Neurology Asia 2024; 29(4) : 1155 – 1162

Perceived social support, and related factors in patients with spinal cord injury

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Abstract

Background and Objectives: With developing technology and techniques, great progress has been made in the rehabilitation of patients with spinal cord injury. However, despite these advancements, insufficient attention is given to the social support perceived by patients and related factors in their rehabilitation. The aim of this study was to determine perceived social support and related factors in patients with spinal cord injury. *Method:* An evaluation was conducted on patients admitted to the outpatient clinic in a university rehabilitation center in Konya , Turkey. A total of 150 subjects aged 18-65 years were included in this study, which had a prospective, controlled study design. Participants were assessed for depression, anxiety, perceived social support, quality of life, and pain. Additionally, the patient group was evaluated for disability status and activities of daily living. *Results:* In the patient group, perceived social support (P=0.002) and quality of life (P<0.001) were found to be statistically significantly lower, while levels of depression (P<0.001), anxiety (P=0.006), and pain (P=0.001) were found to be high. An increase in perceived social support was associated with an improvement in quality of life, particularly in terms of social relations and environment (r=0.405, P<0.001, r=0.276, P=0.016). Furthermore, a significant negative correlation was observed between quality of life and depression (r=-0,478, P<000.1) and anxiety (r=-0.319, P=0.005).

Conclusion: These findings emphasize the importance of social support in patients with spinal cord injury. Healthcare professionals should recognize social support as an integral part of spinal cord injury rehabilitation.

Keywords: Spinal cord injury, social support, perceived social support

INTRODUCTION

Spinal Cord Injury (SCI) is a disorder that can cause temporary or permanent deterioration of the normal motor, sensory, and autonomic functions of the spinal cord. SCI has a deleterious effect in terms of physical, psychological, social, and vocational aspects.[1,2] Social support given to the patient is important in reducing these devastating effects.

Social support is any moral or material support provided by others around a person.[3] Perceived social support is the cognitive perception that there are people who can support and be relied on by an individual. The support a person receives from their close circle such as a spouse, friends, relatives, and the knowledge that there are people who can help in times of distress, will contribute to feeling well and strong physically and emotionally.[4] Previous studies have highlighted the positive impact of social support on health, life satisfaction, and mortality in patients with chronic diseases.[5-7]

With recent emerging technologies and increased awareness of SCI patients, major steps have been taken in SCI rehabilitation treatment. In the past, the main goal of treatment of patients with spinal cord injuries was to keep the patient alive. Today the life expectancy of patients is increasing with improved first aid facilities, increased quality of patient care, and early interventions against complications. In addition, physicians have now begun to see the importance of the patient's

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Date of Submission: 18 January 2024; Date of Acceptance: 19 September 2024

https://doi.org/10.54029/2024ian

mental, and social health, functionality, and quality of life, as well as their physical health.[2]

Unfortunately, despite significant progress, the importance of social support and related factors in the rehabilitation of SCI patients is often overlooked. To our knowledge, there is no comprehensive and adequate study in the literature comparing perceived social support and related factors between SCI patients and a control group. This study aims to address this gap by investigating the perceived social support and related factors in SCI patients in Konya, Turkey.

METHODS

Study design and study population

The study was conducted in accordance with the principles of the Declaration of Helsinki. Written informed consent was obtained from all participants. After approval from the institutional ethics committee (Ethic number: 2017.181), this prospective, controlled, observational study was carried out with SCI patients at the outpatient clinic of a tertiary hospital rehabilitation center between April 2017 and April 2018.

The patient group consisted of 76 patients who applied to the outpatient clinic and were diagnosed with SCI between the ages of 18 and 65 years, regardless of the etiology (traumatic/non-traumatic) of the spinal cord injury, and had been diagnosed for at least 1 year. The control group consisted of 74 healthy volunteers aged 18 to 65 years who visited our hospital's outpatient clinics for general check-ups and did not have any acute or chronic diseases. In both groups, individuals with any drug or alcohol addiction, communication problems, significant psychiatric illness, or hearing and vision impairment were excluded from the study.

Data collection and assessment

The clinical and demographic data of the patients include age, gender, body mass index (BMI), income level, educational status, marital status, family type, social security, employment status, and cohabitation status. The Multidimensional Scale of Perceived Social Support (MSPSS) was used to evaluate perceived social support for both groups. This scale includes 12 questions, with 4 questions each assessing support from family, friends, and significant others. Responses are rated on a 7-point Likert scale from 1 (very strongly disagree) to 7 (very strongly agree), with total scores ranging from 12 to 84. Higher scores indicate greater perceptions of social support, while lower scores indicate less perceived support. The MSPSS demonstrated excellent internal reliability (Cronbach's α = 0.85 to 0.91) and strong test-retest stability over a two to three-month interval (r = 0.72 to 0.85).[3]

The World Health Organization Quality of Life-BREF (WHOQOL-BREF) scale was used to evaluate the quality of life. This scale consists of 26 items that determine mental, environmental, physical, and social well-being. Each of the subdimensions independently shows the quality of life in their subdimensions. The first two questions provide a global assessment of quality of life rather than corresponding to any specific domain. Each item is scored from 1 (very dissatisfied) to 5 (very satisfied), with higher scores indicating higher quality of life.[8,9]

Depression, anxiety, and general body pain levels were assessed using the Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), and Visual Analog Scale (VAS) (0-10 cm) respectively. A BDI score of ≥ 17 was considered indicative of depression, and a BAI score of ≥ 16 was considered indicative of anxiety.[10,11]

A detailed physical examination was performed, and the duration and cause of SCI were recorded in the patient group. The ASIA Impairment Scale was used to classify SCI, and the Craig Handicap Assessment and Reporting Technique - Short Form (CHART-SF) was used to assess the level of disability and participation. The CHART-SF includes 19 items with a maximum total score of 100. A higher score indicates greater participation, while a lower score indicates higher disability. The maximum score of 100 reflects the level of participation of a non-disabled individual and consists of scores in 6 parameters: physical independence, cognitive independence, mobility, occupation, social integration, and economic self-sufficiency. Reliability in this sample was acceptable ($\alpha = 0.667$). Additionally, the Barthel Index (BI) was used to evaluate daily living activities, with scores ranging from 0 to 100. A score of 0 indicates complete dependence, while a score of 100 indicates independence. In studies using the BI, a cut-off score of 60 is typically used, with scores above 60 indicating independent functioning.[13]

Statistical analysis

Statistical analysis was performed using SPSS version 20.0 (IBM Inc., Chicago, IL, USA).

Descriptive statistics for categorical variables were reported as frequencies and percentages, while continuous variables were presented as means ± standard deviations (SD). The normality of continuous numerical variables was assessed using the Kolmogorov-Smirnov test. As the majority of the variables did not follow a normal distribution, non-parametric tests were employed. The Mann-Whitney U test was used for comparisons between two independent groups, and the Kruskal-Wallis test was used for comparisons among multiple groups. Relationships between categorical variables were analyzed using the Monte-Carlo correction of the chi-square test, and relationships between numerical variables were assessed using Spearman's rank correlation coefficient. Post-hoc comparisons among multiple groups were conducted and indicated in the tables using lowercase letters. A multiple linear regression model was established to determine the effects of scale results, demographic, and clinical characteristics on the scale scores, with explanatory power and goodness of fit reported for the model. A type-I error rate of 5% was used throughout the study, with p-values <0.05 considered statistically significant.

RESULTS

A total of 150 individuals participated in the study, with 76 being patients with SCI and 74 being healthy volunteers. Significant differences were observed between the groups in terms of gender, education level, employment status, social security, marital status, duration of marriage, number of children, family type, monthly income, and cohabitation status. The patient group had a higher proportion of males, lower education levels, lower monthly incomes, higher unemployment rates, longer durations of marriage, more children, higher body pain scores, and larger families compared to the control group (Table 1).

The mean BDI and BAI scores were significantly higher in the patient group than in the control group ($p < 0.001$ and $p = 0.003$, respectively). Consequently, the proportion of individuals with depression or anxiety was also higher in the patient group ($p < 0.001$ and $p = 0.006$, respectively). WHOQOL-BREF scores were significantly different between the groups, with all subscores being lower in the patient group ($p < 0.001$). All MSPSS scores were significantly lower in the patient group compared to the control group (Table 2).

When the SCI patient group was subdivided into paraplegic and quadriplegic subgroups according to their injury levels, no statistically significant differences were in BDI, BAI, VAS, WHOQOL-BREF subscales, and MSPSS subscale scores. However, CHART-SF and BI scores were statistically significantly higher in the quadriplegic patients (Table 3).

The relationships between MSPSS subscales and WHOQOL-BREF subscale scores in SCI patients are shown in Table 4. Positive correlations were observed between WHOQOL-BREF social relations and MPSS family, significant other, and total scores. A positive correlation was also detected between the WHOQOL-BREF environment and the MPSS family subscale score. (Table 4).

Table 5 presents the relationships between demographic and clinical characteristics and questionnaire scores in the patient group. Spearman's correlation test was used for analysis. A weak negative correlation was found between BDI, CHART-SF, and BI, while moderate correlations were observed between BDI, BAI, and WHOQOL-BREF.A moderate negative correlation was also found between BAI and WHOQOL-BREF. No statistically significant relationship was found between MSPSS scores of SCI patients and anxiety, depression, demographic data, level of disability, participation in activities of daily living, and body pain. (Table 5).

A regression model was developed to assess the impact of MSPSS and other scale scores. The forward multiple linear regression model was significant ($p = 0.003$) with an explanatory value of $R^2 = 0.150$. Significant contributions to the model were made by the BI (Beta = -0.228; $p = 0.041$) and the WHOQOL-BREF social relations subscale (Beta = 0.279; $p = 0.015$). Independent variables that did not contribute significantly were excluded from the model. Figures 1 and 2 display the results of the regression analysis for the MSPSS (Figures 1, 2).

DISCUSSION

SCI is a disease that causes devastating physical, psychological, social, and vocational impacts, leading to severe disabilities.[1,2] Despite significant advances in rehabilitation that have improved mobility and independence for SCI patients, the assessment of perceived social support—a key factor in successful rehabilitation—is often overlooked. The present study demonstrated that, compared to the control group, SCI patients experienced reduced perceived social support

Table 1: Demographic characteristics according to patient and control groups

		Patient Group (n=76)	**Control Group (n=74)**	**p value**
Age (years)		40.65±13.66	37.87±9.03	0.191
BMI (kg/m2)		25.20 ± 5.05	26.20 ± 4.39	0.065
SCI duration (years)		8.25 ± 8.67		
Marriage duration (years)		22.36 ± 12.50	14.80 ± 9.95	**0.001***
Number of children		2.56 ± 1.16	2.01 ± 0.87	**0.012***
Body pain (VAS)		3.65 ± 3.25	1.94 ± 2.31	**0.001***
Gender (n)	Male	46 (60.5 %)	33 (44.6 %)	**0.014***
	Female	30 (39.5 %)	41 (54.4 %)	
Education (n)	Illiterate/Primary/ Secondary	53 (69.7 %)	17 (22.9 %)	**<0.001***
	High School/University	23 (30.3 %)	57 (77.1 %)	
Working status (n)	Unemployed	61 (80.2 %)	16 (21.6 %)	**<0.001***
	Employed	15 (19.8 %)	58 (78.4 %)	
Social security (n)	Yes	70 (92.1 %)	74 (100 %)	**0.014***
	No	6 (7.9 %)	0 (0.0 %)	
Marriage (n)	Married	41 (53.9 %)	55 (74.3 %)	**0.009***
	Single/Divorced/Widow	35 (46.1 %)	19 (25.7 %)	
Family type (n)	Core family	55 (72.4 %)	64 (86.5 %)	**0.028***
	Large family	21 (27.6 %)	10 (13.5 %)	
Monthly income (n)	<MW x1	56 (73.7 %)	34 (45.9 %)	**<0.001***
	MW x1-1.5	15 (19.7 %)	16 (21.6 %)	
	MWx1.5-2.5	4 (5.3 %)	13 (17.6 %)	
	>MWx2.5	1 (1.3 %)	11 (14.9 %)	
Cohabitation status-(n)	Alone	2 (2.6 %)	3 (4.1 %)	**0.001***
	Parents/Relatives	28 (36.8 %)	17 (23 %)	
	Spouse	35 (46.1 %)	54 (72.9 %)	
	In the nursing home	11 (14.5 %)	0 (0.0 %)	

BMI: Body mass index, SCI**:** Spinal cord injury, **VAS:** Visual analog scale

and quality of life, accompanied by increased pain, depression, and anxiety, regardless of the level of injury.

The National Spinal Cord Injury Statistical Center documented that only 12.4% to 27.7% of SCI patients were employed.[14] Similarly, in our study, most SCI patients were unemployed compared to controls (only 19.7% were employed). Consistent with the existing literature, SCI patients in our study had lower monthly incomes compared to the general population.[15] Additionally, SCI patients had lower sociocultural levels compared to controls; they were more likely to divorce, live with larger families, and have more children. It seems plausible that living with larger families after divorce is associated with SCI patients having difficulty maintaining their daily lives alone and with lower socioeconomic status.

Almost all participants in the present study had social security similar to European countries.[15] While all healthy volunteers participating in our study had social security, 7.9% of those with spinal cord injury did not have social security. On the other hand, some individuals with SCI in our study were not receiving disability benefits (such as disability pension, public/private sector employment privileges for people with disabilities etc.) despite working for low wages or being unemployed. This suggests that some SCI patients were unaware of their social rights or did not know how to claim them. We believe that these patients should be directed to vocational rehabilitation

Table 2: Comparison of depression, anxiety, quality of life, and perceived social support according to patient and control groups

		Patient Group (n=76)	Control Group (n=74)	p value
BDI		16.7 ± 9.6	8.7 ± 9.1	**<0.001***
BAI		14.5 ± 9.1	11.0 ± 10.4	**0.003***
Depression (n)	Yes	39 (51.3%)	14 (18.9%)	**<0.001***
	No	37 (48.7%)	60 (81.1%)	
Anxiety (n)	Yes	35(46.1%)	18(24.3%)	**0.006***
	No	41(53.9%)	56(75.7%)	
WHOQOL-BREF	Overall QoL	5.9 ± 1.8	7.22 ± 1.8	**<0.001***
	Physical health	19.9 ± 6.9	27 ± 5.4	**<0.001***
	Psychological health	20.2 ± 4.8	22.8 ± 4.6	**<0.001***
	Social relations	8.6 ± 2.8	11.6 ± 5.2	**<0.001***
	Environment	25.5 ± 6.2	30.8 ± 10.2	**<0.001***
MSPSS	Family	16.5 ± 8.3	19.8 ± 7.1	**0.020***
	Friends	22.4 ± 5.5	24.8 ± 4.2	**0.002***
	Significant Other	19.6 ± 7.1	23.0 ± 5.0	**0.003***
	Total	58.5 ± 18.6	67.6 ± 14.7	**0.002***

BDI: Beck Depression Inventory, **BAI:** Beck Anxiety Inventory, **QOL:** Quality of Life, **WHOQOL-BREF:** the World Health Organization Quality of Life – BREF, **MSPSS**: Multidimensional Scale of Perceived Social Support

and social rights services and should be informed about their social rights through communication channels such as television, radio, newspapers, the internet, and hospital brochures.

In the present study, in SCI patients regardless of the level of injury, depression, anxiety, and pain levels were increased and the perceived social support, and quality of life decreased. In addition, there was a negative correlation between depression, anxiety, and the quality of life of these

Table 3: Comparison of depression, anxiety, pain, functionality, disability, quality of life, and perceived social support according to paraplegic and quadriplegic groups

		Paraplegic (n=58)	Quadriplegic (n=18)	p value
BDI		16.2 ± 9.6	18.0 ± 9.6	0.474
BAI		14.1 ± 9.3	15.8 ± 8.3	0.362
BI		61.6 ± 25.4	36.3 ± 22.4	**0.006***
VAS		3.5 ± 3.0	4,1 ± 3.8	0.702
CHART-SF Total		284.7±125.3	220.1±163.8	**<0.001***
WHOQOL-BREF	Overall QoL	5.8 ± 1.8	6.2 ± 1.6	0.347
	Physical health	27.0 ± 5.4	17.7 ± 4.8	0.089
	Psychological health	20.1 ± 4.6	20.6 ± 5.4	0.540
	Social relations	8.6 ± 2.7	8.8 ± 3.6	0.868
	Environment	25.1 ± 6.3	26.8 ± 5.9	0.304
MSPSS	Family	16.7 ± 7.8	15.4 ± 9.7	0.466
	Friends	22.5 ± 5.7	22.2 ± 5.0	0.635
	Significant Other	19.5 ± 7.1	19.7 ± 7.1	0.873
	Total	58.8 ± 18.6	57.3 ± 19.2	0.696

BDI: Beck Depression Inventory, **BAI:** Beck Anxiety Inventory, **BI:** Barthel Daily Living Activities Index, **VAS:** Visual analog scale **CHART-SF:** the Craig Handicap Assessment and Reporting Technique-SHORT Form, **QOL:** Quality of Life, **WHOQOL-BREF:** the World Health Organization Quality of Life – BREF, **MSPSS**: Multidimensional Scale of Perceived Social Support

Table 4: Relationships between MSPSS subscales and WHOQOL-BREF subscales' scores in SCI patients

			WHOQOL-BREF				
			Overall QoL	**Physical health**	**Psychological health**	**Social relations**	**Environment**
MSPSS	Family	rho	0.149	0.047	0.128	0.405	0.276
		p	0.198	0.686	0.269	***<0.001****	***0.016****
	Friends	rho	0.021	-0.237	0,014	0.193	0.083
		p	0.858	0.039	0.905	0.094	0.475
	Significant Other	rho	0.117	-0.066	0.107	0.305	0.178
		p	0.313	0.572	0.357	***0.007****	0.125
	Total	rho	0.126	-0.092	0.096	0.331	0.207
		p	0.280	0.430	0.411	***0.003****	0.073

MSPSS: Multidimensional Scale of Perceived Social Support, **WHOQOL-BREF:** the World Health Organization Quality of Life – BREF, **QOL:** Quality of Life,

patients similar to the literature.[16,17] As expected, depression triggers anxiety and anxiety triggers depression in spinal cord injury patients regardless of the level of injury.

Rintala *et al.* found that when there was an increase in perceived social support of SCI patients, quality of life increased.[17] Similarly, in our study, we found that as the higher the perceived social support from family and special people, the better the quality of life of SCI patients in terms of social relations and the environment. In line with this information, we can say that perceived social support increases the quality of life of individuals with SCI.

Khazaeipour *et al.* conducted a study investigating pain-related factors in SCI patients

Table 5: Relationships between demographic features and all scale scores of SCI patients

		BAI	**BDI**	**MSPSS Total**	**CHART-SF Total**	**BI**	**Duration of SCI (years)**	**Age (years)**	**WHOQOL Overall QOL**
Pain (VAS)	rho	0.197	0.132	0.221	-0.070	0.020	0.005	0.278	-0.092
	p	0.090	0.260	0.056	0.551	0.867	0.967	**0.016***	0.433
BAI	rho		0.467	-0.109	-0.039	-0.026	-0.048	0.077	-0.319
	p		**<0.001***	0.348	0.741	0.825	0.677	0.508	**0.005***
BDI	rho			-0.164	-0.282	-0.273	-0.093	0.076	-0.478
	p			0.157	**0.014***	**0.017***	0.424	0.514	**<0.001***
MSPSS Total	rho				-0.088	-0.149	-0.115	-0.011	0.126
	p				0.450	0.198	0.324	0.928	0.280
CHART-SF Total	rho					0.613	0.241	-0.257	0.090
	p					**<0.001***	**0.036***	**0.025***	0.437
BI	rho						0.173	-0.279	-0.013
	p						0.135	**0.015***	0.909
Duration of SCI (years)	rho							0.128	0.155
	p							0.270	0.181
Age (years)	rho								-0.152
	p								0.189

BAI: Beck Anxiety Inventory, **BDI:** Beck Depression Inventory, **VAS**: Visual Analog Scale, **MSPSS**: Multidimensional Scale of Perceived Social Support, **BI:** Barthel Daily Living Activities Index, **CHART-SF:** the Craig Handicap Assessment and Reporting Technique-SHORT Form, **WHOQOL-BREF:** the World Health Organization Quality of Life – BREF

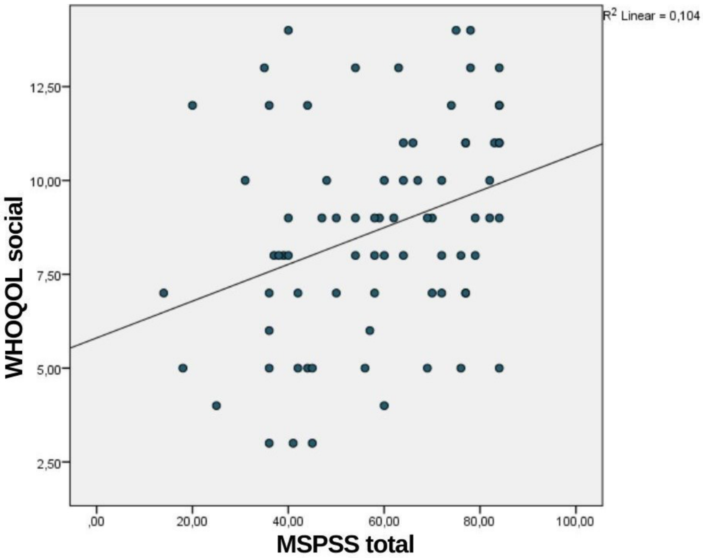

Figure 1. Regression curve between MSPSS total and WHOQOL-BREF social subscore

and showed that similar to our study, there was no relationship between pain and perceived social support of patients.[18] However, it is important to attend to the pain management, as pain can be a sign of comorbidities in these patients and can also reduce the success of rehabilitation.

Some studies suggest that income status positively influences perceived social support in SCI patients.[19,20] However, a review reported that the relationship between social support, gender, marital status, age, education level, employment status, age, injury level, and injury duration is not clear.[21] In another study, no statistically significant relationship was found between these variables, similar to our study.[22] Nonetheless, further prospective controlled studies with larger sample sizes are recommended.

This study is subject to several limitations. First, this is a single-center study with cross-sectional design. The varying educational status between groups may introduce confounding factors affecting questionnaire interpretation and results. Correlation analysis was exclusively conducted within the patient group, limiting broader generalizations. The absence of psychiatric evaluations for depression and anxiety

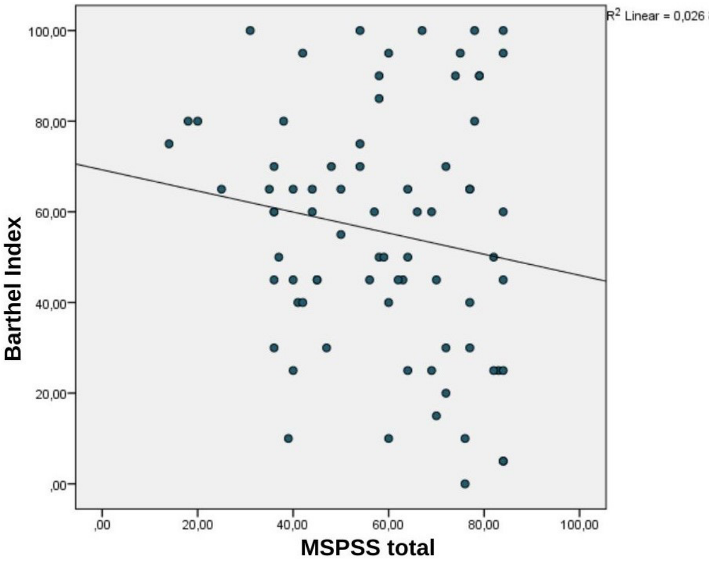

Figure 2. Regression curve between MSPSS total and Barthel Index

represents another limitation.

In conclusion, this study shows the heightened depression and anxiety levels, coupled with diminished perceived social support and quality of life among SCI patients. Recognizing social support as an integral part of SCI rehabilitation is important for healthcare professionals. Additionally, an expansion and heightened awareness of social rights for all SCI patients and their relatives are crucial. State policies fostering social inclusion and productivity for individuals with SCI should be developed.

DISCLOSURE

Financial support: None

Conflict of interest: None

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