

Association between oral health-related quality of life and oral health status in people with spinal cord injuries during the COVID pandemic: a cross-sectional study

Abstract

Aim: Spinal cord injury (SCI) is a serious medical disorder that frequently causes significant morbidity and long-term disability. Untreated oral disease is more common in people with physical limitations. Evidence suggests that dry mouth increases the risk of dental caries by encouraging the growth of dental plaque. Therefore, this study is being considered to determine the association between oral health status and oral health-related quality of life (OHRQoL) among SCI patients during the COVID pandemic.

Materials & methods: This cross-sectional study included 50 SCI patients. The sample size was determined using G*Power software (version 3.1). Information on demographic characteristics and socioeconomic status was also obtained using the Modified Kuppuswamy scale, 2021. OHRQoL was assessed using the Oral Health Impact Profile (OHIP-14) questionnaire, and the World Health Organization Proforma, 2013, was used to record oral health status. Descriptive statistics can be used to compute percentages, means, and standard deviations. Wilcoxon-signed ranks testing was done to compare the association between mean OHIP and oral health status.

Results: 11 of them had complete spinal injuries, while the other 39 had incomplete spinal injuries. Patients with incomplete injuries had more decaying, missing, and filled teeth, gingival bleeding, periodontal pockets, and OHIP scores than patients with complete injuries. The mean OHIP was 20.73. The study participants' mean OHIP and oral health status showed a significant association ($P=0.000$).

Conclusion: SCI patients appear to have poor oral health. The association between oral health status and OHRQoL was statistically significant. It is crucial to support and facilitate patient's and caregiver's education on oral health-related issues.

Keywords: spinal cord injury, complete injury, incomplete injury, OHRQoL, oral health status

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Introduction

A serious disorder with a high risk of morbidity and mortality is spinal cord injury (SCI). A traumatic spinal cord injury (SCI) affects between 250,000 and 500,000 people annually, according to the World Health Organization's most recent data. Injury rates are on the rise in India at an alarming annual rate of 3%, with road traffic accidents being a major contributor. According to the World Report on Road Traffic Injury Prevention, there will be 500,000 fatalities and 15 million DALYs (disability adjusted life years) lost as a result of road traffic accidents by 2024.¹

A lesion to the spinal cord known as a spinal cord injury (SCI) results in temporary or permanent alterations to the way the spinal cord functions. These alterations result in a loss of muscle tone, sensation, or autonomic control in the areas of the body served by the spine below the lesion. The neck and lower back (thoracic and lumbar) regions are where it most usually occurs. Oral health is significantly impacted by spinal cord injury (SCI) patients. Patients with SCI may experience poor oral hygiene due to xerostomic side effects from treatments such as anticholinergic pharmaceuticals (used to control neurogenic bladder and lessen muscle spasms), dependence on others for oral hygiene, access hurdles, and limited manual dexterity.²

Physical barriers (such as dental offices that are inaccessible to

wheelchairs), limited transportation, a lack of dentists who specialise in serving the oral health needs of this population, and a lack of understanding of the oral health issues faced by people with SCI during the COVID pandemic compound the problems with access to dental care that are experienced by people with SCI.³ Therefore, physical difficulties, high costs, dental anxiety, and dental fear are the main barriers preventing community-dwelling persons with SCI from receiving appropriate and routine dental care. WHO states that although spinal cord injury has expensive effects on the victim and society as a whole, it is preventable, treatable, and need not be a barrier to social inclusion or good health.⁴

People with spinal cord injuries and their families can experience less interruption if sufficient medical and rehabilitation care is provided, followed by supportive services and accessible locations. Issues with oral health have a significant detrimental impact on quality of life.⁵ It is crucial to pinpoint the modifiable factors that lead to oral (tooth and gum) issues in SCI patients so that the right education and resources may be focused on enhancing oral health in this vulnerable group. The general health and quality of life of people with SCI can significantly improve as a result.⁶ As a result, the study's objective is to evaluate the relationship between oral health-related quality of life (OHRQoL) and oral health status among SCI injury patients during the COVID pandemic.

Materials and methods

This cross-sectional study was carried out in Chennai to examine the association between oral health condition and OHRQoL among SCI patients. The ethical clearance was obtained from institutional ethics committee (RDC-3123) for the study before it started in order for it to be carried out ethically between May 2022 and June 2022.

Spinal cord injury patients were determined using the American Spinal Injury Association impairment scale. According to this scale, whole loss of sensory and motor function below the level of SCI was referred to as complete injury, whilst partial loss of motor or sensory function below the afflicted area was referred to as incomplete injury. In order to ensure equal explanations, comprehension, and presentation of the codes and criteria for the conditions to be noticed for warranting steady examination, the examiner was standardized and calibrated prior to the start of the study at Chennai rehabilitation center. The participants were given the questionnaire by single interviewer during face-to-face interviews.

All of the questionnaires were written in English, and for ease of comprehension during administration, the interviewer would translate them into the local dialect as needed. The Modified Kuppaswamy scale, 2021, was also used to record information on demographic characteristics and socioeconomic status. The participants oral health status was recorded by the same examiner using the 2013 World Health Organization (WHO) Oral Health Recording Pro forma. According to the type III examination guidelines provided by the WHO, the examination was conducted with the use of a mouth mirror and Community Periodontal Index probe. The Oral Health Impact Profile (OHIP 14), a simplified version that included 14 items and examined seven domains, was used to evaluate data on OHRQoL. A five-point Likert scale, from never to very often, was used by the participants to rate each item's frequency of impact.

Based on the data from a study conducted by Karthikayan R et al.,⁶ the sample size was determined using G*Power software (version 3.1). The following inputs were provided to the software: Power was set at 80% (0.08), effect size at 0.43, and alpha error was set at 5% (0.05). The study included a final sample of 50 individuals with spinal cord injuries from the Chennai rehabilitation center.⁶

Inclusion and exclusion criteria

The study included each and every participant who provided verbal consent. The study included all participants who had been receiving treatment for complete and incomplete levels of SCIs over the previous year; participants who undergone dental treatment 3 months prior to the start of the study as well as those who refused to participate were excluded from the study.

Statistical analysis

Microsoft Office Excel was used to compile the data, and the IBM Corp Statistical Package for the Social Sciences, version 20.0, of New York, USA, was used for the statistical analysis. Convenience sampling was carried out. Computing percentages, means, and standard deviations were all addressed in descriptive statistics. The Wilcoxon-signed ranks test was performed to determine the association between mean OHIP and study participants' oral health status, including gingival bleeding, missing or filled teeth, and periodontal pockets.

Results

Of the total 50 spinal injury patients, 39 were classified as incomplete level of spinal injury and 11 had complete level of spinal

injury. Among the 50 participants, 48(96%) were male and 2(4%) were female with a mean age of 37.8 years.35(70%)among total participants were married. Of the total participants, 8 (16%) were belonged to the upper middle class and 10(20%) belonged to the lower middle class (Table 1).

Table 1 Demographic characteristics of study participants

Demographic characters	N (%)
Age	37.08±10.47years
Gender	
Male	48(96%)
Female	2 (4%)
Marital status	
Married	35(70%)
Unmarried	15(30%)
Socioeconomic status	
Upper	10(20%)
Upper middle	8(16%)
Lower middle	10(20%)
Upper lower	13(26%)
Lower	9(18%)

The comparison of mean distribution scores between complete and incomplete level of injury based on DMFT showed that SCI persons with complete injury had a lower DMFT score of 6.40 when compared to incomplete injury 8.41. Periodontal status assessment among the two levels of spinal injury revealed that SCI with complete injury had lower mean number of the teeth with gingival bleeding and periodontal pocket (3.81 and 2.31respectively) when compared to incomplete injury (7.12 and 4.49). Out of 50 participants,16(32%) have no loss of attachment (Table 2 - Table 4).

Table 2 Comparison of mean distribution between complete and incomplete level of SCI patients based on oral health status, oral health impact profile

	Mean±SD	
	Complete injury (n=11)	Incomplete injury (n=39)
DMFT	6.40±3.22	8.41±2.22
Gingival bleeding	3.81±2.42	7.12±3.81
Periodontal pocket	2.31±1.51	4.49±2.67

DMFT, decayed missing, and filled teeth; SD, standard deviation

Loss of attachment	N%
Score 0	16(32%)
Score 1	30(60%)
Score 2	4(8%)

Table 3 Number of participants reported with the problems related to the oral condition

	Mean score		P value
	Complete	Incomplete	
OHIP	17.33±5.16	24.20 ±8.69	0.002
Oral health status	3.76±2.33	6.3 ± 0.81	

OHIP, oral health impact profile

Table 4 Association between oral health status and OHIP. There was a significant association between mean OHIP and Oral health status (P = 0.000**)

	Very often		Fairly often		Occasionally		Hardly ever		Never	
	Complete	Incomplete	Complete	Incomplete	Complete	Incomplete	Complete	Incomplete	Complete	Incomplete
Functional limitation	2	1	1	5	4	8	3	16	1	9
Physical pain	1	0	2	7	1	9	3	13	4	10
Psychological discomfort	0	2	2	5	3	7	4	11	2	14
Physical disability	2	3	1	6	4	13	2	8	2	9
Psychological disability	1	1	3	7	2	11	1	12	4	8
Social disability	0	0	1	2	2	15	3	10	5	12
Handicap life	2	2	1	5	4	18	3	8	1	6

Discussion

The goal of the current study was to evaluate the OHRQoL and oral health status of SCI patients in a rehabilitation centre in Chennai. All study participants were evaluated following an oral examination in their most comfortable and relaxed positions. With a mean age of 37.8 years, the majority of the patients evaluated were male. A similar study conducted in 2018 by Karthikeyan et al.⁶ found that males have the highest incidence of SCI, with a mean age of 39.4 years. The decaying teeth in this population were responsible for the highest percentage of the DMFT component. This shows unmet need and infrequent dental visits by this population.⁶

According to Shah et al.,⁷ a number of socioeconomic and psychological factors, including financial situation, education level, economic dependency, family and marital status, physical and mental fitness to seek care, and availability/access to care, have an impact on how often people use health care services. Due to their physical condition, these people are unable to thoroughly clean their teeth, which was supported by the findings of our study. The mean periodontal pocket score and gingival bleeding were found to be substantially greater than in the general population.⁷

People with SCI may experience dental issues that could impact their teeth, gums, and overall oral health. According to a study by Pakpour et al.,⁸ people with SCIs had more dental health problems than people without spinal cord injuries, including plaque, gingival bleeding, and dental caries.⁸ Periodontal disease is the main reason for tooth loss in Indian adults, according to Jain et al. He stated that a decline in oral hygiene practises, a drop in socioeconomic level, and a decline in educational attainment were all associated with an increase in periodontal disease.⁹

Quality of life is known to be worsened after spinal cord injury, and positive or negative development is tightly tied to coping mechanisms, various personal and environmental circumstances, and psychological stresses such as depression, anxiety, and posttraumatic stress disorder.¹⁰ The construct of oral health-related quality of life (OHRQoL), a sub-aspect of the general health-related quality of life, has been constructed and extensively acknowledged throughout the past few decades. Thus, the OHRQoL includes the potential impact of oral conditions on quality of life, including dental, periodontal, and functional diseases, tooth loss, and several other pathologies. The OHRQoL has several dimensions, with functional and psychological subscales that may be impacted by various oral disorders.¹¹

In this study, the OHRQoL of SCI patients was evaluated using the OHIP 14 questionnaire. Patients with SCI were found to have a mean

OHIP of 20.7. For the domain of “functional limitation” (41.02%) and the domain of “psychosocial disability” (17.9%) in patients with incomplete level injuries, many participants responded as “hardly ever” and “very often,” respectively. According to a related study by Karthikayan et al.,⁶ the average OHIP score for SCI patients was 16.2.

OHRQoL is influenced by a number of biological, social, psychological, environmental, and contextual variables. Only age was associated with OHRQoL in terms of sociodemographic factors. Older participants may perceive oral health as having a bigger influence on their quality of life because of the prevalence of oral disease as they age.¹² OHRQoL was significantly impacted negatively by all of the oral findings. Poor OHRQoL was reported by participants who had periodontal pockets, gingival bleeding, increased DMFT scores, and dry mouth. Therefore, dental caries, periodontitis, and tooth loss are frequently more prevalent among spinal cord injury survivors, who also visit the dentist less frequently.¹¹

Poor dental hygiene habits, higher plaque levels, gingival bleeding, and caries experience were observed in SCI patients. It is clear that SCI patients’ clinical oral health status and OHRQoL are closely related. Therefore, the most crucial aspect of caring for people with impairments is oral problem prevention. Increasing awareness among individuals and caregivers, routine professional dental health care, plaque control strategies, and a nutritious diet are all part of prevention. There are now several tools available to aid in the prevention of dental illness, including alcohol-free mouthwash, electric toothbrushes, and swabs.⁶

The emerging view of the dental and oral health of people with SCIs is that it is fair and compromised, but poorer than that of the general population. To improve their oral health, oral hygiene, and dental status, those with this problem need oral health services. Due to physical hurdles and dental phobias, people have limited access to dental health facilities. Additionally, their family caregivers might not be qualified or experienced to provide oral health services. Since there aren’t many resources available, it’s even more crucial that these patients receive oral hygiene instructions and that the caregivers are properly trained to maintain the oral hygiene of these physically impaired patients.¹³

As a result, the findings of this study indicate that family caregivers, health service providers, and patients themselves need to be educated and trained in the management of oral health and hygiene.

Study limitations

The cross-sectional design and exploratory methodology of this study are its inherent limitations. Sample bias is more likely because

of the smaller sample size and the convenience sample that was recruited. The mixed urban and rural study settings further restrict the findings' generalizability and may not accurately represent other places.

Conclusion

People with SCI appear to have poor oral health, which shows that this demographic needs extra attention when it comes to receiving sufficient dental and periodontal treatment. The results of this study show that there was a significant relationship between OHRQoL and oral health status. It is crucial that quadriplegics and paraplegics maintain a strict daily oral hygiene regimen. Since teeth are now used for many other purposes, maintaining optimal dental health is of the utmost importance to a person with restricted or no finger or arm movements. The appropriate upkeep of a healthy masticatory system is crucial to the rehabilitation of a patient with a spinal cord injury. It also considerably contributes to good health.

Recommendation

As a long-term initiative, it is advised that an oral care project be planned for residents of SCI and evaluated when necessary. Education about oral health issues should be encouraged and enabled for patients, family members, and the staff. Concerns about the patients' dental health should be discussed with and empowered by the staff. The dental care provided to SCI patients should be maintained and scheduled according to their requirements. With the aid of hands-on demonstrations and guidance from senior nursing staff and the dentist, the difficulties that staff members encounter when cleaning patients' teeth or dentures should be eliminated. Patients shouldn't be encouraged to consume cariogenic meals and beverages, and there should be plenty of tooth-friendly snacks available in the units.

Conflicts of interest

The authors declare that there are no conflicts of interest.

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