Pressure ulcer (risk) assessment

Recommendations to improve nursing practice

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Summary
Pressure ulcer (risk) assessment is complex and multifactorial. National and international guidelines give orientations about pressure ulcer (PU) management and provide important recommendations. However, it's necessary to know our reality in order to improve Evidence-Based Nursing. The main aim of this study was to provide some recommendations to improve clinical practice, clinical research, clinical management and continuous education on PU domain. The study was designed as a retrospective cohort analysis of electronic health record database from adult patients admitted to general wards in a Portuguese hospital during one year. The study had a sample of 8147 participants where 34.4% had "high risk" of PU development at the first PU risk assessment, 7.9% had (at least) one PU at the first skin and tissue assessment and 3.4% developed (at least) one PU during the length of inpatient stay. (Im)"mobility" was the major risk factor assessed through Braden Scale for PU development. The systematic PU risk assessment: is sensitive to patient clinical changes; should be performed since the hospital admission; and should be used in combination with nursing clinical judgement. The systematic skin and tissue assessment: identifies early changes in skin and tissue condition; should be performed since the hospital admission; and should identify wounds of different aetiologies. The PU assessment could be improved with the implementation of a validated tool in order to standardised data record, to monitor PU/wounds characteristics and their evolution.

KEYWORDS: INCIDENCE; NURSING; NURSING ASSESSMENT; PORTUGAL; PRESSURE ULCER; PREVALENCE; RISK ASSESSMENT; RISK FACTORS.

Introduction

Pressure ulcers continue to be a challenge[1-3] to healthcare professionals and institutions and represent an indicator of healthcare quality. The development of pressure ulcer(s) is complex and multifactorial[4,5] and nursing staff needs to manage several pressure ulcer risk factors[5-7] in order to prevent pressure ulcer development.

Nowadays, there are several studies focused on the magnitude of pressure ulcers problem. Each study has a specific methodological design and provides a specific "point of view". In fact, each "photograph" highlights different faces of the problem that allowed us to better understand their complexity.

Nevertheless, we believe that pressure ulcer management should be based on the institutional reality, patients' characteristics, level of risk and patients' specific risk factors.

National[1] and international[2] guidelines give orientations about the "leges artis" on pressure ulcer management and provide important recommendations for clinical practice and clinical research. However, there is a lack of knowledge on pressure ulcers problem dimension in medical and surgical wards of Portuguese hospitals; on the characteristics of the patients who had and/or developed pressure ulcers during the length of inpatient stay; and on the influence of the Braden subscale scores on pressure ulcer development. Therefore, it's necessary to know our reality on those domains in order to implement accurate nursing interventions and improve Evidence-Based Nursing.

During the last years we have developed a set of studies that analysed the characteristics of the patients with higher risk of pressure ulcer development at admission and during the length of stay[8]; the characteristics of the patients that already had a pressure ulcer at admission in inpatient setting[9]; the characteristics of the patients that developed a pressure ulcer during the length of inpatient stay[10]; and the influence of some modifiable and non-modifia-

ble risk factors (with special attention on the risk factors assessed by Braden Scale) on pressure ulcer risk, prevalence and incidence[11-13].

So, the research question that guided this manuscript was: What are the key implications of those evidence studies to improve clinical practice, clinical research, clinical management and continuous education on pressure ulcer domain?

In order to address this research question the main of this manuscript was: To provide some recommendations to improve clinical practice, clinical research, clinical management and continuous education on pressure ulcers domain based on previous evidence studies.

Methods

Retrospective cohort analysis of electronic health record database from adult patients admitted to medical and surgical wards in a Portuguese hospital during 2012. The study was divided in several tasks with specific aims and inclusion and exclusion criteria. The study was performed after Hospital Council Board and Ethics Committee approval. Data was analysed using the SPSS 21.0 and 23.0. Descriptive statistics were calculated for the sample characterisation, the demographic and clinical variables. Pressure ulcer risk was calculated according to "Direção-Geral da Saúde" orientations[1]. Prevalence and incidence of the participants with pressure ulcers were calculated according to European Pressure Ulcer Advisory Panel orientations[14]. The odds ratio was calculated by univariate logistic regression for each variable of interest. The hazard ratio was calculated by univariate Cox regression for each variable of interest and by multivariate Cox regression for the Braden subscales that were statistically significant. Braden Scale accuracy tests were assessed. In all analyses a p-value < 0.05 indicated statistical significance.

Results

As we previously referred, the study[12] was divided in several tasks that allowed us to analyse and discuss our results from different perspectives and develop a set of knowledge of our institutional reality.

Pressure ulcer risk assessment

The study on pressure ulcer risk assessment[8] included a sample of 8147 participants where 34.4% had high risk of pressure ulcer development at the first assessment in inpatient setting. The percentage of participants with high risk of pressure ulcer development significantly decreased in the last assessment when compared with the first one. However, at the time of patient discharge, 14.0% of the participants still had high risk of pressure ulcer development.

Pressure ulcer (point) prevalence

The study on pressure ulcer (point) prevalence[9] included a sample of 7132 participants and reported a point prevalence of 7.9% participants with pressure ulcer at the first skin and tissue assessment in inpatient setting. At admission 1455 pressure ulcers were documented. Most of the pressure ulcers recorded were category/stage I (42.3%). The heels (28.9%) and the sacrum/coccyx (22.4%) were the most critical areas. There was a ratio of pressure ulcers per participant with pressure ulcer of 2.60.

Pressure ulcer incidence

The study on pressure ulcer incidence[10] included a sample of 7132 participants and reported a period prevalence of 10.0% participants with pressure ulcer in inpatient setting during 2012 and a cumulative incidence of 3.4% participants with pressure ulcer in inpatient setting in the same period. During the length of stay, 320 new pressure ulcers were documented. Most of the new pressure ulcers recorded were category/stage II (43.8%). The sacrum/coccyx (35.6%) and the trochanters (17.7%) were the most critical areas. There was a ratio of pressure ulcers per participant that developed a new pressure ulcer of 1.33. One of the biggest risk factors for pressure ulcer development during the length of inpatient stay was the presence of a previous pressure ulcer at the time of admission. In 2012, 1775 pressure ulcers were documented. Most of the pressure ulcers recorded were category/stage I (39.9%). The heels (25.9%), the sacrum/coccyx (24.8%) and the trochanters (13.7%) were the most problematic areas. There was a ratio of pressure ulcers per participant with pressure ulcer of 2.49.

Development of the first pressure ulcer

The studies on the development of the first pressure ulcer in inpatient setting[15,16] included a sample of 6572 participants and highlighted the characteristics of 157 participants (2.3%) that developed their first pressure ulcer during the length of stay. For 80 of those participants (52.3%) that critical event occurred during the first week, with higher frequency (27 participants) at day 5 of inpatient stay.

The influence of Braden subscales on pressure ulcer development

The study on the influence of Braden subscales on pressure ulcer development[11,13] included a sample of 6552 participants and demonstrated that as the total Braden Scale scores decreased, there was a statistically significant increase on the hazard ratio of pressure ulcer(s) development. Our Braden Scale accuracy tests showed a sensitivity of 63.4% (CI 95%: 55.2%-71.0%), a specificity of 73.8% (CI 95%: 72.7%-74.9%) and an area under the curve of 0.69 (CI 95%: 0.64-0.73). The multivaria-

te time to event analysis showed that (im)"mobility" was the major risk factor (assessed through Braden Scale) for pressure ulcer development.

Pressure ulcer risk factors

In all studies it was highlighted that there were important pressure ulcer risk factors not assessed by Braden Scale (such as age, the cause and type of admission, the length of inpatient stay and the presence of a pressure ulcer) that should be considered by nurses when they plan and deliver care.

Discussion

After analysing and discussing our results based on national and international scientific evidence, and comparing them with our current clinical practice, we highlight some key points that may help us to implement accurate nursing interventions and improve Evidence Based-Nursing:

Implications to clinical practice, clinical research, clinical management and continuous education

- The systematic pressure ulcer risk assessment creates a set of (nursing) indicators and identifies patients with higher risk of pressure ulcer development.
- The systematic pressure ulcer risk assessment through Braden Scale identifies changes in the patient condition during the length of stay.
- The total Braden Scale score should be used in combination with nursing clinical judgement in order to identify patients with higher risk of pressure ulcer development.
- There are several (modifiable and non-modifiable) pressure ulcer risk factors not assessed by Braden Scale.
- Nursing interventions should be planned and implemented according to the risk level identified and according to the patients' specific (modifiable and non-modifiable) risk factors.
- Each Braden subscale should be used as a guide to plan more accurate nursing interventions.
- The lack of ability to change and control body position was the major risk factor (assessed through Braden Scale) for pressure ulcer development during the length of stay, independently of the total Braden Scale score.
- The first week was particularly critical for pressure ulcer development and should be a period of highest nursing surveillance and preventive interventions.
- The systematic skin and tissue assessment creates a set of (nursing) indicators and contributes to prevalence and incidence rates analyses.
- The systematic skin and tissue assessment identifies early changes in skin and tissue status.
- The Skin Assessment Tool could be optimised with the inclusion of all pressure ulcer categories/stages preconized by international guidelines.
- The Skin Assessment Tool could be optimised in order to record different wounds of different aetiologies.
- The Skin Assessment Tool template should have a place to describe/identify the anatomical location "others" and/or the wound aetiologies.
- The pressure ulcer assessment could be improved with the implementation of a validated tool to monitor pressure ulcers characteristics and their evolution during the length of stay.
- The nutritional assessment could be improved with the implementation of a validated tool to monitor the nutritional status during the length of stay. The international guidelines for pressure ulcer prevention and treatment proposed the application of a nutritional risk assessment tool that besides documentation of food and fluid intakes should include anthropometrics evaluations and (ideally) biochemical data.
- Clinical practice should be based on scientific evidence. The documentation of nursing assessment, nursing interventions and nursing outcomes is essential to promote the evidence-based nursing, compare data between services and/or between different periods.
- The systematic pressure ulcer risk assessment and the systematic skin and tissue assessment should be performed since the hospital admission and should be implemented in emergency service.
- Pressure ulcer(s) problem is complex and multifactorial. So, pressure ulcer management should (also) be multidisciplinary. Each Science offers different "points of view" of the magnitude of pressure ulcers problem and provides different theoretical contributions and different technical skills to reduce (and ideally) solve it.
- The undergraduate and graduate students are key elements in research projects and could be the main link between the universities and the health care institutions.
- The clinical nurses are vital to the success of any clinical research. They know their institutional reality and should be involved in the clinical research process.
- This study could (and should) be replicated in different care settings like intensive care units, long-term care units and/or nursing homes.
- The results could (and should) be analysed by the Hospital Council Board and could justify the acquisition of supporting surfaces, assistive equipment, repositioning equipment, prophylactic dressings and/or the improvement of nurse-to-patient staffing ratios.
- The results could (and should) be analysed and discussed in a multidisciplinary way in order to improve clinical practice and patients' outcomes.

• The upgrade and/or the implementation of new assessment tools should be preceded by a training period and followed by continuous education and periodic audits to identify and correct possible problems and optimise the entire process.
• The interaction between the hospital and other care settings and/or home care is essential to improve continuous care. The informal caregivers and the patients themselves are key elements on that empowerment process.
• Universities and health care institutions should work together to promote the bidirectional link between theory and practice; to find answers to clinical problems; to create relations between clinical research and clinical practice; and to involve undergraduate and graduate students in research projects.

Conclusion

In our studies, approximately one third of all participants had high risk of pressure ulcer development at admission in inpatient setting. The Braden Scale scores significantly increased in the last assessments showing that Braden Scale was sensitive to patient clinical changes during the length of inpatient stay. Although the prevalence and incidence rates were lower than the ones reported in previous national surveys, they followed the trend of current international studies. The presence of a pressure ulcer at the first skin and tissue assessment could be an important measure of frailty. The participants with pressure ulcer(s) commonly had more than one documented pressure ulcer and highest odds of developing a new one during the length of inpatient stay. The first week of inpatient stay was a critical period for the development of pressure ulcer(s). The lack of ability to change and control body position was the major risk factor for pressure ulcer development during the length of stay independently of the total Braden Scale score. The awareness of the existence of modifiable and non-modifiable risk factors (and the influence of each Braden subscale) could contribute to improve nursing care and patients' outcomes. A previous national survey[17] concluded that most pressure ulcers could be avoided if the preventive measures were implemented based on (the best) scientific evidence. We believe that our results were important to improve the knowledge on the magnitude of pressure ulcers problem in general wards (based on our own reality) and have provided important implications to clinical practice, clinical research, clinical management and continuous education.

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