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RISK OF INJURY DEVELOPMENT DUE TO SURGICAL POSITIONING: AN OBSERVATIONAL STUDY

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ABSTRACT

Objective: To classify the risk of developing injury due to surgical positioning. **Method:** Observational, longitudinal, prospective study with a quantitative approach carried out in a public hospital, with 135 patients undergoing elective surgery. Instruments containing sociodemographic, clinical, and surgical characteristics and a risk assessment scale for the development of injuries due to surgical positioning were used. Descriptive analysis, Fisher's exact test or χ^2 test and odds ratio association measure were used as appropriate. **Results:** Most participants were male (51.11%), adults (52.59%) and were classified as having a higher risk for developing injuries due to surgical positioning (51.85%). Elderly, hypertension, diabetes mellitus and urological surgeries were statistically significant ($p < 0.05$) for a higher risk of developing lesions. The incidence of pressure injuries was 0.74%, with observation only in the sacral region. **Conclusion:** There was a greater risk of developing lesions due to surgical positioning and low incidence of pressure injury. Perioperative nursing should incorporate validated risk measurement tools into care practice for safe, individualized and quality care for surgical patients.

DESCRIPTORS: Pressure ulcer. Patient positioning. Elective surgical procedures. Risk factors. Perioperative nursing. Enterostomal therapy.

RISCO DE DESENVOLVIMENTO DE LESÃO EM DECORRÊNCIA DE POSICIONAMENTO CIRÚRGICO: ESTUDO OBSERVACIONAL

RESUMO

Objetivo: Classificar o risco de desenvolvimento de lesão por posicionamento cirúrgico. **Método:** Estudo observacional, longitudinal, prospectivo, de abordagem quantitativa realizado em hospital público, com 135 pacientes submetidos à cirurgia eletiva. Utilizaram-se instrumentos contendo caracterização sociodemográfica, clínica e cirúrgica e escala de avaliação de risco para desenvolvimento de lesões decorrentes do posicionamento cirúrgico. Empregaram-se análise descritiva, teste exato de Fisher ou teste χ^2 e a medida de associação odds ratio, conforme apropriado. **Resultados:** A maioria dos participantes era do sexo masculino (51,11%), adulta (52,59%) e foi classificada como maior risco para o desenvolvimento de lesões por posicionamento cirúrgico (51,85%). Ser idoso, hipertensão, diabetes mellitus e cirurgias urológicas foram estatisticamente significativos ($p < 0,05$) para maior risco de desenvolvimento de lesões. A incidência de lesão por pressão foi de 0,74%, com observação

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apenas na região sacra. **Conclusão:** Verificou-se maior risco para desenvolvimento de lesão em decorrência do posicionamento cirúrgico e baixa incidência de lesão por pressão. A enfermagem perioperatória deve incorporar à prática assistencial ferramentas validadas de mensuração de risco para um cuidado seguro, individualizado e de qualidade aos pacientes cirúrgicos.

DESCRITORES: Lesão por pressão. Posicionamento do paciente. Procedimentos cirúrgicos eletivos. Fatores de risco. Enfermagem perioperatória. Estomaterapia.

RIESGO DE DESARROLLO DE LESIONES DEBIDO AL POSICIONAMIENTO QUIRÚRGICO: ESTUDIO OBSERVACIONAL

RESUMEN

Objetivo: Clasificar el riesgo de desarrollar lesión por posicionamiento quirúrgico. Método: Estudio observacional, longitudinal, prospectivo, con abordaje cuantitativo, realizado en un hospital público, con 135 pacientes sometidos a cirugía electiva. Se utilizaron instrumentos que contenían características sociodemográficas, clínicas y quirúrgicas y una Escala de Evaluación de Riesgo para el Desarrollo de Lesiones por Posicionamiento Quirúrgico. Se utilizó el análisis descriptivo, la prueba exacta de Fisher, o chi-cuadrado y la medida de asociación odds ratio, según corresponda. Resultados: La mayoría de los participantes eran hombres (51,11 %), adultos (52,59 %) y se clasificaron con mayor riesgo de desarrollar lesiones debido al posicionamiento quirúrgico (51,85 %). Ancianos, hipertensión, diabetes mellitus y cirugías urológicas fueron estadísticamente significativos (p 0,05) para mayor riesgo de desarrollar lesiones. La incidencia de lesiones por presión fue del 0,74%, observándose solo en la región sacra. Conclusión: Hubo un mayor riesgo de desarrollar lesiones debido al posicionamiento quirúrgico y una baja incidencia de lesión presión. La enfermería perioperatoria debe incorporar herramientas validadas de medición del riesgo en la práctica asistencial para una atención segura, individualizada y de calidad a los pacientes quirúrgicos.

DESCRIPTORES: Úlcera por presión. Posicionamiento del paciente. Procedimientos quirúrgicos electivos. Factores de riesgo. Enfermería perioperatoria. Estomaterapia.

INTRODUCTION

In 2021, 4,203,024 surgical procedures were performed through the Unified Health System (*Sistema Único de Saúde*) in Brazil[1]. Regardless of the categorization into small, medium or large, surgeries involve multiple steps, and safe surgical positioning of the patient is essential, sometimes underestimated[2,3].

Patient positioning should allow access to the surgical site, monitoring, ventilation, and medication administration. It is a multidisciplinary activity that requires knowledge of anatomy, physiology, pre-existing health conditions, technology, safety, possible risks and complications[2,4]. Among the complications, musculoskeletal pain, permanent loss of vision, nerve injuries and pressure injuries (PI) stand out.[3,5,6].

The development of lesions is related to intrinsic, extrinsic and specific intraoperative risk factors. The extrinsic factors are pressure, friction, shear, humidity and heat. Intrinsic factors are related to individual and clinical aspects of the patient, such as age, weight, nutritional status, comorbidities, physical status according to the scale of the American Society of Anesthesiologists (ASA), immobility, loss of sensitivity, reduced motor capacity, incontinence urinary or fecal infection, low hemoglobin levels, and surgical risk. Specific intraoperative factors include surgical position, anesthetic-surgical time, type of anesthesia, type of surgery, hypothermia and use of support surfaces[7-12].

Identifying the risk of developing injuries supports care planning, decision-making, review of practices, adoption of appropriate care and strengthening of patient safety culture[12,13]. The Risk Assessment Scale for the Development of Injuries Due to Surgical Positioning (ELPO), the Munro Scale and the Scott Triggers Tool stand out as validated and reliable

instruments for assessing the risk of perioperative injuries.12.The latter contains the patient's serum albumin value as a variable, a procedure not routinely performed in Brazil.

Concerning perioperative injuries due to surgical positioning, this study focuses on PI. It should be noted that PI is an indicator of the quality of care[14,15] associated with pain, increased length of stay, physical and emotional consequences, interference in social relationships and patients' quality of life, and the high institutional costs involved in the treatment[14,16].

Although studies indicate incidences of PI due to surgical positioning ranging from 37.7 to 77% in Brazil[6,12], with a more significant predominance of stage 1 lesions in the sacral and calcaneal regions, the research emphasizes the lack of knowledge about the prevention of PI by the perioperative nursing team[17].

In this context, this study is justified for the expansion of the theme, identification of risk factors and risk score for injuries resulting from surgical positioning, planning and implementation of preventive strategies for PI by the perioperative nursing team and institutional management. Thus, it aims to classify the risk of developing injury by surgical positioning.

METHOD

An observational, longitudinal, prospective study with a quantitative approach, guided by the Strengthening the Reporting of Observation Studies in Epidemiology (STROBE) tool, carried out in the operating room and the surgical inpatient unit of a medium-sized hospital in the city of Rio de Janeiro (RJ), in July and August 2022.

Patients of both genders, aged 18 years or older, who underwent elective surgery were included in the study. Patients undergoing dental surgery were excluded.

For the calculation of the sample, the following were considered: incidence of injuries resulting from surgical positioning of 50%, the precision of 5% and confidence interval of 95%[12], the average of monthly surgeries referring to the years 2019, 2020 and 2021 and the finite population of 190 surgeries, resulting in a total of 128 participants. The recruitment process was non-probabilistic.

For the recruitment of patients, the surgical map made available the day before the surgery, was consulted. With the identification of the patient and hospitalization unit, a research team member went to the respective bed to invite them to participate in the study, guide the research, and read and collect the signature of the Free and Informed Consent Form (FICF). Afterward, data regarding the sociodemographic and clinical characterization and the accuracy of the information confirmed in the medical record were collected. Weight and height variables were consulted on the daily map of the hospital nutrition sector. The body mass index (BMI) was calculated based on the parameters recommended by the World Health Organization (WHO): underweight (BMI < 18.5 kg/m^2), eutrophic (BMI ≥ 18.5 and < 25 kg/m^2), overweight (BMI ≥ 25 and < 30 kg/m^2) and obesity (BMI ≥ 30 kg/m^2). For older adults, the Lipschitz classification was considered: thinness (BMI < 22 kg/m^2), eutrophic (BMI 22-27 kg/m^2) and obesity (BMI > 27 kg/m^2).

Intraoperatively, data from the anesthetic-surgical procedure were collected. Physical status classification according to the ASA scale was extracted from the anesthetic chart.

The ELPO version 2 scale was applied immediately after the patient was anesthetized and positioned on the operating table and reapplied when there was a change in positioning, type of anesthesia and duration of surgery. The ELPO is a scale developed and validated in Brazil for assessing the risk of developing injuries due to surgical positioning. It has as variables surgical position, time, type of anesthesia, support surface, position of limbs, comorbidities and patient age. When delimiting the score of each item, the highest score corresponding to the answer should be considered. For example, for a diabetic and obese patient, only the obesity item with the highest score will be assigned a score[4].

The scores can range from 7 to 35 points with those factors added together. The higher the score, the greater the risk. The cutoff points determined by the scale's authors were used to stratify the risk of developing injury due to surgical positioning (score up to 19 points, lower risk; and score equal to or greater than 20 points, higher risk)[4].

Data collected on clinical variables were used to calculate the most prevalent comorbidities, predefined as cancer, diabetes, vascular disease, hypertension, neuropathy, venous thrombosis and other comorbidities.

In the postoperative period, to identify the development of PI, stomal therapist nurses evaluated the full extension of the patient's skin through inspection and palpation at three different times (24, 48 and 72 hours after the surgical procedure). For PI classification, the clinical guidelines recommended by the National Pressure Injury Advisory Panel (NPIAP) were adopted, with the following names: stages 1, 2, 3, 4, non-classifiable injuries, deep tissue and injuries related to medical devices.

The collected data were entered into the Microsoft Excel® program and analyzed using the Jamovi statistical software. Categorical variables were analyzed using absolute and relative frequency distributions, and quantitative variables, using measures of central tendency (mean and median) and variability (amplitudes and standard deviation). Data were organized into contingency tables and submitted to Fisher's exact test or Pearson's χ^2 test and the odds ratio measure of association, as appropriate, to verify the association of sociodemographic, clinical and anesthetic-surgical procedure variables with the risk score. The significance level considered was 5% ($\alpha = 0.05$).

This study was carried out following Resolution nº 466/2012 of the National Health Council, and the Research Ethics Committee approved the research project under opinion nº 5,492,043.

RESULTS

Some 136 patients who underwent elective surgical procedures met the criteria for inclusion in the study, with one being excluded at the time of data organization due to a need for more information in the data collection instrument. Thus, the final sample consisted of 135 participants. Of these, most were male, adults and self-declared brown, as shown in Table 1. Participants aged 60 years or older were classified as elderly.

Table 1. Sociodemographic characteristics of study participants (n = 135), Rio de Janeiro (RJ), Brasil, 2022.

Variables	n	(%)
Gender		
Male	69	51.11
Female	66	48.89
Age group		
Adults	71	52.59
Elderly	64	47.41
Color/Ethnicity		
Brown	75	55.56
White	44	32.59
Black	14	10.37
Yellow	2	1.48

Regarding weight, height and BMI, the averages were 76.36 kg, 1.66 m and 27.66 kg/m2, respectively, as shown in Table 2. Regarding the nutritional classification, of the 71 adult participants, there was a predominance of overweight (35; 49.30%), followed by obesity (20; 28.17%) and eutrophy (16; 22.54 %). Among the 64 elderly, most were eutrophic (30; 46.88%), followed by obese (27; 42.19%) and thin (7; 10.94%).

As for the specialties of elective surgeries, the following frequencies were observed: general surgery (51; 37.8%), urology (49; 36.3%), gynecology (20; 14.8%), proctology (8; 5, 9%), vascular surgery (4; 3%) and gastroenterology (3; 2.2%).

Table 2. Age, weight, height and body mass index (BMI) categorization of study participants (n = 135), Rio de Janeiro (RJ), Brasil, 2022.

Variables	Average	Medium	Standard deviation	Minimum	Maxim
Age	57.05	59	14.93	18	86
Weight	76.36	75	16.12	43	150
Height	1.66	1.65	0.10	1.48	1.90
BMI	27.66	26.73	5.77	15.79	64.08

The average length of stay of the patient in the operating room was 2 hours and 47 minutes (standard deviation – SD = 1h34min), a minimum of 45 minutes and a maximum of 9 hours and 28 minutes, with the average duration of the anesthetic-surgical procedure being 2 hours and 29 minutes (SD = 1h32min), a minimum of 34 minutes and a maximum of 9 hours and 28 minutes.

Most patients were classified according to physical status in ASA II (121; 89.63%), underwent general and regional anesthesia (62; 45.93%), with supine positioning (99; 73.33%), in the surgical table with conventional mattress and cushions made of cotton fields (90; 66.67%) and opening of upper limbs smaller than 90° (96; 71.11%), as highlighted in Table 3.

Table 3. Distribution of study participants (n = 135) according to the variables of the Risk Assessment Scale for the Development of Injuries Due to Surgical Positioning, Rio de Janeiro (RJ), Brazil, 2022*.

Variables	n	(%)
Position		
Supine	99	73,33
Lithotomy	32	23,70
Side	3	2,22
Prone	1	0,74
Time (hours)		
Up to 1	39	28,89
Above 1 up to 2	51	37,78
Above 2 up to 4	39	28,89
Above 4 up to 6	4	2,96
Above 6	2	1,48
Anesthesia type		
General and regional	62	45,93
General	51	37,78
Regional	20	14,81
Sedation	2	1,48
Supporting surface		
Foam mattress + cotton field cushions	90	66,67
Foam mattress + viscoelastic cushions	22	16,30
Foam mattress + foam cushions	20	14,81
No use of support surface or rigid supports.No padding, or narrow leggings	3	2,22

continue...

Table 3. Continuation...

Variables	n	(%)
Position of members		
Opening of the upper limbs < 90°	96	71.11
Elevation of the knees > 90° and opening of the lower limbs > 90° or opening of the upper limbs > 90°	31	22.96
Elevation of the knees > 90° or opening of the lower limbs > 90°	4	2.96
Anatomical position	3	2.22
Elevation of the knees < 90° and opening of the lower limbs < 90° or neck without mento-sternal alignment	1	0.74
Comorbidities		
Obesity or undernutrition	53	39.26
No comorbidities	37	27.41
Vascular disease	31	22.96
Diabetes	12	8.89
Pressure ulcer or previously diagnosed neuropathy or deep vein thrombosis	2	1.48
Patient age (years)		
Between 18 and 39	18	13.33
Between 40 and 59	55	40.74
Between 60 and 69	34	25.19
Between 70 and 79	24	17.78
> 80	4	2.96

*Systemic arterial hypertension was computed as a vascular disease; the options Trendelenburg position, local anesthesia and support surface viscoelastic mattress + viscoelastic cushions were omitted because they were not observed.

Regarding comorbidities, the most prevalent were hypertension (71; 52.60%), cancer (28; 20.70%) and diabetes (26; 19.30%). As for the risk of developing injuries resulting from surgical positioning, through the ELPO, the participants were classified as higher (70; 51.85%) and lower risk (65; 48.15%). An average score of 19.87 points (SD = 3.20) was obtained, with a minimum of 14 and a maximum of 30.

The analysis of age groups identified higher risk scores in the elderly compared to adults (Fig. 1).

The fact of being elderly increased by 9.47 times the probability of being classified as a higher risk for the development of injury resulting from surgical positioning, as well as patients with systemic arterial hypertension (SAH) and diabetes mellitus (DM), with an increase of 3.07 and 2.47 times more likely to be classified as at higher risk for injury, respectively, according to Table 4.

Of the 135 participants, 39 (28.89%) remained hospitalized after the surgical procedure for more than 72 hours. Regarding the length of stay of the others, 16 (11.85%) were discharged within 24 hours after the surgery, 55 (40.74%) between 24 and 48 hours and 25 (18.52%) length of stay over 48 hours and less than 72 hours. Notably, of the participants classified as higher risk (ELPO), 49 (70%) were discharged before 72 hours.

The development of PI due to surgical positioning was observed in only one participant (0.74%), adult, brown, eutrophic, ASA III, classified as lower risk (ELPO), submitted to general and regional anesthesia to perform resection of the neoplasm in the kidney. The lesion was observed on the third postoperative day, in the sacral region, in stage 1.

Table 4. A risk score of the Risk Assessment Scale for the Development of Injuries Due to Surgical Positioning (ELPO) and clinical, sociodemographic and surgical specialty variables, Rio de Janeiro (RJ), Brasil, 2022.

Variables		ELPO risk score				p-value	*Odds ratio*
		Higher risk		Lower risk			
		n	(%)	n	(%)		
Gender							
Female	Observed	36	54.55	30	45.45	0.540#	1.24
	Expected	34.2	...	31.8	...		
Male	Observed	34	49.28	35	50.72		
	Expected	35.8	...	33.2	...		
Age group							
Elderly	Observed	50	78.13	14	21.88	□ 0.001#*	9.47
	Expected	33.2	...	30.8	...		
Adult	Observed	20	28.17	51	71.83		
	Expected	36.8	...	34.2	...		
Color							
White	Observed	26	59.09	18	40.91	0.038@*	None$
	Expected	22.81	...	21.19	...		
Yellow	Observed	2	100	0	0		
	Expected	1.04	...	0.96	...		
Brown	Observed	39	52.00	36	48.00		
	Expected	38.89	...	36.11	...		
Black	Observed	3	21.43	11	78.57		
	Expected	7.26	...	6.74	...		
BMI							
Altered	Observed	48	53.93	41	46.07	0.501#	1.28
	Expected	46.1	...	42.9	...		
Eutrophy	Observed	22	47.83	24	52.17		
	Expected	23.9	...	22.1	...		
Comorbidities							
Hypertension	Observed	46	64.79	25	35.21	0.002*#	3.07
	Expected	36.8	...	34.2	...		
No hypertension	Observed	24	37.50	40	62.50		
	Expected	33.2	...	30.8	...		
Diabetes	Observed	18	69.23	8	30.77	0.048*#	2.47
	Expected	13.5	...	12.5	...		
No diabetes	Observed	52	47.71	57	52.29		
	Expected	56.5	...	52.5	...		

continue...

Tabela 4. Continuation...

Variables		ELPO risk score				p-value	*Odds ratio*
		Higher risk		Lower risk			
		n	(%)	n	(%)		
Surgical specialty							
General surgery	Observed	22	43.14	29	56.86	0.041@*	Não há$
	Expected	26.44	...	24.56	...		
Gastroenterology	Observed	0	0	3	100.00		
	Expected	1.56	...	1.44	...		
Gynecology	Observed	8	40.00	12	60.00		
	Expected	10.37	...	9.63	...		
Proctology	Observed	5	62.50	3	37.50		
	Expected	4.15	...	3.85	...		
Urology	Observed	33	67.35	16	32.65		
	Expected	25.41	...	23.59	...		
Vascular	Observed	2	50.00	2	50.00		
	Expected	2.07	...	1.93	...		

*statistically significant result (p ≤ 0.05); ...: numerical data is not applicable; # χ^2test; @Fisher's exact test; $data not presented in the contingency table, which makes the calculation impossible; BMI: body mass index.

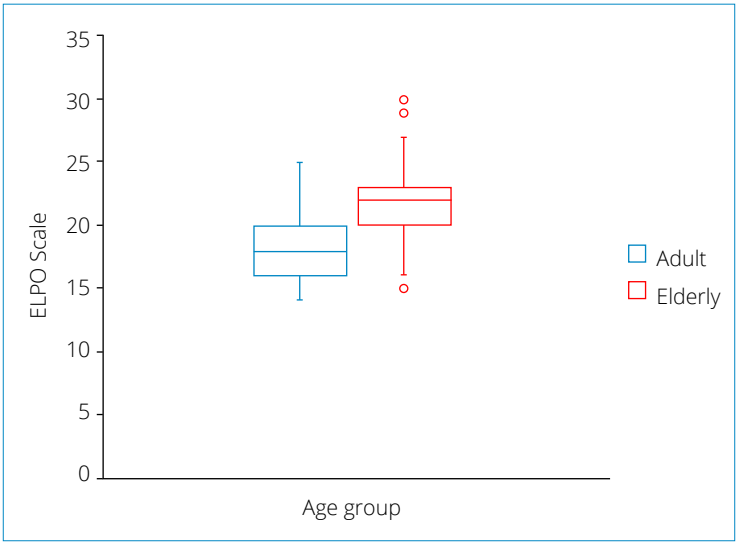

Figure 1. The risk score of the Risk Assessment Scale for the Development of Injuries Due to Surgical Positioning (ELPO) by age group, Rio de Janeiro (RJ), Brasil, 2022.

DISCUSSION

The results identified a more significant number of male, adult and brown participants, as a survey carried out with surgical patients in Ceará[13] and divergent from studies carried out in the States of Minas Gerais[12] and Bahia[18].

Concerning the risk of developing injuries resulting from surgical positioning, there was a prevalence of patients classified as higher risk, with higher scores in the elderly population, but age should not be considered an isolated risk

factor for the occurrence of injuries of the skin, with different results described in the literature regarding the ELPO risk score, prevalence of P I and age group[6,18].

Regarding body composition, both age groups showed alterations: mostly overweight and obese adults; and the elderly at the extremes of obesity and thinness. Low weight contributes to the accentuated exposure of bony prominences[8]; the increase in adipose mass can compress blood vessels, reduce tissue perfusion and favor the appearance of lesions[3]. In this study, patients with altered or eutrophic BMI did not present statistically significant differences in risk classification for developing lesions, contrary to findings in another Brazilian study[6]. An integrative review highlighted divergences between body composition and the occurrence of PI in adults and the elderly. Still, it emphasized that more body fat may be a protective factor for the elderly, and a reduction in body water may be associated with a greater risk of developing lesions[19].

Most patients were classified as ASA II, as well as other studies with elective surgical patients[6,7,12], but unlike patients who underwent cardiac surgery, classified as ASA III[18], according to the mild or severe systemic diseases presented at the time of the preoperative evaluation[20].

Still, on health status, the most prevalent comorbidities were SAH, cancer and DM. There was a statistically significant difference between the risk of developing a lesion resulting from surgical positioning and SAH and DM. These comorbidities increased the probability of being in the highest-risk group and, consequently, developing injuries. This finding corroborates an American research, which pointed out that the probability of developing PI in hypertensive patients increased 28 times compared to non-hypertensive patients.10, and meta-analysis indicated twice the probability of developing PI related to surgery in diabetic patients[21].

As it is a general hospital, the specialty of general surgery performs the largest number of surgical procedures. A statistically significant difference was found for a lower risk of developing a lesion in patients at the referred clinic and for a higher risk in urology patients. It is assumed that the findings are related to the lithotomy position, which is more used in urological procedures when compared to general surgery, with a higher prevalence of the supine position. Surgical positioning is a risk factor for developing injuries, each with specific pressure points.[17]

On the ELPO scale, lithotomy is the position with the highest risk score4, which may cause nerve damage (obturator, lateral femoral cutaneous, sciatic, peroneal and femoral), deep venous thrombosis and compartmental syndrome of the lower limbs[7]. In this study, the supine position was the most adopted, according to other studies, whose results ranged from 71.50 to 100%[6,18], and unlike another study that identified the Trendelenburg positioning as the most prevalent, in 43.2% of patients[12].

It is up to the multidisciplinary team involved in perioperative care to position the patient to allow access to the surgical site, in addition to comfort, privacy, physiological alignment, body stabilization, and support of extremities and joints, with minimization of pressure points[5].

Regarding anesthesia, general anesthesia combined with regional anesthesia was the most prevalent, exposing patients to the risk of developing PI due to immobility, blockage of pain sensitivity in pressure areas, increased pressure in places of bony prominence, occlusion of blood flow and tissue ischemia[5,8].

The most used support surface was a foam mattress and cotton cushions, mainly in the occipital region, in a circular shape, made manually with a bandage of crepe and cotton. This result differed from that described in a Brazilian study, with the use of a viscoelastic polymer mattress in 100% of the patients.[18]

The support surfaces are mattresses, overlays or pillows made of gel, viscoelastic polymer or foams, to redistribute body pressure and control shear and tissue friction[12,22,23].

Despite the consensus on the importance of using support surfaces in surgical patients to prevent complications such as PI and compartment syndrome, studies show disagreement regarding the effectiveness of certain materials in the distribution of interface pressure, characterized by compression of soft tissues at the interface between prominences bone and surgical surfaces, making clinical decision-making difficult for the selection of the most appropriate resource[22-24].

A recent systematic review found no statistically significant difference between the standard operating table mattress and low-technology support surfaces. Still, the opposite was observed compared to high- and low-technology support surfaces, with high technology being more effective[25].

It is noteworthy that the varied terminologies referring to supplies, lack of institutional protocols, political issues, deficit of economic resources and lack of knowledge of managers and professionals about the products can hinder the availability of support surfaces for surgical patients[12,23,24].

The opening of the upper limbs smaller than the 90º angle was the most adopted position of the limbs, widely used for non-invasive pressure monitoring and administration of fluids, medications and blood components. It should be ensured that the angle used in this study is maintained, minimizing the occurrence of nerve injuries. The cuff should be positioned at the height of the operating table to avoid straining the brachial plexus, and the patient's arms should be aligned with the palms facing upwards to decrease pressure on the ulnar nerve[5,17].

The average anesthetic-surgical time was 149 minutes, lower than that of the research carried out in Brazil, with an average time of 202 minutes6, and that of the survey in North America, with an average time of 365 minutes[9]. Anesthetic-surgical time is significant for the development of lesions due to the risk of tissue damage; for each additional hour of surgical time, the risk of developing PI increases by 48%[9].

It was identified, in only one participant, the occurrence of PI as a result of surgical positioning. The literature highlights that PI can be observed from the immediate postoperative period to five days after surgical positioning[6,7]. However, 71.11% of patients were discharged before 72 hours postoperatively, making it impossible to identify possible other injuries.

Failure to follow up with patients classified as being at greater risk for developing injuries due to surgical positioning implies underreporting of injuries, failure in early identification and adequate treatment. In an American outpatient surgical unit, patients with a higher risk of skin lesions are guided and followed up after hospital discharge. The possible body areas that suffered pressure during surgical positioning and post-anesthetic recovery are highlighted, and, in the presence of alterations related to skin color, appearance, consistency and temperature, pain and/or itching, contact with the health unit is indicated[7].

Finally, it is emphasized that the perioperative nursing team has an essential role in protecting the skin of patients[9] through preoperative assessment for risk classification of injuries related to surgical positioning, use of support surfaces for pressure redistribution, application of prophylactic dressings in areas subject to pressure, friction and shear, safe practices for surgical positioning and follow-up of the patient in the postoperative period to identify the lesion[5].

Limitations of the study include the impossibility of following up with all patients in the postoperative period for 72 hours due to hospital discharge to identify the development of PI through surgical positioning; and the association of the outcome with risk scores.

FINAL CONSIDERATIONS

The study identified the prevalence of male patients, adults, self-declared brown, with altered BMI and classified as ASA II. Regarding the risk of developing perioperative injury due to surgical positioning, the majority presented a higher risk. Age equal to or greater than 60 years, hypertension, DM and urological procedures were statistically significant risk factors for developing lesions. There was a low incidence of PI due to surgical positioning. As a result of hospital discharge, most patients could not be followed up within 72 hours of the postoperative period to identify possible injuries.

Identifying the risk of developing injuries due to surgical positioning is the first strategy for clinical decision-making and implementing preventive care for injuries related to the perioperative period, minimizing impacts on patients' health and quality of life, emotional distress, pain, length of stay and hospital expenses. The perioperative nursing team should incorporate validated risk measurement tools into care practice for individualized, safe and quality care.

AUTHORS' CONTRIBUTION

Substantive scientific and intellectual contributions to the study: Sé ACS, Oliveira EBS and Lima LLM; **Concept and design:** Sé ACS, Oliveira EBS and Lima LLM; **Collection, analysis and interpretation of data:** Sé ACS, Oliveira EBS, Lima LLM, Oliveira RCS, Trivino GS, Lobato IS, Medeiros FM and Gonçalves EF; **Article writing:** Sé ACS, Oliveira EBS, Lima LLM and Gonçalves EF; **Critical review:** Pestana LC, Gonçalves RCS and Freitas VL; **Final approval:** Sé ACS, Oliveira EBS and Lima LLM.

DATA AVAILABILITY STATEMENT

All data were generated or analyzed in the present study.

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