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Pressure ulcer prevalence in emergency hospitals: a cross-sectional study

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ABSTRACT

Aims: To identify the point prevalence of pressure ulcers in an emergency hospital and in different units and to investigate the association between the presence of ulcers and demographic and clinical variables.

Method: This is a cross-sectional, descriptive, and analytical study, held over a single day in a public hospital aimed at teaching emergency in a university course, involving 87 adults and elderly patients hospitalized throughout the hospital. A risk assessment was carried out for pressure ulcers and skin inspection of patients.

Results: The point prevalence of pressure ulcers in the institution was 40%. The point prevalence was higher in the intensive care unit. An association was found between the presence of ulcers and a greater amount of drugs, as well as longer hospital stays and lower scores on the Braden Scale. **Conclusion:** The methods used for assessing the prevalence can be used by nurses in operational research to assess the problem context and also in scientific studies that allow the comparison of results in national and international contexts.

Descriptors: Pressure Ulcer; Prevalence; Patient Safety; Nursing; Emergency Medical Services.

INTRODUCTION

In recent years, the number of epidemiological studies on pressure ulcers (PU), along with incidence and prevalence studies, has increased significantly, allowing for a better understanding of the dynamics of their development. The occurrence of PU may be related to the patients' health conditions, as well as patients' assistance^(1,2).

The international classification system, developed jointly by the National Pressure Ulcer Advisory Panel (NPUAP) and the European Pressure Ulcer Advisory Panel (EPUAP), recommends that ulcers are classified according to visible tissue loss, considering four categories/stages/degrees (I to IV) and two additional conditions: suspected deep tissue damage and ulcers that cannot be classified^(2,3). There are also PUs related to medical devices used for diagnostic or therapeutic purposes, such as probes, drains, catheters, cannula, and immobilization equipment⁽²⁾.

The evaluation of individuals in any health institution and the identification of risk factors should be undertaken in order to identify their vulnerability, increase understanding of the factors leading to the occurrence of the damage, and facilitate changes in care practice, improving patient safety and healthcare quality^(2,4).

Risk factors for PU can be identified by means of scales built on a conceptual framework. The Braden Scale is the most widely used worldwide and is considered an assessment and risk prediction tool. The scale was developed by Braden and Bergstrom in 1987 and it was validated for use in Brazil by Paranhos and Santos in 1999⁽⁵⁾. It is composed of six domains (or subscales): sensory perception; mobility; activity; moisture; nutrition; friction; and shearing. The score ranges from six to 23

and the patients considered at risk are those with scores lower than or equal to 18. The total score and subscores allow the identification of patients at risk. The use of a validated tool allows the immediate adoption of preventive measures^(1,5,6).

To reduce the occurrence of PU, it is first necessary to focus efforts on prevention and return attention to the development of protocols with effective actions. The implementation of measures for risk assessment, prevention programs, and campaigns to establish targets to reduce the occurrence of ulcers represent fundamental actions for ulcer control. Studies on the occurrence of PU are increasingly used as tools of refinement for prevention practices capable of assessing the variation in the number of individuals affected by the problem, the quality of care in health, and the effectiveness of prevention efforts. In Brazil, few studies have reported such initiatives, taking into account the aspect of institutional quality^(7,8).

The investigation of prevalence is the first step to characterizing the situation quantitatively and it can be a tool used in epidemiological research or quality improvement programs^(1,2,7).

The evaluation of the prevalence of PU can be associated with the quality assessment of other indicators of assistance, such as risk identification or patient vulnerability, assessment of skin integrity conditions identified by inspection staff during admission, followed by medical records and implementation plans of the care to be carried out⁽²⁾.

As a negative indicator of quality, PU is regarded internationally as an adverse event and represents an important challenge for healthcare as it contributes to increases in morbidity, mortality, time, healthcare costs, and it affects large numbers of people^(6,7). Thus,

in Brazil, the Ministry of Health, through Ordinance No. 529, April 1, 2013, established the National Program for Patient Safety, in which one of the strategies is the monitoring of the occurrence of PU^(6,9).

The objectives of this study were to identify the contents of point prevalence of PU in an emergency hospital and in its hospitalization units and investigate the association between the presence of PU and demographic and clinical variables.

METHOD

This is a cross-sectional, descriptive, and exploratory study using a quantitative approach performed in an emergency public hospital of a major university. The study subjects were all patients aged 18 years or older, who were admitted on the day of data collection. Patients admitted to the burns unit were excluded because they could have experienced acute skin injuries using topical treatments and specific coverage, which may have hindered the skin assessment and identification of the presence of PU. Patients admitted to the psychiatric unit were excluded because they generally do not have limitations to ambulate. When bedridden due to clinical complications they are treated in other hospital units. Patients undergoing surgery were evaluated at the time they returned to the hospitalization units or anesthesia care unit.

Data collection occurred over a single day, as recommended by international guidelines^(2,10). Data collection started at 7am and ended at 11pm, when all hospitalized patients and their medical records were evaluated. We used the data-recording instrument developed by the authors of the study.

Data were collected by the authors and 10 trained previously-trained nurses. The

training lasted for four hours and audiovisual resources were used in the dialogued lecture. The objectives of the training were to standardize the procedures for the use of the Braden Scale, PU identification and classification, and the procedures for inputting information in the search tool. Nurses were considered able to perform data collection to obtain 100% agreement with the authors in the case study analysis.

The collection was carried out by pairs of nurses in order to increase the reliability of the data and they used a concordant assessment^(2,10). From the records, demographic data and some clinical data were collected, such as length of hospitalization, medical diagnostics, and drugs used.

Using the Braden Scale, each patient was evaluated for the risk of developing PU and for skin integrity. The skin inspection was carried out at the time of personal hygiene inspection, to identify the presence or absence of ulcers, their classification, and the anatomical regions of the location.

For patients who had PU that could not be assessed by the researchers during personal hygiene inspection because the unit's employees had not changed the bandages, the information on the characteristics of the ulcers was collected from medical records. When there was no record of this data, the unit's nurses obtained the information.

The results were analyzed using descriptive statistics and statistical tests (chi-square, Fisher's exact test and the Mann-Whitney U test) using the Statistical Package for the Social Sciences (SPSS) version 16.0. The significance level of $p=0.05$ was adopted.

A study of point prevalence of PU was performed as recommended by international guidelines. For the calculation, the number of patients with PU on the collection day was

considered (without taking into account the start time of the injury), divided by the number of hospitalized patients and the study participants, and multiplied by 100^(2,7,10).

The development of the research met the national and international standards of ethics in research involving human subjects. The study was approved by the Research Ethics Committee according to the National Council of Health No. 466/2012⁽¹¹⁾. Data collection occurred over a single day, on September 3, 2014.

RESULTS

On the data collection day, there were 108 hospitalized patients who met the inclusion criteria. Of these, 11 refused to participate and 10 were unable to sign the consent form and their respective guardians have not been located to obtain their consent and signature of the consent form term. For two patients admitted to the intensive care unit (ICU), it was not possible to perform a complete inspection of the skin because, according to the unit's employees, the patients had hemodynamic instability. Therefore, the complete mobilization for bodily hygiene and inspection of the skin in the dorsal region could not be performed. Also, there was no information on the presence or absence of PU in the medical records of the patients and the unit's nurses had no such information. Thus, 85 patients participated in the study.

Patients' ages ranged from 20 to 90 years, with an average of 54.01 years (standard deviation (SD): 19.14). As for gender, there were 47 (54.02%) men.

The number of medical diagnoses per patient ranged from one to 10 (median: 2; SD: 1.78). The diagnosis "circulatory diseases" was more frequent (18.14%), followed by "injuries,

poisoning, and some other consequences of external causes" (17.16%).

Patients' prescription drugs ranged between two and 22 (median: 10; mean: 10.86; SD: 4.28). The most common therapeutic classes of drugs were non-narcotic analgesics (91; 11.99%), antibiotics (65; 8.56%), antiemetics and antinauseants (60; 7.91%), antiulcer (58; 7.64%), and anti-hypertensives (54; 7.11%).

Regarding the risk of PU, the scores of the patients in the Braden Scale ranged between eight and 23 (mean: 15.57; SD: 4.91). Patients admitted to the ICU and semi-ICUs obtained lower scores than in other units. In the ICU, the variation of the score was from nine to 20 (mean: 12.14; SD: 2.34). In the semi-ICU, the variation of the score was from eight to 21 (mean: 11.44; SD: 2.37). Thirty patients (34.48%) had a score greater than 18, so they were not at risk.

The point prevalence of PU in the institution was 40% and the point prevalence of PU in different units is presented in Table 1.

Table 1 - Distribution of the number of patients according to the type of industry and the point prevalence of pressure ulcers (n=85). Ribeirão Preto, 2014.

Sector type	Pressure Ulcer		
	No n (%)	Yes n (%)	Total n (%)
Infirmaries	24 (60,00)	16 (40,00)	40 (47,06)
Emergency room	14 (82,35)	3 (17,65)	17 (20,00)
Intensive care unit	3 (25,00)	9 (75,00)	12 (14,12)
Semi-Intensive	4 (44,44)	5 (55,56)	9 (10,59)
Coronary care unit	4 (100,00)	-	4 (4,71)
Anesthetic recovery	2 (66,67)	1 (33,33)	3 (3,53)
Total	51 (60,00)	34 (40,00)	85* (100,00)

*In two patients it was not possible to investigate this variable.

Source: authors

The highest point prevalence (75%) was found in the ICU, followed by the semi-ICU (55.56%).

The 34 PU patients had a total of 84 lesions. Category/stage II ulcers were more frequent (42.86%), followed by category/stage I ulcers (20.24%), category/stage III ulcers (11.9%), ulcers that could not be classified (9.52), suspected deep tissue injury (5.95), and category/stage IV ulcers (3.57%). Five ulcers (5.95%) could not be classified due to the fact that either the dressing had not been removed at the time of data collection, there was no classification record in the chart, or the unit's nurses did not know how to provide the information. Most ulcers occurred in the calcaneus (28.57%), followed by the sacral region (22.61%). All three category/stage IV ulcers occurred in the sacral region and suspected deep tissue injury occurred on the heels and sacral plant.

By excluding the four patients who had category/stage I PU, the point prevalence of PU in the institution was 35.29%.

Table 2 presents the distribution of the number of patients according to skin color variable, age, and the presence of PU.

Table 2 - Distribution of the number of patients according to skin color, age, and presence of pressure ulcers. Ribeirão Preto, 2014.

Demographic and clinical variable	Pressure Ulcer			p-value
	No n (%)	Yes n (%)	Total n (%)	
Skin color				0,077*
White	36 (54,55)	30 (45,45)	66 (77,65)	
Brunette	10 (76,92)	3 (23,08)	13 (15,29)	
Black	5 (83,33)	1 (16,67)	6 (7,06)	
Total	51 (60,00)	34 (40,00)	85 (100,00)	
Age (years)				0,153**
<60	32 (66,67)	16 (33,33)	48 (56,47)	

≥60	19 (51,35)	18 (48,65)	37 (43,53)
Total	51 (60,00)	34 (40,00)	85 (100,00)

*Fisher's exact test; **Chi-squared test.

Source: authors

Although the frequency of patients with white skin color was higher for cases of PU, the difference was not statistically significant. The same was true for patients aged greater than or equal to 60 years.

Table 3 shows the values of length of hospitalization, number of diagnoses and medication used, the total score, and the subscales scores of the Braden Scale, considering the presence or absence of PU.

Patients with PU had longer hospital stays compared to those without ulcers, with a statistically significant difference ($p < 0.0001$). As for the number of diagnoses, the mean and median of patients with PU was higher, but the difference was not statistically significant ($p = 0.065$). The amount of drugs that ulcer patients were using was higher than that of patients without ulcers, with a statistically significant difference ($p = 0.009$).

The mean scores of the Braden Scale and its subscales were always lower for patients with PU. The differences of the total score and its subscales in patients with and without PU were statistically significant.

DISCUSSION

The point prevalence of PU in the institution was 40%; in the units, it varied between zero and 75%. In the unit with zero prevalence (coronary care unit), the average of the Braden Scale was 18.25, indicating that patients had no risk or a low risk of PU. In units with higher prevalence, such as the ICU (75%) and semi-

Table 3 - Distribution of length of stay values, number of diagnoses and medicines, the total score and subscales scores of the Braden Scale, according to the presence of pressure ulcers. Ribeirão Preto, 2014.

Clinical variables (n=85)	UP	Minimum	Maximum	Median	Average	DP*	p-value**
Hospitalization time (days)	No	0	61	4	7	9	<0,0001
	Yes	3	201	16	26	41	
Diagnosis quantity	No	1	10	1	2,18	1,76	0,065
	Yes	1	8	2	2,68	1,82	
Medication quantity	No	2	22	9	9,86	4,15	0,009
	Yes	4	21	12,5	12,03	3,99	
Values of the total score and subscales of the Braden Scale (n=85)							
Braden	No	9	23	20	17,86	4,62	<0,0001
	Yes	8	23	12	12,32	3,3	
Sensory perception	No	1	4	4	3,57	0,92	<0,0001
	Yes	1	4	2,5	2,41	1,23	
Humidity	No	1	4	4	3,51	0,7	<0,0001
	Yes	2	4	3	2,88	0,64	
Activity	No	1	4	3	2,39	1,21	<0,0001
	Yes	1	4	1	1,35	0,69	
Mobility	No	1	4	3	2,96	1,18	<0,0001
	Yes	1	4	1	1,56	0,7	
Nutrition	No	1	4	3	3,14	0,72	0,009
	Yes	2	4	3	2,79	0,59	
Friction and shearing	No	1	3	3	2,29	0,85	<0,0001
	Yes	1	3	1	1,32	0,63	

*Standard deviation; ** Mann-Whitney U test.

Source: authors

ICU (55.56%), the average Braden scores were also lower (12.14 and 11.44, respectively). This confirms the validity of the Braden Scale as a tool for detecting the risk of PU and the vulnerability of the patient, who should continue to receive preventive interventions and treatment for the control of risk factors, even with the presence of ulcers⁽¹²⁾.

The point prevalence, with the exclusion of four patients with category/stage I ulcers, was 35.29%. It is important to highlight this information, as many studies do not consider patients with category/stage I ulcers, making it difficult to compare studies^(12,13).

A national study conducted in a university hospital also found that the prevalence of PU was higher in the ICU (32.7%)⁽¹⁴⁾. In Belgium, a multicenter study conducted in 84 hospitals evaluated the prevalence of PU

in 19,968 patients. Considering the ulcers in categories/stages I to IV, the prevalence was 12.1%; excluding category/stage I ulcers, the prevalence was 7%. Ulcers were more common in patients in the intensive care and geriatric units⁽¹³⁾.

A study of 295 patients in three hospitals in Jordan identified the point prevalence of PU as 16%. By excluding patients with category/stage I ulcers, the rate decreased to 8.8%. The prevalence was higher in the ICUs (44%) and internal medicine (27%)⁽¹⁵⁾.

In another study in Spain, in 319 inpatient units with 8,170 patients, the prevalence of PU was 7.87%. In ICUs, the prevalence was significantly higher (18.5%) than in other units⁽¹⁶⁾.

The demographic and clinical variables selected in this study are factors traditionally considered in national and international

studies to verify the presence of association with the occurrence of PU. No association was found between skin color, age, number of diagnoses, and the occurrence of ulcers. These results are similar to those found in another study⁽¹⁴⁾.

The research identified that PU occurrence was associated with longer hospital stays, greater amounts of prescription drugs, and lower scores on the Braden Scale and its subscales.

A study conducted in France found that a length of stay greater than four hours, a higher number of treatments and comorbidity, and a higher number of drugs were associated with the occurrence of PU⁽¹⁷⁾. National studies also found that the length of hospital and ICU stay were higher in patients with PU^(8,18).

The association between risk of PU and low scores on the Braden Scale and the subscales has been confirmed in other studies, particularly for patients in ICUs^(8,18,19).

The risk assessment for developing PU, inspection of the ulcerated skin, and medical records are essential steps recommended by international guidelines and the protocol for the prevention of PUs, which is part of the Patient Safety National Program^(1,6,12).

To facilitate the adherence of professionals to strategies for the prevention and treatment of PU, it is necessary to regularly assess the knowledge and attitudes of professional staff, as well as their characteristics, such as the number of employees available for assistance and the hours required to provide care⁽¹²⁾.

The limitations of the research are related to the nature of the study of point prevalence, which has a transversal character. Another limitation is that some data on PU characteristics were collected from the medical records of patients and also from nurses' information when there was no record. The national study

aimed to compare the data on the PU, which is contained in a quality indicator system with records in terms of nursing developments in patient charts, but the study found it difficult to obtain the information on file and it has identified PU underreporting⁽²⁰⁾.

CONCLUSION

The point prevalence of PU in the institution was high; however, it was higher in ICU. The variables associated with the presence of ulcers were longer hospital stays, higher amounts of prescription drugs, and lower scores on the Braden Scale and the subscales. Knowledge in terms of the point prevalence of PU in the institution allows for the planning of changes in order to provide safe and quality care to patients. The methods used in this study to assess prevalence can be used both by nurses in operational research to assess the problem context in an institution, and also in scientific studies, which allow the comparison of results in national and international contexts.

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