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PREVENTION OF PRESSURE INJURIES: ACTIONS PRESCRIBED BY INTENSIVE CARE UNIT NURSES[1]

Paula Knoch Mendonça[2], Marisa Dias Rolan Loureiro[3], Oleci Pereira Frota[4], Albert Schiaveto de Souza[5]

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[2] M.Sc. in Nursing, UFMS. Campo Grande, Mato Grosso do Sul, Brazil. E-mail: paulaknoch@hotmail.com
[3] Ph.D. in Health Sciences. Professor, PPGENF - Academic Master's Degree in Nursing, UFMS. Campo Grande, Mato Grosso do Sul, Brazil. E-mail: marisarolan@gmail.com
[4] Ph.D. in Health and Development in the Central-West Region. Professor, Nursing Course, of UFMS. Campo Grande, Mato Grosso do Sul, Brasil. E-mail: olecifrota@gmail.com
[5] Ph.D. in Sciences. Professor, *Programa de Pós-Graduação em Saúde e Desenvolvimento na Região Centro-Oeste*, UFMS. Campo Grande, Mato Grosso do Sul, Brasil. E-mail: albertss@hotmail.com

ABSTRACT

Objective: to describe the nursing actions prescribed by nurses for the prevention of pressure injuries and their occurrence in intensive care units.

Method: a cross-sectional, descriptive, analytical, quantitative study was conducted in two teaching hospitals in Campo Grande, Brazil. The collection occurred between March and June 2016, with 104 participants. The data were submitted to statistical analysis.

Results: a statistical association was found between the actions of change of decubitus, application of hydrocolloid dressings on the sacral region, performance of external hygiene, change of the orotracheal catheter and/or nasoenteral catheter fixation device and inspection of the skin without pressure injuries. The occurrence of pressure injuries was found in 49% of the clients in both institutions.

Conclusion: the elaboration and implementation of procedures and the monitoring of reports and of higher risk groups are strategies that direct the prescription of appropriate preventive actions for pressure injuries.

DESCRIPTORS: Nursing care. Patient safety. Pressure ulcer. Patient care planning. Nursing.

PREVENÇÃO DE LESÃO POR PRESSÃO: AÇÕES PRESCRITAS POR ENFERMEIROS DE CENTROS DE TERAPIA INTENSIVA

RESUMO

Objetivo: descrever as ações de enfermagem prescritas por enfermeiros para a prevenção de lesões por pressão e sua ocorrência em centros de terapia intensiva.

Método: estudo transversal, descritivo e analítico, de abordagem quantitativa conduzido em duas instituições hospitalares de ensino de Campo Grande, Brasil. A coleta ocorreu entre março e junho de 2016 com 104 participamtes. Os dados foram submetidos à análise estatística.

Resultados: foi encontrada associação estatística entre as ações de mudança de decúbito, aplicação de cobertura hidrocoloide em região sacral, realização de higiene externa, troca de fixação do cateter orotraqueal e/ou cateter nasoenteral e inspeção da pele com a ausência de lesões por pressão. A ocorrência de lesões por pressão foi encontrada em 49% dos clientes em ambas as instituições.

Conclusão: a elaboração e implementação de protocolos, o acompanhamento dos registros e dos grupos de maior risco são estratégias que direcionam a prescrição de ações preventivas adequadas para lesões por pressão.

DESCRITORES: Cuidados de enfermagem. Segurança do paciente. Úlcera por pressão. Planejamento de assistência ao paciente. Enfermagem.

PREVENCIÓN DE LESIÓN POR PRESIÓN: ACCIONES PRESCRITAS POR ENFERMEROS DE CENTROS DE TERAPIA INTENSIVA

RESUMEN

Objetivo: describir las acciones de enfermería prescritas por enfermeros para la prevención de lesiones por presión y su ocurrencia en centros de terapia intensiva.

Método: estudio transversal, descriptivo y analítico, de abordaje cuantitativo conducido en dos instituciones hospitalarias de enseñanza de Campo Grande, Brasil. La recolección ocurrió entre marzo y junio de 2016 com 104 participantes. Los datos se sometieron al análisis estadístico.

Resultados: se encontró asociación estadística entre las acciones de cambio de decúbito, aplicación de cobertura hidrocoloide en región sacral, realización de higiene externa, cambio de fijación del catéter orotraqueal y/o catéter nasoenteral e inspección de la piel con la ausencia de lesiones por presión. La presencia de lesiones por presión fue encontrada en el 49% de los clientes en ambas instituciones.

Conclusión: la elaboración e implementación de protocolos, el seguimiento de los registros y de los grupos de mayor riesgo son estrategias que orientan la prescripción de acciones preventivas adecuadas para lesiones por presión.

DESCRIPTORES: Cuidados de enfermería. Seguridad del paciente. Úlcera por presión. Planificación de atención al paciente. Enfermería.

INTRODUCTION

Tens of millions of clients worldwide annually suffer from disabling injuries and death as a result of unsafe healthcare practices. On average, these incidents affect one in ten clients. This estimate is higher in developing countries.[1] Pressure injuries (PIs), previously known as pressure ulcers, may present as whole or ruptured skin and can be painful or not. They are characterized by localized damage to the underlying skin and/or soft tissues, usually on a bony prominence or related to the use of a medical device or artifact. They can also be affected by factors such as the microclimate, nutrition, peripheral perfusion, comorbidities and by the condition of the skin.[2]

Brazil is part of the World Alliance for Patient Safety, proposed by the World Health Organization, the main purpose of which is to institute measures that increase the safety and quality of the health services. The prevention of PIs is the sixth goal of the International Patient Safety Goals, combined with the reduction of the risk of falls.[1] The Patient Safety Program prioritizes actions for identifying patient safety solutions and initiatives that can be disseminated in Brazilian hospitals.[3] Ordinance No. 529 and RDC Resolution No. 36, both published in 2013 by the Ministry of Health, explain the actions for client safety in health services and refer to the purpose of improving health care through the proposition and validation of procedures, guidelines and manuals, including a focus on PIs.[4-5]

A study carried out in a Brazilian hospital on the total expenses for treatment of PIs showed that they entail high costs for the health systems. Stage 2 PIs varied from R$67.69 to R$172.32; in stage 3 PIs the cost was between R$29.02 and R$96.38; those of stage 4 ranged from R$20.04 to R$225.34; and the costs of unclassifiable PIs varied from R$16.41 to R$260.18.[6]

Despite technological and scientific advances and improvements in healthcare, the incidence of PIs is high and ranges from 23.1% to 59.5%, mainly in Intensive Care Unit (ICU) clients.[7] In a cross-sectional study carried out in a university hospital, the prevalence of PIs was 40%, with higher rates in the ICU.[8] In a reference hospital for trauma, over a period of 31 days and with 75 clients, the prevalence of PIs was 33.3% in the ICU.[9]

The studies reveal the importance of the physical examination performed by nurses, which should include the careful evaluation of the skin and the classification of risk for PIs to prescribe preventive care for these injuries. The development and inclusion of the nursing diagnosis Risk for pressure ulcer, incorporated into the North American Nursing Diagnosis Association (NANDA) terminology, 2015-2017, also denotes their importance for nursing.[10]

It is assumed that the occurrence of PIs in an ICU is directly related to the preventive care to avoid the development of these injuries. In view of the above, in relation to the importance of the prevention of these injuries and the nurse's role in the process, the following guiding question was elaborated: Is there an association between the preventive actions prescribed by ICU nurses and the occurrence of PIs? Accordingly, the aim of this study was to describe the nursing actions prescribed by nurses for the prevention of PIs and their occurrence in the ICU.

METHOD

A cross-sectional, descriptive, analytical, quantitative study was conducted in two teaching hospitals in Campo Grande, Brazil, linked to the *Sistema Único de Saúde*, the Brazilian nation health system.

Data collection was carried out from March to June 2016, in the units selected for the study. All

clients aged 18 years or over that had been hospitalized in the ICU for at least 24 hours were eligible for inclusion in the study, irrespective of their risk of developing PIs. Pregnant women were excluded due to the physiological aspects and positioning in the bed, as were those from long-term institutions, due to the difficulty in obtaining information, and the polytraumatized, in order to maintain homogeneity of the sample between the institutions, since one of the hospitals is the state reference for the care of these clients.

The data collection instrument was developed by the researcher and submitted to the evaluation of three specialists of the PI area who considered the following criteria: clarity, pertinence, content and proposal of suggestions. All the suggestions proposed were included in the instrument. A pretest was applied with three clients of the Coronary Unit of one of the institutions included in the study, after signing the terms of consent form.

The sample consisted of 104 participants, 45 from Institution 1 and 59 from institution 2. The instrument used for data collection included the following sociodemographic variables and risk factors: sex, age group, Body Mass Index, body temperature, use of vasoactive drugs, skin conditions and use of invasive mechanical ventilation; risk assessment for PIs by means of the Braden scale score; occurrence and location of pressure injuries; and prescriptions of nurses for the prevention of these injuries. The form was applied once by the researcher, after completing the 24 hours of hospitalization in the ICU, for the evaluation of the clients and collection of the information from the medical record.

The Statistical Package for the Social Sciences (SPSS), version 23.0, was used to analyze the data, using Student's t-test, the chi-square test, Fisher's exact test and the Odds Ratio. The level of significance considered was 5%. The data analyzed were presented in descriptive statistics format and tables.

The study contemplated the ethical and legal principles, and obtained authorization No. 1.300.163/2015 and the Certificate of Presentation for Ethical Appreciation (CAAE) No. 50011615.6.0000.0021 from the Ethics Committee for Research with Human Subjects of *Univerdade Federal do Mato Grasso do Sul*. All study participants signed a terms of consent form.

RESULTS

The sociodemographic characteristics of the sample (n=104) are presented in Table 1. Participants aged ≥59 years (55%; 58/104) predominated, with a statistically significant association for the occurrence of PIs in this group (p=0.032). Furthermore, hyperthermia (p=0.029) and edema (p=0.012) were factors associated with the occurrence of PIs.

Table 1 - Relationship between sociodemographic characteristics and risk factors and the occurrence of pressure injuries in clients hospitalized in the Intensive Care Units of two teaching hospitals. Campo Grande, MS, Brazil 2016 (n=104)

Sociodemographic characteristics / Risk factors	Pressure Injury				p-value*	Total	
	Yes		No				
	n	%	n	%		n	%
Gender					1.000		
Female	24	47.1	27	52.9		48	46
Male	27	52.9	29	54.7		56	54
Age group					**0.032**		
Up to 59 years	17	33.3	29	54.7		46	44
Over 59 years	34	66.7	24	45.3		58	56
Body Mass Index classification (kg/m2)					0.594		
Underweight (<18.5)	1	4.2	1	4.8		2	4.4
Eutrophic (adults: 18.5-24.9 or older adults: 22-27)	15	62.5	15	71.4		30	67
Overweight (≥25 and <30)	6	25	5	23.8		11	24
Obese (≥30)	2	8.3	-	-		2	4.4
No information							59
Temperature					**0.029**		
Normothermia	23	45.1	36	67.9		59	57
Hyperthermia	28	54.9	17	32.1		45	43
Use of vasoactive drugs					0.246		

No	21	41.2	28	52.8		49	47
Yes	30	58.8	25	47.2		55	53
Skin conditions					**0.012**		
Without edema	18	35.3	32	60.4		50	48
With edema	33	64.7	21	39.6		54	52
Mechanical ventilation					0.610		
Yes	41	80.4	45	84.9		86	83
No	10	19.6	8	15.1		18	17

* Chi-square test or Fisher's exact test. *P*-value in bold indicates a significant association ($p<0.05$).

Table 2 presents the occurrence and location of PIs in the clients, with a presence in 49% (n=51) of the study population, considering both institutions. Regarding the location of the PIs, there was no statistical association between individuals from the different institutions (p-value between 0.235 and 1.000). Regarding the location of the PIs, the gluteal region was the most prevalent: 88.9% (n=40) in Institution 1 and 86.4% (n=51) in Institution 2. In the sacral region PIs were present in 29.8% (n=31) of the clients of the two Institutions.

Table 2 - Occurrences and location of pressure injuries in clients hospitalized in the Intensive Care Units of two teaching hospitals. Campo Grande, MS, Brazil, 2016 (n=104)

Occurrence/Location	Institution 1		Institution 2		*P*-value*	Odds Ratio (95% CI)
	n	%	n	%		
Occurrence of pressure injury					0.435	1.38 (0.64-3.02)
Yes	20	44.4	31	52.5		
No	25	55.6	28	47.5		
Calcaneus					1.000	1.08 (0.32-3.65)
Yes	5	11.1	7	11.9		
No	40	88.9	52	88.1		
Pinna					0.288	0.43 (0.10-1.90)
Yes	5	11.1	3	5.1		
No	40	88.9	56	94.9		
Gluteal					0.773	1.26 (0.38-4.13)
Yes	40	88.9	51	86.4		
No	5	11.1	8	13.6		
Malleolus					0.504	0.56 (0.47-0.66)
Yes	-	-	2	3.4		
No	45	100	57	96.6		
Trochanter					0.235	0.28 (0.05-1.52)
Yes	5	11.1	2	3.4		
No	40	88.9	57	96.6		
Sacral					0.666	1.31 (0.55-3.08)
Yes	12	26.7	19	32.2		
No	33	73.3	40	67.8		
Labial commissure					0.433	0.43 (0.34-0.53)
Yes	1	2.2	-	-		
No	44	97.8	59	100		
Dorsal					1.000	0.76 (0.47-2.47)
Yes	1	2.2	1	1.7		
No	44	97.8	58	98.3		
Tibial					0.433	0.43 (0.34-0.53)
Yes	1	2.2	-	-		
No	44	97.8	59	100		
Scapular					1.000	0.56 (0.48-0.67)
Yes	-	-	1	1.7		
No	45	100	58	98.3		

*Fisher's exact test

Regarding the PI risk prediction, Student's t-test was used to calculate the Braden Scale mean for each of the institutions, with Institution 1 presenting a mean of 10.98±0.41. The frequency of Institution 2 was 10.25±0.23, when the same statistical test was applied. The result of the predictive scale of risk for PIs showed this to be high risk for both institutions.

The nursing actions that were statistically associated with PI prevention were: change of decubitus, application of hydrocolloid dressings on the sacral region, performance of external hygiene, change of orotracheal catheter (OTC) and/or nasoenteral catheter (NEC) fixation device, skin inspection, maintaining the perineum clean and dry, rotation of oximeter sensor, observation of positioning and fixation of the OTC, and maintenance of the headboard of the bed elevated to 30 degrees (p between <0.001 and 0.005). Table 3 presents this data.

Table 3 - Nursing actions prescribed by nurses to prevent pressure injuries in clients hospitalized in the Intensive Care Units of two teaching hospitals. Campo Grande, MS, Brazil, 2016 (*n*=104)

Nursing action prescriptions	Pressure Injury				*p-Value**	*Odds Ratio* (IC 95%)
	Yes		No			
	n	%	n	%		
Change of decubitus						
Prescribed	42	82,4	44	83	**0,005**	1,05 (0,38-2,90)
Not prescribed	9	17,6	9	17		
Application of hydrocolloid dressing on the sacral region						
Prescribed	-	-	1	1,9	**<0,001**	1,98 (1,64-2,40)
Not prescribed	51	100	52	98,1		
Use of emollients for skin hydration						
Prescribed	41	80,4	39	73,6	0,488	0,68 (0,27-1,71)
Not prescribed	10	1,6	14	26,4		
Comfort cushions						
Prescribed	22	43,1	20	37,7	0,69	0,80 (0,37-1,76)
Not prescribed	29	56,9	33	62,3		
External hygiene						
Prescribed	32	62,7	38	71,7	**<0,001**	1,50 (0,66-3,43)
Not prescribed	19	37,3	15	28,3		
Change orotracheal catheter and/or nasoenteral catheter fixation device						
Prescribed	11	21,6	13	24,5	**<0,001**	1,18 (0,47-2,95)
Not prescribed	40	78,4	40	75,5		
Air mattress						
Prescribed	3	5,9	1	1,9	0,358	0,31 (0,03-3,06)
Not prescribed	48	94,1	52	98,1		
Skin Inspection						
Prescribed	7	13,7	12	22,6	**<0,001**	1,84 (0,66-5,13)
Not prescribed	44	86,3	41	77,4		
Dry and clean perineum						
Prescribed	3	5,9	2	3,8	**<0,001**	0,63 (0,10-3,92)
Not prescribed	48	94,1	51	96,2		
Rotate oximeter sensor						
Prescribed	21	41,2	13	24,5	**<0,001**	0,46 (0,20-1,07)
Not prescribed	30	58,8	40	75,5		
Observation of positioning and fixation of orotracheal catheter						
Prescribed	11	21,6	10	18,9	**<0,001**	0,85 (0,32-2,20)
Not prescribed	40	78,4	43	81,1		
Bed headboard raised to 30 degrees						
Prescribed	5	9,8	5	9,4	**0,043**	0,96 (0,26-3,53)
Not prescribed	46	90,2	48	90,6		

Fisher's exact test and Odds Ratio

DISCUSSION

Regarding the sociodemographic characteristics, the variables studied may have some influence on the occurrence of PIs and, at times, should be considered as risk factors. A study carried out in a Brazilian hospital evidenced a high risk of PIs in older adults with a mean age of 67 years.[11] It is known that advanced age predisposes the skin to a greater risk of injury.[11-13] Despite this, it can often be noted that patients hospitalized in ICUs have other therapeutic priorities due to their critical clinical conditions that make it difficult to perform preventive care for PIs.

Regarding gender, a study carried out in ICUs of Vitória, Espírito Santo state, found that 59% of the male population had PIs.[14] Another study performed in a large hospital in southern Brazil revealed that females presented a higher occurrence of PIs.[15] This difference between studies may be related to the comorbidities of each client and not to their genders. Furthermore, men constituted a discrete majority of the population of the present study.

The majority of the population studied presented normal BMI, of whom 66.7% developed PIs. This is similar to a study carried out in an ICU of Minas Gerais, where PIs were diagnosed in 50% of the eutrophic patients, with no statistical difference in PI frequencies according to nutritional status (p=0.179).[16] A study performed in the USA with clients hospitalized in ICUs revealed that the BMI classifications, underweight and important obesity were characterized by a high risk for PIs and that these clients required more attention than those with normal weight.[17] The lack of registration in the medical records made a more consistent analysis difficult, although it is important to consider this data as a predictor of risk for PIs.

Hyperthermia presented a statistically significant association with the occurrence of PIs (p=0.029). However, the study did not corroborate the finding of a study developed in an adult ICU of a public hospital in João Pessoa, state of Paraíba (p=0.137).[11] Microclimatic control is fundamental, since an increase in body temperature represents a potential impact on the risk of a given individual developing PIs.[18] The strict control of the temperature of clients in ICUs guides other clinical reasoning related to the therapy and the evolution of the disease.

The use of vasoactive drugs did not show a significant association between clients with and without PIs (p=0.246). A study carried out in the ICU of a public hospital in João Pessoa demonstrated that hospitalization and use of vasoactive drugs may contribute to the genesis of PIs.[11] Although the present study did not corroborate these findings, the clinical evaluation and association of technologies in the prevention of PIs should be adopted for all clients at risk.

Edema and the occurrence of PIs were also significantly associated (p=0.012). A study carried out in an ICU of a public hospital in João Pessoa did not demonstrate the same statistical association in clients with edemas (p=0.896).[11] This finding is not uncommon in clients hospitalized in ICUs due to their impaired mobility, the infusion of large volumes of liquids and multiple organ dysfunctions.

Invasive mechanical ventilation did not show a greater risk for PIs than unassisted breathing (p=0.610). A study conducted in ICUs and semi-intensive care units in Rio Grande do Sul revealed that there was an association between the use of mechanical ventilation and the development of PIs.[19] However, it is known that its use may predispose to the development of PIs due to factors such as immobility, contact of bony prominences and difficulty in maintaining adequate ventilation-perfusion, which impairs tissue oxygenation.[11]

Another aggravating factor is poor tissue perfusion that can affect PI healing.[18] Although the use of mechanical ventilation did not demonstrate a significant association with the occurrence of PIs, frequent mobilization, adequate positioning of the client, and daily skin inspections are care practices that are indispensable for the prevention of these injuries.

The occurrence of PIs in both institutions corresponding to 49% is considered high, with 44.4% in Institution 1 and 52.5% in Institution 2, which in agreement with the situation described in the Brazilian literature. In a study carried out in a public hospital in João Pessoa, Paraíba state, the prevalence of LP in adults in the ICU was 37.8%.[11] In another Brazilian study carried out in a university hospital in the city of São Paulo, the incidence of PIs ranged from 23.1% to 59.5%.[20] This differed in the multicenter cross-sectional study conducted in 12 hospitals in China, where the prevalence of PIs was 1.58% and the incidence was 0.63%.[21] Despite the availability of all material resources for PI prevention and professional updating on the subject in health institutions, the findings confirm the high occurrence and negative impact of PIs, especially in clients hospitalized in ICUs of Brazilian hospitals.[11]

Regarding the location of the PIs, the frequency found was: 87.5% in the gluteal region,

with 88.9% in Institution 1 and 86.4% in Institution 2; 29.8% in the sacral region, with 26.7% in Institution 1 and 32.2% in Institution 2; and 11.5% on the calcaneus, with 11.1% and 11.9% in Institutions 1 and 2, respectively. A national study carried out in an ICU of a hospital in the state of Rio Grande do Norte revealed that the occurrence on the gluteus, sacrum and calcaneus was 81.8%.[22] This is justified, due to the sites of bony prominences that increase the predisposition for PIs and the possible longer permanence of the client in dorsal decubitus.

Regarding PIs related to medical devices, the incidence was 7.7% in the auricular pavilion, with 11.1% in Institution 1 and 5.1% in Institution 2. Two studies performed in the USA revealed that the occurrence of these injuries ranged from 4.6% to 19.9% in the atrial region.[23-24] The most prevalent areas are associated with pressure areas, mainly in ICUs, since clients remain immobilized due to various issues related to the health conditions and the use of sedatives and vasoactive drugs.

Regarding the nursing actions, the change of decubitus (every two hours) was the most common, in 82.7% of the prescriptions, with a greater association with absence of PIs (p=0.005). In a Brazilian qualitative, exploratory study with ICU nurses, this was considered one of the main preventive measures for PIs.[25] The repositioning of individuals at risk or those with PIs should be performed, except in situations where there are contraindications (hemodynamic instability, ideal positioning for the performance of invasive procedures, for example), as this promotes the redistribution of pressure, especially in areas of bony prominence.[26-27] In ICUs, periodic repositioning should be performed or supervised by the nurse, for all clients, with this recorded as a guarantee of the care provided and as support for the nursing team.

Only 1% of the prescriptions mentioned the use of a hydrocolloid dressing on the sacral region, although it was the second most frequent location of PIs. There was a significant association between the absence of this action and the occurrence of the injury (p<0.001). This finding may be related to the absence or scarcity of material resources in the institutions (only one of the institutions studied had hydrocolloid dressings available for use). In a study carried out between 2013 to 2014, with 25 clients hospitalized in a ICU of a private teaching hospital in the state of Paraná, regarding the comparison of the hydrocolloid dressing with transparent film for the prevention of PIs in the sacral region, it was demonstrated that the second presented better cost-effectiveness in the final outcome, for the prevention of these injuries.[28]

A study carried out in a Brazilian university hospital with the aim of evaluating the use of transparent film in the prevention of PIs on the calcaneal, evidenced that its application associated with clinical guidelines for prevention (according to international guidelines) was effective.[29]

The use of emollients for hydration, found in 76.9% of the nursing prescriptions, converges with the recommended international guidelines (use on dry skin) to reduce the risk of skin damage.[18] A prospective study carried out in a school hospital in the city of São Paulo, in 2009, demonstrated that the use of soft emollient with essential fatty acids immediately after bathing for protection and hydration of the skin in elderly patients and/or those with dry skin, combined with other preventive measures, reduced the incidence of PIs.[7]

Public health services do not always have emollients available for skin care. In some situations, the nurse may suggest that the relative or person responsible acquire this with hygiene material and advise them about the importance of its use.

Regarding the use of comfort cushions, 40.4% of the nurses included this in their prescriptions. The use of pillows and wedges reduces pressure on bony prominences, especially when used between surfaces of the skin, such as knees, where there may be friction, and under calves, in order to reduce heel interface pressures.[30]

The maintenance of clean and dry skin is also recommended as preventive skin care.[18] A Brazilian retrospective cohort study carried out in the Hospital de Clínicas, Porto Alegre, found that PIs and moisture frequency had a significant association (p<0.01).[31] The performance of external hygiene is among the actions related to this care, which correlated with the absence of PIs (p<0.001). However, only 4.8% of the prescriptions studied included keeping the perineum clean and dry, which was related to the occurrence of PIs (p<0.001). The routine of changing diapers and wet bedding should be a priority practice, as it avoids discomfort for the client and other types of skin injuries.

Adults using medical devices are at risk of developing PIs, therefore they need to be repositioned to avoid the risk of injury.[18] In situations where repositioning does not relieve the pressure, care must be taken not to use covers that create additional pressures.[24] The action prescribed by nurses related to the use of these devices and to the absence of PIs was to change the fixation device of the OTC

and/or NEC (p<0.001). Nursing prescriptions for rotating the oximeter sensor and observing the positioning and fixation of the OTC were associated with the occurrence of PIs (p<0.001). At the time of bed repositioning for intensive care clients, attention to the position of all medical devices is necessary in order to avoid injuries of this nature.

Regarding the use of air mattresses, 3.8% of the clients presented this prescription in their nursing care. Their use is still restricted to clients with high risk of PIs in many health institutions, due to their high cost and low availability. The use of reactive foam mattresses of high specificity is advocated instead of reactive foam mattresses of low specificity. Alternating pressure air mattresses with small cells, that is, with a diameter of less than 10 centimeters, cannot inflate enough air to ensure the relief of pressure on the cells that are deflated. The choice of a specific type of support surface does not dispense with frequent manual repositioning, especially in individuals with high risk for PIs.[18]

The inspection of the skin was prescribed for the clients by 18.3% of the nurses, which showed a statistical association with the absence of PIs (p<0.001). The admission evaluation should include a risk assessment as well as a cutaneous assessment. Both should be combined as a single step in the process of assessing PIs on admission to the ICU. The structured risk assessment for PI prevention should be performed as soon as possible, i.e. within eight hours of admission.[25] The physical examination of the skin, both upon admission and in the daily assessment of the clients, should be included in the practice of the nurses, since the application of predictive scales of PI risk in ICUs guides the implementation of preventive measures based on scientific evidence and supports the care procedures.

The maintenance of the headboard of the bed raised at 30 degrees was prescribed by 9.6% of the nurses, which presented a statistically significant association with the occurrence of PIs (p=0.043). This care is critical for all clients, especially those classified as moderate, high, and very high risk on the Braden Scale.[30] The positioning of individuals avoids sliding in the bed and the creation of shear forces.[18] Furthermore, this angle of the headboard provided the highest respiratory system dynamic compliance value in relation to the other angles.[31] The present study did not evaluate whether the prescribed nursing actions were actually performed.

The Braden Scale has been translated and validated for use in Brazil and covers the main factors that can lead to PIs. A cross-sectional and retrospective Brazilian study, conducted with 187 clients in 2008, revealed that the use of the Braden Scale total score provides a broad view of the client. However, the analysis of the subscales specifies the main limitations of each client and directs the nursing care aimed at the prevention of PIs.[32]

There was randomness in the elaboration of the nursing prescriptions and no differentiation of actions according to the risk assessment (Braden Scale). The application of a risk assessment instrument and procedures guide the implementation of nursing actions and provide a uniform practice for professionals in each specific situation of PI prevention. However, the prescriptions followed a common prescription model for all subjects with different risk classifications. The evaluation by nurses of clients hospitalized in the ICU should be made carefully and include the existing and potential risk factors for PIs. The nursing actions employed are tools to achieve the safety goals.

Another point to be considered is that sociodemographic variables and risk factors may have influenced the findings of this study, including the statistically significant associations for the occurrence of PIs. The performance of further studies on the subject in scenarios with diverse client profiles and in different health service contexts is suggested.

CONCLUSION

The age group over 59 years, hyperthermia and edema were statistically significant risk factors for the occurrence of PIs. The result of the predictive scale for PI risk indicated high risk for both institutions.

There was a high rate of occurrence of PIs and the bony prominence sites showed higher rates for this type of injury. The nursing actions presented statistically significant associations regarding the absence of PIs, which evidences their importance in the preventive care of these injuries. However, the prescribed nursing actions were random and did not fulfill the individual needs of the client or those based on the risk assessment.

Skin care is not sufficiently valued in ICU settings, as the clinical conditions of the client are often more compromised and therapeutic priorities prevail over actions for the prevention of PIs. In this current context, the importance of actions with a focus on client safety is highlighted, with PI prevention needing to be treated as a priority and goal.

The elaboration and implementation of PI pre-

vention procedures as management tools will lead to improved care quality. The nurse, together with the nursing team, has the responsibility of evaluating the skin, discussing the nursing actions and deciding on their implementation regarding prevention.

Further studies are needed with larger populations and specific characteristics, with it being necessary to observe whether the actions prescribed by the nurses are being performed and registered.

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Correspondence: Paula Knoch Mendonça
Rua Marco Pólo, 342- casa 08
79005-650 - Vila Carvalho, Campo Grande, MS, Brazil
E-mail: paulaknoch@hotmail.com

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