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Resilience in people with traumatic spinal cord injury: Relationship with suicidal ideation, self-esteem, social support, life meaningfulness and life satisfaction

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Abstract--Introduction: The rehabilitation of people with traumatic spinal cord injury (SCI) should encourage resilience, which is a complex issue that involves self-esteem, social support, life

meaningfulness and life satisfaction in order to prevent suicidal ideation. Objective: To analyze resilience and its relationship with suicidal ideation, self-esteem, social support, life meaningfulness and life satisfaction in people with SCI. Methods: Quantitative, cross-sectional, descriptive, correlational and comparative study carried out with 204 Brazilian adults with SCI. Data were collected with previously validated instruments using an online platform. Results: Among the participants, 74% were male, with a mean age of 36.1 years (SP=9.24), 64.7% were retired or receiving benefits, and with an average time of injury of 8.6 (SP=7, 73). Suicidal ideation ($p \leq 0.001$), self-esteem ($p \leq 0.001$), social support, life satisfaction ($p \leq 0.001$) and life meaningfulness ($p \leq 0.001$) were strongly associated with resilience. Discussion: The variables related to mental health were shown to be influenced by resilience, indicating that participants with higher levels of resilience have better results in the assessment of emotional factors. Implications for practice: It is recommended that psychological and social factors be considered in the rehabilitation of people with SCI.

Keywords--mental health, psychiatry, psychiatric nursing scope of practice, resilience.

Accessible Summary

- What is known about the subject?
 - People with traumatic spinal cord injury (SCI) constitute a large portion of the economically active population whose challenges extend beyond the difficulty of locomotion.
 - Resilience should be encouraged in people with SCI, but emotional, physical and social factors can influence this process.
- What does the article add to existing knowledge?
 - Knowledge about the complexity of resilience in the rehabilitation of Brazilians with SCI.
 - Contributes by connecting resilience to the development and improvement of strategies for the rehabilitation of people with SCI.
- What are the implications for practice?
 - Alert the health care services of the person with SCI to consider the emotional, cultural and social aspects of these individuals, including their entire support network.
 - Stimulate studies that address the mental health of people with SCI to strengthen the development of coping strategies in the face of post-injury challenges.

Introduction

Traumatic spinal cord injury (SCI) is defined as any injury to spinal cord components that causes changes in motor, visceral, autonomic, vasomotor, sphincter, sexual and trophic and superficial and deep sensory deficits

(Albuquerque *et al.*, 2021; Brasil, 2015a). After SCI, each person, according to their life experiences, develops different coping and adaptation mechanisms, although the way they deal with the changes will depend on their environmental and individual resources (Brasil, 2015; Machado *et al.*, 2016). According to the World Health Organization (WHO) neurological traumatic impairments are associated with suicidal ideation. The risks inherent to such ideation may result from the impact of biological factors characterized by bodily dysfunctions together with the injury and psychological factors, such as self-esteem, social support, life meaningfulness and life satisfaction (Pincock *et al.*, 2020; Jiang, Sun & Meng, 2021; Machado *et al.*, 2016).

Accordingly, it is important to highlight that self-esteem is the value judgment and consideration that people have for themselves and how much they like themselves (WHO, 2000; Dini, Quaresma, & Ferreira, 2004), while social support refers to the resources (emotional, affective support, positive social interaction, information and material) that are offered to people in crisis situations or during readaptation (Zanini, Peixoto, & Nakano, 2018; Ruiz *et al.*, 2018). Life satisfaction is characterized by self-judgment, according to given criteria, when comparing one's own life with a standard that is considered adequate (Diener *et al.*, 1985). The sense of living a meaningful life, or life meaningfulness, is a positive variable that indicates well-being, coping and adaptation, always from the personal point of view (Steger, Frazier, Oishi, & Kaler, 2006).

In this regard, rehabilitation after SCI must involve physical, psychological and occupational therapy to help people with SCI reintegrate into society (American Psychological Association, 2020). For this purpose, strategies that support positive adaptation to SCI and coping mechanisms can favor the development of resilience. Resilience is related to the process of overcoming difficulties and involves behaviors, thoughts and actions that can be learned and developed over time in response to traumatic events (Pincock, & Terrill, 2020). In this study, for data analysis purposes, resilience was considered an outcome variable since having resilience after SCI is crucial for rehabilitation and the reintegration of people with SCI as active members of society. Additionally, the complexity of mental health was considered, with an assessment of the relationship between resilience and social support, life satisfaction and life meaningfulness, as well as the risk of suicide in this specific population. Despite the relevance of emotional factors in the rehabilitation of people with SCI, there are still few Brazilian studies that relate resilience to mental health factors specifically in people with SCI. The expectation is that this study will contribute to the connection of resilience to the development and improvement of strategies for the rehabilitation of people with SCI.

Objective

The present study aims to analyze resilience and its relationship with suicidal ideation, self-esteem, social support, life meaningfulness and life satisfaction in people with SCI.

Method

Guiding question

Is resilience in people with SCI associated with factors such as suicidal ideation, self-esteem, social support, life meaningfulness and life satisfaction?

Ethical aspects

This study was approved by the Research Ethics Committee in accordance with Resolution 466/12 of the National Council for Ethics in Research of the Brazilian Ministry of Health, which addresses ethics in research with human beings under the protocols No. 68651117.6.0000.5393/79532717.7.0000.5393/89766518.6.0000.5393/68619417.5.0000.5393.

Study design

This is a quantitative, cross-sectional, descriptive, correlational and comparative study.

Sample and inclusion and exclusion criteria

In total, 204 people participated in this study, aged 18 years or older, with traumatic spinal cord injury (SCI) and residing in Brazil. The participants were selected through a voluntary registration for participation in studies on SCI of the Center for Research and Assistance in Neuropsychomotor Rehabilitation (Neurorehab) of the School of Nursing of Ribeirão Preto, University of São Paulo (EERP-USP). To publicize the study, specific links were created for each data collection resource (e-mail and messaging application) and sent to the 700 registered volunteers. The links to the online questionnaire were available for two months, during which 204 people responded to the questionnaire. Participants who did not fully respond to all scales were excluded.

Data collection instruments

For data collection, five scales validated in Brazil with prior authorization were used, as shown in Figure 1:

Procedure for data collection

After the bibliographic update and exhaustive literature review, the instruments for data collection were selected and authorized to be included in Survey Monkey®. A usability test of the online instruments was carried out with 5 participants to assess the applicability and make any necessary corrections. Subsequently, specific links were created for each data collection method (e-mail and WhatsApp) and sent to the participants who registered at the volunteer database. The links were available on the Survey Monkey® platform for 3 months until reaching the minimum sample size of 204 participants. Data was exported directly from Survey Monkey® to the software Statistical Package for the Social

Sciences (SPSS), where descriptive, comparative and correlational statistical analyses were performed.

Analysis of results and statistics

For descriptive statistical analysis of the data, calculations of absolute and relative frequencies were performed for qualitative variables and central tendency (mean, median) and variability (minimum, maximum and standard deviation) were calculated for quantitative variables. The mean (m) and median (md) values were presented with the respective standard deviation (sd). For analysis purposes, the RS-14 scale groupings were categorized as low (low and low moderate), moderate and high (high and high moderate). To verify the presence of an association between the BSI variables and the RS-14, the Cochran-Armitage Chi-Square test was used (Agresti, 2007). Comparisons of the average scores of the AS Scales (Material, Affective, Emotional, Information and Social Interaction domains), Life Satisfaction, Self-esteem (Rosemberg), Life Meaningfulness (Search and Presence domains) and Time of Injury by Classification of Resilience was performed by the Jonckheere-Terpstra test (Jonckheere, 1954; Terpstra, 1952). The analyses were conducted using R software (R Core Team, 2017) considering a significance level of 5% ($\alpha = 0.05$).

Results

The sample consisted of 204 participants, aged between 18 and 60 years, mean of 36.1 years ($SD= 9.24$), mostly male, 74.01% (151) and with a mean time of injury of 8.6 years ($SP=7.73$). Table 1 shows the sociodemographic data, highlighting the majority of participants as retired or receiving benefits and with SCI acquired after traffic accidents. The result of suicidal ideation showed that 34.4% (70) of the participants were classified as having suicidal ideation. Below, the results referring to the analyses considering resilience as an outcome variable will be presented. The relationship between resilience and suicide risk showed that the more resilient, the lesser the suicidal ideation among the participants ($p\leq 0.001$) (Table 2).

Regarding the RS-14 scale, an average of 81.7 responses ($MD=83$) was observed, which is considered moderate according to the classification. For the ESV, the findings revealed an average response of 21.26 ($SD=7.62$), evidencing that the participants had little satisfaction with life. Concerning social support, the higher the score, the higher the level of social support; therefore, the results were divided according to the five supports. Affective support that involves expressions of love, esteem, affection and interest had the highest average among the other variables ($m=81.7$), followed by material support, related to helping people in case of need and also reflects access to health services ($m=79$), emotional support, related to empathy, trust, love, affection, listening and interest ($m=69.9$), support of positive social interaction, related to interpersonal relationships ($m=69, 2$) and, finally, information support measured through people's access to advice, suggestions, guidance and information ($m=67.6$).

Concerning the variables life satisfaction ($p\leq 0.001$) and the sense of living a meaningful life ($p\leq 0.001$) were related to resilience, given that the greater the

person's resilience, the greater the life satisfaction and the greater the sense of living a meaningful life. Regarding the meaning of life questionnaire (QSV), an average search for the meaning of life of 22.61 (sp 7.81) was observed, which indicates that the participants are not looking for meaningfulness in their lives. For the subscale of presence of life meaningfulness, the average was 25.32 (SP=7.31), which indicates that participants have a sense of life meaningfulness. Finally, regarding the associations for social support, the results showed that affective AS ($p \leq 0.0044$), emotional AS ($p \leq 0.0003$), information AS ($p \leq 0.0013$) and interaction AS ($p \leq 0.0007$) are associated with resilience, where the greater the social support, the greater the resilience (Table 3).

Discussion

In the evaluated sample, there was a predominance of young, male participants with completed higher education studies, as shown in previous studies (Faleiros *et al.*, 2022; Pelosi, Faleiros, Pereira, Bimbatti, & Tholl, 2021; Kumar *et al.*, 2018). These findings show the prevalence of SCI related to adventurous behavior, which commonly involves risky activities such as urban violence, traffic accidents, accidents caused by firearms, sharp instruments and weapons, falls, sports, work accidents and diving in shallow waters (Albuquerque *et al.*, 2021). Notably, the profile of people with SCI is similar in most regions of the country and the world. It is important to highlight the alarming data on the high number of people with income from retirement/benefits or unemployed. Current studies have also found the prevalence of SCI in the economically active population, thus impacting the low contribution to GDP and the use of greater financial resources from public services for health care and social security (Brazil, 2015b; Rabeh, Caliri, & Hass, 2009; Faleiros *et al.*, 2020). These results underscore the government's importance of investing in public policies focused on rehabilitation, better accessibility and opportunities to return to the job market and awareness campaigns for safe driving and the prevention of urban violence.

Surprisingly, the findings revealed a level of resilience considered moderate by the participants. However, almost all variables were associated with resilience, indicating its relationship with emotional factors. Previous studies suggest that people with lower resilience are more susceptible to depression after SCI, while higher resilience is associated with less anxiety and depressed mood (Pincock, Terrill, 2020; Battalio, Tang, & Jensen, 2020). The significant association between resilience and suicidal ideation found in this study ($p \leq 0.001$) corroborates the findings of a British cohort study carried out with 2,304 people with SCI, which showed the odds ratio of mortality (OR=4.32, $P \leq 0.001$) and much higher suicide OR (9.46, $P \leq 0.001$) for people who acquired SCI through attempted suicide compared to the other causes (Savic *et al.*, 2018). These data reinforce the need for rehabilitation in the physical, social and psychological context after SCI that focuses on the preservation of autonomy and the reintegration of these people into society.

Furthermore, this study showed a strong associative relationship between resilience and self-esteem of people with SCI. The literature emphasizes that emotional resilience encompasses satisfying experiences that culminate in feelings of self-esteem, which positively directs the processes of modifications and

adaptations (Cerezetti, Nunes, Cordeiro, & Tedesco, 2012). These aspects, when associated with exposure to stress and impaired coping, can generate symptoms of anxiety, depression, anger, impulsivity and low self-esteem. Regarding the life satisfaction of people with SCI, the findings revealed an association with resilience. Similar data were found in a survey carried out with 200 Brazilians with SCI, which identified an average on the Life Satisfaction Scale of 21.26 for the category little satisfied (Faleiros, Bimbatti, Carvalho, Gonçalves, Lopes, & Schutt, 2020). A possible hypothesis for these findings may be that the participants in the present study were young and had difficulty coping with limitations in social and daily activities.

Regarding the search for and the presence of life meaningfulness, the findings revealed that people with SCI considered themselves “reasonably satisfied” and “satisfied”. The results also corroborate the aforementioned study, which identified that most participants find life meaningful, although they do not explicitly seek this meaning (Faleiros, Bimbatti, Carvalho, Gonçalves, Lopes, & Schutt, 2020). These data emphasize the need to consider the variables, the search for meaning in life and the presence of life meaningfulness in the rehabilitation of people with SCI. When analyzing the influence of social support, an important associative relationship of emotional support, information and positive and affective social interaction with resilience was observed, enabling participants to face the difficulties of life. Such findings intensify the magnitude of social and affective support for greater chances of feelings of understanding, attention and companionship for people with SCI. It is worth noting that material support, despite not showing significant associations with resilience, averaged = 26, evidencing the benefits of resilience and greater chances of contributing to the physical and emotional health of these individuals.

However, it is noteworthy that the process of elaborating the new life condition is individually contextualized as it incorporates changes in life habits, feelings of loss, vulnerability and resignification (Cruz, Machado, & Afiúne, 2021). Although it is generally agreed that each person will respond differently, these findings incite the need for care that addresses emotional, cultural and social factors. Based on the above, it is emphasized that shared and interdisciplinary care is essential for the provision of quality care for people with SCI that reinforces resilience, self-esteem, social support and life meaningfulness, and promotes care and health to reduce the risk of suicide. This study has some limitations, such as the use of the cross-sectional model, which makes it impossible to identify cause-and-effect relationships between the explored variables. Moreover, data collection using an online platform may have limited and hindered the participation of a portion of the Brazilian population without internet access. In this sense, studies that include data collection from people without internet can add other relevant data.

Implications for nursing practice

The present study presents relevant findings that contribute positively to nursing practice and interventions. The nurse, as a knowledge multiplier, will be able to empower and enable the autonomy of people with SCI so that they can participate in their care plan and be active members of their community. The variables

analyzed in this study will serve as a basis for the nursing team to encourage freedom and decision-making with the aim of emancipating the person with SCI by promoting autonomy and resilience, which will indirectly provide greater life satisfaction and meaningfulness and decrease the risk factors for suicidal ideation.

Conclusion

The findings showed that the variables suicidal ideation, self-esteem, social support, life meaningfulness and satisfaction have an influence on the resilience process of people with SCI. It is therefore recommended that rehabilitation and psychiatry services that care for people with SCI consider emotional factors. However, more studies are needed to understand resilience, aiming at its promotion so that the rehabilitation of people with SCI can maximize their autonomy and participation in society.

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Ethical Statements

This study was approved by the Ethics and Research Committee (CEP) of the USP School of Nursing of Ribeirão Preto (EERP-USP), according to Resolution 466/12, of the National Council of Ethics in Research of the Ministry of Health that addresses ethics in research with human beings under the protocols No. 68651117.6.0000.5393/79532717.7.0000.5393/89766518.6.0000.5393/68619417.5.0000.5393.

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Declaration of interest

There are no conflicts of interest.

Tables

Table 1
Distribution of participants according to biosociodemographic data (n=204),
Brazil, 2022

Occupation	Frequency	Percentage %
Retired and beneficiary	132	64.7
Employed or self-employed	33	16.2
Student	18	8.8
Unemployed	16	7.8
Other	5	1.9
Cause of Injury	Frequency	Percentage %
Traffic accident	104	50.9
Firearm and melee weapon	43	21.1
Diving	24	11.7
Fall	18	8.8
Other	15	7.3
Type of Injury	Frequency	Percentage %
Paraplegic	108	52.9
Quadriplegic	94	46.1
Could not inform	2	1.0
Attends or has attended rehabilitation services	Frequency	Percentage %
Yes	180	88.2
No	24	11.7

Source: Elaborated by the authors, 2022.

Table 2
Association between suicidal ideation and resilience (n=204), Brazil, 2022

Suicidal Ideation	Resilience			p-value*
	High	Medium	Low	
No	91	41	2	0.001
Yes	25	26	19	

*Cochran–Armitage chi-square test for trend

Source: Elaborated by the authors, 2022

Table 3
Mean, median and standard deviation of variables according to resilience (n=204),
Brazil, 2022

Variable	Resilience			p-value*
	Average	Median	Standard-Deviation	
Satisfaction with life	20.9	23.00	7.69	0.001
Searching for meaningfulness life	22.8	24.00	7.73	0.2851
Presence of meaningfulness	24.9	27.00	7.37	0.001

Self-esteem	8.3	8.00	5.46	0.001
Emotional Social Support (SS)	69.6	75.00	27.93	0.0003
Social Support (SS) information	67.6	75.00	27.54	0.0013
Social Support (SS) for positive social interaction	69.2	75.00	25.87	0.0007
Affective Social Support (SS)	81.1	91.67	25.06	0.0044
Material Social Support (SS)	79	93.75	26.36	0.8798

* *Kruskal-Wallis*

Source: Elaborated by the authors, 2022.

Figure Description

Figure 1. Data collection instrument used in the study, Brazil, 2022.