



ORIGINAL

Predictive validity and reliability of the Braden scale for risk assessment of pressure ulcers in an intensive care unit[☆]

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KEYWORDS

Incidence;
Pressure ulcers;
Braden scale;
Reliability;
Predictive validity;
Intensive care units

Abstract

Objective: Contribution to validation of the Braden scale in patients admitted to the ICU, based on an analysis of its reliability and predictive validity.

Design: An analytical, observational, longitudinal prospective study was carried out.

Setting: Intensive Care Unit, Hospital Virgen del Rocío, Seville (Spain).

Patients: Patients aged 18 years or older and admitted for over 24 h to the ICU were included. Patients with pressure ulcers upon admission were excluded. A total of 335 patients were enrolled in two study periods of one month each.

Interventions: None.

Variables of interest: The presence of grade I–IV pressure ulcers was regarded as the main or dependent variable. Three categories were considered (demographic, clinical and prognostic) for the remaining variables.

Results: The incidence of patients who developed pressure ulcers was 8.1%. The proportion of grade I and II pressure ulcer was 40.6% and 59.4% respectively, highlighting the sacrum as the most frequently affected location. Cronbach's alpha coefficient in the assessments considered indicated good to moderate reliability. In the three evaluations made, a cutoff point of 12 was presented as optimal in the assessment of the first and second days of admission. In relation to the assessment of the day with minimum score, the optimal cutoff point was 10.

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PALABRAS CLAVE

Incidencia;
Úlceras por presión;
Escala de Braden;
Fiabilidad;
Validez predictiva;
Unidad de cuidados
intensivos

Conclusions: The Braden scale shows insufficient predictive validity and poor precision for cutoff points of both 18 and 16, which are those accepted in the different clinical scenarios.
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Validez predictiva y fiabilidad de la escala de Braden para valoración del riesgo de úlceras por presión en una unidad de cuidados intensivos

Resumen

Objetivo: Contribuir a la validación de la escala de Braden en el paciente ingresado en la UCI mediante un análisis de su fiabilidad y validez predictiva.

Diseño: Analítico, observacional, longitudinal y prospectivo.

Ámbito: Unidad de Cuidados Intensivos del Hospital Virgen del Rocío (Sevilla).

Pacientes: Se incluyeron los pacientes de 18 años o más que permanecieron ingresados en la unidad durante más de 24 h. Fueron excluidos los pacientes que presentaron úlceras por presión al ingreso. En total, 335 pacientes fueron incluidos durante dos períodos de estudio de un mes de duración cada uno de ellos.

Intervenciones: Ninguna.

Variables de interés principales: Como variable principal se consideró la aparición de UPP en estadios del I al IV. Para el resto de variables se tomaron 3 categorías: demográficas, clínicas y de pronóstico.

Resultados: La incidencia de pacientes que desarrollaron úlceras por presión fue del 8,1%. Un 40,6% han sido de estadio I y un 59,4% de estadio II, destacando el sacro como localización más frecuente. El valor del coeficiente alfa de Cronbach en las valoraciones consideradas ha indicado una fiabilidad de buena a moderada. En las 3 valoraciones realizadas un punto de corte de 12 se presentó como óptimo en la valoración del primer y segundo días de ingreso. En relación a la valoración del día con puntuación mínima, el punto de corte óptimo fue 10.

Conclusiones: La escala de Braden muestra una insuficiente validez predictiva y pobre precisión tanto para un punto de corte de 18 como de 16, que son los aceptados en los distintos escenarios clínicos.

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Introduction

Patients admitted to the Intensive Care Unit (ICU) usually present the failure of one or more organs or systems, or even multiorgan failure (MOF), and often require life support measures such as mechanical ventilation, continuous sedation, vasoactive medication and a range of devices including catheter, drains and tubes, as well as immobilization. Such measures have a significant negative impact upon one of the main mechanisms for preserving skin integrity—mobility—leaving patients highly vulnerable to the development of pressure ulcers (PUs).^{1,2} In this regard, although PUs can be found in many healthcare settings, they are particularly relevant in the ICU, with incidences ranging widely between 3.3% and 52.9%.^{3,4} Pressure ulcers are not recognized as an actual cause of mortality during hospital admission, though they are associated to both mortality and to other complications in patient recovery, with an increased risk of infection, in-hospital malnutrition, prolonged stay, increased nursing care burden, and healthcare cost increments.⁵

The identification of patients at risk is essential for the correct implementation of preventive programs and

adequate resource utilization. In this regard, different risk assessment scales have been developed with the aim of helping healthcare professionals to identify individual risks for the development of PUs.⁶

A risk assessment scale should be able to distinguish between patients with and without a risk of suffering PUs. Validated risk assessment tools are recommended, in this respect, though it is not clear which tool is best suited to a concrete healthcare setting.⁷

At present, only 7 scales have been validated for use in the ICU. Three of them have been specifically developed for application in critical patients (Cubbin–Jackson, Norton Mod. Bienstein and Jackson–Cubbin), while the remaining four are of a more general nature (Norton, Waterlow, Braden and Braden Mod Song–Choi).⁸

The greatest efforts to analyze the risk factors underlying PUs have undoubtedly been made by Barbara Braden and Nancy Bergstrom, who were the first (and to date the only) authors to develop a conceptual map of the development of PUs. The Braden scale was developed in 1985 in the United States, in the context of a research project in sociosanitary centers, with the aim of resolving some of the limitations of the Norton scale. The authors developed their scale based on

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