

**ARTIGO  
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## Identification of factors associated to pressure sores in paraplegic individuals and related to leisure activities

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### ABSTRACT

The spinal cord injury provokes motor and sensory deficits, vasomotor and autonomic alteration bellow the level of injury. The pressure sore (PS) is frequently observed and serious among paraplegic individuals. The goals of this study are to identify the factors associated to PS among paraplegic individuals which injury was in T6 or bellow and related then to PS prevention and leisure activities. The study was done in a selection place of a rehabilitation center in São Paulo-Brazil. The population was constituted by 35 paraplegic individuals and 90,32% were male; 22,58% had more than 53 years old; 45,16% had paraplegia from 1 to 3 years and 83,87% had trauma as the cause of injury. The use of television and videocassette was cited by 67,74%. In relation to the nature of leisure activities, 70,0% referred as passive activities and 18,18% as active. The PS occurred less frequently among individuals with active leisure actions. The preventive interventions cited more often were skin self-exam and change of positions. The health assistance must be holistic and based on preventive intervention. In the selection the rehabilitation professional's an opportunity to promote therapeutic approach in order to prevent PS.

### KEY-WORDS

paraplegia, pressure sore, rehabilitation

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## Introduction

According to the 2000 demographic census<sup>1</sup> in Brazil, there are 950,000 tetraplegic, paraplegic or hemiplegic individuals in the country. Spinal cord injuries cause superficial and deep motor and sensory deficits below the injury level, vasomotor dysfunctions and autonomic alterations, sphincter alterations and sexual dysfunctions, among others<sup>2</sup>.

The large number of paraplegic individuals that presented pressure ulcers (PU) observed at the triage, initial clinical evaluations and returning clinical assessments at AACD Rehabilitation Center, as well as in the inpatients of the same institution, caught the attention of the researchers, taking into account that this clinical observation is considered one of the attributions and responsibilities of the nursing staff as a member of the healthcare team of a Rehabilitation Center<sup>3</sup>.

Appropriate discussions were carried out with the other healthcare rehabilitation professionals on the possibility of biopsychosocial factors interfere with the development of PS, in addition to the organic consequences of the spinal cord injury. Age, sex, ethnicity, underlying pathologies, housing, time spent to reach the rehabilitation center and leisure activities as social re-integration factors were analyzed. Thus, the larger research that originated this article allowed us, based on the results obtained, a better comprehension of the causes and consequences of PS in the life of the paraplegic individual.

One of the most accepted definitions for PS is the one given the National Pressure Ulcer Advisory Panel (NPUAP)<sup>4</sup>, which defines PU as being localized cell death areas that develop when the soft tissue is compressed between a bony protrusion and a hard surface, for a prolonged period of time<sup>4</sup>.

The classification of PU was also developed under the supervision of NPUAP that proposes its staging based on tissue involvement. This classification consists of four stages: Stage I: non-blanching intact skin erythema, after pressure removal; Stage II: Partial skin loss involving the epidermis, dermis or both. The ulcer is superficial and clinically presents as an abrasion, blister or shallow crater; Stage III: full thickness skin loss involving damage or necrosis of subcutaneous tissue that may extend down to, but not through, the underlying fascia. The ulcer presents clinically as a deep crater with or without undermining of the adjacent tissue; Stage IV: full thickness skin loss with extensive destruction, tissue necrosis or damage to muscle, bone or supporting structures such as tendon or joint capsules<sup>4</sup>.

The tissue tolerance to pressure and ischemia depends on the nature of the tissue itself, and is influenced by the capacity of the skin and supporting structures, such as blood vessels, collagen and interstitial fluid, to re-distribute the pressure applied on the tissue surface to the skeletal frame. As the muscular tissue is more sensitive to pressure and ischemia than the skin, the skin lesion in PU is frequently referred to as being the "iceberg tip", because a large area of ischemia and necrosis is expected in the bone-tissue interface<sup>5,6</sup>.

The known risk factors for the development of PU are friction,

decreased sensibility, immobility and nutritional state<sup>7</sup>. The exposition of skin to excessive moisture, caused by urinary incontinence, perspiration and other factors, must also be taken into account<sup>6,8</sup>.

Pressure ulcers are severe, although frequent, complications in patients with spinal cord injuries and directly or indirectly interfere with quality of life of these patients, as the healing of advanced-stage skin ulcers (stages III and IV) demand, most of the times, frequent visits to healthcare institutions (outpatient clinics, hospitals, clinics) or homecare with a competent professional, for dressing changes or plastic surgery<sup>9</sup>. PU also have different effects on the quality of life of individuals with spinal cord injuries when they cause pain, when they bring an alteration to the patient's body image with a decrease in productivity and when it causes social isolation<sup>10</sup>.

The work of healthcare professionals who care for paraplegic individuals with PU demands not only knowledge about the physiopathology of the ulcer, the current treatments, updated information on skin lesions and their prevention, but also a deep knowledge of spinal cord injuries and their consequences, and mainly, the particular characteristics of each individual, which involve social, psychological, financial, educational and structural (physical) aspects.

Faro<sup>11</sup> and Oot-Giromini<sup>12</sup> showed that the causes of PU in individuals with spinal cord injuries involve elements that are beyond those characteristic of the injury, such as incontinence (vesical and fecal), alteration of motricity and sensibility, alteration of skin tonus and elasticity, social-economical factors, individual motivation, activities developed by the individual, nutritional status, and knowledge acquired throughout life.

It is important to stress that the spinal cord trauma itself is a risk factor for the development of PU due to the several sensory and motor alterations that accompany this type of trauma. Nevertheless, one can presume that, in individuals who present T6 level paraplegia or below, self-care is more easily and independently accomplished, due to the non-impairment of the upper limbs.

By self-care, one understands the practice of activities, started and performed by the individual him or herself, on his or her own benefit for the maintaining of life, health and well-being. The individual's capacity to engage in self-care activities depend on age, developmental stage, life experience, social-cultural assistance, health status and available resources<sup>13</sup>.

For paraplegic individuals, factors such as financial resources, necessary to acquire orthoses and walkers, and joint deformities among others, can affect the individual's functionality.

## Objective

To identify the factors associated to pressure ulcers in paraplegic individuals with T6 level injuries or below, related to the prevention of PU and leisure activities.

## Patients and Methods

This is a descriptive, explorative, transversal, applied field study. The research was carried out in the outpatient clinic of the Rehabilitation Center of the Assistance Association to the Deficient

Child (AACD), located in the city of São Paulo, Brazil, after being appraised, approved and authorized by the Research Ethical Committees of AACD and Escola de Enfermagem da USP (University of São Paulo Nursing School).

The referred institution performs systematic triages of individuals with spinal cord injuries, who are then assessed by a physiatrist, a physical therapist, an occupational therapist and a nurse. The paraplegic and tetraplegic individuals are outpatients at AACD and come from several regions of the state of São Paulo and from other regions of Brazil.

The population of this study consisted of 35 paraplegic individuals, who underwent the triage at the Spinal Cord Injury Clinic from April to October 2004.

The inclusion criteria for this study were: minimum age of 18 years; medical diagnosis of T6 level paraplegia or below, regardless of the nature of the injury; agreeing in participating in the study after being informed on the study objectives and signing a written Informed Consent Form.

The 35 patients were initially paired and compared regarding the values considered for the 24 registered variables. To achieve the study aim, two different strategies were hypothesized for the isolation of each factor's effect and reduction of the effect of the remaining independent or competing variables, usually employed indirectly through probabilistic sampling or directly, by an outlining that allows the acquiring of stratified samples. As the measurement of similarity, the ratio between "concordance > discordance", analyzed by the unicaudal Chi-square test was considered, with 1 degree of freedom,  $p=0.05$ . The independent variables were vesical control, fecal control, positioning, leisure and occupational activities; the competing variables were age range, sex, ethnicity, educational level, income, housing, region, transportation, time of locomotion, housing conditions, sanitary conditions, duration of paraplegia, etiology, cause of injury, prevention, type of prevention, pathologies, smoking, type of medication used and the dependent variables were pressure ulcers, number of PU, staging and local of the PU.

Data collection was performed by the main researcher and nurse at the institution where the research was carried out, by applying a questionnaire during individual interview with the paraplegic individual. The questionnaire comprised 21 closed questions, consisting of personal, and biodemographic data and information concerning the urinary and fecal elimination, PU prevention and leisure activities.

It is understood that leisure with a high degree of activity, which demands more mobilization by the paraplegic individual, is more active, and a lower degree of activity that demands less mobilization and/or displacement, is more passive.

## Results

This study presents some results in a descriptive form, and others are presented in Tables. Of the 35 paraplegic individuals, 90.32 were males. Age range varied from >53 years (22.58%) and

18 to 22 (19.35%). The duration of paraplegia varied between 1 to 3 years in 45.16% of the individuals, and the trauma etiology of the paraplegia occurred in 83.87% of the cases.

Regarding the leisure activities, Table 1 shows the distribution of answers of the paraplegic individuals interviewed:

Table 1  
Leisure activities mentioned by the paraplegic individuals seen at the triage of the Spinal Cord Injury Clinic of AACD. São Paulo, 2004.

Leisure activity	Number of times mentioned	%
Movies/theater	2	6,45
Watching TV/videocassettes	21	67,74
Dancing	3	9,67
Receiving visits	9	29,03
Reading	5	16,12
Outings (church, shopping mall)	11	35,48
Visiting family members	11	35,48
Others	6	19,35

We observed that the most frequently mentioned leisure activity is watching TV and/or videocassettes, a resource that is found in most communities, regardless of the individual's social-cultural level.

The relations between the leisure activities mentioned by the studied population and the presence or absence of PU are shown in Figure 1.

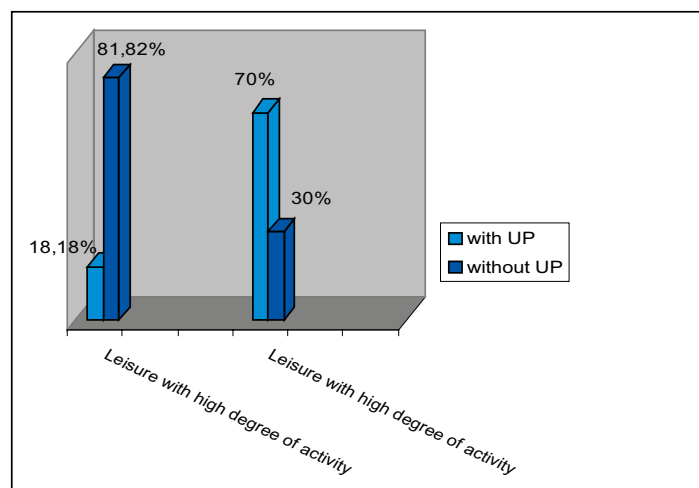


Figure 1  
Relation between leisure activities and the presence or absence of PU

Leisure activities that demand a higher degree of body mobilization such as dancing, practicing sports, as well as external activities such as visiting friends and family, going to the movies and theater, going to bars and parties, appear as variables of possible interference in the presence or absence of PU, as they occur in 18.18% of the cases. PU were present in 70% of the cases who had leisure activities with less mobilization.

Regarding the competing variables that refer to PU prevention or not, and type of prevention employed, when the prevention is performed, the following results are observed, as shown in Tables 2 and 3.

Table 2  
Paraplegic individuals who perform or do not perform PU preventive measures. São Paulo, 2004.

Number of cases	PU prevention	%
15	Sim	42,85
20	Não	57,14

When inquired regarding the type of prevention performed, several responses concerning activities and the use of adequate materials are mentioned.

Table 3  
Type of prevention mentioned by the paraplegic individuals that were interviewed. São Paulo, 2004.

Number of patients	Type of Prevention	%
11	Change of decubitus	35,48
9	Use of air or water pillow	29,03
5	Use of inadequate pillow*	16,12
14	Skin self-examination	45,16
7	Ischiatic decompression	22,58
4	Frequent hygienic measures	12,90
4	Special mattress	12,90

\*round pillow with a central hole.

It is noteworthy the fact that some individuals mentioned more than one preventive method. The frequent hygienic measures was mentioned as a preventive method, with the observation that it is performed more often during the day aiming at preventing skin rashes, cracks or excessive moisture, especially when the paraplegic individual needs diapers. Regarding the skin examination, 10 (28.57%) individuals mentioned that they performed skin self-examination twice a day, and 4 (11.42%), once a week. Of the 14 (100%) who performed skin examination, 6 (42.85%) used a mirror as aid. Eight individuals (57.14%) needed help from someone to perform the procedure.

## Discussion

Biodemographic data show that the male sex was predominant in this population (90.32%), which is in accordance with several studies on the demographic characterization and profile of the spinal cord injured patient that shows a predominance of the male sex<sup>14,15</sup>. The predominant age range in the study was a surprising factor, as the highest frequency was observed among individuals older than 53 years (22.58%), followed by the age range of 18 to 22 years (19.35%). Other studies show a predominance of younger individuals<sup>14,16</sup>.

The duration of the spinal cord injury is another important factor to be mentioned, as the studies by Basta<sup>17</sup> and Alman<sup>18</sup> showed that this can be considered a risk factor for the development of PU. In this study, 45.16% of the population studied had sustained

the spinal injury for 1 to 3 years, which is in accordance to other studies in literature<sup>2,3,11-19</sup>.

The biopsychosocial factors can be correlated to the individual factors that direct the individual's behavior. In this study, 67.74% of the individuals mentioned watching TV and videocassettes as the most frequent leisure activity, which require little or no mobilization, i.e., more passive activities.

Loureiro; Faro; Chaves<sup>19</sup> studied the quality of life in the view of people who suffered a spinal cord injury and concluded that after the injury, there are consequent alterations, regarding the behavioral aspect as well as change of habits such as leisure absence, social and material re-structuring with feelings of material loss or in the meaning of life, interfering with the acceptance and practice of the self-care.

When analyzing the relation between leisure activities and the presence of absence of PU, we observed that leisure activities that require more mobilization or displacement are significant in PU prevention, as previously described in other studies<sup>11,12</sup>.

The performance of PU preventive actions appeared as an interesting factor in this study, as 32.25% of the studied sample who declared that they performed preventive actions presented PU, whereas 22.58% who did not perform preventive actions also presented PU. Those who did not perform preventive measures (80%) said that they see no need for PU prevention, and 60% said that they do not know how to perform PU preventive measures.

It is worth mentioning that the triage can be considered a therapeutic opportunity, as not all individuals will be chosen to undergo treatment at the institution and can end up without any type of assistance.

## Conclusions

According to the method employed in the research and the nature of the study, the results obtained and disclosed in this study allow us to conclude that, regarding the factors associated with the development of pressure ulcers in paraplegic individuals, the cognitive, biomechanical and functional-organic factors must be mentioned, as shown in Chart 1.

Chart 1  
Association of factors related to the development of pressure ulcers in paraplegic individuals.

Factors associated to development of PU	Areas involved with the determination of PU	Resources to be used
Cognitive factors	Knowledge	Patient / caregiver Family / nurse / doctor Health professionals
Biomechanical factors	Technology	Use of: support pads / pillows Positioners/beds / mattresses Beds / wheel chair/others
Functional and Organic factors	Diagnostic exams Functional capacity	Laboratory / clinical exams Functional Independence Measurement (FIM)

Considering the social, financial, functional and clinical conditions, the leisure activities mentioned by the paraplegic individuals can be considered to be more passive. Furthermore, the use of television and videocassette player are the most accessible types of leisure for people in general, which means that they remain in the same position for longer periods of time. However, this leisure activity congregates people and allows a higher degree of socialization as well as keeping individuals up-to-date with current issues.

In addition, a holistic approach by the rehabilitation health professionals is fundamental for the effectiveness of pressure ulcer prevention regarding the compliance and practice of preventive biopsychosocial measures for the paraplegic individual as well as for the rehabilitation health professionals within their technical and scientific capabilities.

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