

# Linking the Braden Scale to the International Classification of Functioning, Disability and Health.

Relação entre a Escala de Braden e a Classificação Internacional de Funcionalidade, Incapacidade e Saúde (CIF).

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## Abstract

**Introduction:** Pressure ulcers (PU) are defined as an injury to the skin and / or underlying tissue, resulting of pressure or combination of pressure and torsional strength. Its occurrence can be prevented by establishing protocols with risk assessment and preventive measures. The Braden Scale is a tool for assessing risk of developing PU. The International Classification of Functioning, Disability and Health (ICF), in turn, provides a scientific basis for the study of health and conditions related to it, as well as be used to guide the creation and the use of outcome measures in rehabilitation.

**Objective:** To relate the contents of the Braden Scale with the contents of ICF. **Method:** The present study was exploratory descriptive. The content of the Braden Scale was linked to the content of the ICF, using rules proposed in the literature. Four health professionals participated in the linking process. **Results:** Twenty-nine meaningful concepts were identified in the Braden Scale. From this total, 21 were linked to 17 ICF categories, 6 were classified as nd (not definable) and 2 were classified as nc (not covered by ICF). None of the significant concepts of the Braden Scale was related to some category of the component Body Structures of ICF. **Conclusion:** The content of the Braden Scale showed a moderate convergence with the contents of the ICF, being possible to consider that this scale is within the biopsychosocial model of health. These results place the Braden Scale as a possible tool to be used to assist in the implementation of the ICF in patients at risk of developing PU.

**Keywords:** Pressure ulcer; International Classification of Functioning, Disability and Health; Health status.

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## Resumo

**Introdução:** Define-se úlcera por pressão (UP) como lesão na pele e/ou no tecido subjacente, resultante da pressão ou da combinação de pressão e força de torção. Sua ocorrência pode ser evitada pelo estabelecimento de protocolos com avaliação de risco e medidas preventivas. A Escala de Braden é um instrumento de avaliação de risco para desenvolver UP. A Classificação Internacional de Funcionalidade, Incapacidade e Saúde (CIF), por sua vez, proporciona uma base científica para o estudo da saúde e das condições relacionadas a ela, podendo ser utilizada para nortear a criação e a utilização de medidas de desfecho em reabilitação. **Objetivo:** Relacionar o conteúdo da Escala de Braden ao conteúdo da CIF. **Método:** Em um estudo exploratório descritivo relacionou-se o conteúdo da Escala de Braden ao conteúdo da CIF, utilizando regras de ligação propostas na literatura. Esse processo foi efetuado por quatro profissionais da saúde. **Resultados:** Foram identificados 29 conceitos significativos na Escala de Braden. Desse total, 21 foram relacionados a 17 categorias CIF, 6 foram classificados como nd (não definível) e 2 foram classificados como nc (não coberto pela CIF). Nenhum dos conceitos significativos da Escala de Braden foi relacionado a alguma categoria do componente Estruturas do Corpo da CIF. **Conclusão:** O conteúdo da Escala de Braden apresentou uma convergência moderada com o conteúdo da CIF, sendo possível considerar que essa escala se insere no modelo biopsicossocial de saúde. Estes resultados colocam a Escala de Braden como um possível instrumento a ser utilizado para auxiliar na aplicação da CIF em pacientes com risco de desenvolver UP.

**Palavras-chave:** Úlcera por pressão; Classificação Internacional de Funcionalidade, Incapacidade e Saúde; Nível de saúde.

## INTRODUCTION

Internationally, pressure ulcer (PU) is defined as skin injury and/or on the underlying tissue, resulting from the pressure or the combination of pressure and torsional forces, which generally occurs over bone prominence.<sup>(1)</sup> In most cases, this clinical picture is preventable, which makes the establishment of protocols with risk assessment and basic preventive measures.<sup>(2)</sup>

Risk factors for developing infections are the same factors that constitute risk for the development of PU in individuals with spinal cord injury. Among them, we can mention excessive moisture in place for sweating, incontinence or exudation, immobility, which hinders adequate local infusion and migration of immune cells, and altered sensitivity, which prevents the perception and correction of the described items.<sup>(3)</sup>

The risk assessment for PU development can take place through the predictive scales. Among these scales, are the Norton Scale, the Waterlow Scale, the Braden Scale, among others, the latter being one of the most used and tested.<sup>(2)</sup>

Despite the magnitude of the data obtained from the Braden Scale is also important to know the impact of PU in the patient's daily life, which can be enabled by the International Classification of Functioning, Disability and Health (ICF). According to the World Health Organization (WHO)<sup>(4)</sup> (p. 7), ICF aims "[...] to provide a unified standard language as a framework for describing the health and related health conditions."

ICF belongs to the Family of International Classifications of the World Health Organization (WHO-FIC). The WHO-FIC is a set of product classifications approved by the WHO, which can be used in an integrated way to compare health

information.<sup>(5)</sup> The WHO\_FIC's objective is to assist the development of reliable statistical systems at the regional level, national and international, in order to improve the conditions and health care.<sup>(5)</sup>

The prospect of ICF addresses health from the biopsychosocial model, where levels act on each other and are all influenced by environmental factors.<sup>(6)</sup> This is a multidimensional, multidirectional and dynamic models.<sup>(7)</sup>

ICF apply to different contexts (individual, institutional and social) and purposes (ie, economic analysis, planning and policy development, research, etc.).<sup>(8)</sup> Thus, the use of ICF is being disseminated worldwide.

Studies show the insertion stage of that classification in Brazil. Ruaro et al.<sup>(9)</sup> state that their use, although increasing, is incipient in the Brazilian scientific community. Castaneda and Castro<sup>(10)</sup> add that the number of publications on this classification is small especially compared to European countries.

Still, apparently the use of ICF is being consolidated in Brazil.<sup>(11)</sup> According to Santos et al.<sup>(12)</sup>, the progress of this panorama demand that ICF guide the redesign of many social aspects, including procedures and instruments evaluation.

Among the health sciences that apply the classification in question is nursing. In this area, ICF can be used, for example, in the diagnosis and rehabilitation, favoring a comprehensive assessment of the functionality.<sup>(12)</sup> Therefore, such classification is useful within the PU, given that PU is a recurring problem in services health and generates negative consequences for both the individual and the institution.

Cieza et al.<sup>(13)</sup> have developed binding rules to relate clinical measures, techniques, interventions and health

conditions to ICF. Studies<sup>(14-16)</sup> have applied these binding rules to compare the contents of assessment tools and content of the ICF.

Then, list the contents of the Braden Scale the contents of CIF will expand the knowledge about the scope of this predictive scale in terms of functionality and the patient's disability, in addition to guiding the PU prevention planning from the biopsychosocial perspective of ICF.

## METHODS

This study was exploratory and descriptive. The Braden Scale consists of the following subscales: Sensory Perception, humidity, activity, mobility, nutrition and friction and shear. The subscales Sensory Perception, Activity and Mobility evaluate pressure exposure causes, while the subscales humidity, nutrition and friction and shear assess tissue tolerance to pressure.<sup>(17)</sup>

The friction and shear subscale is scored from 1 to 3 and the other subscales were scored from 1 to 4, so that the total score ranges from 6 to 23, indicating high risk (score  $\leq 16$ ) and low risk (score  $\geq 17$ ). Lower mean scores poor functional capacity and hence a high risk of developing PU.<sup>(18)</sup>

The ICF, in turn, is divided into two parts (Functionality and Disability; Contextual Factors) and each part is divided into two components (Body Functions and Body Structures, Activities and Participation, Environmental Factors, Personal Factors). Each component contains multiple domains and each domain contains various categories (classification units).

Briefly, ICF classifies health and health-related states through codes of categories plus qualifiers, which specify the size of the functionality of or inability in that category or specify how an environmental factor is a facilitator or barrier.<sup>(4)</sup>

The relationship between the content of the Braden Scale and content of the ICF was conducted using the 8 binding rules developed by Cieza et al.<sup>(13)</sup> As these binding rules, every significant concept of an instrument must be connected to the ICF category to represent more precisely.<sup>(13)</sup>

The significant concepts that provide insufficient information to support the choice of the most representative ICF category should be classified as nd (not definable) and, in special cases, nd-gh (not definable - general health), nd-ph (not definable - physical health), na-mh (not definable - mental health) or na-ql (not definable - quality of life) 13. The significant concepts that are not in the ICF, but are personal factors, attributed to pf (personal factors), while the significant concepts that are not contained in the ICF and are not personal factors attributed to nc (not covered by the ICF).<sup>(13)</sup> The significant

concepts that relate to a diagnosis or medical condition to be classified as a hs (health status).<sup>(13)</sup>

The establishment of the relationship between the content of the instruments took place in four stages, performed by four health professionals. Initially, the significant concepts of the Braden Scale were identified by a psychologist. Then the result of that first moment was checked by a nurse, which also contextualized the application of significant concepts identified in nursing practice in order to eliminate possible conceptual confusion. Subsequently, the most representative of ICF categories were selected by a psychologist. Finally, the result of this third moment was verified by two physical therapists and discussed the four health professionals involved. All professionals in their respective fields, were familiar with the ICF.

It is important to clarify that the identification of significant concepts of the Braden Scale considered both the content of the subscales as the content of the response options. The response options are considered when they have concepts beyond those contained in the corresponding items.<sup>(14)</sup>

## RESULTS

We identified 29 significant concepts in the Braden Scale. Of this total, 21 (72.4%) were related to 17 ICF categories, 6 categories of the body Functions component, 10 categories of the Activities and Participation component and 1 category of Environmental Factors component.

Among the categories of the Body Functions component, 3 belong to Chapter 1 - Mental functions, 1 to Chapter 2 - Sensory functions and pain, 1 to Chapter 7 - neuromusculoskeletal functions and related to the motion and 1 to Chapter 8 - Functions of the skin and related structures. Among the categories of Activities and Participation component, the first part of Chapter 3 - Communication, while the other 9 are part of Chapter 4 - Mobility. In turn, the only category of Environmental Factors component belongs to Chapter 5 - services, systems and policies.

The relationship between the 21 significant concepts of the Braden Scale and the 17 ICF categories is set out in Table 1.

You can highlight that among the 17 ICF categories, 9 (52.9%) belong to Chapter 4 - Mobility inserted into the Activities and Participation component. It is observed that none of the significant concepts of the Braden Scale was related to some category of ICF Body Structures component.

For the other 8 (27.5%) significant concepts of the Braden Scale, which were not related to ICF categories, 6 were classified as nd (not definable) and 2 as nc (not covered by CIF), as Table 2.

**Table 1.** Relationship between the significant concepts of the Braden Scale and the ICF categories.

COMPONENTS	CHAPTERS	CATEGORIES	SIGNIFICANT CONCEPTS	
Body function	1 – Mental functions	b1470 psychomotor control	Agitation	
		b1564 tactile perception	Sensory impairment which limits the ability to feel pain or discomfort	
		b1671 Expression Language	Ability to communicate discomfort Moan Ability to express the need to change position	
	2 - Sensory functions and pain	b2703 Sensitivity to noxious stimuli	Ability to respond to discomfort Ability to react to painful stimuli Ability to feel pain	
	7 - Neuromusculoskeletal functions and related movement	b770 Tasks related to gait pattern	Walking ability	
	8 – Skin function and related structures	b810 Protective functions of the skin	Skin friction	
	Activities and participation	3 - Comunication	d310 Communicate and receive oral messages	Ability to respond to verbal commands
		4 – Mobility	d410 Change the basic body position	Ability to change the position of the body
d4103 Sit down			Ability to sit	
d4104 Put yourself in the foot			Stand up	
d4150 lie down			Ability to remain well positioned in bed	
d4153 remain seated			Ability to remain well positioned in the chair	
d4154 Remain standing			Ability to sustain its own weight	
d420 Auto transfers			Moving	
d4201 Auto transfer in the lying position		Confinement to bed		
d4500 Walking short distances	Walking short distances			
Ambiental Factors	5 - Services, systems and policies	e5800 Health-related services	Bed linen change	

**Table 2.** Relationship between the significant concepts of the Braden Scale and other assignments proposed by Cieza et al.<sup>(13)</sup>

SIGNIFICANT CONCEPTS	OTHER ATRIBUTIONS
Sensory impairment which limits the ability to verbalize pain or discomfort	nd
Level of physical activity	nd
Stay in bed	nd
Staying in the chair	nd
Eat	nd
Drink	nd
Moisture content of skin exposure	nc
Food consumption	nc

## DISCUSSION

In general, the content of the Braden Scale might be related to the content of the ICF, as 21 of the 29 significant concepts identified in the Braden Scale were correlated to 17 ICF categories. Therefore, in addition to assessing the risk of PU development, the Braden Scale can promote awareness of the functionality and the patient's disability and thus assist the planning of PU prevention.

Whereas, among the 17 of ICF categories, 9 belong to Chapter 4 - Mobility of the Activities and Participation component, it is possible to deduce the importance of this dimension of functionality for the treatment of patients who are at risk of being affected by PU. These 9 categories of ICF were selected because they are the most representative of the most significant concepts of items Activity, Mobility and Friction and Shear of

the Braden Scale. In a study that analyzed data from 1503 patients from the risk of PU development, identified the limitation of activity as the factor with the greatest strength of association with the PU outcome, followed by mobility limitation.<sup>(19)</sup> These data support the results of this study. Moreover, examining data from six other studies on the prevalence of PU in 17666 residents of 234 long-stay institutions in Germany, researchers found the Friction and Shear item as the main indicator PU.<sup>(20)</sup> These findings reinforce the importance of considering the mobility, as proposed by the ICF, for the treatment of cases of risk of involvement by PU.

In addition, it can be inferred that the Braden Scale is not limited to strictly physiological functional, also considering activities execution aspects and involvement in everyday situations consistent with the biopsychosocial model of ICF.

Considering that none of the significant concepts of the Braden Scale was related to some category of the ICF component of Body Structures, should be emphasized that the predictive scales are parameters to be used in conjunction with clinical assessment of the nurse<sup>(21)</sup> to report on the condition of these structures. It is also worth mentioning that despite the clinical evaluation and prescription skin care are the nursing field, the work of a multidisciplinary team is critical to the prevention of PU, since the competencies and skills of other professionals can come to be required.<sup>(21)</sup>

As presented in the previous section, 8 significant concepts of the Braden Scale were not related to ICF categories. The concepts sensory impairment which limits the ability to verbalize pain or discomfort, degree of physical activity, stay in bed, stay in the chair, eating and drinking were classified as nd (not definable) and the concepts degree of skin exposure to moisture and consumption food were classified as nc (not covered by the ICF).

The fact that only one of the 17 categories of the ICF to be part of the Environmental Factors component can be understood as a limitation of the Braden Scale as they often care for prevention and treatment of PU are not executed due to accessibility and usability limitations contemplated in environmental field. Proper planning in public services, the supply of materials for home care and effective self-care can impact positively in response to the real needs of the user at risk of developing PU.<sup>(22)</sup> The ICF recognizes the environment (physical, social and attitudinal) as a the determinants of Functioning, disability and health of the individual.<sup>(4,6)</sup> As regards the prevention of PU, the environment is an impact factor, given that such prevention has been considered both an indicator of quality of service health as an indicator of nursing care quality.<sup>(17)</sup>

## CONCLUSION

The content of the Braden Scale has attributes related to the content of the ICF, having shown a moderate convergence with the biopsychosocial model of health. These results place the Braden scale as a possible tool to be used to assist in the implementation of the ICF in patients at risk of developing PU.

However, it can be considered as a limitation of predictive scale in question, the fact that a single meaningful concept report on environmental factors.

Importantly, the Braden Scale is only an instrument in the PU prevention context, to which must be added other sources of information, for example, clinical findings and results of additional tests.

Finally, it is proposed to verify the clinical applicability of the results of this study and also to carry out studies that relate the content of other predictive scales with the content of the ICF in order to provide scientific support to health professionals selecting the most appropriate instruments their practices and research related to the PU.

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