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INTEGRATIVE REVIEW

Avaliação do risco para úlcera por pressão em unidades de terapia intensiva: uma revisão integrativa

Assessment of risk for pressure ulcers in intensive care units: an integrative review

Evaluación del riesgo para las úlceras por presión en unidades de cuidados intensivos: una revisión integradora

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ABSTRACT

Objective: To analyze in the scientific production the use of risk assessment scales for Pressure Ulcer (UPP) in the Intensive Care Unit. **Method:** There was conducted an integrative review the databases LILACS, MEDLINE and SciELO, with selection of 18 articles. **Results:** It was discovered that several risk factors, such as: the difference in the prevalence of UPP in relation to gender, body mass index and the difficulty in mobility in bed, altered sensory perception compromising the verbalization of discomfort, and the use of the Urinary Catheter preventing the appearance of the lesions. The scores of the scales remained at high risk and the use of the Glasgow coma scale helped in preventing the risk associated with the UPP when associated to the Bradem. **Conclusion:** It is needed new studies evaluating the risks of UPP, so it can be possible to provide knowledge, which can modify this reality. **Descriptors:** Scales, Pressure ulcer, Nursing.

RESUMO

Objetivo: Analisar na produção científica a utilização de escalas de avaliação de risco para Úlcera por Pressão (UPP) em Unidade de Terapia Intensiva**. Método:** Realizou-se uma revisão integrativa nas bases de dados LILACS, MEDLINE e SciELO, com seleção de 18 artigos. **Resultados:** Constataram-se vários fatores de risco, tais como: a divergência na predominância da UPP em relação aos sexos, o índice de massa corporal e a dificuldade de mobilidade no leito, a percepção sensorial alterada comprometendo a verbalização de desconforto, e o uso da Sonda Vesical de Demora prevendo o surgimento das lesões. As pontuações das escalas mantiveram-se em risco elevado e a utilização da escala de coma de Glasgow ajudou na prevenção do risco para UPP quando associada à de Bradem**. Conclusão:** são necessárias novas pesquisas que avaliem os riscos para UPP, bem a fim de proporcionar conhecimento que possa modificar essa realidade. **Descritores:** Escalas, Úlcera por pressão, Enfermagem.

RESUMEN

Objetivo: Analizar en la producción científica el uso de las escalas de evaluación de riesgos para Úlceras por Presión (UPP) en la Unidad de Cuidados Intensivos. **Método:** Se realizó una revisión integradora en las bases de datos LILACS, MEDLINE y SciELO, con la selección de 18 artículos. **Resultados:** Se ha descubierto que varios factores de riesgo, en las que destacó: la divergencia en la prevalencia de UPP en relación con el sexo, el índice de masa corporal y la dificultad de la movilidad en la cama, la percepción sensorial alterada comprometiendo la verbalización de incomodidad, y el uso de la catéter urinario para prevenir la aparición de las lesiones. Las puntuaciones de las escalas se mantuvo en alto riesgo y el uso de la escala de coma de Glasgow ayudó en la prevención de los riesgos para la UPP cuando asociada a la de Bradem. **Conclusión:** Se necesitan más estudios que evalúen los riesgos para la UPP, así como para proporcionar el conocimiento que pueda cambiar esta realidad. **Descriptores**: Escalas, Úlceras por Presión (UPP), Enfermería.

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INTRODUCTION

Skin lesions have leveraged discussions in nursing, especially in the hospital environment.[1] The Pressure Ulcer (PU) constitutes one of the major skin lesions affecting vulnerable people inside the hospitals, both in clinic setting or in the Intensive Care Unit (ICU).

The PU is defined as an area that undergoes cell death, developing when soft tissue is compressed between a bony prominence and a hard surface over a prolonged period of time.[2] In this context, scholars argue that there are several terms to define it: bedsore, decubitus ulcer and pressure sore. However, the term UPP is shown that the most appropriate since it has been found that the pressure exerted on the tissue and bony prominences over the bed, the most important etiological factors for these lesions.[3]

Whereas the development of the PU during hospitalization is an important indicator of quality of care was recently established by the MH/GM nº 529/2013 the National Patient Safety (PNSP), in which a focus is the monitoring incidence of UPP, as well as institutional programs to minimize this condition.[4]

Thus, it is expected to be adopted systematic approach to prevention as a strategy to mitigate the problem,[5] since the quality of health care has been widely discussed in the national and international, since the 1980s, due to the high costs for maintenance of services, scarce resources and aging global population.[6]

In Brazil, few studies have described higher rates of PU in ICU, reaching 10,62 % to 62,5%.[7-8] In the practice of the University Hospital of USP, the incidence is around 42,6 % and the operating units of 39,5%.[9] A survey in a university hospital in Sweden reported that after the beginning of the introduction of a treatment protocol of PU and education programs, the incidence decreased from 23% to 5 %.[10]

Thus, the PU, besides being a problem for people and hospitals, causes increased incidence of morbidity and mortality, resulting in increased costs. Therefore, reducing the incidence decrease costs dressings, as well as the use of antibiotics and there would still be a vast improvement in quality of life, in order that the damage does not measure the psychological distress of the subject, nor the wear caused by hospitalization time.[3,10]

The success of prevention depends on knowledge and skills of health professionals on the subject, mainly members of the nursing staff who provide direct care and seamlessly to the people. However, it is necessary to understand the factors that influence individual and institutional knowledge and use of evidence by professionals, so that strategies can be devised and used in institutions.[5]

Indeed, to decrease the incidence, a protocol is needed for the prevention and reduction of risks.[3] Thus, the use of instruments or scales for assessing risk of UPP facilitate the identification of predisposing factors or risk factors for its development, favoring the planning of preventive measures to avoid the emergence of these lesions.[6] In choosing the

appropriate method for assessing risk to the involvement of the PU may be considered important to the effectiveness and ease of application of the measuring instrument. There are some tools for assessing and predicting the risk of developing the PU, like the scales of Norton, Gosnell, Waterlow and Bradem.

Thus, the Norton scale assesses in five parameters (physical condition, level of consciousness; activity; mobility; incontinence) punctuated with values from 1 to 4 which produce scores from 5 to 20 points in which the lower the score the greater the risk.[11] The scale of Gosnell also consists of five risk factors being an adaptation of the Norton scale, adding nutrition and removing physical condition, and their score ranges between 5 and 20 whose critical stage is still in testing.[12]

The Waterlow scale uses variables such as BMI, continence, mobility, sex, appetite, skin type, debit neurologic, nutrition and medication, with scores ranging from 10 to 20 scores, and the higher the score the greater the risk.[13]

The scale assesses Bradem sensory perception, moisture, activity, mobility, nutrition, friction and shear. The maximum score is 23 points and the lower the score the greater risk.[14]

These scales are used to provide basis for clinical diagnosis made by the clinician.[15-16] Thus the question is: these scales are being used in the clinical nursing care in the ICU?

Given the importance of the theme aimed to analyze the scientific use of risk assessment scales for PU in the Intensive Care Unit.

METHOD

This is an integrative review, a term used to indicate a method which provides a synthesis of knowledge and incorporation of the applicability of results and significant studies in practice.[17]

The methodological process carefully fulfilled the following steps: selection of hypotheses or questions for review; establishment of selection criteria sample, categorizing studies and synthesis of knowledge produced, analysis of data and results, and interpretation of results, which provided the critical examination of the findings.

It was performed the analysis of the selected studies, guided by the research question: What are the tools of risk assessment of pressure ulcers being used in Intensive Care Units?

The literature review was carried out from September, October and November 2012 in the databases: LILACS, MEDLINE and SciELO.

The inclusion criteria were: research in the intensive care unit; articles that address the risk of PU, available in full and in Portuguese, Spanish or English published between 2008 and 2012, studies with empirical research which explain the use a scale/ tool for risk assessment PU. Be excluded: monographs and articles from the literature review or theoretical review. In the selection of descriptors, we used the health terminology found in

the Descriptors in Health Sciences (MeSH) from the following words: escalas/scale, úlcera por pressão/pressure ulcer, enfermagem/nursing and medição de risco/risk mensurement.

To systematize the searches were used Boolean operators to the following scheme: Scales and pressure ulcer and nursing. Additionally, there was a strategy that included the use of the keyword in association with other keywords (scales and pressure ulcer; scales and nursing, and nursing pressure ulcer), in order to increase the specificity and completeness of variables that influence the whole process of information retrieval, covering thus all descriptors. Based on this, it was found in the database a total of 98 references (7 LILACS, 82 MEDLINE, 9 SciELO).

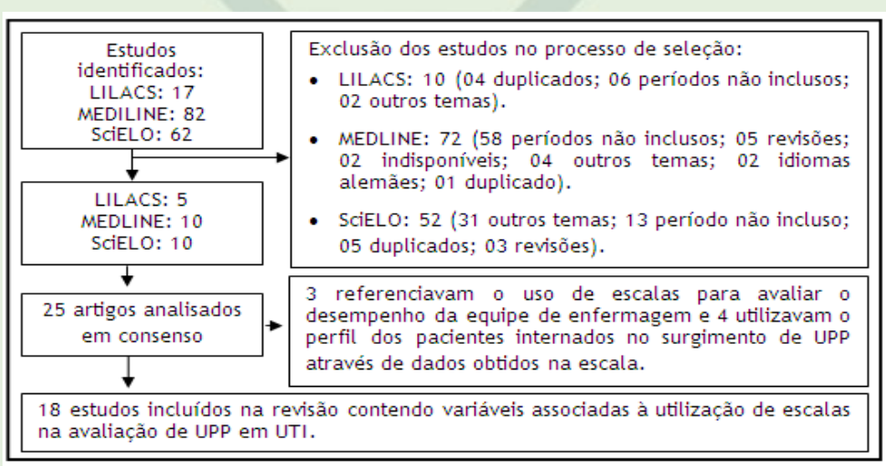
In order to achieve a greater number of references have been added evaluation descriptors, risk factors and intensive care units, measurement of risk, one at a time replacing them and/or by putting them back to the descriptor nursing.

Thus, the LILACS database, showed a sample of 17 references because they were duplicates 4, 6 after the deadline and two different themes were selected only 5 studies. In MEDLINE, an increase in the references found (82), of which 58 were outside the stipulated period, 5 literature reviews, 2 unavailable , 4 addressed other issues, two other languages were not included in the criteria (German) and one (1) was doubled. So on this basis, contain 10 references.

Already emerged in SciELO 62 references, 31 of which addressed another issue, 13 were outside the stipulated period, five duplications and three revisions. Thus, 10 references were selected for deeper analysis.

Thus, after the reading of the abstracts, it was screened for relevance and ownership that answered the purpose of coming to study a sample of 19 papers selected for conducting this review.

Figure 01. Selection process of the studies in LILACS, MEDLINE and SciELO. Floriano-PI, November 2012.



For data extraction, was elaborated and adopted an instrument contemplating variables: type of study, study site, people, sample, year of completion, data collection and assessment tools UPP. A summary of the data extracted from the articles presents a descriptive way in the tables, gathering the knowledge produced on the subject investigated.

RESULTS AND DISCUSSION

Characterization of the studies

On the **characterization studies**, the articles present different characteristics with respect to the countries in which they were made, the people and the methodological design. These characteristics are highlighted in Table 01.

Table 01 - Characteristics of the scientific literature on the risk assessment for pressure ulcers in intensive care unit. Floriano-PI, Brazil, 2012.

References	Country	Method	Sample	Place
18	Brazil	Descriptive-exploratory	48 adults of both genders	University Hospital
19	Hong Kong	Cohort	197 adults of both genders	University Hospital
20	Brazil	Descriptive-exploratory	14 adults of both genders	University Hospital
21	Germany	Comparative	24 adults of both genders	University Hospital
22	Brazil	Transversal	142 clients	Hospital
23	Brazil	Tranversal	21 clients	Hospital
24	Brazil	Exploratory longitudinal	42 adults of both genders	IRUE*
25	Brazil	Transversal	63 adults of both genders	IRUE*
26	Brazil	Transversal analitical	42 adults of both genders	IRUE*
27	Brazil	Transversal	13 clients	Hospital
13	Brazil	Descriptive-exploratory	53 clients	Hospital
28	Brazil	Transversal	60 clients	Public Hospital
29	Brazil	Longitudinal	74 clients	University Hospital
30	Brazil	Longitudinal	189 clients	Public Hospital
31	Brazil	Descriptive-exploratory	53 adults of both genders	University Hospital
32	Brazil	Transversal	187 clients	Hospital
33	Brazil	Exploratory longitudinal	42 clients	IRUE*
34	Brazil	Exploratory longitudinal	96 clients	University Hospital

* Reference Institute in urgent and emergency (IRUE)

Based on Table 01, it can be seen as the origin of the publications, 16 articles were Brazilians, five of São Paulo-SP, two of João Pessoa, six Fortaleza, one of Porto Alegre-RS, one of Belo Horizonte - MG and Recife-PE, a German-born and one (11%) of Chinese origin.

Regarding the methodological design, the research shows drawings observational and analytical seeking a greater understanding of the risk factors associated with ulcer like subsidies to plan actions seeking to minimize the problem. Five studies were descriptive and exploratory, one cohort, a comparative study of five exploratory longitudinal, transverse

and five analytical cross. Regarding the sample size, there were studies with small number of subjects, one of the limitations of this review study.

As for the local scene investigations, 14 were conducted in four university hospitals and institutes emergency care. Based on the results of the use of scales, one has to use validated questionnaires relates to methodological tools that assess the integrity of the skin of the patient in the ICU management beyond the empirical data obtained by simple observation of everyday conduct of nurses or usual this unit. Table 02 presents a summary of the main findings raised in this review.

Table 02. Summary of key findings of the articles of this integrative review. Floriano - PI, Brazil, 2012.

Ref*	Main Results
18	Physical activity, mobility, sensory perception, moisture, friction/shear and nutrition related to low scores (average of 11, varying between 8 and 19) Bradem range on the first day of hospitalization.
19	9.1% developed UPP. Modified Bradem scale OR = 0.736 and Bradem scale OR = 0.648. Bradem scale modified presented better sensitivity (89%), specificity (62%) and sensory perception [(Beta = -1.544) (OR = 0.214); (p = 0.016)].
20	The incidence of UPP through the Bradem range was higher in the elderly (42,8%). In the initial assessment, among the investigated 14, 8 obtained risk score, high risk < 11; 5 with moderate risk – scores ranging from 11 to 16; and with low risk.
21	The reliability of the scale of Bradem (OR = 0,72); (95% CI 0,52 -0,87) was greater than that of Waterlow [(OR = 0,36); (95% CI 0,09 -0,63)].
22	The length of hospitalization > 10 days [(OR = 7,61); (IC 95%; -2,92-19,82)] and high risk and high on the scale of classification [Bradem (OR = 4,96); (IC 95% = 1,50 -16,50)].
23	The reliability of the scale of Bradem demonstrated high compliance levels. The lowest frequency of coincidence occurred in nutrition and moisture (Kappa 0,37 and 0,31, respectively).
24	UPP in cranial Encephalic trauma clients (61,9%), average time of emergence of the UPP 9.6 (SD ± 3,3), score of Norton 8,8 to 9,1 (SD ± 6,7) (p = 0.028), Bradem 11,6 to 12.5 (SD ± 6,7) (p = 0,004) and Waterlow 22,9 to 24,8 (SD ± 16,1) (p = 0,003).
25	31,7% of customers have high risk for UPP, 28,6% highest risk and 19% were at risk, gender/risk (p = 0,016); major surgery/degree of risk (p = 0,0001) and salute/mobility (p = 0,033).
26	Scores of Bradem and Waterlow increased (p < 0,001). Developed lesions (p = 0,005) in alto (2%) and high risk (92%). Waterlow scale revealed that scores the best of Bradem, except with respect to specificity (11,7%).
27	Eleven presented IMC above average. It was observed that eight clients had occasional incontinence and three, double incontinence. The predominant factor was sex (11 women). Impaired skin integrity (100%), impaired Ambulation (87%) and impaired bed mobility (80%). Waterlow scale showed incidence of high risk for UPP 76% (p = 0,070) in relation to impaired bed mobility.
13	Bradem scale scores ranged from 12 to 14 in relative sensitivity (95%).
28	Waterlow scale score performed an average of 5.49, indicating that 75% of clients had at most a score equal to eight. After ten days of hospitalization (p = 0,036) 68.3% exhibited UPP. Male predominance (81,7%).
29	Of 45 (60,8%) admitted, five (11,1%) developed UPP through the scale of Bradem. In 29 (39,1%) cases there was no daily application, the average score was 11,35, where the highest score was 20 and the lowest was seven.
30	There was significant Association (p < 0,05) between second risk score Bradem and neurological changes, urinary, and nutritional.
31	Waterlow scale scores ranged from 12 to 18 points in which showed that senior citizens with higher risks were female (52,8%), that presented increase or decrease of the IMC (22,6%) and physical mobility impaired (67,9%).
32	Nutrition (p = 0,034) changed showed important factor, followed by mobility problems (p = 0,045) and alteration of sensory perception (p = 0,012) and moisture (p = 0,026) with ≤ 13 scores points in the range of Bradem.
33	Bradem scale presented scores with averages between 11,6 to 12,5 per day of hospitalization and 9,1 the 16,7 per patient admitted.
34	Prevalence of 63,6% in ICU with PU. In relation to the Bradem scale, the average score of 12, straight through from 8 to 19 points. There was low value in the subescores moisture (0,473) and nutrition (0,514) in against position sensory perception (0,746), activity (0,807), mobility (0.665), friction and shear (0,829).

*Reference

Variables associated with the development of pressure ulcers

Table 02 presents a summary of the main results of the selected studies, addressing the different risk factors in the development of the PU. Regarding the gender, studies show divergence, with some predominance of risk in and other female[18,20,31] in the male.[26,28-29]

In a descriptive exploratory study[20] with 14 adults of both sexes found predominance of risk in females corroborates another study that also showed similar incidence.[18] However, points up the limitation of the small sample size and may lead to bias result. Some authors link this finding to the fact that women have more adipose tissue culminating in increased pressure on tissues and exposure to hypoxia.[18,20]

By contrast, three studies showed males as more prevalent in the incidence of PU.[26,28-29] This finding, in two studies [26,28] might be related to a sampling bias, since more than 80% of the sample were male, a fact consistent with the characteristics of the site survey, a tertiary care hospital trauma that serves people mostly victims of traffic accidents as males.

Regarding BMI, we observed that the majority of those studied had scores above average ranging from 22,6%[31] to 44,4%[18,25] showing PU risk. In this sense, one study[31] showed that despite being emaciated people more prone to PU, obese clients, by presenting restricted mobility, have restricted their movements in bed favoring the emergence of PU (p = 0,245). The same event occurs when the client is bedridden or confined to wheelchair.[18,20,31]

With regard to sensory perception (18,8%)[31] were identified statistical differences between values (Beta = -1,544, OR = 0,214, p = 0,016)[19] found in two studies. This risk factor (sensory perception) is essential in the treatment and prevention of UPPS, because through it the client can verbalize pain or discomfort while performing professional testing sensitivities and even favor for changing positions.

Regarding the use of indwelling urinary catheters two studies showed its prevalence, one with 87,3%[25] and the other 88,6%[31]. This important fact is being considered by the authors as a protective factor since the subjects in their use does not have excessive skin exposure to moisture. Thus, another study[31] showed that only 1,1% of the ICU inmates showed a clingy wet skin when using SVD.

Another variable found was the duration of surgical procedures. Some authors showed that people undergoing this procedure lasting more than two hours at high risk of developing PU (p=0, 0001)[25], being supported by two other studies that reported prevalence exceeding 60% of UPP in surgical procedures long term.[24,26]

This finding correlates with the fact that the immobilization of the surgical table customer, either through clamps or leggings as well as the process which makes anesthetic property, creating the possibility for the development of ulcers. Moreover, the transfer of the operating table to the stretcher recovery room after anesthesia can trigger friction and shear forces, and is considered a risk factor.[18]

Regarding the hospitalization period , there was media development PU ranged from 8 to 40 days [18,20], corroborating other in which the average time was 9,6 days (DP± 3,3)[24,26] and 18,43 days (p 0,015)[18]

Already in preventing PU instruments are used to assess the physical condition of the ICU aimed at decision-making regarding the prevention and possible treatment. Among these there are the scales used in the articles analyzed as described in Table 3.

Table 03. Scales used to prevent the emergence of UPP according to the selected studies. Floriano-PI.

References (n=18)	Scales	fi	Fr
13,18-20,22-23,29-30,32-34	Bradem	11	61%
25,27-28,31	Waterlow	4	22%
21,26	Bradem e Waterlow	2	11%
24	Norton, Bradem e Waterlow	1	6%

Were verified through the scales used, that of the 18 selected studies, 11 used the scale Bradem four to Waterlow, two scales Bradem and Waterlow, and the scales of Norton, and Waterlow Bradem. In the selected studies did not find the use of the scale Gosnell.

There are several criticisms with respect to risk scales Norton, Bradem, Waterlow and Gosnell, as some may underestimate while others overestimate risk assessment.[26] this context, considering the use of Bradem scale, the maximum score was found 19 points[18-19,34] and the minimum was 8[18,34] with the majority of studies scores were between 10 and 16 points.[13,20,22,24,29-30,32-33] Demonstrating that people inside the ICU have great chances of develop UPP which requires greater vigilance and intervention of nursing staff.

One study 18 highlights that low scores on the scale Bradem are associated with significant changes in the level of consciousness. The association of scale Bradem with Glasgow Coma Scale assists practitioners changing their position and improves risk prediction of PU. Because of the change in sensory perception, there was difficulty of the subject under study verbalize the discomforts of hospital which provided the dependence of being looked after by others to maintain their hygiene as well as other procedures that act directly on the control and prevention of PU.

Another study that examined the risk of PU by Bradem modified scale, in which the author added height and skin type and excluded the power of risk factors, noted that the same (0, 736) is more predictive of developing PU to provide better sensitivity (89%) and specificity (62%) of the scale Bradem (0,648).[19]

The Bradem scale 0,72 (IC 95% 0,52-0,87) evaluated in a comparative study in a university hospital aimed to determine the validity of the risk scale scales Bradem and Waterlow, also showed significant results, the provide better correlations than the Waterlow 0,36 (95 % IC 0,09-0,63) compared to its sensitivity. The absolute degree of correlation between measurements ranged from 0,51 to 0,77.[21] Another study, however showed opposite result compared to the Waterlow scale (p=0,004)[25] showing that when combined with scale Bradem they correlate inversely proportional defined various characteristics about the moderate and high risk of developing the UP.

Yet another article that used only the Waterlow Scale, showed that among elderly 33,96 % had no risk, high risk 33,96%, 22,64% were at risk and 9,43% very high risk. [31] This finding supports with other studies that have shown a greater incidence for ulcers since it increases age.[20, 23]

Guests accompanied by the Norton scale, also showed some degree of risk, and the study found moderate risk in two subjects (4,8%) and high risk in 40 (95,2%), but the author claims that there was no statistical significance of this association (p=0,070).[24]

Despite knowing the risk factors related to PU, it is still possible to identify the record of UPP in people admitted to ICU as shown by the prevalence of selected studies with 9,1%[19], 31,7%[25], 59,5%[24] and 76%[26] being required assistance through the use of scales of risk for PU.

Knowing this reality, it is up to the nurse to effectively intervene in their care so that people can be met in an individualized and humanized in order to at least reduce the incidence of the development of PU based on the application of protocols aimed at reducing this risk.

Regarding the sensitivity of these institutions for nurses to use these tools in daily work a longitudinal prospective study conducted in the ICU of a university hospital in southern Brazil, with a view to implementing the use of scale Bradem identified implementation difficulties daily this scale. In 45 (60,8%) were admitted to fill the same day and in five (11,1%) of them were developing UPP. In 29 (39,1%) cases there was no daily application of the scale, with 14 (48,2%) of them developed PU.[29]

Another study evaluated the implementation of a protocol by applying the scale Bradem and showed that the instrument was properly interpreted and understood by the examiners (kappa between 0,45 and 1,00) in the variable sensory perception, physical activity, mobility, friction and shear and risk classification allowing to use the protocol safely and diagnosis appropriate to clients at risk of developing PU.[23] the rating scales of the UPP are considered subject to bias by the subjectivity of individual interpretation as well as the need for clinical knowledge prior for such applications. Technical competency and clinical skills of the nurse to assess the scale items are indispensable to the exercise of care with excellence. [23]

Given the complexity of PU and resuming the decree nº 529/2013 which deals with safety of care, it is essential to developing and supporting the implementation of protocols, guides and safety manuals, as well as the implementation of systematic surveillance and monitoring of incidents in health care by promoting a safety culture with an emphasis on learning and organizational improvement, engagement of health professionals in the prevention of incidents PU, with emphasis on secure systems.[4]

Thus, it is argued the importance of the use of risk assessment scales for PU ICU technologies as predictive for the development of pressure ulcers, for the same meet the individual risk of each person and ensures the development of a plan nursing care efficiently and accurately.

CONCLUSION

The research could prove the feasibility of clinical scales Bradem, Waterlow and Norton. Points out that there were no publications that used the scale Gosnell although it

also one of the instruments used in risk assessments. Several risk factors were analyzed and that among these stood out the discrepancy in the prevalence of PU in relation to male and female genders, BMI was related to difficulty in mobility in bed, sensory perception changed with the difficulty of verbalization of discomfort and the use of SVD prevented the appearance of the lesions.

The scores of the scales showed high levels of risk for PU; highlighting the use of the Glasgow Coma Scale as a useful tool in the prevention of PU risk when associated with Bradem scale.

Thus, more research is needed to continue evaluating the risks associated with the emergence of the PU and their rating scales to provide knowledge that can change this reality.

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