Original Article

Psychological Well-being and Quality of Life for Patients with Stable Spinal Cord Injury: A Cross-sectional Study

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Abstract

Background: Spinal cord injury (SCI) results in severe physical impairments and significant lifestyle disruptions, including paralysis, increased dependence on caregivers, and a tendency toward social isolation. These challenges deeply affect the psychological health and overall quality of life (QOL) of those impacted, especially in younger patients. Investigating the psychological and QOL outcomes in individuals with stable SCIs is crucial for developing tailored rehabilitation strategies. **Aim:** The study aimed to investigate the psychological health and QOL in patients with stable SCIs. **Materials and Methods:** This observational cross-sectional study involved patients with stable traumatic SCIs recruited through WhatsApp support groups from two major centers in India. Eligible participants were adults who were at least 1-year postinjury. Those with severe head injuries or nontraumatic spinal injuries were excluded. Participants provided sociodemographic information and injury history and completed assessments evaluating psychological health and QOL. Data were analyzed using IBM SPSS software, and statistical significance was determined through Chi-square tests. **Results:** Psychological distress was identified in 26.2% of the participants. Younger participants exhibited significantly poorer QOL in the psychological domain (P = 0.02). Employment status showed a significant association with the physical domain (P = 0.037) and overall QOL scores (P = 0.046). Socioeconomic status was significantly correlated with both the psychological (P = 0.004) and social domains (P = 0.009). **Conclusions:** The study underscores the considerable impact of SCI on psychological health and overall QOL, with younger individuals disproportionately affected. Healthcare providers should prioritize the integration of psychological support and counseling in SCI rehabilitation programs.

Keywords: *Mental health interventions, psychological health, quality of life, rehabilitation, spinal cord injury*

Introduction

Spinal cord injury (SCI) is a devastating and medically complex condition associated with long-term or lifelong complications, significantly impacting the lifestyle of affected individuals.[1,2] As a result of the injury, the functions of the spinal cord distal to the level of injury are interrupted.[3] SCI can be traumatic or nontraumatic. Traumatic SCI is more common in young males, often resulting from potentially life-threatening events such as motor vehicle accidents, gunshot wounds, and falls, whereas nontraumatic SCI is reported more frequently in older adults.[4-6] Younger individuals face greater challenges following SCI due to the abrupt disruption of their active lifestyles, career aspirations, and social roles, which can lead to significant psychological distress.

According to the World Health Organization, approximately 250,000–500,000 people suffer from SCI each year globally, with mortality rates 2–5 times higher than those of the general population.[7] The average annual incidence of SCI is 40–80 cases per million.[7] Although the exact incidence of SCI in India is unknown, it is gradually increasing, leading to higher morbidity and mortality.[8] Complication and mortality rates following SCI are documented to be higher in low- and middle-income countries compared to high-income countries.[7]

The sudden onset of SCI brings drastic changes in life, including paralysis, loss of functions (e.g., walking), changes in bowel and bladder habits, reliance on caregivers, disruption of routines, social isolation, and occupational impact. These changes make it challenging for affected individuals to accept their new reality.[8] SCI negatively impacts the psychological health and quality

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of life (QOL) of affected individuals.[9,10] The World Health Organization defines QOL as "an individual's perception of their position in life, within the context of culture and value systems, and in relation to their goals, expectations, standards, and concerns."[11] Given this background, this study aims to evaluate the psychological health and QOL in patients with stable SCIs.

Materials and Methods

This observational cross-sectional study was conducted among patients with SCIs using WhatsApp support groups from two centers: Indian Spinal Injury Center, New Delhi, and CMC Vellore. These centers serve the majority of the population in their respective geographic areas. WhatsApp support groups were chosen due to their widespread use across socioeconomic classes in India and their role as trusted, pre-existing communities for SCI patients. In addition, they provide a convenient, cost-effective platform for secure and private communication with a geographically dispersed and demographically diverse population. Participants were selected using purposive sampling to ensure the inclusion of individuals meeting the study criteria. The study was approved by the Institutional Review Board of the Dharwad Institute of Mental Health and Neurosciences, Dharwad, India (No: DIMHANS/IEC/66/2021-22). Informed consent was obtained from each of the study participants before their inclusion in the study.

Patients with stable traumatic SCI, characterized by being at least 1-year post-injury with ongoing deficits, were included in the study. Participants were required to be 18 years of age or older and capable of reading and understanding either Hindi or English. Those excluded from the study included individuals with severe head injuries and patients with nontraumatic spinal injuries resulting from tumors, space-occupying lesions, or infections, as these conditions could confound the study's focus.

All participants meeting the inclusion criteria were enrolled, and a link to the pro forma was sent to them through the WhatsApp group. Informed consent was obtained from each participant. The pro forma included sociodemographic details (e.g., name, age, sex, education, occupation, and socioeconomic class), history of injury, duration since injury, and questions from the General Health Questionnaire (GHQ-12)[12] and World Health Organization Quality-of-Life Scale-Best Available Techniques Reference Documents (WHOQOL-BREF) scale.

The GHQ-12 was used to assess overall psychological health. It is a short, self-reported clinical tool, in which subjects reflect on their personal lives over the past few weeks. Scores range from 0 to 36, with scores of 11–12 indicating no distress, >15 indicating distress, and >20 indicating severe psychological distress.[13]

The WHOQOL-BREF scale, a 26-item questionnaire, assessed health-related QOL across four domains: physical health (7 items), psychological health (6 items), social relationships (3 items), and environmental health (8 items). Each item is scored from 0 to 5 using an ordinal scale and then linearly transformed to a 0–100 scale.[14]

Data were analyzed using IBM SPSS Software Version 20.0. Armonk, NY, USA: IBM Corp. Categorical data were expressed as frequencies and proportions, whereas continuous data were expressed as means and standard deviations. Chi-square tests were used to assess statistical significance. P <0.05 was considered statistically significant.

Results

A total of 65 individuals with SCI participated in the study, with a mean age of 31.46 ± 7.76 years. The majority of participants were under 30 years old (53.8%) and male (90.8%), reflecting the demographic trend that SCI is more prevalent among younger males. Educationally, most participants were graduates (46.2%), followed by those with postgraduate degrees (23.1%). A notable proportion (23%) were unemployed, which may indicate the impact of SCI on employment opportunities. In addition, 67.7% of the participants belonged to the upper socioeconomic class, suggesting that the study population was predominantly from a higher socioeconomic background [Table 1].

The mean duration since injury was 9.8 ± 4.1 years, indicating that the majority of participants had been living with SCI for a significant period. The most common cause of injury was road traffic accidents (RTAs), accounting for 75.4% of cases, followed by swimming accidents (12.3%) and falls from height (7.7%). The high prevalence of RTAs as the cause of SCI underscores the need for road safety measures. In addition, 86.2% of participants had obtained a disability certificate, with a mean level of disability of 86.24 ± 12.6%, highlighting the severe and lasting impact of their injuries [Table 2].

QOL was assessed across four domains: physical, psychological, social, and environmental. The mean scores in these domains were 54.62 ± 13.12, 58.35 ± 19.30, 59.03 ± 23.60, and 58.57 ± 19.08, respectively, with an overall QOL score of 57.6 ± 16.5. These scores suggest that participants experienced moderate impairments in QOL across all domains, with the physical domain being the most affected. Psychological distress was identified in 17 participants (26.2%), with severe distress observed in 7 participants (10.8%). The mean GHQ-12 score was 12.11 ± 5.2, indicating that a significant portion of the participants experienced mental health challenges following their injury. Younger participants (<30 years) reported poorer QOL in the psychological domain compared to their older counterparts (>30 years), and this difference was statistically significant (P = 0.02). This suggests that younger individuals may struggle more with the psychological impact of SCI. Employment status also

Table 1: Distribution according to sociodemographic variables

Sociodemographic variables	Frequency (*n*=65), *n* (%)
Age (years)	
≤30	35 (53.8)
>30	30 (46.2)
Sex	
Male	59 (90.8)
Female	6 (9.2)
Education	
Illiterate	1 (1.5)
Up to 10th standard	6 (9.2)
Up to 12th standard	13 (20.0)
Graduate	30 (46.2)
Postgraduate	15 (23.1)
Occupation	
Accountant	2 (3.1)
Private job	8 (12.3)
Author	1 (1.5)
Automotive electronics	1 (1.5)
Business	11 (16.9)
Doctor	8 (12.3)
Farming	1 (1.5)
Government job	2 (3.1)
Music producer	1 (1.5)
Athlete/Para-athlete	4 (6.2)
Student	9 (13.8)
Trading share market	2 (3.1)
Unemployed	15 (23)
Socioeconomic status	
Upper	44 (67.7)
Upper middle	10 (15.4)
Middle	6 (9.2)
Lower middle	3 (4.6)
Lower	2 (3.1)

Table 2: Distribution according to clinical history

History	Frequency (*n*=65), *n* (%)
Mode of injury	
Accident from swimming	8 (12.3)
Electric shock accident	1 (1.5)
Fall from height	5 (7.7)
Gunshot	1 (1.5)
Playing kabaddi	1 (1.5)
RTA	49 (75.4)
Duration since injury (years), mean±SD	9.8±4.1
Disability certificate	
Yes	56 (86.2)
Level of disability, mean±SD	86.24±12.6

SD: Standard deviation; RTA: Road traffic accidents

showed significant associations with the physical domain of QOL (P = 0.037) and overall QOL scores (P = 0.046), with employed participants experiencing better QOL, particularly in the physical aspects of life. Socioeconomic status significantly influenced the psychological (P = 0.004) and social domains (P = 0.009) of QOL, with those from higher socioeconomic backgrounds reporting better outcomes. This highlights the role of socioeconomic factors in mitigating some of the negative impacts of SCI on mental health and social well-being [Tables 3 and 4].

A significant correlation was found between psychological distress and QOL scores across various domains. Participants experiencing distress had lower scores in the physical ($P < 0.05$), psychological ($P < 0.05$), social ($P < 0.05$), and environmental ($P < 0.05$) domains compared to those without distress, as shown in Table 5. This indicates that psychological health plays a critical role in determining the overall QOL for individuals with SCI.[15]

In summary, the results of this study highlight the significant impact of SCI on both physical and psychological health, particularly among younger individuals. The findings emphasize the importance of addressing both the physical and mental health needs of SCI patients, with particular attention to those who are unemployed or from lower socioeconomic backgrounds.

In summary, the results of this study highlight the significant impact of SCI on both physical and psychological health, particularly among younger individuals. The findings emphasize the importance of addressing both the physical and mental health needs of SCI patients, with particular attention to those who are unemployed or from lower socioeconomic backgrounds. These results underscore the critical need for tailored rehabilitation programs that address psychological distress and aim to improve QOL. In addition, socioeconomic disparities should be considered when developing interventions to ensure equitable support for all individuals with SCI.

Discussion

SCI is a devastating condition that significantly impacts various aspects of health, including physical, psychological, vocational, and social well-being, often leading to dependence on caregivers for daily activities. The sudden trauma associated with SCI makes it challenging for individuals to accept their new reality. This study underscores the substantial effects of SCI on health and QOL, with a particular focus on its negative impact on psychological health.

The mean age of patients in our study was 31.46 ± 7.76 years, and the majority were males (90.8%) from upper socioeconomic classes (67.7%), with RTAs being the most common cause of injury (75.4%). These observations align with previous studies, such as Singh *et al*., which reported a median age of 27 years for SCI patients.[16] Schwartz *et al*. also found SCI to be prevalent among young males.[17] Researchers have also observed a

Table 3: Correlation between sociodemographic variables and General Health Questionnaire

Sociodemographic variables	GHQ			*P* (Chi-square test)
	No distress (%)	Distress present (%)	Severe distress (%)	
Age (years)				
≤30	51.2	52.9	71.4	0.609
>30	48.7	47.1	28.6	
Sex				
Male	90.2	100.0	71.4	0.088
Female	9.8	0.0	28.6	
Education				
Illiterate	2.4	0.0	0.0	0.940
Up to 10th standard	12.2	5.9	0.0	
Up to 12th standard	22.0	17.6	14.3	
Graduate	43.9	47.1	57.1	
Postgraduate	19.5	29.4	28.6	
Occupation				
Unemployed	26.8	17.6	14.3	0.634
Employed	73.2	82.4	85.7	
Socioeconomic status				
Upper	61.0	76.5	85.7	0.678
Upper middle	17.1	17.6	0.0	
Middle	12.2	0.0	14.3	
Lower middle	4.9	5.9	0.0	
Lower	4.9	0.0	0.0	

GHQ: General Health Questionnaire

Table 4: Correlation between sociodemographic variables and quality of life

Sociodemographic variables	QOL (mean)									
	Physical	*P*	Psychological	*P*	Social	*P*	Environmental	*P*	Overall	*P*
Age (years)										
≤30	52.7	0.36	56.29	0.75	54.46	0.10	56.03	0.99	218.94	0.02
>30	55.05		62.65		59.7		56.02		226.30	
Sex										
Male	54.42	0.715	57.93	0.585	58.25	0.410	58.47	0.901	229.08	0.574
Female	56.50		62.50		66.67		59.50		245.17	
Education										
Illiterate	44.00	0.204	31.00	0.231	31.00	0.137	19.00	0.041	125.00	0.069
Up to 10th standard	44.00		47.83		42.67		48.00		182.50	
Up to 12th standard	55.54		61.15		63.54		56.77		237.00	
Graduate	54.77		57.17		57.03		58.27		227.23	
Postgraduate	58.47		64.33		67.53		67.60		257.93	
Occupation										
Unemployed	45.67	0.037	47.93	0.064	48.33	0.077	48.00	0.073	189.93	0.046
Employed	57.30		61.48		62.24		61.74		242.76	
Socioeconomic status										
Upper	55.45	0.000	60.32	0.004	61.20	0.009	61.05	0.000	238.02	0.000
Upper middle	60.20		65.80		67.50		64.50		258.00	
Middle	58.50		53.17		53.17		56.33		221.17	
Lower middle	23.00		20.67		14.67		14.67		73.00	
Lower	44.00		50.00		53.00		47.00		194.00	

QOL: Quality of life

mean age of 39.45 ± 2.69 years, with a predominance of males in their studies.[18,19] These findings highlight that SCI often affects the productive age group, particularly those in high-risk occupations involving travel.

Besides RTAs, other causes included accidents while swimming (12.3%) and falls from height (7.7%). The mean duration since injury was 9.8 ± 4.1 years. These results are consistent with previous research by Mohammadi *et al*. and

Table 5: Correlation between quality of life and General Health Questionnaire

QOL (mean±SD)	GHQ			*P*
	No distress	Distress present	Severe distress	
Physical domain	57.24±14.77	50.76±6.07	48.57±12.37	0.099
Psychological	63.05±18.62	53.41±13.38	42.86±27.78	0.015
Social	63.71±25.20	49.65±16.85	54.43±23.15	0.101
Environmental	61.66±20.94	53.47±12.79	52.86±18.53	0.235
Overall	245.66±70.14	207.29±36.56	198.71±76.85	0.050

QOL: Quality of life; SD: Standard deviation; GHQ: General Health Questionnaire

Singh *et al*., who also identified RTAs as the leading cause of SCI, followed by falls from height.[16,18]

In our study, the mean GHQ-12 score was 12.11 ± 5.2, indicating psychological distress in 26.2% of participants and severe distress in 10.8%. Middleton *et al*. assessed psychological distress in SCI patients over 24 months and found higher distress levels immediately following SCI, which decreased over time.[20] Similarly, Carrard *et al*. found significantly higher psychological distress and poorer mental health in individuals with SCI compared to the general population.[21] Mohammadi *et al*. described various emotional responses to SCI, including shock, sadness, depression, and fear of the future, further corroborating our results.[18]

The mean overall QOL score was 57.6 ± 16.5, with the physical domain being the most affected. This finding aligns with Middleton *et al*., who documented significant impacts on QOL post-SCI, with improvements noted in all domains except physical health after discharge.[20] Carrard *et al*. and Migliorini *et al*. also reported a negative impact of SCI on QOL across all domains.[9,21] Our study concurs with Geyh *et al*., who highlighted the adverse effects of SCI on QOL, particularly concerning time since injury and unemployment.[22] Simão and Pereira found similar results, noting significantly lower physical and overall WHOQOL-BREF scores in SCI patients compared to the general population.[23]

There were significant associations between the age of participants and overall QOL and between education level and the environmental domain of QOL ($P < 0.05$). These associations may be attributed to younger participants' career aspirations and their subsequent dependence on family postinjury. Significant associations were also noted between occupation and QOL, with employment status being crucial for physical and overall well-being. The psychological and social domains of QOL were significantly influenced by socioeconomic status ($P < 0.05$). In addition, a significant association was found between psychological distress and QOL ($P < 0.05$), with the majority of participants scoring below 60 on the QOL scale, indicating poor QOL. This observation aligns with existing literature that suggests socioeconomic factors significantly influence health outcomes and QOL in patients with SCI.[22,23]

Limitations and future research directions

This study has certain limitations. The sample size is relatively small, and the study population is limited to two centers, which may not fully represent the broader population of individuals with SCI. In addition, the cross-sectional design does not allow for the assessment of changes over time. Data collection through a WhatsApp support group may introduce self-selection bias, as it may not capture individuals without access to or familiarity with this technology.

Despite these limitations, the findings provide valuable insights into the psychological well-being and QOL of individuals with SCI. Future research should include larger and more diverse populations to enhance generalizability. Longitudinal studies are needed to understand changes in psychological well-being and QOL over time. Incorporating direct interviews and qualitative methods could provide deeper insights into the experiences of individuals with SCI. Exploring the impact of specific rehabilitation programs and interventions on psychological well-being and QOL will be a key focus of future research.

Contributions of the study

This study contributes to the understanding of the psychological and QOL challenges faced by individuals with SCI. By identifying significant factors such as age, employment status, and socioeconomic status that influence QOL, the study provides a foundation for developing targeted interventions aimed at improving the well-being of SCI patients.

Conclusions

This study highlights the critical impact of SCI on psychological well-being and overall QOL, especially among younger individuals. The significant psychological distress observed necessitates targeted mental health interventions and the integration of psychological support and counseling into SCI rehabilitation programs. The association between employment status and QOL underscores the need for vocational rehabilitation to help individuals regain independence and purpose. Comprehensive, multidisciplinary rehabilitation approaches that address both physical and psychological aspects of recovery can significantly enhance the QOL for individuals with SCI. Future research should explore and validate effective rehabilitation strategies to ensure holistic care for this vulnerable population.

Ethical statement

The study was approved by the Institutional Review Board of the Dharwad Institute of Mental Health and Neurosciences, Dharwad, India (No: DIMHANS/IEC/66/2021-22).

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Conflicts of interest

There are no conflicts of interest.

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