

Factors associated with sexual satisfaction of men with spinal cord injury

Fatores associados à satisfação sexual de homens com lesão medular

Factores asociados a la satisfacción sexual de hombres con lesión medular

Fernando Luiz Cardoso^{1,2}, Isabela Passos Porto¹, Helton Pereira De Carvalho^{1,4}, Elisa Pinheiro Ferrari³

ABSTRACT | The aim of the study was to analyze the factors associated with sexual satisfaction after spinal cord injury. Eighty men with spinal cord injury composed the sample. We used a semi-structured questionnaire on the practice of post-injury physical activity, weekly sexual frequency and sexual satisfaction before and after the cord injury, besides the characteristics of the injury and the sociodemographic ones. The programs SPSS (version 20.0) and R (version 3.3.1) were used for statistical analysis, respecting the range of 5%. Initially, we used the descriptive analysis through absolute and relative frequencies. The Spearman correlation was used to analyze the magnitude of the association between the independent variables (weekly sexual frequency, age, education level and injury time) and the sexual satisfaction level after the injury. The association between sexual satisfaction and physical activity, and type of injury and stable sexual partner was verified by the Policoric test. We observed that the satisfaction level decreased significantly after the injury ($p < 0.001$), and also an association between the level of sexual satisfaction after injury and its time ($r = 0.28$, $\rho = 0.01$) and weekly sexual frequency ($r = 0.25$, $\rho = 0.02$) with stable sexual partners ($r = 0.26$, $\rho = 0.01$). The conclusions point that sexual satisfaction is affected by spinal cord injury, associating positively with the injury time, sexual frequency and presence of stable sexual partners after injury. New studies based on the ASIA scale ratings are suggested.

Keywords | Men; Spinal Cord Injuries; Sex Factors; Rehabilitation; Motor Activity.

RESUMO | O objetivo deste estudo foi analisar os fatores associados à satisfação sexual pós-lesão medular. Oitenta homens com lesão medular compuseram a amostra. Utilizou-se um instrumento semiestruturado sobre prática de atividade física pós-lesão, frequência sexual semanal e satisfação sexual antes e após a lesão, além das características sociodemográficas e da lesão. Para análise estatística utilizaram-se os programas SPSS versão 20.0 e o R versão 3.3.1, considerando um nível de significância de 5%. Inicialmente, empregou-se a análise descritiva por meio de frequências relativas e absolutas. A correlação de *Spearman* foi utilizada para analisar a magnitude da associação entre as variáveis independentes (frequência sexual semanal, idade, nível de escolaridade, tempo de lesão) com o nível de satisfação após a lesão. Verificou-se a associação entre satisfação sexual e a prática de atividade física, tipo de lesão e parceiro sexual estável por meio da correlação policórica. Constatou-se que a satisfação sexual diminuiu após a lesão ($p < 0.001$), havendo associação entre o nível de satisfação sexual após lesão com o tempo de lesão ($r = 0,28$, $\rho = 0,01$) e frequência sexual semanal ($r = 0,25$, $\rho = 0,02$) e com parceiras sexuais estáveis ($r = 0,26$, $\rho = 0,01$). Concluiu-se que a satisfação sexual é afetada pela lesão medular, associando-se de forma positiva com o tempo de lesão, frequência sexual e com presença de parceiros sexuais estáveis após a lesão. Sugerem-se novos estudos com classificações baseadas na escala ASIA.

Descritores | Homens; Traumatismos da Medula Espinal; Fatores Sexuais; Reabilitação; Atividade Motora.

Study developed at the Laboratório de Gênero, Sexualidade e Corporeidade (Lagesc) of the Centro de Ciências da Saúde e do Esporte (Cefid) of Universidade do Estado de Santa Catarina (Udesc) – Florianópolis (SC), Brazil.

¹Graduate Program in Human Movement Sciences (PPGCMH) of Universidade do Estado de Santa Catarina (Udesc), Florianópolis (SC), Brazil.

²Graduate Program in Education (PPGE) of Universidade do Estado de Santa Catarina (Udesc), Florianópolis (SC), Brazil.

³Graduate Program in Physical Education of Universidade Católica de Brasília (UCB), Brasília (DF), Brazil.

⁴Capes scholarship student.

RESUMEN | El objetivo de este estudio fue analizar los factores asociados a la satisfacción sexual después de la lesión medular. Un total de 80 hombres con lesión medular compusieron la muestra. Se utilizó un instrumento semiestructurado sobre práctica de actividad física después de la lesión, frecuencia sexual semanal y satisfacción sexual antes y después de la lesión, además de las características sociodemográficas y de la lesión. Para el análisis estadístico, se utilizaron los programas SPSS versión 20.0 y R versión 3.3.1, considerándose un nivel de significancia del 5%. Inicialmente, se llevó a cabo el análisis descriptivo mediante frecuencias relativas y absolutas. Se utilizó la correlación de Spearman para analizar la magnitud de la asociación entre las variables independientes (frecuencia sexual semanal, edad, nivel de escolaridad, tiempo de lesión) con el nivel de satisfacción

después de la lesión. Se verificó la asociación entre satisfacción sexual, práctica de actividad física, tipo de lesión y pareja sexual estable por medio de la correlación policórica. Se constató que la satisfacción sexual disminuye después de la lesión ($p < 0.001$), con asociación entre el nivel de satisfacción sexual después de la lesión con el tiempo de lesión ($r = 0.28$, $p = 0.01$), frecuencia sexual semanal ($r = 0.25$, $p = 0.02$) y con parejas sexuales estables ($r = 0.26$, $p = 0.01$). Se concluye que la satisfacción sexual es afectada por la lesión medular, asociándose de forma positiva con el tiempo de lesión, frecuencia sexual y con presencia de parejas sexuales estables después de la lesión. Se sugieren nuevos estudios con clasificaciones basadas en la escala ASIA.

Palabras clave | Hombres; Traumatismos de la Médula Espinal; Factores Sexuales; Rehabilitación; Actividad Motora.

INTRODUCTION

Spinal cord injury is responsible for triggering a severe chronic illness and physical disability, implying significant neurological changes¹⁻³. It is characterized by motor, sensory and neurovegetative disturbances of the body segments located below the injury, compromising superficial and deep sensitivity, motor and autonomic functions⁴⁻⁶. Its incidence is predominantly in young male adults, and the main etiology is traumatic^{6,9}.

Although some implications of the spinal cord injury, such as physical limitations, are noticeable, their sequelae are not limited to the observable one, which can lead to a decrease in self-esteem, feelings of inadequacy, difficulty in accepting new body image, and sexual alterations, considerable impact in the context of this physical disability¹⁰⁻¹³.

However, spinal cord injury does not eliminate the sexual context of the affected individual's life and, considering that most of the affected people are young, sexuality has been mentioned as of great importance for the patient, its partner and its relatives, reflecting in an important aspect in the process of physical rehabilitation and social reintegration¹⁴.

At the same time that Masters and Johnson were researching human sexuality in their functional scope, in an unprecedented way, Bors and Comarr¹⁵ investigated the changes in the sexual function of men with spinal cord injury and, in recent years, the study of sexuality

in people with this spinal cord injury has attracted the attention of researchers and health professionals, who have been deprived of the conception of their patients as asexual beings, realizing that sexuality is inherent to the human being and that it is a priority for many of the people affected, attaching importance and studying it with greater determination¹⁶⁻¹⁹.

The international literature presents a considerable number of studies emphasizing difficulties and disabilities after spinal cord injury, but the same does not occur with the national literature. Some studies^{20,21} began to present possible data on the reality of men and women with spinal cord injury in Brazil, but still without a satisfactory number of participants and also with conclusions that generated more curiosity about the subject.

In addition, studies on the sexuality of people with spinal cord injury focus very much on some aspect of sexuality alone – behavior, desire, response, sexual satisfaction – leaving aside the possibility that these very factors are affecting each other. As well as being affected by social, biological, psychological and physical aspects, such as stability in a relationship, time after injury, frequency with which individuals practice sex, practice of physical activities, age in order to help to understand the factors inherent to sexual satisfaction after spinal cord injury. In this context, the objective of this study was to analyze the factors associated with the level of sexual satisfaction after spinal cord injury.

METHODOLOGY

Participants

This study was conducted based on the database of the research project entitled “Sexuality in Spinal Cord Injury”. The study protocol was approved by the Research Ethics Committee (Process No. 023/05). The study population was composed of male spinal cord injured in the city of Florianópolis, SC.

For the selection of the sample, the associations of disabled people were contacted in order to inform them about the subjects’ objectives and characteristics for participation in the study. This initial communication with the institutions was necessary for them to assist in the capture process of the subjects, who should present the following inclusion criteria: 1) to have spinal cord injury; 2) to have had any type of sexual activity before spinal cord injury; 3) to have a cognitive preservation; 4) age equal or superior to 18 years.

From this, the coordinator of each institution invited people with spinal cord injury to participate in the study, and sent the contact of the interested ones to the researchers. Recruitment of the sample continued using the “snowball” technique, in which one participant indicated friends and acquaintances to also participate in the study. This technique allowed greater comprehensiveness and increase in the number of

subjects. The data collection was developed under three forms of application of the instrument: via e-mail, mail and face-to-face. This technique, also used in different studies^{13,22,23,24}, was intended to guarantee that all subjects would receive the same instructions in refers to the completion of the instruments, regardless of the form of application, before each question contained a prior explanation of the concept being investigated and how the respondent should answer the question.

Instruments

Until the development of the research, in the second semester of 2015, standardized and validated questionnaires to evaluate aspects of the sexuality of individuals with spinal cord injury were not evidenced in the national literature. Similarly, studies already performed in Germany²⁵ and the United States¹⁶ presented the same methodological difficulty regarding standardized and validated questionnaires, and the instruments used were developed by the research institution itself.

Based on these studies, the semi-structured questionnaire used in the present study was composed of three closed and open items that assessed physical activity/sports practice after injury, weekly sexual frequency and sexual satisfaction before and after spinal cord injury. Figure 1 illustrates the instrument used.

No. register: _____	<i>MALE</i> questionnaire	Date: ____/____/____
GROUP I → SOCIODEMOGRAPHIC CHARACTERISTICS		
1) Age: _____		Date of birth: ____/____/____.
2) What is your profession? _____		
4) Do you do the house services? 0.() No 1.() Yes		
5) What is your education level?		
0.() Primary education	3.() High school	6.() Qualification
1.() Secondary education	4.() Some college	7.() Masters degree
2.() Some high school	5.() College degree	8.() PhD degree
7) What is your CURRENT marital status?		
0.() Single and without girlfriend	2.() I live with my partner	4.() Separated or divorced
1.() Single and with girlfriend	3.() Married	5.() Widowed
8) What was your marital status BEFORE SPINAL CORD INJURY?		
0.() Single and without girlfriend	2.() I live with my partner	4.() Separated or divorced
1.() Single and with girlfriend	3.() Married	5.() Widowed
GROUP II → HEALTH DATA		
1) Spinal cord injury time (in months and years): _____	Date of injury: ____/____/____.	
7) Spinal cord injury cause:		
0.() Traffic accident	0.() Diving in shallow water	0.() Firearmde fogo
1.() Falls	1.() Work accident	1.() Others
2.() Sports	2.() Meele weapon (knife...)	Which one? _____.
3) Neurologic level of spinal cord injury _____	Type of injury: 0.() Complete 1.() Incomplete	
5) Do you play any sport, go to the gym or other form of exercise?		
0.() No. 1. Yes, occasionally.	2. Yes, often.	Are you para-athlete?
Which one? _____	Which one? _____	0.() No 1.() Yes

Figure 1. Part of the semi-structured questionnaire

The practical variable of physical activity was obtained through the question: “Do you practice any sport, do gymnastics or another form of physical exercise? (no, yes occasionally, yes often)”. Issues related to sexuality were obtained with reference to two periods, pre and post-injury.

The weekly sexual frequency and sexual satisfaction before and after the spinal cord injury were obtained through the questions, “What is your weekly sexual frequency (≥ 2 and < 2)”; and “How sexually satisfied are you?” Sexual satisfaction was verified by a numerical scale of 11 points (0-10), where zero is “unsatisfied”, one to three is “less satisfied,” four to six “moderately satisfied” and seven to ten “very satisfied”. In order to respond to these types of scales the participants should compare themselves subjectively with the people of their convivality. For purposes of statistical analysis two categories were considered “unsatisfied” (zero to five points) and “satisfied” (six to ten points).

The sociodemographic variables (age, educational level, biological sex, stable sexual partner, injury characteristics, adapted physical exercise/sport, etc.) were obtained through a self-administered questionnaire. Being categorized as follows: type of injury (quadriplegia and paraplegia); age (≤ 30 years and > 30 years); level of schooling (elementary education, high school and higher education), stable sexual partner (yes and no) and practice of physical exercise/gymnastics/sport (no, yes occasionally, yes often). It was also checked whether or not the participant was a para-athlete.

Statistical analysis

Initially, descriptive analysis was performed using relative and absolute frequencies. Spearman's correlation was used to analyze the magnitude of the association between the independent variables (weekly sexual frequency, age, educational level) and the level of satisfaction after the injury. The Policoric correlation was performed to verify the relationship between the level of satisfaction after the injury and the practice of physical activity, type of injury and stable sexual partner. For the interpretation of the correlation coefficients, the classification was considered as fracture < 0.49 ; moderate 0.50-0.69; strong 0.70-0.89 and very strong 0.90-1.00²⁶. The association between sexual satisfaction and the occurrence of the injury was verified using the Chi-squared test. Statistical analysis was performed using SPSS (*Statistical Package for Social Sciences*)

for Windows version 20.0[®], considering a level of significance of 5%. For statistical analysis, statistical software R version 3.3.1 for *Windows* was used.

RESULTS

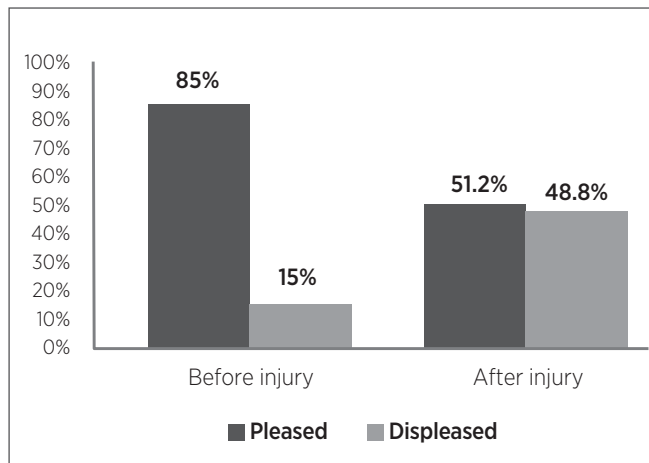
80 male medullary injuries, average age 32.2 (± 8.9) years and injury time of 9.2 (± 7.6) years, have participated in this study. Of these, 42.5% had a higher education level, with no stable sexual partner (63.8%), physical activity practitioners (75.0%), spinal cord injured at a time ≤ 10 years (68.8%) and (56.2%) (Table 1).

Table 1. Characterization of the sample referring to sociodemographic, sexual and spinal cord injury variables in Florianópolis, Brazil, 2009

Variable	Relative frequency (n)	Absolute frequency (%)
Age		
≤ 30 years	40	50
> 30 years	40	50
Education level		
Elementary School incomplete and complete	13	16.3
High School incomplete and complete	33	41.3
Higher Education incomplete and complete	34	42.5
Stable sexual partner		
Yes	29	36.3
No	51	63.8
Weekly sexual frequency		
≤ 2	57	71.3
< 2	23	28.8
Physical activity practice		
Yes	60	75
No	20	25
Spinal cord injury time		
≤ 10 years	55	68.8
> 10 years	25	31.3
Injury type		
Paraplegia	45	56.2
Quadriplegia	35	43.8

Graph 1 shows the proportion of satisfied and sexually unsatisfied individuals before and after the occurrence of the spinal cord injury and it is possible to identify that after the injury the prevalence of sexual dissatisfaction (48.8%) was higher than that presented before (15.0%). The data demonstrate a significant difference ($p < 0.001$), in which sexual satisfaction

decreases considerably after injury in the participants in this study.



Graph 1. Proportion of sexual satisfaction and dissatisfaction before and after the occurrence of spinal cord injury

The results showed a significant but weak correlation between the level of sexual satisfaction after injury with time of injury, weekly sexual frequency and with stable sexual partners. No significant correlations were found between the level of sexual satisfaction after injury and the level of schooling, age, physical/sports activity and type of injury (Table 2).

Table 2. Relationship between sexual satisfaction level after spinal cord injury and sociodemographic, sexual and spinal cord injury in Florianópolis, Brazil, 2009

Variable	R value
Age	0.10
Education level	0.33
Stable sexual partner	0.26**
Weekly sexual frequency	0.25*
Practice of physical activity	0.22**
Spinal cord injury time	0.28*
Injury type	0.11**

Bold: p-value<0.05; * Spearman correlation test; ** Polychoric correlation test.

DISCUSSION

In general, the present study contributes to the literature by adding body of knowledge to the area of spinal cord injury, demonstrating that the level of sexual satisfaction after injury was associated with longer injury time (adaptation), higher weekly sexual frequency and the maintenance of stable sexual partners. In addition, the occurrence of spinal cord injury interfered with the participants' level of sexual satisfaction.

According to the characterization of the subjects of the present study, 56.2% of the interviewees had paraplegia, however, a considerable prevalence of quadriplegics of 43.8% was noted. According to the literature, the relationship between quadriplegia and paraplegia is similar, although the incidence of paraplegics with complete injury and quadriplegic injuries with incomplete injury is higher^{2,6,27}. In relation to age, participants in the current study presented an average of 32,2 years, corroborating with the literature that reports the prevalence of spinal cord injuries in young male adults, standing out as the main traumatic etiology^{2,10}.

Another important aspect found in this study refers to the high prevalence of physical activity among the injured (60.0%). This data demonstrates that a significant portion of individuals with spinal cord injuries perform some type of physical/sports activity. This fact is justified in the literature, since the advances in medicine occurred in the last decades and the consequent increase in survival of people victims of spinal cord injury were accompanied by an evolution in their treatment that began to aim at minimizing the disabilities and complications and the return to society²⁸. In this sense, sports and leisure begin to be part of the medical treatment because they are fundamental in the process of coping with the "disadvantage" of the physically disabled. Sport plays a fundamental role in rehabilitation, as it complements and broadens the alternatives; stimulates and develops physical, psychological and social aspects and favors independence^{29,30}. Considering that human sexuality is a multidimensional phenomenon and its self-perception is subjective, it is believed that the socialization offered in the environments of physical and sports practices has a great impact on the self-esteem and sexual and affective self-confidence of the spinal cord injured. This hypothesis was recently confirmed by Porto, Cardoso and Sacomori²⁴, when they demonstrated quantitatively better data on sexual rehabilitation in men with spinal cord injury in two conditions: para-athletes and sedentary ones.

Regarding the sexual satisfaction before and after the spinal cord injury, we identified that the sexual satisfaction diminished sensibly after the occurrence of the injury. The Study¹⁶ that compared pre and post-injury periods found that before the injury most men were satisfied or very satisfied with their sex life, while a minority showed sexual indifference or dissatisfaction. After the injury, however, the percentage of satisfied has

declined to less than half, while most are indifferent, dissatisfied or very dissatisfied with the sexual scope of their lives¹⁶. This significant change between the pre- and post-trauma periods is independent of the injury level and time, and is reported by both the injured patients with quadriplegia and paraplegia, both by newly injured individuals and with a long period of injury¹⁶.

Among the factors associated with sexual satisfaction after spinal cord injury, we highlight the frequency of sexual activity, in which the participants with the highest frequency of sexual relations are more satisfied with their sexuality, while the participants who are not sexually active are dissatisfied with the sexual sphere of their lives. This result corroborates, with Cardoso³ that in carrying out a study with men, affirms that the impairment of spinal cord injury and the consequent decrease in the frequency of sexual activity and difficulty in the practice of sexual intercourse have contributed to a decrease in sexual satisfaction among its participants, which is based on the capacity to provide sexual satisfaction to the partner, showing self-realization of masculinity.

Satisfaction was correlated with having stable sexual partners, which facilitates access to sex. This result corroborates the results found by Phelps et al.³¹ when evaluating people with spinal cord injury and by Michael et al.³² when analyzing the American population in general, who observed that married or stable-union adults showed sexual differences, including more sexual experiences frequent and satisfactory than in single adults, finding satisfaction with marriage, non-sexual aspects of the relationship, and the frequency of the partner's orgasm, were strongly related to sexual satisfaction.

In addition, injury time was also associated with sexual satisfaction, since it is reduced in the newly injured, but tends to increase with the passage of time, although it does not completely recover. Fisher et al.¹¹ noted in their longitudinal study that sexual satisfaction decreased considerably shortly after the trauma, reflecting what they called the period of asexuality, followed, however, by increasing and maintaining sexual satisfaction, in which the increase and maintenance of sexual activity during the period in which he followed his participants (immediate post-injury to 18 months).

In one of the few Brazilian studies performed, Alves et al.²⁰ verified the existence of a relationship between

the sexual satisfaction of men with spinal cord injury and the time of rehabilitation, noting that more than half of the participants who declared themselves to be sexually satisfied had already obtained discharge of the rehabilitation service. This study demonstrates that the rehabilitation process assists in the readaptation to sexuality and that participants who are at the beginning of the rehabilitation process do not yet have sexuality as a fundamental concern, and may not have survived after the injury, keeping as a reference the sexual practice prior to injury. With these results it is believed that the presence of a longer injury time and a longer rehabilitation time correlates with an increase in sexual satisfaction after spinal cord injury, since it allows more time for sexual readaptation to its new condition.

In this study, no correlation was found between the level of sexual satisfaction after injury with age, physical activity and type of injury. However, the study by McCabe and Teloporos¹² showed that individuals who engage in some physical activity practice have better body and sexual self-esteem, emphasizing an improvement in sexual life. The high prevalence of physical activity presented by the subjects investigated in this study made them a homogeneous group in relation to this variable, a fact that may justify the lack of association between the variables, physical activity and sexual satisfaction found by the present study.

As methodological limitations, the use of a semi-structured instrument through self-reports was collected in three different ways: via e-mail, mail and face-to-face. This limitation is typical for the area studies that address invasive issues of private life and the difficulty of accessing these patients spread throughout the general population after a long process of institutionalized rehabilitation. There are practically no studies in this area that evaluate the sexual function of people with spinal cord injury in a probabilistic way and who use primary or direct measures. As a consequence, sexual function after spinal cord injury, despite arousing great interest among researchers and health professionals, still requires studies such as comparative studies that show the similarities and singularities of the pre- and post-injury periods. Another limitation is the classification of spinal cord injury. Since this study only classified the individuals according to the level of the injury (paraplegia and quadriplegia). For a more concise analysis it is suggested that the studies use the ASIA (American Spinal Injury Association) scale to obtain information on the neurological and

functional classification of spinal cord injuries. It is necessary to carry out comparative studies with people of the objective of establishing a parameter to be used in relation to the results obtained.

CONCLUSION

According to the data of the present study it can be concluded that the occurrence of the spinal cord injury interfered with the level of sexual satisfaction. Although the level of sexual satisfaction after injury was associated with the injury time, that is, a longer time adaptation to the new condition; to a higher weekly sexual frequency that implies greater accessibility to sex and; the maintenance of stable sexual partners that provides greater accessibility to sex. The other variables controlled in this study deserve more studies that evaluate its effects on sexual rehabilitation after spinal cord injury in larger groups and from other regions of Brazil.

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