Profile of people with pressure injury in rehabilitation: relationship between braden and functional dependence

Perfil das pessoas com lesão por pressão na reabilitação: relação entre braden e dependência funcional

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RESUMO

O objetivo deste estudo foi traçar o perfil das pessoas com lesão por pressão atendidas em um Centro Estadual de Reabilitação na cidade de Goiânia e, avaliar a associação entre as variáveis da escala de Medida de Independência Funcional e escala de Braden. Trata-se de um estudo transversal, descritivo, com abordagem quantitativa. Foram entrevistadas 54 pessoas, das quais houve predominância do sexo masculino, idade adulto-jovem, baixo nível de escolaridade e baixa renda familiar. Os diagnósticos mais relevantes, foram traumatismo raquimedular, seguido de acidente vascular cerebral, sendo tetraplegia a sequela mais dominante. De acordo com a escala de Medida de Independência Funcional houve maior ênfase na dependência total para o domínio motor, e conforme a escala de Braden a maioria apresentaram alto risco de desenvolver Lesão pro Pressão, foi confirmado uma correlação positiva e moderada entre essas escalas, sendo que a dependência funcional pode ser um dos preditores do risco de desenvolver Lesão pro Pressão. Podemos concluir que reconhecer características da população assistida favorece um melhor planejamento das ações preventivas e que ampliar as formas de diagnóstico precoce do risco de desenvolver lesão por pressão, contribui para o trabalho interdisciplinar, garantindo melhor qualidade de vida ao paciente.

Palavras chave: Lesão por Pressão. Doenças do Sistema Nervoso. Centros de Reabilitação

ABSTRACT

The objective of this study was to trace the profile of people with pressure injuries treated at a State Rehabilitation Center in the city of Goiânia and to evaluate the association between the variables of the Functional Independence Measure and Braden scale. It is a cross-sectional, descriptive study with a quantitative approach. Fifty-four people were interviewed, of which there was a predominance of males, young adult age, low educational level and low family income. The most relevant diagnoses were spindle trauma, followed by stroke, with tetraplegia being the most dominant sequel. According to the Functional Independence Measure scale, there was greater emphasis on total motor domain dependence, and according to the Braden scale most were at high risk of developing Pro-Pressure Injury, a positive and moderate correlation was confirmed between these scales, being that functional dependence may be one of the predictors of the risk of developing Pro-Pressure Injury. We can conclude that recognizing characteristics of the assisted population favors a better planning of preventive actions and that expanding the early diagnosis of the risk of developing pressure injury contributes to the interdisciplinary work, guaranteeing a better quality of life for the patient.

Keywords: Pressure Injury. Nervous System Diseases. Rehabilitation Centers

NOTA

[1] Falta, falta, falta, falta.....

INTRODUCTION

Pressure Injury (LPP) is still one of the main complications in patients with neurological sequelae, even though it may be preventative. It is capable of developing negative physical and emotional repercussions of great impact on the social life of the individual, besides harming the process of rehabilitation, increase length of stay in hospital and also increase the risk to infection, increasing the mortality rate[1].

The Specialized Center in Rehabilitation (CER) is a hospital environment with care directed to the great incapacitated, and the institution under study offers services exclusively through the Unified Health System (SUS), being recognized by the Ministry of Health (MS) as CER IV , for serving people with physical, hearing, visual and intellectual disabilities.

Among the neurological lesions that affect the central and peripheral nervous system, we highlight some potentially disabling factors for directly altering physical mobility with individuals, such as Cranioencephalic Trauma (TCE) and Spinal Cord Trauma (TRM), currently occupy the first places in the Brazilian classification of trauma , commonly resulting from auto accidents that affect mostly young people in good health[2].

The degree of physical limitation directly reflects the individual's level of inability to perform activities of daily living, generally impaired mobility is at greater risk of developing LPP. In addition to bladder and bowel alterations, characterized by bladder and / or neurogenic intestine, responsible for the increase of humidity in the perineal regions through involuntary diaper loss, which also favor the development of dermatitis and cutaneous lesions[3].

To evaluate functional dependence, we can use the Functional Independence Measure (MIF) scale, which evaluates 18 basic tasks essential to the daily routine, grouped in tasks of self-care, transfers, sphincter control, locomotion and cognitive abilities, thus, each evaluated topic receives a score that varies from one to seven, according to the degree of help that the individual needs to complete the activity, one means full help and seven, complete independence[3].

Its resulting score can be classified as low dependency, ranging from 80 to 126, moderate dependence with score of 37 to 79 and complete dependence with results from 18 to 36. Each class may correspond to the need for care described in hours, with the equivalent low up to two hours; to moderate between three and six hours and to discharge more than seven hours of intermittent care[3-4].

Highlighting that LPP is one of the main complications for patients who are bedridden or who have impaired mobility and this is a preventable complication, the use of an instrument or scale for risk assessment is essential in the early detection of predisposing factors[5].

Another scale that can be used is the Braden scale, which allows an integrative assessment of the risk factors for LPP development, including changes in mobility, sensory perception and activity, nutrition, moisture and friction, and shear. Each subscale can be scored from one to four, except the one of friction and shear that can be punctuated from one to three. The sum of the subscores will result in values ranging from six to twenty-three, is commonly divided according to the level of exposure at low risk, referring to scores between 15 and 18, moderate risk that covers scores between 13 and 14, high risk indicated by scores between 10 and 12 and very high risk when the result is less than nine[5].

In view of the above, a guiding question arises: Even if it is possible for preventive actions, why are pressure injuries still frequent in the hospital setting? To know sociodemographic characteristics and to increase the availability of evaluation scales would contribute to the early diagnosis?

Thus, the objective of the study was to identify the profile of people with LPP, who were treated at a rehabilitation center, providing an amplification of the clinical perspective and early recognition of those persons at greater risk of developing new LPP or their likelihood of worsening. Considering that the forms of prevention are the responsibility of all the interdisciplinary team and seeking to increase the early identification of the risk of developing LPP, it also aimed to test the possibility of predicting the risk of developing LPP through the application of the MIF scale in relation to the Braden scale.

METHOD

This is a cross-sectional, descriptive study with a quantitative approach, carried out at the State Center for Rehabilitation Dr. Henrique Santillo (CRER) in the city of Goiânia. A total of 54 patients older than 18 years, who had at least one pressure lesion and who were being treated during the study period, were interviewed. The mode of selection of the participants followed non-probabilistic sampling, of the type for accessibility and / or convenience.

The data collection was done through an interview, using a semistructured questionnaire, prepared by the researchers. The first and second part of the questionnaire included independent socio-demographic variables. The third part included dependent variables such as: presence of systemic arterial hypertension (SAH) and diabetes mellitus (DM) morbidities, medical diagnosis, time of neurological injury, functional capacity according to the MIF scale; anthropometric data such as height and weight; risk of developing LPP through the Braden scale, quantity and time of LPP, and the use

of support surfaces for body weight distribution and nutritional supplementation, and data complemented with electronic chart analysis, when necessary.

The data collection period was from September to November 2017, after approval by the Ethics Committee under the number 2,328,822 of the Committee of Ethics in Research of the Hospital Alberto Rassi (HGG). After data collection was completed, the data were transcribed by a single researcher, in an Excel for Windows spreadsheet, and statistically analyzed by Statistical Package for Social Science (SPSS) version 24.0. First, a descriptive analysis of the variables was performed, and the results presented in tables counting absolute and percentage frequency, some data were expressed in mean and standard deviation. For the correlation between the time variables of neurological lesion and LPP stage, the Spearman test was applied. In order to test the association between the Braden scale and the MIF scale, a simple linear regression test was performed in conjunction with the Pearson correlation, evaluating the predictive value among the variables, considering a value of $p < 0.05$ for that the sample is statistically significant.

To construct the theoretical discussion of the subject matter, it was decided to privilege scientific dissemination journals consulted in the VHL, Scielo and Pubmed using the descriptors in question, prioritizing periodicals published in the last ten years.

RESULTS

A total of 54 individuals who had impaired skin integrity and had at least one pressure lesion were interviewed. The socio-demographic data found are described in Table 1.

Of the 54 participants, 46% lived in the interior of the state of Goiás, remaining in the municipality of Goiânia only for rehabilitation treatment. As for marital status, 44.4% were single, 24.1% were married, 14.8% were widowers, 11.1% were divorced and 5.6% had a stable union.

Regarding the origin of the financial resources of the family, 39% of the participants were retired, 39% received sickness benefit until analysis of the social security service and 22% were unemployed, that is, depended on the help of family and friends.

Regarding the morbidities, 61.1% of them reported having had hypertension and DM, 18.5% reported having both morbidities together, 14.8% were hypertensive and 5.6% had diabetes mellitus. In the sample, BMI values between 33.5 and 11.5 were observed, with a mean of 23.0 (standard deviation ± 4.45). When we classified the data according to the weight, we found that 53.7% had normal weight, 20.4% were pre-obese, 13% were underweight, 7.4% were obese and 5.6% were overweight.

Regarding the level of functional dependence according to the MIF scale, the following results were found in table 2.

Dividing the motor IMF scale, we found an average score of 34.6 (standard deviation ± 26.8), and 31.4% of the participants presented complete motor dependence. For cognitive MIF, we showed mean values of 24.3 (standard deviation ± 12.6), the majority with 48.1% showed totally independent for cognitive needs.

TABLE 1 – Distribution of socio-demographic data of health users. State Center for Rehabilitation Dr. Henrique Santillo, Goiânia, Goiás, 2017 (N = 54)

Variables	F	%
Gender		
Male	38	70,4
Female	16	29,6
Age		
Adolescence (18-21)	5	9,3
Adult (22-64)	35	64,8
Elderly (>65)	14	25,9
Schooling		
Illiterate / elementary school incomplete	26	48,1
Complete primary education	15	27,8
Complete high school	8	14,8
Full Higher Education	5	9,3
Economic class		
B3	3	5,6
C1	9	16,7
C2	9	16,7
D / E (up to one minimim wage)	33	61,1

Source: survey data, 2017

Variáve
Sexo
Mas
Fem
Idade
Adole
Adult
Idoso
Escolar
Analf
Ensin
Ensin
Ensin
Classe
B3
C1
C2
D / E

Fonte: da

By the limitation of functional capacity, 59.3% lived with spouses, when they had children, and 35.2% still lived with their parents, revealing an audience of young and old caregivers, remaining 5.6% who lived alone.

Table 3 below presents data on neurological lesions, complementing information on the functional dependence of the individual victim of motor and sensory sequelae.

Among the 54 participants in the study, a total of 110 LPP were reported, and the anatomical sites and stages of the lesions are described in table 4 below.

Of the 110 LPPs, 28% were acquired at the rehabilitation institution where the research was conducted, of which 64% were in semi-intensive care. The remainder of LPP corresponding to 72% were acquired before the patient started treatment at the rehabilitation center, being admitted with previous LPP.

Regarding the time that the individual remains in LPP treatment, we observed that 44.4% treated LPP for three months, 39.6% for more than one year, 14.8% between seven months to one year and 11.1% from four to six months.

We can confirm using the Spearman test that there is a positive and moderate correlation between the time of neurological injury and the LPP stage ($\rho = 0.462$; $p < 0.05$), that is, the longer an individual presents a neurological sequel, the worst tends to be the stage of an existing LPP, according to table 5.

Analyzing the risk of developing LPP through the Braden scale, we show the following results pointed out in table 6.

Among the interviewees, 61.1% reported using a pyramidal mattress at home, 17.1% had a pneumatic mattress, and 14.8% said they did not use any support surface that allows the distribution of body weight. Regarding the use of protein supplement to assist in the healing process, 81.5% claimed not to use and were not followed up with a nutritionist.

Pearson's correlation showed a positive and moderate relationship between MIF and Braden scales. Simple linear regression confirmed the hypothesis that the FIM scale is a predictor of the Braden scale for the degree of risk of developing LPP, justifying around 32% of the sample, [$F(1,52) = 25,440$, $p < 0.001$; $R^2 = 0,329$], with absence of self-correlation evidenced by the Durbin-Watson value of 2,094. We can arrive at the Braden scale score by applying the score resulting from the MIF scale in the following formula: Braden = 11.219 + 0.039. (MIF scale).

TABLE 2 – Distribution of data regarding functional dependence according to the MIF scale. State Center for Rehabilitation Dr. Henrique Santillo, Goiânia, Goiás, 2017 (N = 54)

Variables	F	%
High functional dependence	23	43
Moderate functional dependency	17	31
Low functional dependence	14	26

Source: survey data, 2017

TABLE 3 – Distribution of data related to the diagnosis of neurological injury of health users. State Center for Rehabilitation Dr. Henrique Santillo, Goiânia, Goiás, 2017 (N = 54)

Variables	F	%
Medical diagnostic		
Spinal cord trauma	26	48,1
Stroke	20	37,0
Cranioencephalic trauma	5	9,3
Hypoxia Encephalopathy	2	3,7
Myelomeningocele	1	1,9
Neurological injury time		
Up to 3 months	13	24,1
4 months to 6 months	8	14,8
7 months to 1 year	8	14,8
over 1 year	25	46,3
After-effects		
Tetraplegia	20	37,0
Paraplegia	14	25,9
Hemiplegia D	8	14,8
Hemiplegia E	7	13,0
Tetraparesia	5	9,3

Source: survey data, 2017

TABLE 4 – Distribution of data regarding the characteristics of pressure injuries. State Center for Rehabilitation Dr. Henrique Santillo, Goiânia, Goiás, 2017 (N = 110)

Variables	F	%
Anatomical sites of LPP		
Sacral	37	33,6
Trochanter	26	23,6
Calcaneus	17	15,5
Ísquio	9	8,2
Malleolus	5	4,5
Others	5	4,5
Buttock	4	3,6
Occipital	2	1,8
Elbow	2	1,8
Shoulder blade	2	1,8
Interglúteo	1	0,9
Stages of the LPP		
Stage 2	13	11,8
Stage 3	36	32,7
Stage 4	37	33,6
Not classifiable	24	21,8

Source: survey data, 2017

TABLE 5 – Spearman's test - Correlation between time of neurological injury and stage of pressure injury. State Center for Rehabilitation Dr. Henrique Santillo, Goiânia, Goiás, 2017

			Neurological injury time (months)	Stress of pressure injury
Spearman's Rho	Neurological injury time (months)	Correlation Coefficient	1,000	,462**
		Mon (bilateral)	.	,000
		N	54	54
	Stress of pressure injury	Correlation Coefficient	,462**	1,000
		Mon (bilateral)	,000	.
		N	54	54

**. The correlation is significant at the 0.01 level (bilateral)

Source: survey data, 2017

TABLE 6 – Distribution of data regarding the risk of developing pressure injury according to the Braden scale. State Center for Rehabilitation Dr. Henrique Santillo, Goiânia, Goiás, 2017 (N = 54)

Variables	F	%
Very High risk	1	1,9
High risk	20	37
Moderate risk	16	29,6
Low risk	17	31,5

Source: survey data, 2017

DISCUSSION

The prevalence of males in the adult-young age is also evident in studies with victims of Rquimedular Trauma (MRT), justified by the greater exposure to the etiological factors that are included in the daily routine of these individuals, since the prevalence of the elderly corroborates with directed studies to victims of stroke, targeting that cardiovascular diseases are closely related to increased longevity[2-6].

Predominant levels of schooling were illiterate and incomplete elementary education totaling 48.1% of the sample, as for economic class, the majority with 61.1% were in class D and E with family income of up to a minimum wage, as demonstrated in Table 1. We emphasize that low schooling together with low family income can directly affect the quality of care of people with greater functional dependence, since they require full-time care support, as well as complex material resources for health maintenance[7].

Among the 54 participants, if single, widowed and divorced individuals were added, they accounted for almost 70% of the total sample, and knowing that the hours of care required by a person can be calculated by their level of dependence, the study in question was evidenced that 42.6% needed three to six hours of daily care, demonstrating the indispensable presence of a companion / caregiver to guarantee basic needs[4].

According to Pereira et al.[8], the need for full-time care often involves few family components generating role accumulation and exposing the caregiver to physical and emotional overload, and may compromise the efficiency of care, since some actions may go unnoticed or gain less importance for caregivers, such as change of position every two hours for example, being one of the main preventive forms of LPP.

Cutaneous lesions, specifically those caused by excessive pressure, are more prevalent in people with impaired physical mobility, since the prevalence of MRE and stroke diagnoses found in the sample can be explained as a result of increased urban violence, increased life expectancy, and advances in the field of medicine, which prolongs survival of patients with serious diseases[9].

It is known that neurological lesions can cause motor, sensory and / or cognitive alterations, the studied public presented tetraplegia and paraplegia as the main developed neurological sequels, being 37.0% and 25.9%, respectively. This was a divergent result in another cross-sectional study, carried out in Maceió with victims of MRT, where there was a prevalence of the paraplegia sequel with 41.4%[9]. Revealing a greater motor impairment, since tetraplegia affects trunk, lower limbs and upper limbs, leaving the individual with greater degree of impairment in the physical mobility and consequently more susceptible to develop LPP..

Among the 54 subjects covered in the study, a total of 110 LPP were recorded, resulting in an average of two lesions for each person (standard deviation ± 1.57). Discussing the characteristics of LPP, the most prevalent anatomical regions were the sacral region 33.6%, followed by the trochanteric region 23.6% and the calcaneal region 15.5%. Among the classification of the stages of pressure injuries, we had the predominance of stages four with 33.6% and three with 32.7%, evidencing the high complexity of the lesions described in table 3.

A review of the literature focused on the prevention and treatment of pressure injury has also demonstrated the prevalence of LPP in the sacral, trochanteric and calcaneal regions, justified because they are sites of more prominent bone prominence and that remain directly in contact with the support surface in bedridden patients[10].

The use of dressings as LPP prophylaxis has been a subject of much study today, and Santamaria et al.[11] shows that the multilayer silicone foam composite cover has offered positive results in the prevention of these lesions in critically ill patients through a randomized , in an Australian hospital involving 440 patients, evidenced a 10% reduction in the incidence of LPP in the control group that received casual care associated with the use of silicone coverage in the sacral and calcaneal regions, when compared to the experimental group that received only usual care of prevention.

When discussing the stages of LPP and comparing to the results described in a study conducted by Mota et al.[12], in the same institution of this study between the period 2011 and 2012 on the quality of life in patients with LM with pressure ulcers, we observed a change in the prevalence of stages evolving to more complex tissues, with an increase of stages three and four, showing the importance of following the profile of the public served, which facilitates the recognition of new needs, besides guiding the updating of institutional protocols.

A study involving eight Dutch rehabilitation centers revealed that LPP stages three and four are characteristic of patients with chronic spinal cord injury and have already been reinserted in the community after a period of hospital rehabilitation, contributing to our study, since we have participants up to 32 years of age of neurological damage[13].

Applying a statistical test on the present sample, we can confirm with Spearman's correlation the existence of a positive and moderate correlation between the neurological injury time and the LPP stage, ($\rho = 0.462$, $p < 0.05$), that is , the longer an individual has a neurological sequela, the worse the tendency of an existing LPP, according to table 4.

Regarding the time people were on LPP treatment, values ranging from one month to eight years were found, and 44.4% reported being treated for LPP for three months and 29.6% were in the fight to find of wound healing for over a year. Staying with LPP for a long time allows the growth of multiresistant bacteria in the wound bed, raising the risk of developing bacteremia, characterized by one of the worst clinical outcomes, since it is associated with the constant use of broad-spectrum antibiotics, resulting in the need for intensive care , which can lead to death, besides generating costly expenses for the maintenance of critical patients[14].

Of the 110 pressure injuries recorded among the participants of the present study, there was a prevalence of 28% of LPP acquired in the studied institution, even though the majority of the individuals were under semi-intensive care, revealed a worrying data when compared to the American literature, which evidenced a prevalence rate between 6.2% and 13.5% through a cohort and cross-sectional study, analyzing intensive care and rehabilitation institutions for a period of ten years [15].

The prevalence of PPK after admission generates a great impact for the rehabilitation facilities, according to bibliographic data can cause direct negative repercussion to the patient, who suffers less motor gain, increase the length of stay in the hospital institution and less chance of returning to the community with good quality of life and maintenance of earnings[9].

A Spanish study aimed at evaluating the impact of the incidence and prevalence of LPP in a rehabilitation unit

found through a longitudinal analysis performed with 261 patients, an increase of 22 days of hospitalization to patients with LPP, when compared to patients with preserved tissue integrity, in addition to observing a lower tendency of these patients to achieve functional independence and a rise in the risk of developing other pressure injuries[1].

In contrast, the other 72% of the pressure injuries described in this study were previous, that is, they were acquired prior to admission to the rehabilitation center, often in emergency care and intensive care units. Patients admitted to the emergency room and transferred to the ICU are usually more exposed to risk factors that contribute to the development of a LPP, sometimes until clinical diagnosis is concluded, remain on rigid surfaces to guarantee immobilization, intensified by the degree and duration that remains in the state of hypotension, besides the use of vasoactive drugs[11]. Stressing that a prior LPP can be characterized as a clinical predictor strongly associated with the development of new LPP in victims of MRT, according to an observational cohort study, when listing risk factors associated with pressure ulcer in rehabilitation in 159 patients with spinal cord injuries, we should investing in preventive actions[16].

When considering that unalieved pressure causes compression of the tissular region and compromised blood flow, leading to tissue death, Picham et al. (17) perform studies with the purpose of proving the effectiveness of the change of decubitus every two hours or decompression for at least 15 minutes before LPP prevention, through the installation of sensors in ICU patients, and indication by monitor of the right moment of the change of decubitus, seeking to increase the adhesion of these protocols in these units, since the adhesion rate is less than 50 %.

It is known the relevance of an adequate supply of nutrients, in the contribution of the prevention and cicatrization of LPP. In order to evaluate the nutritional status of LPP-associated amputees, a study at the rehabilitation clinic in Curitiba showed that individuals with overweight are associated with protein and micronutrient deficiencies, such as vitamins A, C and E, copper and zinc, which are important in the healing process (18). In the present study, micronutrient deficits were not investigated, but 53.7% had normal weight, 20.4% were pre-obese and both groups had LPP.

There was also an expressive number of individuals who did not use industrialized supplementation, being 81.5%. Results allegedly justified by the majority of the sample do not fit into malnutrition, however, "Anholt, et al., Concluded that industrialized supplements can address micronutrient deficiencies even in patients without nutritional risk who present with pressure ulcers, considerably reducing the time recovery of the lesion" [18].

Regarding the risk of developing LPP, according to the Braden scale, 31.5% of the participants were at low risk, the other 68.5% were classified as moderate, high and very high risk, considering that individuals with high risks are about 25 times more likely to develop the adverse event when compared to those with low or moderate risk and that a prior LPP is a strong predisposing factor for the development of other lesions, the Braden scale should not be used exclusively for the detection of risk[19].

Mertens et al.[20] have shown that levels of functional dependence contribute directly to the risk of developing LPP, and that a commonly used care dependency scale in Germany, known as the Care Dependency Scale (CDS), worked well for ulcer risk by pressure, the factors most predictive being the patient's continence, mobility and hygiene.

When comparing the Braden scale with the MIF scale because it is the most used in the institution under study, to evaluate the functional dependence, we showed a positive and moderate correlation between them, allowing to understand that the higher the MIF scale score, the higher the Braden scale score, that is, the more independent the individual is, the lower the risk of developing LPP.

When applying the regression test between the aforementioned scales, we showed that it is possible to predict the Braden scale by applying the MIF scale, from the formula described previously in the results, allowing the interdisciplinary team to extend the early diagnosis of the risk of developing LPP , since the Braden scale is used mostly by the nursing team. Noting that the test performed in the study explains only 32% of the sample results, even though it is statistically significant and showing that the degree of dependence explains the risk of developing LPP.

CONCLUSIONS

The study population had a prevalence of males, with an adult-young age, followed by the elderly, with low level of schooling and low family income. With predominance of the diagnosis of TRM, evolving to tetraplegia as one of the main neurological sequels. There was a prevalence of individuals with high functional dependence, evidencing a greater impairment of bed mobility activities and transfers between support surfaces.

AtenuandoWe show that the MIF scale is a predictor of the Braden scale, based on the positive and moderate correlation between them, allowing us to guarantee a better communication among the interdisciplinary team, since the Braden scale is closely related to nursing care, being often unknown by other health professionals.

Considering that the forms of prevention are the responsibility of the entire interdisciplinary team, the study effectively contributes to the quality of patient care with neurological alterations, emphasizing that knowing the socio-demographic characteristics of the public attended and that the early identification of the risk of developing LPP, allows a better planning of preventive interventions and orientations directed to the patient and caregivers.

As a limitation of this study, we can point out that it was performed in a single health institution, not allowing coverage of the results for the society as a whole, besides considering a small sample for the regression test that delimited the prediction of the Braden scale by the MIF scale, however it is suggested that future research deserves to be performed, with larger samples, aiming at a more robust correlation coefficient.

REFERENCES

1. Pérez JMC, Pollo MCA, Aguilera MV, Grantham SJ, Sánchez AR, Ribeiro ASF. Impact of chronic wounds on functional rehabilitation units. Gerokomos. 2015; 26(3):109-114.
2. Jacomo AE, Garcia ACF. Analysis of Motorcycle Accidents at the Rehabilitation and Rehabilitation Center Dr. Henrique Santillo (CRER). Acta Fisiátr. 2011; 18(3):124-129.
3. Riberto M, Miyazaki MH, Jucá SSH, Lourenço C, Battistella LR. Functional independence in people with encephalic lesions acquired under outpatient rehabilitation. Acta Fisiátr.2007; 14(2):87-94.
4. DiVita MA, Granger CV, Goldstein R, Niewczyk P, Freudenheim JL. Risk Factors for Development of New or Worsened Pressure Ulcers Among Patients in Inpatient Rehabilitation Facilities in the United States: Data From the Uniform Data System for Medical Rehabilitation. American Academy of Physical Medicine and Rehabilitation. 2015; 7(6):599-612.
5. Rogenski NMB, Kurcgant P. Evaluation of agreement in the application of the inter-observer braden scale. Acta Paul Enferm. 2012; 25(1):24-28.
6. Scalzo PL, Souza ES, Moreira AGO, Vieira DAF. Quality of life in patients with stroke: physiotherapy clinic Puc Minas Betim. Rev Neurocienc. 2010; 18(10):139-144.
7. Viana RAS, Zuffi FB, Barduchi Ohl RI, Chavaglia SRR. Socio-epidemiological profile of clients with mobility limitations and their caregivers. Rev. Enferm. UERJ. 2013; 21(4):439-445.
8. Pereira RA, Santos EB, Fhon JRS, Marques S, Rodrigues RAP. Overload of caregivers of elderly with stroke. Rev Esc Enferm USP. 2013; 47(1):185-192.
9. Costa RC, Caliri MHL, Costa LS, Gamba MA. Factors associated with pressure ulcer in spinal cord injuries. Revvista Neurocienc. 2013; 21(1):60-68.
10. Luz SR, Lopacinski AC, Fraga R, Urban CA. Pressure ulcers. Geriatrics & Gerontology. 2010; 4(1):36-43.
11. Santamaria N, Gerdtz M, Sage S, McCann J, Freeman A, Vassiliou T, Vincentis S, Ng AW, Manias E. A randomised controlled trial of the effectiveness of soft silicone multi-layered foam dressings in the prevention of sacral and heel pressure ulcers in trauma and critically ill patients: the border trial. International Wound Journal. 2013; 12(3):302-8.
12. Mota D, Ribeiro R, Barbosa M. Quality of life in patients with spinal cord injury with pressure ulcer. Enfermería Global. 2016; 15(2):13-39.
13. Verschueren JHM, Post MWM, Groot S, Woude LHV, Asbeck FWA, Rol M. Occurrence and predictors of pressure ulcers during primary in-patient spinal cord injury rehabilitation. Spinal Cord. 2011; 49(1):106-112.
14. Braga IA, Pirett CCNS, Ribas RM, Gontijo Filho PP, Diogo Filho A. Bacterial colonization of pressure ulcers: assessment of risk for bloodstream infection and impact on patient outcomes. Journal of Hospital Infection. 2013; 83(4):314-20.
15. VanGilder C, Lachenbruch C, Algrim-Boyle C, Meyer S. The International Pressure Ulcer PrevalenceTM Survey: 2006-2015. J Wound Ostomy Continence Nurs. 2017; 44(1):20-28.
16. DeJong G, Hsieh CJ, Brown P, Smout RJ, Horn SD, Ballard P, Bouchard T. Factors Associated with Pressure Ulcer Risk in Spinal Cord Injury Rehabilitation. American Journal of Physical Medicine & Rehabilitation. 2014; 93(11):971-86.
17. Pickham D, Ballew B, Ebong K, Shinn J, Lough ME, Mayer B. Evaluating optimal patient-turning procedures for reducing hospital-acquired pressure ulcers (LS-HAPU): study protocol for a randomized controlled trial. Trials. 2016; 6(1):17-190.
18. Teixeira ES, Pinto JD, Araújo CG, Baptista DR, Lopes JP. Evaluation of nutritional status and dietary intake of amputated patients with pressure ulcers treated at a Rehabilitation Hospital Center. O mundo da Saúde. 2011; 35(4):448-453.
19. Fernandes LM, Silva L, Oliveira JLC, Souza VS, Nicola AL. Association between pressure injury prediction and biochemical markers. Rev Rene. 2016; 17(4):490-7.
20. Mertens RN, Halfens RJG, Dietz E, Ramona Scheufele BA, Theo Dassen RN. Pressure ulcer risk screening in hospitals and nursing homes with a general nursing assessment tool: evaluation of the care dependency scale. Journal of Evaluation in Clinical Practice. 2008; 14(6):1018-25.