DOI: *http://dx.doi.org/10.18502/cjn.v22i4.14529*

Current Journal of Neurology

Original Paper

Curr J Neurol 2023; 22(4): 238-48

Chronic pain among Lebanese individuals with spinal cord injury: Pain interference and impact on quality of life

Received: 09 June 2023
Accepted: 14 Aug. 2023

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Keywords
Chronic Pain; Spinal Cord Injuries; Quality of Life; Lebanon

Abstract

Background: Chronic pain is one of the most disabling consequences of spinal cord injury (SCI). Although studies have identified a link between chronic pain and decreased quality of life (QOL) among this population, few studies have looked into the experience of chronic pain in Lebanese individuals with SCI and the impact of pain characteristics on QOL. Thus, the present study evaluated the chronic pain experience and its associated factors among Lebanese individuals with SCI in order to determine the impact of pain on QOL.

Methods: A cross-sectional study was conducted on 81 Lebanese individual with SCI between August 1st and October 31, 2022. The collected information included sociodemographic characteristics, SCI-related information, pain-related variables, and the 12-item Short Form Health Survey (SF-12). Factors associated with pain interference were evaluated using a linear regression model. One-way ANOVA and independent sample t-test were used to evaluate the association of different baseline and pain characteristics with QOL.

Results: In the present study, 81.5% of participants reported chronic pain with the majority of them having neuropathic pain type. Employment status (P = 0.034), type of pain (P = 0.009), and pain severity (P = 0.028) were significantly associated with pain interference. Unemployed participants and those with severe chronic pain, particularly neuropathic pain, had lower QOL.

Conclusion: Chronic pain was found to be highly prevalent among Lebanese patients with SCI. Pain interference and QOL were significantly affected by employment status and pain type. Therefore, targeting chronic pain and its associated factors in rehabilitation practice is warranted.

How to cite this article: Saleh NE, Fneish S, Orabi A, Al-Amin G, Naim I, Sadek Z. Chronic pain among Lebanese individuals with spinal cord injury: Pain interference and impact on quality of life. Curr J Neurol 2023; 22(4): 238-48.

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Introduction

Spinal cord injury (SCI) is a serious medical condition that leads to a significant disability.[1] Various health complications result from SCI including sensory and motor function impairments, neurogenic bladder and bowel function problems,[2,3] cardiovascular and respiratory complications,[4] sexual disorders,[5] spasticity,[6] chronic pain,[7] and others.[8] These underlying problems affect the patient's physical and psychological functioning, which significantly impacts their quality of life (QOL).[9-11]

QOL,[12] commonly reduced in the SCI population,[13-15] has been a key outcome measure in rehabilitation.[16,17] QOL is considered multidimensional, and several studies have emphasized various factors as producing negative impacts on QOL.[18-20] Age, gender, employment, education, as well as injury-related factors such as injury level and duration have been studied as factors that lower QOL levels in SCI.[21-23] Therefore, chronic pain has been proposed to have an eventual major impact on QOL due to its effect on mood, sleep, recreational and vocational activities, and different rehabilitation outcomes.[24-28]

Chronic pain is one of the most debilitating consequences of SCI.[29,30] It has been reported in approximately 68% of the SCI population;[7] it is classified into the two types of nociceptive and neuropathic pain with the latter being considered the most disabling.[31,32] The experience of chronic pain after SCI is infrequently resolved[33] and it is influenced frequently with various factors.[34-36] Previous studies found that pain experience is associated with sociodemographic factors, injury characteristics and complications, and other psychological and environmental factors.[36-38]

The experience of chronic pain in SCI encompassing its characteristics, types, and associations has been an area of interest for researchers in the last decade with the aim to improve pain management procedures.[32,39-41] Although various studies have examined the relationship between chronic pain experience and different clinical and sociodemographic factors,[38] it remains unclear and inconclusive in the literature,[42,43] and a need for studies on the characteristics of pain severity and interference with daily life and their predictive factors has emerged.[44] In addition, studies have reported the association of chronic pain with decreased QOL;[9,32,45,46] thus, limited studies have investigated the impact of pain characteristics including severity, interference, and specific types on QOL.[46,47]

Accordingly, it has been recently recommended that clinical research focus on pain interference and its influencing factors rather than only focusing on pain severity, which is frequently studied in pain research.[48] Its precise influence on QOL has yet failed to be conclusive specifically in individuals with SCI in developing countries.[49] To the best of our knowledge, no studies have been performed to evaluate the prevalence of chronic pain experience, its characteristics among individuals with SCI, and its impact on their QOL particularly in Lebanon. In this regard, proceeding from the necessity of understanding this relationship as a great concern to update efficient rehabilitative protocols for chronic pain management in individuals with SCI, we tried initially to assess this concept in the Lebanese population with SCI. The primary aim of the present study was to evaluate the experience of chronic pain and to identify the factors associated with pain interference in Lebanese individuals with SCI. The second aim was to determine the impact of different factors, particularly pain, on their QOL.

Materials and Methods

Participants: The participants included individuals with SCI who were recruited mainly from the Health, Rehabilitation, Integration, and Research Center (HRIR), a tertiary outpatient rehabilitation center for people with disabilities located in three main geographic areas (Beirut, South, and Bekaa) in Lebanon, and through contacting healthcare professionals from different inpatient and outpatient rehabilitation centers nationwide to randomly include Lebanese individuals with SCI. Individuals with chronic SCI (time since injury > 1 year) who were 18 years of age or older, lived in Lebanon, and were able to read and comprehend the questionnaire were considered eligible for inclusion. Participants were excluded if they had significant psychological or cognitive impairment, congenital disorders, neurodegenerative illnesses, infections, or unstable medical conditions.

Study design and procedure: This cross-sectional study was carried out on 81 Lebanese individuals with SCI over a period of 3 months extending from August 1st until the end of October 2022. This study was conducted according to the research ethics guidelines of the Declaration of Helsinki[50] and was approved by the Institutional Review Board of HRIR, Beirut, Lebanon. A

detailed explanation of the study aims and procedures were presented to the participants during a telephone call interview. Throughout the conversation, further information was provided as needed. Involvement in the study was requested with a clear indication of voluntary participation and a focus on respect for confidentiality in data collection and storage. Following their oral consent, written informed consent was obtained via an electronic system from participants who agreed to participate. Participants were invited to complete a self-report questionnaire as an online survey utilizing a link to "Google Forms" software via email or any other social media platform of their choice, or through a telephone interview. It should be highlighted that all information in the survey was gathered anonymously and treated with strict confidentiality.

Instrument: The questionnaire was presented with a definition of chronic pain experienced after SCI, and a description of the purpose of the study and its procedure, followed by a reassurance question on the consent to participate. The first part of the questionnaire included questions on socio-demographic and injury attributes related to age, gender, educational level, occupational and marital status, time since SCI, level of SCI (cervical, thoracic, or lumbar), and degree of impairment (tetraplegia or paraplegia). The second section comprised questions on the experience of chronic pain after SCI. Participants were asked if they have experienced and are experiencing chronic pain after an injury. The questionnaire also included questions on the characteristics of pain including its pattern, duration, triggering factors, and relieving factors. In addition to a question that asked about the use of pain medication in the past week. Evaluation of pain severity and interference with daily activities was assessed using the Arabic version of the Brief Pain Inventory (BPI).[51] The type of pain (neuropathic or non-neuropathic pain) experienced was concluded from the 7 self-report items of the Arabic Version of the Neuropathic Pain Questionnaire [Douleur Neuropathique en 4 (DN4)].[52] The third section of the questionnaire encompasses the 12-item Short Form Health Survey (SF-12), a QOL measure.[53]

Measures

Arabic version of the BPI: We used the first screening item of the BPI which is related to the presence of pains other than everyday pains, and the BPI pain intensity and interference scores. The BPI is a self-administered questionnaire that was initially intended to evaluate cancer pain[54] and is currently used as a common pain measure for different chronic pain conditions.[55] The BPI intensity and interference scores are regularly used in SCI pain research studies.[37,56,57] The BPI has been translated into Lebanese and validated among Lebanese cancer pain patients.[51]

The pain severity score is obtained as the sum of the scores of the 4 questions on pain intensity divided by 4. These 4 questions measure pain severity on a 0-10 numeric rating scale (NRS), with 0 denoting no pain and 10 denoting the worst possible pain, throughout the course of the previous week ((worst pain, least pain, pain at average, present).

The pain interference score is calculated as the sum of the scores of 7 items divided by 7. The 7 questions are rated on a 0-10 NRS (does not interfere-completely interfere), which inquire about the extent of pain-related impairment in general activity, mood, walking ability, normal work, relations with other people, sleep, and enjoyment of life. Greater interference is reflected by higher scores.

Arabic version of the DN4 questionnaire: The 7 symptom questions of the Arabic DN4 questionnaire, which include characteristics (burning, painful coldness, and electric shocks) and symptoms (tingling, pins and needles, numbness, and itching), were utilized to diagnose the presence of neuropathic pain symptoms.[52] These verbal descriptions are scored 1 to each positive item and 0 to each negative item (total score range 0–7). We adopted a cut-off score of 3 reflecting neuropathic pain, which had previously been shown to be accurate and reliable.[58] The DN4 was originally designed in French as a 10-item diagnostic test for neuropathic pain with 3 clinical questions and 7 self-reported questions. It has been translated into other languages and validated in Arabic among Lebanese populations.[52] Its sensitivity and specificity for identifying neuropathic pain are 70% and 67%, respectively.[59]

Arabic version of the SF-12: To measure the QOL of participants, we used the Arabic version of the SF-12. It is a health-related QOL measure derived from the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36).[60] The SF-12 evaluates QOL in the 8 domains of physical functioning (PF), role limitations due to physical problems (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role limitations due to emotional problems (RE), and

mental health (MH), and generates the physical component score (PCS) and mental component score (MCS). It has been used widely and extensively established as reliable and valid in different health clinical conditions.[61-63] An Arabic version of the SF-12 has been recently validated in the Lebanese population.[53]

The generated data from "Google Forms" on an excel spreadsheet were transported to the SPSS statistical software (version 26, IBM Corp., Armonk, NY, USA) for analysis. Given that the response to all questions was required, there was no missing data to substitute. Descriptive statistics were used to describe the baseline characteristics of participants. Categorical variables were presented as frequency and percentage, and mean ± standard deviation (SD) was used to present continuous variables. To identify potential predictors of pain interference, a univariate analysis was performed for each variable using a non-parametric test. All variables in the univariate analysis with a p-value < 0.1 were entered into a multiple linear regression model.

To evaluate the association of different baseline and pain characteristics with QOL, mean scores of the SF-12 domains and its subscales (PCS and MCS) were compared between groups using one-way analysis of variance (ANOVA) and independent samples t-test. Two-tailed P-values < 0.05 were considered significant.

Results

Baseline characteristics of individuals with SCI: The population included 81 individuals with SCI. Men constituted the majority of the total sample (86.4%). The mean age of the participants was 38.15 ± 11.75 years with 40.7% aged between 26 and 35 years. Out of the total sample, 54.3% were married, 67.9% did not have a college degree, and 66.7% were unemployed. Regarding the injury characteristics, 59.3% had a lumbosacral injury, and 77.8% were paraplegic. Finally, concerning the pain experience characteristics, 18.5% did not experience chronic pain, and 81.5% are experiencing chronic pain with the majority of them (n = 48) presenting a DN4 symptoms score of above 3, reflecting neuropathic pain. As for pain severity in participants with chronic pain, the average score of pain severity was 5.48 ± 2.27 with 56.1% of them describing their pain as moderate and 31.8% as severe. The average score of interference of pain with daily activities was 4.29 ± 2.39. A detailed description of the baseline characteristics of participants is presented in table 1.

Multiple linear regression evaluating associations with pain interference: Results of the univariate analysis illustrated 6 possible predictors of high pain interference (P = 0.10) to be included in the multivariate analysis, age range, marital status, occupational status, SCI level, type of pain (Neuropathic/Non-neuropathic), and pain severity scores. Table 2 depicts the associations between the resulting variables from the univariate analysis and pain interference scores. The regression model showed a significant correlation between pain interference and occupational status (Wald-Chi square = 5.38; P = 0.02), SCI level (Wald-Chi square = 5.65; P = 0.05), type of pain (Wald-Chi square = 4.18; P = 0.04), and pain severity (Wald-Chi square = 3.69; P = 0.05). Participants with thoracic injuries are more prone to higher pain interference, 4.118 times (95% CI: 0.05-0.95) that in those with lumbosacral injury. Unemployed participants were 4.268 times (95% CI: 1.25-14.55) more likely to have high pain interference scores compared with employed participants. The risk of higher pain interference among individuals with neuropathic pain (DN4 ≥ 3) was 3.430 times (95% CI: 1.05-11.17) higher than those with non-neuropathic pain. Moreover, participants with pain severity ≥ 4 were more likely to have higher pain interference, 3.699 times (95% CI: 0.97-14.05) those with pain severity scores of less than 4.

Comparison of QOL domains in individuals with SCI according to baseline and pain characteristics: The SF-12 domains, PCS, and MCS scores for different baseline characteristics are presented in table 3.

The mean GH domain score was significantly lower in individuals older than 35 years compared to those below 35 years of age (P = 0.004). The mean PF domain score was significantly lower in individuals with tetraplegia than in those with paraplegia (P = 0.007), and lower in individuals who experience neuropathic pain as compared with those with non-neuropathic pain and those who do not experience chronic pain (P = 0.030). Moreover, it was lower in individuals with severe and moderate pain as compared with those with mild pain (P = 0.032). The role limitation due to physical problems domain presents a statistically significant difference between different pain severity scores (P = 0.030).

Table 1. Baseline characteristics of individuals with spinal cord injury (SCI)

Baseline characteristic	n (%)	Baseline characteristic	n (%)
Age range (year)		Level of injury	
18-25	9 (11.1)	Paraplegia	63 (77.8)
26-35	33 (40.7)	Quadriplegia	18 (22.2)
36-45	15 (18.5)	Locomotion	
46-55	15 (18.5)	Wheelchair dependent	61 (75.3)
56-65	9 (11.1)	Walking ability	20 (24.7)
Gender		Pain pattern	
Male	70 (86.4)	Always	23 (34.6)
Female	11 (13.6)	No pattern	28 (28.4)
Marital status		1-3 days a month	2 (2.5)
Single	37 (45.7)	1-2 days a week	6 (7.4)
Married	44 (54.3)	3-6 days a week	7 (8.6)
Educational level		No pain	15 (18.5)
< 12 years of education	55 (67.9)	Duration of pain	
> 12 years of education	26 (32.1)	Not specified	34 (42.0)
Employment status		Few days	7 (8.6)
Unemployed	54 (66.7)	Few times a day	16 (19.8)
Employed	27 (33.3)	5 min-1 hour	5 (6.2)
Time since SCI (year)		< 5 min	4 (4.9)
1-2	8 (9.9)	No pain	15 (18.5)
2-5	3 (3.7)	Pain type	
> 5	70 (86.4)	No pain	15 (18.5)
SCI level		Neuropathic pain (DN4 > 3)	48 (59.3)
Cervical	21 (25.9)	Non-neuropathic pain (DN4 < 3)	18 (22.2)
Thoracic	12 (14.8)	Pain severity	
Lumbosacral	48 (59.3)	Mild	8 (12.1)
Hospital visits to take pain medication (during the past month)		Moderate	37 (56.1)
0 hospital visits	42 (64.6)	Severe	21 (31.8)
1-2 times	19 (29.2)	Pain interference	
> 3 times	4 (6.2)	Mild	19 (28.8)
Age (mean ± SD)	38.15 ± 11.75	Moderate	34 (51.5)
Pain severity score (Pain subjects) (mean ± SD)	5.48 ± 2.27	Severe	13 (19.7)
Pain interference score (Pain subjects) (mean ± SD)	4.29 ± 2.39		
PCS (mean ± SD)	36.26 ± 21.36		
MCS (mean ± SD)	52.16 ± 22.94		

SCI: Spinal cord injury; DN4: Douleur Neuropathique en 4; PCS: Physical component score; MCS: Mental component score; SD: Standard deviation

However, the BP domain varied significantly with occupational status (P = 0.050), presence of pain and its type (P = 0.010), pain severity (P = 0.005), and pain interference (P = 0.006). A statistically significant difference was found in the role limitation due to emotional problems domain depending on the educational level (P = 0.019), and in the SF domain according to the type of paralysis (P = 0.050). Mean PCS scores were significantly higher in employed individuals, those not experiencing pain or with non-neuropathic pain type, and those with mild pain severity and interference compared to their counterparts. The mean score of MCS differed only between employed and non-employed individuals (P = 0.041).

Discussion

The present study examined a sample of Lebanese individuals with SCI in terms of their experiences with chronic pain and factors that contribute to pain interference, and assessed the impact of several factors, most notably pain characteristics, on their QOL. This study demonstrated that 81% of the participants experienced chronic pain, and more than 70% of them experienced neuropathic pain symptoms. These results are consistent with the prevalence rate of any kind of pain after SCI reported in earlier studies,[38,64] and the high proportion is justified by the time since the injury being more than 5 years in most individuals, as previous studies have reported that a longer time since the injury presented high pain prevalence.[65]

Table 2. Factors associated with pain interference

	Factors	OR	95% CI	Wald-Chi square	P	Effect size (required sample size)
Dependent variable:	Age (year)			0.98	0.32	0.12 (68)
Pain interference	< 35	0.55	0.17-1.77			
	> 35	Reference				
	Marital status			1.13	0.28	0.15 (55)
	Single	0.49	0.13-1.82			
	Married	Reference				
	SCI level			5.65	0.06	0.25 (34)
	Cervical	0.30	0.08-1.12			
	Thoracic	0.21	0.04-0.94			
	Lumbar	Reference				
	Occupational status			5.38	0.02	0.26 (33)
	Unemployed	4.26*	1.25-14.58			
	Employed	Reference				
	Type of pain			4.18	0.04	0.22 (39)
	Neuropathic	3.43*	1.05-11.17			
	Non-neuropathic	Reference				
	Pain severity			3.69	0.05	0.25 (34)
	> 4	3.69*	0.97-14.04			
	< 4	Reference				

SCI: Spinal cord injury; OR: Odds ratio; CI: Confidence interval
*P-value < 0.05 was considered significant.
The required sample size was estimated assuming 80% of statistical power.

Thus, most of the individuals experiencing pain also had pain location below the level of the SCI, which is similar to the finding that neuropathic pain location below the level of SCI develops gradually over months to years after an injury.[66] Overall, the study sample presented an average pain intensity of 5.48 and pain interference of 4.29, reflecting moderate ranges according to pain severity and interference categories.[67] These levels are comparable to those reported in the literature in chronic SCI participants.[28,64,68]

Demographics and injury-related attributes proved not to be associated with pain interference ratings; this is consistent with the findings of prior studies.[28,43] Our study highlighted a significant association with employment status, type of pain, and pain intensity levels. The results showed that unemployed individuals with SCI are more susceptible to higher pain interference when compared to employed individuals; these findings are in line with those of previous studies.[28,69,70] In addition, the magnitude of higher levels of pain interference is predicted by pain intensity and type of pain. In terms of pain intensity, our findings are consistent with previous research outlining its relationship with interference, as well as the role of pain intensity in mediating the interference with activities.[44] Moreover, we found that the participants with neuropathic pain were more likely to experience higher levels of interference with daily activities, which is in accordance with a recent study by Felix et al. that compared pain interference between neuropathic pain and non-neuropathic pain.[64]

The findings of the present study revealed different determinants of QOL in individuals with SCI. In terms of sociodemographic characteristics, individuals over the age of 35 years had lower levels of GH than younger individuals, which is in line with previous findings showing that age is not closely associated with global QOL.[71] Moreover, unemployed individuals exhibited lower levels of QOL in the BP domain as well as in the PCS and MCS subscales which is in line with the results of various studies that have shown a significant association between employment status and QOL.[72,73]

Individuals who had not completed a university education had lower scores on the RE domain, which is supported by the findings of Halvorsen et al. indicating the significant impact of education on QOL and social participation,[20] as well as the proven relationship between educational level and different emotional problems and the MH component of QOL.[74,75] Furthermore, we found that individuals with tetraplegia had lower scores on the PF and SF domains than individuals with paraplegia in terms of injury characteristics.

Table 3. Comparison of quality of life (QOL) domains for individuals with spinal cord injury)SCI (according to baseline and pain characteristics

Variable	GH	PF	RP	BP	VT	RE	MH	SF	PCS	MCS
Age (year)										
< 35	48.81 ± 28.12	27.98 ± 28.79	20.24 ± 38.34	63.69 ± 31.81	57.74 ± 24.37	40.48 ± 48.43	63.99 ± 25.92	51.19 ± 34.01	40.17 ± 21.34	53.34 ± 19.72
> 35	31.41 ± 24.81	32.05 ± 29.77	11.54 ± 31.33	53.21 ± 34.01	52.56 ± 0.23	46.15 ± 49.18	55.45 ± 27.92	49.36 ± 29.51	32.05 ± 20.83	50.88 ± 26.17
P	0.004	0.530	0.260	0.150	0.390	0.620	0.150	0.790	0.080	0.630
Educational level										
< 12 years of education	42.27 ± 27.58	31.82 ± 31.71	14.55 ± 34.25	55.00 ± 33.47	55.00 ± 27.38	34.55 ± 47.01	58.86 ± 26.96	53.18 ± 31.56	35.90 ± 21.32	50.39 ± 22.07
> 12 years of education	36.54 ± 28.48	25.96 ± 22.89	19.23 ± 37.62	66.35 ± 31.57	55.77 ± 27.66	61.54 ± 47.55	62.02 ± 27.72	44.23 ± 31.86	37.01 ± 21.86	55.88 ± 24.70
P	0.390	0.400	0.570	0.150	0.900	0.010	0.620	0.230	0.280	0.820
Occupational status										
Unemployed	37.50 ± 26.04	28.24 ± 30.73	12.96 ± 32.48	68.52 ± 28.24	52.31 ± 28.01	37.96 ± 47.51	56.94 ± 26.67	46.76 ± 57.41	33.10 ± 19.52	48.49 ± 22.45
Employed	46.30 ± 30.77	33.33 ± 25.94	22.22 ± 40.03	53.70 ± 34.48	61.11 ± 25.31	53.70 ± 49.85	65.74 ± 27.42	57.41 ± 29.26	42.59 ± 23.77	59.49 ± 22.52
P	0.180	0.460	0.260	0.050	0.170	0.170	0.170	0.150	0.050	0.041
Paralysis										
Paraplegic	41.27 ± 28.45	34.52 ± 26.72	15.87 ± 34.577	56.75 ± 33.05	57.94 ± 27.97	38.10 ± 47.27	60.91 ± 28.44	53.97 ± 32.13	37.10 ± 21.53	52.72 ± 23.66
Quadriplegic	37.50 ± 26.080	13.89 ± 32.33	16.67 ± 38.348	65.28 ± 33.36	45.83 ± 23.08	61.11 ± 50.16	56.25 ± 21.96	37.50 ± 27.45	33.33 ± 21.11	50.17 ± 20.68
P	0.610	0.007	0.930	0.330	0.090	0.070	0.500	0.050	0.510	0.680
Pain type										
No pain	36.67 ± 22.88	39.18±10.11	30.00 ± 45.51	80.00 ± 30.17	45.00 ± 33.00	50.00 ± 50.00	54.17 ± 31.57	51.67 ± 29.07	22.24 ± 5.74	50.20 ± 26.76
Non-neuropathic pain	34.72 ± 25.92	33.36 ± 7.86	22.22 ± 39.19	61.11 ± 29.97	66.67 ± 25.72	50.00 ± 48.50	64.58 ± 23.96	41.67 ± 24.25	21.10 ± 4.97	55.72 ± 21.25
Neuropathic pain	43.75 ± 29.84	21.51 ± 3.10	9.38 ± 28.53	51.04 ± 32.59	54.17 ± 24.91	38.54 ± 48.64	59.90 ± 26.91	53.13 ± 34.83	20.10 ± 2.90	51.43 ± 22.63
P	0.430	0.030	0.090	0.010	0.060	0.580	0.550	0.420	0.035	0.740
Pain severity										
Mild	46.74 ± 28.50	42.39 ± 38.01	28.26 ± 44.78	71.74 ± 34.79	53.26 ± 31.35	45.65 ± 49.80	56.52 ± 28.17	50.00 ± 32.85	47.28 ± 24.33	51.36 ± 23.43
Moderate	41.22 ± 28.39	29.76 ± 30.22	23.81 ± 40.67	60.81 ± 24.67	59.46 ± 23.82	37.84 ± 49.16	65.20 ± 23.59	53.38 ± 32.89	32.09 ± 14.14	53.97 ± 22.67
Severe	32.14 ± 25.17	22.30 ± 18.43	4.05 ± 18.17	40.48 ± 37.48	50.00 ± 28.50	50.00 ± 47.43	54.17 ± 30.95	45.24 ± 29.17	31.54 ± 24.88	49.85 ± 23.72
P	0.210	0.030	0.030	0.005	0.410	0.630	0.260	0.640	0.010	0.790
Pain interference										
Mild	47.50 ± 28.12	30.83 ± 24.28	21.67 ± 40.86	69.17 ± 31.95	50.83 ± 28.22	53.33 ± 49.01	60.83 ± 30.39	56.67 ± 37.67	42.29 ± 22.18	55.41 ± 26.79
Moderate	36.84 ± 25.16	34.87 ± 32.64	17.11 ± 35.40	58.55 ± 31.44	57.24 ± 23.90	36.84 ± 47.48	59.87 ± 25.02	48.03 ± 26.24	36.84 ± 20.99	50.49 ± 18.34
Severe	34.62 ± 33.13	13.46 ± 24.19	00.00 ± 00.00	34.62 ± 29.82	59.62 ± 34.66	38.46 ± 50.63	57.69 ± 26.78	42.31 ± 31.26	20.67 ± 11.79	49.51 ± 26.32
P	0.210	0.070	0.170	0.006	0.520	0.350	0.940	0.330	0.008	0.610

GH: General health; PF: Physical functioning; RP: Role limitations due to physical problems; BP: Bodily pain; VT: Vitality; SF: Social functioning; RE: Role limitations due to emotional problems; MH: Mental health; PCS: Physical component score; MCS: Mental component score

This finding is consistent with the findings of several research studies that attribute the difference to higher levels of dependency in more severe injuries.[49,76,77]

Regarding the experience of chronic pain and its effect on QOL, the current study emphasizes that individuals with higher pain intensity have lower levels of QOL in the PF, RP, and BP domains, and the PCS subscale. These findings comply with the research by Ataoglu et al. demonstrating lower levels of QOL in all domains in individuals with higher pain intensity.[78] The specificity of the relationship between pain intensity and the physical dimensions of QOL reflects the demonstrated association between pain intensity and physical function in people living with pain.[79,80] Similarly for pain interference, higher levels are associated with lower BP domain and PCS subscale scores, which is in accordance with numerous studies that have reported the impact of pain on PF,[25,81,82] as well as studies that have reported that pain interference is more significant for the conceptualization of the link between pain and QOL.[83]

The current study found that having chronic pain reduced the BP, PF, and PCS subscale scores of the SF-12. In particular, neuropathic pain has been demonstrated to exacerbate the decline in QOL levels in SCI. These results are consistent with recent studies that have demonstrated the highest reductions in QOL among individuals with SCI reporting neuropathic pain (NP).[46,84]

To the best of our knowledge, this is the first study to evaluate the chronic pain experience of Lebanese individuals with SCI. This cross-sectional study assessed the impact of neuropathic pain type on QOL, since the majority of previous research has examined pain in general, without distinguishing between types. Thus, this study emphasized the significance of the employment of individuals with SCI on the improvement of their chronic pain experience, pain interference, and QOL. The findings of this study will add to the literature concerning the Lebanese individuals with SCI on the Lebanese SCI population since data targeting this population remains scarce in Lebanon.[85] Furthermore, since the application of legislative actions taken by the Lebanese government such as regulations for schools, workplaces, and government programs remains lacking[86] and 80% of Lebanese people with disabilities stay unemployed,[87] this study can help to support the importance of including people with disabilities, particularly individuals with SCI, in the labor force in order to enhance their QOL.

Our study does have certain limitations. Although several variables evaluating pain experience were gathered, it is possible that some important variables such as coping and pain adaptation, along with the perceived effect of adopted pain management procedures, were underestimated. It is also worth noting that the sample size is inadequately similar to SCI-pain studies which might be related to the lack of population-based records and registers on individuals with physical abilities.[88] The findings of this study were based on self-reported data, thus increasing the possibility that the responses were influenced by personal and psychological factors since the psychological state of participants was not evaluated.

The current study raises intriguing questions and suggests possible future directions. Hence, further research with a greater sample size is required, with an emphasis on understanding the effective pain-relieving methods utilized by Lebanese individuals with SCI.

Conclusion

A high proportion of Lebanese individuals with SCI experience chronic pain. This study highlights the substantial and negative influence of chronic pain, particularly neuropathic pain, on QOL. Pain interference is a better effective method to understand the experience of pain, and employment status is the main factor affecting interference and QOL. It is critical to broaden the current study's findings in order to promote QOL by warranting chronic pain management and incorporating employment and social reintegration as primary rehabilitation goals for individuals with SCI in Lebanon.

Conflict of Interests

The authors declare no conflict of interest in this study.

Acknowledgments

We would like to thank all participants for cooperation and the Imam-Sadr Foundation - Derdghaya center for people with disabilities for helping in the recruitment of individuals with SCI.

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