Periods"))
SCOPUS	ALL(("Pressure Ulcer" OR "Pressure Ulcers" OR "Bedsore" OR "Bedsore" OR "Pressure Sore" OR "Pressure Sores" OR "Bed Sores" OR "Bed Sore" OR "Decubitus Ulcer" OR "Decubitus Ulcers" OR "Injury skin") AND ("Risk Assessment" OR "Risk Assessments" OR "Risk Analysis" OR "Risk scale" OR "Risk Assessment Scale for the Development of Injuries due to Surgical Positioning" OR "ELPO" OR "Patient Positioning" OR "Patient Positionings")) AND ((("Perioperative Care") OR ("Perioperative Period" OR "Perioperative Periods"))
LILACS	((("Pressure Injury" OR "Pressure Ulcer" OR "Pressure Ulcer" OR "Decubitus Scar" OR "Decubitus Ulcer" OR "Pressure Ulcer" OR "Pressure Ulcer" OR "Pressure Ulcers" OR "Skin Injury" OR "Pressure Injury") AND ("Risk Measurement" OR "Risk Assessment" OR "Riesgo Measurement" OR "Risk Analysis" OR "Risk Assessment" OR "Risk Scale" OR "Risk Scale for the Development of Injuries resulting from positioning" OR "ELPO" OR "Patient Positioning" OR "Patient Positioning" OR "Patient Positioning" OR "Patient Position"))))

Figure 1 – Final strategies for searching for primary studies in the selected databases. Ribeirão Preto, SP, Brazil, 2023

The eligibility criteria were studies whose authors investigated the application of ELPO in the perioperative period, published in three languages (English, Portuguese, or Spanish), from January 2016 to January 2024. The time frame is justified since the publication of the first article on the construction and validation of ELPO occurred in 2016. Traditional literature reviews (narratives) and secondary studies were excluded.

The EndNote online reference manager and the Rayyan web platform were used to remove duplications and select studies, respectively⁽⁴⁻⁵⁾. Two independent reviewers analyzed titles and abstracts in Phase 1 and full studies in Phase 2, with a third reviewer resolving conflicts in the selection of research. The pro-

cess was documented using the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) flowchart⁽⁶⁾.

The extraction of data from the research included in the integrative review was carried out through the construction of summary tables with different items (title, authors, year and name of the journal, objectives, type of study, brief characterization of the sample, and data collection, main results on the application of ELPO, level of evidence and conclusions). Determining the type of study considered the indications of the authors of the primary studies.

A hierarchy of evidence classification that considers the type of clinical question of the study was adopted. Thus, the strength of evidence can be clas-

sified into seven levels (level I, systematic review, or meta-analysis of randomized clinical trials) for clinical questions directed to intervention/treatment or diagnosis/diagnostic test. In the case of a clinical question of prognosis/prediction or etiology, the strength of evidence can be classified into five levels (level I, synthesis of cohort or case-control studies). For clinical significance issues, the strength of evidence can be classified into five levels (level I, meta-synthesis of qualitative studies)⁽⁷⁾. The analysis and synthesis of the results of the integrative review were carried out in descriptive form.

Results

From the delimited searches, 533 records were identified. After removing duplicates and applying the eligibility criteria, 279 records were selected for reading titles and abstracts, 264 of which were also excluded due to the defined eligibility criteria. Thus, 15 studies were selected for full reading. The search in SOBECC collection resulted in the inclusion of two studies. The review sample was composed of 17 primary studies. Figure 2 shows the flowchart of the selection process of research included in the integrative review.

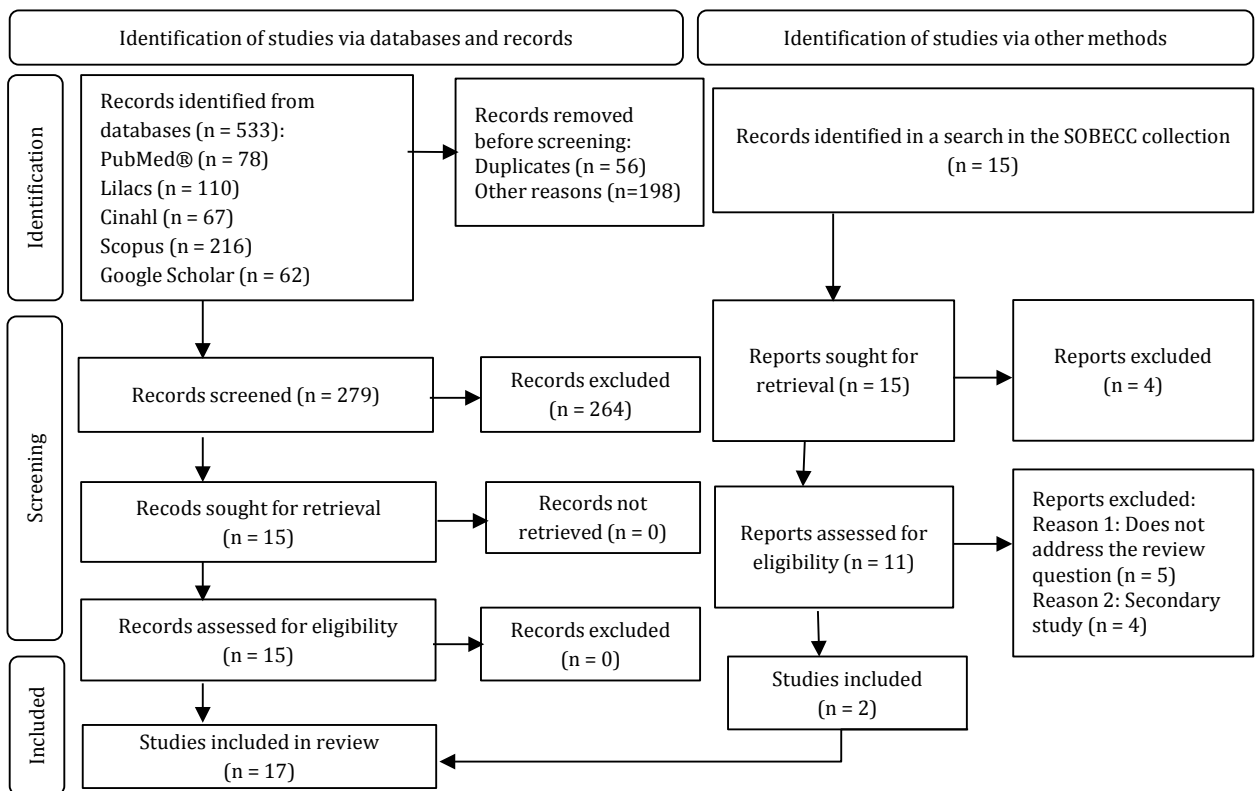


Figure 2 – Flowchart of the primary study selection process for inclusion in the integrative review. Ribeirão Preto, SP, Brazil, 2023

Figure 3 presents a summary of the selected primary studies with the identification of articles, study designs, sample sizes, and main results on the ELPO tool.

Authorship, country	Study design	Sample size	Main results
Trevilato et al Brazil ⁽⁶⁾	Cross-sectional	378	In the investigated sample, 19.05% of patients (n=72) were at higher risk of developing injuries resulting from surgical positioning. The average ELPO score was 16.31 points, indicating a lower risk of injury.
Bezerra et al Brazil ⁽⁹⁾	Cross-sectional	154	Of the 154 patients, 7 had 11 skin injuries (pressure injuries stages I, II, and abrasions), mainly in the gluteal region and chest. The results showed that participants with skin lesions had higher scores in the following ELPO domains: surgery time, type of anesthesia, and comorbidities (significant difference).
Eskildesen et al Brazil ⁽¹⁰⁾	Cross-sectional	50	The medical records of patients undergoing vascular surgery were analyzed. Among these patients, 26% had lower ELPO scores (19 points or below), while 74% had higher scores, above 20 points.
Oliveira et al Brazil ⁽¹¹⁾	Longitudinal	45	The average ELPO score was 16.9 points; 14 participants (31.1%) were classified as higher risk and 31 (68.9%) as lower risk. When comparing the two groups, there were significant associations between age (p=0.013), arterial hypertension (p=0.039), and the risk of developing injuries due to surgical positioning.
Peixoto et al Brazil ⁽¹²⁾	Observational	278	In the investigated sample, 157 patients (56.5%) had higher scores on the ELPO, with an average score of 20.09 points. Significant factors for the development of pressure injuries were female sex, advanced age, and high body mass index. In 77% of participants (n=214), pressure injuries occurred due to surgical positioning.
Nascimento; Rodrigues Brazil ⁽¹³⁾	Longitudinal	106	The majority of participants were at higher risk of injuries resulting from surgical positioning. In the sample, 87.8% of patients did not present skin lesions, and 92.5% did not report pain (assessed using the Numerical Scale). The results showed an association between the scale scores and positioning injuries, allowing for adequate risk prediction.
Buso et al Brazil ⁽¹⁴⁾	Observational	239	The occurrence of pressure injuries was 37.7% (n=90), with 90.0% of patients (n=81) presenting stage I injuries. The most frequent regions were the sacral and calcaneal areas. Adulthood and a higher risk according to the ELPO score were predictive factors for this type of injury.
Gonzaga et al Brazil ⁽¹⁵⁾	Cross-sectional	31	The majority of patients were male, young (18 to 39 years old), and of mixed race. All participants had a lower risk when applying the ELPO (≤ 19 points).
Lima et al Brazil ⁽¹⁶⁾	Observational	52	Of the patients, 34.6% (n=18) were classified by the ELPO as being at higher risk, and 65.4% (n=34) as lower risk. The occurrence of pressure injuries was 7.69%. Of the participants evaluated, 4 (8%) developed 1 pressure injury after surgery lasting more than 4 hours, undergoing general anesthesia, and the majority were in the supine position.
Sousa Brazil ⁽¹⁷⁾	Methodological	114	ELPO was used to analyze the concurrent validity of the Munro scale (adaptation and validation of the national version), with results showing significant differences in both the pre-test and validation phases.
Caetano; Mattia Brazil ⁽¹⁸⁾	Observational	89	In the multivariate analysis, age increased by 1.11 times and obesity by 13.77 times the chance of a higher risk of injuries due to surgical positioning. Regarding the main complications, at time 0 (transporting the patient from the surgical table to the stretcher), the proportions of pain (34.1%) and pressure injuries in the sacrococcygeal region (91.7%) were higher in participants with an ELPO score >19 points.
Luz et al Brazil ⁽¹⁹⁾	Cross-sectional	146	In the sample studied, 50.7% of participants were female. The average ELPO score was 17.6 points, and 75.3% of patients were classified as having a lower risk for developing injuries.
Santos et al., Brazil ⁽²⁰⁾	Cross-sectional	258	Of the patients investigated, 59.7% (n=154) were male, and 53.1% (n=137) underwent myocardial revascularization. All patients used the viscoelastic operating table mattress and cushions. The ELPO score classified 90.7% of participants (n=234) as lower risk for developing injuries.
Sengul et al., Türkiye ⁽²¹⁾	Methodological	184	In the study, ELPO was translated into Turkish and validated in Turkey. The Content Validity Index was 0.944. The average ELPO score was 18.45 points, and 35.9% of patients were at higher risk for developing injuries.
Nova et al Brazil ⁽²²⁾	Cross-sectional	138	The sample comprised elderly individuals (≥ 60 years old), the majority of whom were female. When evaluating the strength of the relationship between the variables (ELPO domains) and risk stratification (low or high) using the weight of evidence method, the variables "type of surgical position," "type of anesthesia," and "surgery time" showed a strong relationship with a high risk of injuries resulting from positioning.
Souza et al Brazil ⁽²³⁾	Cross-sectional	55	Of the sample investigated, 31 patients (56.4%) were female with a mean age of 45.5 years. When applying the ELPO, 33 participants (60%) were at higher risk of developing injuries resulting from positioning. Comparing the two groups (low or high risk), the results showed that the risk of developing injuries increases proportionally with age, body mass index, and surgery time.
Sé et al Brazil ⁽²⁴⁾	Observational	135	The majority of participants were male. The occurrence of pressure injuries was 0.74% (n=1). When applying the ELPO, 70 participants (51.8%) were classified as higher risk for developing injuries resulting from positioning. Being elderly (odds ratio of 9.47), and having systemic arterial hypertension (odds ratio of 3.07) and diabetes mellitus (odds ratio of 2.47) increased the probability of being at greater risk for developing injuries.

ELPO: Risk Assessment Scale for the Development of Injuries Resulting from Surgical Positioning

Figure 3 – Summary of primary studies included in the integrative review. Ribeirão Preto, SP, Brazil, 2023

Of the 17 studies included in the review, 94.1% were published in national journals, with the years 2019⁽⁹⁻¹²⁾, 2021⁽¹⁴⁻¹⁷⁾ and 2022⁽¹⁸⁻²¹⁾ having the largest quantity (four studies in each year). The research sample ranged from 31⁽¹⁵⁾ to 378 participants⁽⁸⁾.

In the national surveys included (n=15), the authors applied ELPO in health services. In eight primary studies, the authors assessed the patient's risk for developing injuries resulting from positioning^(8,10,15,18-20,22-23); in three studies, the occurrence of skin injuries and risk assessment^(9,11,13) and, in four studies, the occurrence of pressure injuries and risk assessment^(12,14,16,24). In one study, the scale was adopted to analyze the concurrent validity of the Munro scale⁽¹⁷⁾ and, in another, for the translation and validation of ELPO in Turkey⁽²¹⁾.

In clinical practice, when using ELPO, it is recommended to use the raw score (7 to 35 points). However, to optimize the work dynamics of health professionals, there is a suggested cutoff point for risk assessment. To delimit the cutoff point, the Receiver Operating Characteristic (ROC) curve was adopted. Therefore, given the results obtained, a score of 20 is indicated as the cutoff point. Patients classified with scores up to 19 points can be considered at lower risk for developing injuries, and those with scores of 20 or more can be classified as at higher risk. The scale must be applied when the patient is positioned on the operating table for surgery, with the item being the estimated surgery time. At the end of the surgery, this item must be reviewed and classified correctly⁽²⁾.

Considering the evidence hierarchy model adopted, 15 studies presented a clinical question of prognosis/prediction or etiology, all with a level of evidence IV (evidence from a single descriptive or qualitative study)^(8-16,18-20,22-24). In two studies^(17,21), the type of study was not classified in the model used. These results indicate the need to carry out research with designs that can produce strong evidence (for example: clinical trials) on the use of ELPO in conjunction with other interventions to prevent injuries resulting from surgical positioning.

Discussion

Surgical positioning is an important activity of the perioperative team. The nurse must collaborate with all members in developing a care plan to minimize the risk of injuries associated with the procedure. The use of a specific tool helps to identify risk and offers support for reducing complications, through the implementation of effective interventions⁽²⁵⁾. ELPO demonstrates international recognition as a validated scale for risk assessment in the perioperative setting⁽²⁶⁾.

Considering the set of results evidenced by the application of ELPO in the perioperative period, in the analysis of the seven domains of the scale (type of surgical position, surgery time, type of anesthesia, support surface, limb position, comorbidities, and patient age), in 11 studies included in the review, the supine position was the most frequent^(9-11,13-16,18-20,24). In a systematic review and meta-analysis, whose objective was to identify the occurrence of harmful incidents related to surgical positioning, 22 studies with different designs were included in the review (randomized clinical trial, prospective cohort study, and cross-sectional study, among others). The authors concluded that damage occurs due to positioning (peripheral nerve injury, musculoskeletal and vascular, ocular, and skin injuries), being the most common in the prone position. The consequences of the damage can be serious, causing pain and other symptoms, and may even lead to disability. They also highlighted that there is a need to develop well-designed research to investigate the occurrence of these incidents and how to reduce them in clinical practice⁽²⁷⁾.

In five primary studies, surgical time over 2 to 4 hours was the most frequent^(9,13-14,16,18). In eight studies, general anesthesia was the most frequent^(8,10,13-14,16,18,20,23). Surgical time and general anesthesia are predisposing factors for the occurrence of complications due to surgical positioning. Any procedure lasting more than 2 hours should be considered to pose a risk for the development of a pressure injury.

Anesthetic agents used in surgery can cause a drop in blood pressure and combined with intraoperative blood loss, cause peripheral hypoperfusion, affecting tissue metabolism and, consequently, contributing to the development of pressure injuries^(26,28).

In a cross-sectional study conducted in Turkey, the delimited objective was to evaluate the risk factors for pressure injuries in patients during surgery. The sample investigated included the participation of 250 patients, with a higher frequency of general surgery (18.4%). The results showed that factors associated with increased risk of this type of injury were male, age ≥ 60 years, obesity, chronic disease, low levels of hemoglobin and albumin, cardiovascular surgery, duration of surgery over 6 hours, moist skin, vasopressor medications and non-use of support surfaces⁽²⁹⁾. In another cross-sectional study, also conducted in Turkey, researchers investigated the risk and occurrence of pressure injuries in the operating room (24 hours after surgery). Of the 250 patients, 26.8% underwent neurosurgery. Chronic illness, general anesthesia, and orthopedic surgery were risk factors for the development of this type of injury⁽³⁰⁾.

The foam mattress (conventional) with cotton field cushions was the support surface used most frequently in nine primary studies included in the review^(8-12,14,16,19,24), and only in one study was there the use of a viscoelastic device⁽²⁰⁾.

In the literature, there is evidence that the standard operating table mattress contributes to the development of pressure injuries. Generally, this device is made with elastic foam and covered with black vinyl fabric. Although the most effective support surface has not been determined, several types of surfaces redistribute pressure. Thus, for use during surgery, there are support surfaces classified as high technology (for example device with an alternating pressure system) and low technology ones (for example: a viscoelastic polymer device). The choice of a type of surface or combination of devices must be evaluated by the perioperative team, and the use of a scale to assess risk for injuries can help in their choice^(26,28,31).

In three primary studies, vascular disease was the most common^(10,11,20). In seven surveys, the most frequent age group was between 40 and 59 years old^(8,10-12,14,20,24). Age > 60 years (changes in the structure of the skin and adjacent tissues resulting from the aging process) and vascular disease (impaired circulation and tissue perfusion) are considered intrinsic factors for the development of pressure injuries⁽³²⁾.

In ten primary studies, the average ELPO score was reported. Among these, seven studies^(8,11,13-14,18-19,24) indicated a lower risk for the development of injuries, while three studies^(9,12,23) indicated a higher risk. The lowest average score was 16.3 points⁽⁸⁾, and the highest was 21.7 points⁽⁹⁾. It is important to note that the authors of the included studies did not investigate the relationship between the average scale score and the development of injuries resulting from surgical positioning.

In six studies^(8,15-16,22-24), the authors applied ELPO in the operating room, after anesthetic induction and, in one study⁽¹¹⁾, before anesthetic induction. The intraoperative period (without specific indication of the moment) was indicated in five studies^(12-14,18-19) and, in three studies, data were collected from medical records^(9-10,20). Health services can contribute to improving surgical patient care through educational programs aimed at best practices in surgical positioning, the use of effective support surfaces, and the application of scales to assess injury risk⁽²⁵⁻²⁷⁾.

Study limitations

When conducting the integrative review, language restrictions can be considered as limitations. Bias may occur in the preparation of results due to the combination of data from different types of research.

Contributions to practice

The evidence generated provides support for the application of ELPO in health services. The ELPO is a validated scale for assessing the risk of injuries in

the perioperative setting. Regarding knowledge gaps, no studies were identified to evaluate the use of the scale in conjunction with other interventions to prevent injuries resulting from surgical positioning.

Conclusion

In this integrative review, it was found that the Risk Assessment Scale for the Development of Injuries Resulting from Surgical Positioning is being applied in health services, in the national context. Its application was mainly aimed at assessing the risk of injuries in different surgical environments. The evidence generated indicated the relevance of this technology for clinical practice.

It is also important to highlight the need to conduct well-designed studies, with a robust sample and in different surgical scenarios, in addition to developing research to evaluate the use of the Risk Assessment Scale for the Development of Injuries Resulting from Positioning Surgical in conjunction with other interventions to prevent injuries.

Acknowledgements

To the National Council for Scientific and Technological Development; to the Institutional Scientific Initiation Scholarship Program for the scholarship to Caroline Rodrigues de Souza (project code: 2022-1167); and for the level E Research Productivity grant to Cristina Maria Galvão (process: 304554/2022-7).

Authors' contributions

Conception and design or analysis and interpretation of data; Writing of the manuscript or critical review of relevant intellectual content; Final approval of the version to be published; Agreement to be responsible for all aspects of the manuscript relating to the accuracy or integrity of any part of the manuscript to be appropriately investigated and resolved: Souza CR, Mendes KDS, Moraes CM, Galvão CM.

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