



BRADEN SCALE AND INCIDENCE OF PRESSURE ULCERS IN AN INTENSIVE CARE UNIT

ESCALA DE BRADEN E INCIDÊNCIA DE ÚLCERA POR PRESSÃO EM UMA UNIDADE DE TERAPIA INTENSIVA

ESCALA DE BRADEN Y LA INCIDENCIA DE ÚLCERAS POR PRESIÓN EN UNA UNIDAD DE CUIDADOS INTENSIVOS

Juliana Araújo Ventura¹, Luiza Taciana Rodrigues de Moura², Maria de Fátima Alves Aguiar de Carvalho³

ABSTRACT

Objective: to analyze the incidence of pressure ulcers in a Intensive Care Unit, correlating it with scores on the Braden Scale. **Method:** quantitative, descriptive, prospective study. We made a follow-up of 64 patients who, according to the Braden Scale, were at risk of developing pressure ulcers (PU). After approval of the research project by the Research Ethics Committee (Protocol No. 0008/170412), data were collected, tabulated and analyzed using Epi Info™ software (version 3.5.2). The results were presented in tables. **Results:** the incidence of pressure ulcers was 18.8 % in the subjects of our sample. Considering the scores on the Braden scale, among those subjects who developed pressure ulcers, most were at high risk (77.7%) and 11.1% were at very high risk of developing PU. **Conclusion:** there was a higher incidence of PU among those who were at very high risk according to the Braden Scale. **Descriptors:** Pressure Ulcer; Intensive Care; Epidemiology.

RESUMO

Objetivo: analisar a incidência de úlceras por pressão em uma Unidade de Terapia Intensiva, correlacionando-a com os escores obtidos na Escala de Braden. **Método:** estudo quantitativo, descritivo, prospectivo. Foram acompanhados 64 pacientes que após aplicação de Escala de Braden possuíam risco para desenvolver úlceras por pressão (UP). Os dados foram coletados, tabulados e analisados no software Epi Info™ 3.5.2 e apresentados em tabelas, após a aprovação do projeto de pesquisa pelo Comitê de Ética em Pesquisa, Protocolo nº 0008/170412. **Resultados:** constatou-se a incidência de úlceras por pressão em 18,8% dos indivíduos avaliados. Considerando os escores obtidos na escala de Braden, entre os clientes que desenvolveram uma úlcera por pressão, a maioria apresentou risco elevado (77,7%) e 11,1% apresentou risco muito elevado. **Conclusão:** verificou-se maior incidência de úlceras entre os que obtiveram um escore de risco muito elevado avaliado pela escala de Braden. **Descritores:** Úlcera por Pressão; Terapia Intensiva; Epidemiologia.

RESUMEN

Objetivo: analizar la incidencia de úlceras por presión en una Unidad de Cuidados Intensivos, correlacionándola con las puntuaciones obtenidas en la Escala de Braden. **Método:** estudio cuantitativo, descriptivo, prospectivo. La muestra estuvo formada por 64 pacientes que tenían riesgo de desarrollar úlceras por presión (UPP) según la Escala de Braden. Después de la aprobación del proyecto de investigación por el Comité de Ética en Investigación (Protocolo 0008/170412), se recolectaron, tabularon y analizaron los datos empleando el software Epi Info™ versión 3.5.2. Los resultados se presentaron en tablas. **Resultados:** la incidencia de úlceras por presión en el grupo fue del 18,8 %. Teniendo en cuenta las puntuaciones obtenidas en la escala de Braden, entre los sujetos que desarrollaron úlcera por presión, la mayoría tenía alto riesgo (77,7%) y el 11,1% tenía muy alto riesgo. **Conclusión:** se observó una mayor incidencia de UPP entre los sujetos de riesgo muy alto según la Escala de Braden. **Descritores:** Úlcera por Presión; Cuidados Intensivos; Epidemiología.

¹Nursing graduate from Vale do São Francisco Federal University -UNIVASF. Petrolina (PE), Brazil. E-mail: julianaventura87@hotmail.com;
²Nurse, MSc. Student in Biological and Health Sciences, Professor, Nursing College, Vale do São Francisco Federal University /UNIVASF. Petrolina(PE), Brazil. E-mail: ltrim27@hotmail.com; ³Nurse, PhD Student in Nursing, Nursing Postgraduation Program, Federal University of Bahia/PPGENF/UFBA, Professor, Nursing College, Vale do São Francisco Federal University /UNIVASF. Petrolina (PE), Brazil. E-mail: fatimaaguiar@hotmail.com.br

INTRODUCTION

Pressure ulcers (PU) are defined as injuries to the skin and underlying tissue, which develop when a soft tissue is compressed for prolonged periods between a bony prominence and a hard surface. Compression of certain areas reduces local blood flow, facilitating the onset of ischemic tissue injury, which causes inadequate nutritional intake and, consequently, cell death.^{1,2}

In order to facilitate communication between health professionals, as well as the documentation and description of the wound assessment, the National Pressure Ulcer Advisory Panel (NPUAP) classified PU in four stages. In the first stage, the skin is still intact but hyperemic, not turning white after removal of the pressure. In stage II, there is superficial injury to the epidermis and dermis. Stage III reaches the subcutaneous tissue, and there may be necrosis. In stage IV, there is a great destruction of tissue, there is the presence of necrotic tissue, and muscles and bones become exposed.^{1,3,4}

There are several risk factors that contribute directly or indirectly to the emergence of PU. These include variables mentioned in the Braden Scale, such as sensory perception (related to the degree of disorientation, i.e., the ability to respond to the discomfort generated by the exerted pressure), activity, mobility, skin moisture due to urinary and/or fecal incontinence, nutrition, friction and shear forces. There are also other factors that contribute to the formation of PU: age, sex, length of hospital stay, comorbidities, chronic diseases, and use of certain medications.⁵

The incidence of pressure ulcers has some variations depending on the population and the peculiarities studied. In Brazil, there are still few studies on the incidence of PU in intensive care units (ICU).⁶ The high occurrence rate of PU constitutes a major problem in the care process, as it negatively influences the recovery of hospitalized patients confined to bed and of persons who need to be cared for at home and are unable to reposition themselves. Thus, it becomes a parameter for the evaluation of health services.^{3,7}

The importance of education in health care and the role of nurses in implementing tools that are used as parameters for the early detection of patients at risk of developing PU is well-known. Some scales for predicting PU development risk have been studied and implemented in vulnerable groups or groups more exposed to changes in skin integrity.⁸

These practices improve the quality of the care process, which must be performed in a continuous and comprehensive way, in order to reduce complications to the patient's health.⁹⁻¹⁰ In this sense, the aim of this study is:

- To analyze the incidence of pressure ulcers in a Intensive Care Unit, correlating it with scores on the Braden Scale.

METHOD

The present article was drawn from a monograph entitled << **Incidence of pressure ulcers in an Intensive Care Unit** >> submitted to the Vale do São Francisco Federal University - UNIVASF - as a mandatory requirement for obtaining the bachelor's degree in Nursing. Petrolina/PE, Brazil, 2012.

This is a quantitative, descriptive, prospective study conducted at a public hospital in Petrolina-PE. The study sample consisted of 64 clients admitted to the Intensive Care Unit of the hospital. Inclusion criteria were: not having developed pressure ulcers, assessment within 48 hours of admission and Braden scale score equal to or lower than 16.

Data collection was performed through the Braden Scale, which is a tool used by health professionals in order to assess the risk of developing pressure ulcers, through the evaluation of sensory perception, skin moisture, activity, mobility and nutrition.¹¹ In addition, we used a questionnaire-tool with structured questions that addressed socio-demographic data, clinical features, Braden Scale score and aspects related to pressure ulcers (quantity, site and stage). Data collection was conducted by only one researcher three times a week, in the afternoon, in the months from August to November 2012. Collection was extended for two weeks to better monitor patients who were admitted at the end of the data collection period. Participants were followed up until discharge, death or the development of pressure ulcers.

Data were tabulated and analyzed using Epi Info™ software (version 3.5.2). We calculated the overall incidence and found a relationship between this incidence and the following variables: age, sex, race, length of hospital stay, number of pressure ulcers, site, stage and Braden scale score. The results were grouped and presented in tables.

The research project was approved by the Ethics and Deontology Committee on Studies and Research (CEDEP) of the Vale do São Francisco Federal University (UNIVASF),

Protocol No. 0008/170412. We followed the ethical principles, standards and regulatory guidelines for research involving humans, established by Resolution 196/96 of the National Health Council. All study participants or their legal representatives signed the informed consent form.

RESULTS

During the study period, 121 patients were admitted to the ICU of the Emergency and Trauma Hospital. 64 of these patients were considered at risk for PU development, i.e., they had total Braden scale scores equal to or

lower than 16. From these participants, 12 developed a total of 15 PU, representing an incidence of 18.8%.

The age of study participants ranged between 15 and 90 years. Among those who developed PU, the predominant age group (66.6%) was younger than 65 years old. There was a higher incidence of males (70.3%) in the sample and also among those who developed PU, corresponding to 75% of cases. The white race was the most frequent (51.6%) and accounted for 66.7% of the patients who developed PU (Table 1).

Table 1. Demographic characteristics associated with the incidence of PU. Petrolina, 2012.

Variable	No UP N=52		01 PU N=9		02 PU N=3	
	N	%	N	%	N	%
Age						
15-35	23	44.2	02	22.2	02	66.7
36-55	11	21.2	2	22.2	-	-
56-65	7	13.4	2	22.2	-	-
66 e +	11	21.2	3	33.3	01	33.3
Gender						
F	16	30.8	03	33.3	-	-
M	36	69.2	06	66.7	03	100
Color/Race						
White	25	48.1	05	55.6	03	100
Black	09	17.3	02	22.2	-	-
Brown	18	34.6	02	22.2	-	-

Patients who did not develop PU were hospitalized for a period ranging from one to more than 16 days, with a prevalence of 42.3% in the interval ranging from 4 to 6 days. The

highest incidence of PU occurred in the period ranging from 7 to more than 16 days of

hospitalization in those who developed only one PU; and above 10 days of hospitalization in those who developed two PU (Table 2).

Table 2. Distribution of participants according to the length of hospital stay. Petrolina, 2012.

Length of hospital stay	No PU N=52		01 PU N=09		02 PU N=03	
	N	%	N	%	N	%
1 to 3d	11	21.2	0		0	
4 to 6d	22	42.3	4	44.4	1	33.3
7 to 9d	7	13.5	2	22.2	0	
10 to 15d	6	11.5	2	22.2	1	33.3
16+	6	11.5	1	11.1	1	33.3

Regarding the number of PU, most of the subjects (75%) had a single lesion. The most frequent anatomical site was the sacral region (46.6%), followed by the region of the

calcaneus (40%), as shown in Table 03. Regarding the classification of the PU, we found lesions in stage I (73.3%), II (20%) and III (6.6%). There were no lesions in stage IV.

Table 3. Distribution of ulcers according to site. Petrolina, 2012.

Site	n	%
Sacral	07	46.7
Lateral malleolus	0	0
Heel	06	40
Elbow	0	0
Scapula	0	0
Trochanter	0	0
Others	02	13.3
Total	15	100

With regard to the overall score on the Braden Scale, among those individuals who developed 1 PU, most (77.7%) were at high

risk, with scores between 10 and 12; and 11.1% were at very high risk (score 9). In cases

where the risk was assessed as mild, no PU

developed, as described in Table 4.

Table 4. Distribution of participants according to the incidence of PU and the Braden Scale scores. Petrolina, 2012.

Total Braden Scale score	No PU N=52		01 PU N=09		02 PU N=03	
	n	%	n	%	n	%
9	-	-	1	11.1	-	-
10	8	15.4	1	11.1	1	33.3
11	21	40.4	4	44.4	1	33.3
12	2	3.8	2	22.2	-	-
13	3	5.8	-	-	-	-
14	8	15.4	1	11.1	1	33.3
15	9	17.3	-	-	-	-
16	1	1.9	-	-	-	-

The risk factors with the lowest scores were: activity and physical mobility, since all participants were confined to bed and had movement restrictions. Regarding the sensory perception, which refers to the ability of the person to respond to the discomfort caused by the pressure, it was considered to be very

limited in 43.75% of cases. Most participants had occasionally moist skin (98.4%). Regarding nutrition, 93.8% of the subjects had an adequate nutrition, being fed by tube. As for the friction and shearing forces, 64.1% had a problem, requiring moderate to maximum assistance in moving (Table 5).

Table 5. Distribution of participants according to risk factors of the Braden Scale. Petrolina, 2012.

Criteria	n=64	%
Sensory Perception		
Completely limited	12	18.75
Very limited	28	43.75
Mildly limited	20	31.25
No limitation	04	6.25
Moisture		
Constantly moist	0	0
Very moist	0	0
Ocasionalmente moist	63	98.4
Rarely moist	01	1.6
Activity		
Confined to bed	64	100
Confined to chair	0	0
Walks occasionally	0	0
Walks often	0	0
Mobility		
Completely immobilized	41	64.1
Very limited	19	29.7
Mildly limited	04	6.2
No limitation	00	0
Nutrition		
Very poor	0	0
Probably inadequate	02	3.1
Adequate	60	93.8
Excellent	02	3.1
Friction and Shear		
Problem	41	64.1
Potential for problem	23	35.9
No apparent problem	0	0

DISCUSSION

In this study, the incidence of PU was similar to that found in a study conducted at a public hospital: 19.2% in patients admitted to the intensive care unit and wards.¹² Another study performed in three Intensive Care Units (ICU) of a Health Institute that is reference in urgency and emergency care in the Northeast of Brazil identified an incidence of 59.5%.¹³ These differences may be related to aspects such as: the methodology used in the studies, demographic characteristics and morbidity of the population studied, organization of

nursing care and staff dimensioning, among others.

Advanced age is an important risk factor for PU development, due to physiological changes in the cellular tissue, which contribute to tissue trauma.¹ A study conducted in Santa Catarina identified a higher prevalence of pressure ulcers (63.9%) in patients aged over 60 years.¹⁴ However, in this study, most of the patients who developed PU were younger than 60 years. This is due to the epidemiological characteristics of the evaluated ICU, where most admissions are of victims of external causes in the age group of young adults.

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There was a predominance of males in both groups, with and without PU. A similar finding was observed in other studies.¹⁵⁻¹⁶ In disagreement with this evidence, a study of patients admitted to the medical clinic and ICU of a university hospital revealed a predominance of females (68%).¹⁸ In the literature, there is no consensus regarding the influence of gender in the etiology of PU. This variable is presented only as a demographic characteristic.²³

Among the subjects in this study, the predominant skin color was white. These findings are consistent with findings in the literature, which show a higher rate of white subjects in studies related to PU. 65% and 75.6% of the participants, respectively, had this skin color.^{16,14}

Regarding the length of hospital stay, there was a higher incidence of PU in patients with a length of stay greater than 7 days. A similar finding was obtained in another study, showing that the time of onset of lesions was inferior to 10 days.⁷ A third study found that participants who developed PU were hospitalized for more than 10 days.¹⁹

Ulcers can be located in various regions of the body that are under continuous pressure, including the sacral, occipital, trochanteric, lateral malleolus, calcaneus, ischium, elbow, and scapula regions, among others.¹ A study conducted in Sao Paulo revealed that most participants presented PU in the sacral (32.47%) and trochanteric regions (32.47%).²⁰ In another study performed in the ICU of a hospital in Belo Horizonte, it was found that the sacral (36%) and calcaneus regions (22%) were the most predominant sites for the development of these ulcers; these data resemble those found in this study.¹⁹

There are many factors that predispose to the appearance of such lesions and many of them can be avoided by through a thorough evaluation by health professionals. One of the tools to be used for this purpose are the risk assessment scales, since they are necessary measures to improve the care provided.²¹ According to the Braden scale, the risk for PU development is classified as follows: patients with a score equal to or lower than 9: very high risk; score equal to or between 10 and 12: high risk; score 13 or 14: moderate risk; and scores 15 or 16: mild risk.²² The scores on the Braden scale show that the majority of individuals were classified as being at very high to high risk of developing PU. These results corroborate a study that found that 47.37% of subjects had scores equal to or lower than 11.²³ A similar result was also found in a teaching hospital.¹¹ These aspects

emphasize the importance of the relationship between risk scores on the Braden Scale and the incidence of PU.

Regarding individual parameters verified in the Braden scale, the results of this study were similar to a research conducted at the ICU of a public hospital in Recife, in what regards skin moisture, activity, mobility, friction and shear forces. Different results were found in this study for the criteria sensory perception and nutrition, because the highest levels in relation to sensory perception were found in the category "very limited" and most participants had an adequate nutrition. Conversely, in the study previously cited, in the sensory perception parameter, the highest rates were found in the category "completely limited" or "mildly limited", and most participants probably had an inadequate nutrition.²⁴

CONCLUSION

This study allowed us to relate the Braden Scale scores and other risk factors with the incidence of pressure ulcers in the ICU. We found a higher incidence of ulcers among those subjects who were at very high risk according to the predictive scale. This evidences the importance of using these tools for identifying patients likely to develop these skin lesions. These patients should be assessed both at admission and during hospitalization, so that individualized preventive measures can be taken, in order to avoid the appearance of these lesions.

We stress that the simple establishment of preventive measures may not be sufficient to change the present situation in this service. It is necessary that, in addition to these measures, professionals are also aware of the incidence of PU and continually assess whether these preventive actions are really being effective. Thus, they should be able to identify those aspects of the care provided that need to be changed.

One should take into account the limitations and the risk factors presented by the critical patient, so that the nursing care is carried out in an individualized and comprehensive way, in order to promote patient safety and improve the quality of the care provided.

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Submission: 2013/07/15

Accepted: 2014/05/21

Publishing: 2014/07/01

Corresponding Address

Luiza Taciana Rodrigues de Moura
Colegiado de Enfermagem
Universidade Federal do Vale do São Francisco
- Campus Petrolina
Av. José maníçoba s/n / Centro
CEP 56300-000 – Petrolina (PE), Brazil