

Quality Of Life Of Patients Following Traumatic Spinal Cord Injury-Cross Sectional Analytical Survey

Dr.Vinu.V.Gopal^{1*},Prof (Dr).P.T.Baburaj ^{2*}

^{1*}Phd Research Scholar, School of Behavioural Sciences, Kottayam MG university, 686560

email:vinoogopa@gmail.com

^{2 *}Dean and faculty of behavioural sciences

School of Behavioural Sciences

MG university ,Kottayam 686560

***Corresponding Author:** Dr.Vinu.V.Gopal

^{*}Phd Research Scholar, School of Behavioural Sciences, Kottayam MG university, 686560

email:vinoogopa@gmail.com

ABSTRACT

INTRODUCTION

Traumatic spinal cord injury(SCI) is the fourth most important emerging public health problem reaching epidemic proportions. Apart from the physical disability, a SCI patient has the added burden of psychological, social and vocational burden which in turn worsened all the domains of quality of life. This aspect is not well studied in India, where there is lack of baseline statistics regarding the incidence of the etiological factors contributing to traumatic spinal cord injury. The main aim of the study is to assess quality of life of patient in relation to various variables so that specific health care policies can be adopted to mainstream such patient to the society.

METHODS

A cross sectional analytical questionnaire survey was conducted among 50 patients of SCI selected on per inclusion criteria from Neurosurgery Department, Govt. Medical College Kottayam between June 2022 and June 2023. Quality of life(QOL) were assessed by WHO BREF questionnaire. The influence of demographic variables, severity of injury and type of treatment on Quality of life were analyzed using nonparametric statistics.

RESULT

Out of 50 patient studied, majority (28%) were in 56 -65 years age group. Mean age was studied 46.2 ± 15 . 38% of patients had complete SCI. The cause of spinal cord injury was road traffic accident(34%). Completeness of SCI, mode of treatment, employment status, education of patient significantly influenced quality of life ($p = 0.02$, $p = 0.016$, $p = 0.052$, $p = 0.001$ and $p = 0.046$ respectively).

CONCLUSION

Complete spinal cord injury significantly reduced the quality of life. Thus to conclude the quality of life is an important area that need to be addressed and not neglected. The study will be an eyeopener for health authorities in Kerala where there is no base line data addressing the issue of caregiver burden. We hope that though our study was a survey done on small size population attending a tertiary centre, this study will guide future experimental research which would be relevant in health policy making in Kerala as well as in India. The study results will also motivate the society in community based rehabilitation in the form of support groups which reduces the economic and psychological burden and also is an eyeopener to adopt specific preventive measure to reduce road traffic accidents and formulate specific health care policies. The study also reiterates the need for SCI registry which is lacking in India.

Key words: quality of life, spinal cord, injury, traumatic

INTRODUCTION

Traumatic spinal cord injury(SCI) is the fourth most important emerging public health problem reaching epidemic proportions. Most common aetiology being RTA (road traffic accidents) which is a byproduct of industrialisation (Cripps et al 2011). Global incidence of traumatic spinal cord injury varies widely from 30 /million in industrialised countries to fewer than 10/million in developing countries. The prevalence of SCI is 365/million population (Cripps 2011). In India the incidence and prevalence of spinal cord injury is 15 /million and 236/million respectively. (Mukherjee 1994). Reduced functional capacity of an individual after SCI not only affects patient quality of life, there is also an impact on

the family. Apart from the physical disability, a SCI patient has the added burden of psychological, social and vocational problems. The cost of care in SCI is also very high. (Dryden DM (2005)The bulk of this occurs in the first year after injury wherein hospitalization expenses account for the major expenditure. Costs also depend on the level of injury; higher the level, longer the hospitalization, greater the cost. Indirect costs also is very high due to loss of future wages and productivity. Younger the age of injury, higher is the indirect costs..Burden of care negatively correlates with quality of life of patient. Burden of care also worsens all the domains of QOL Thus there should be special attention to quality of life in terms of completeness of spinal cord injury, cost of care, mode of treatment adopted, employment and education status. Considering these facts it is appropriate to consider a study that would give light to all these facts. There are no base line data or research in Kerala dealing with quality of life of such patients.

NEED AND SIGNIFICANCE OF STUDY

Arnerstedt et al (2006) showed that burden of care negatively correlate with quality of life of caregiver. Thus there is a need to give attention to quality of life in term of overall satisfaction, marital adjustment, perceived social support; economic burden along with patient quality of life in terms of general health status and mental wellbeing. Correlating impairment due to spinal cord injury with disability help in understanding the impact of injury on the individual. Considering these facts it is appropriate to consider a study that would give light to all these facts. There are no base line data or research dealing with the above problems. This study would definitely guide future experimental research on these unexplored areas which are relevant in health policy making in Kerala as well as in India. The result of the study will definitely help in early psychological interaction leading to positive belief and attitude change among society and family members to these disabled individual. This will also motivate the community in community based rehabilitation (CBR) and economic burden among the disabled person with spinal cord injury. This is the relevance of the present study in the current clinical scenario.

SCOPE OF THE STUDY

Studies regarding this subject are very few especially in Kerala and most have conflicting reports. No studies relating to and quality of life were reported from Kerala. The scope of the present study is to provide a base line data on the on quality of life of patients with neurological deficit following spinal cord injury.

METHODOLOGY

Research design adopted was a cross sectional analytical questionnaire survey. After obtaining ethical clearance from IRB, Govt. Medical College, and Kottayam, 50 patients were selected on per inclusion criteria from Neurosurgery outpatient clinic, wards and ICU, Govt. Medical College Kottayam. between June 2022 and June 2023. Patient with spinal cord injury due to causes other than trauma and early admissions were excluded from the study. A purposive sampling technique was adopted. Quality of life were assessed by WHO BREF score. A 20–25-minute interview along with filling of the questionnaire by patients was done. Demographic variables were assessed. Quality of life were assessed in relation to completeness of injury and mode of treatment Other variables that influence quality of life like education and employment status, cost of care, monthly income, marital status, addiction were also assessed. Mann Whitney test was used for non-parametric data on two groups and Kruskal Wallis test was done for non parametric data on three groups. Chi square test was done for categorical variables. Finding were considered significant if $p < .05$ Statistics were done using SPSS software version: 16(Chicago Inc)

RESULT

DESCRIPTIVE STATISTICS

a)Demographic profile

Out of 50 patient studied, majority (28%) were in 56 -65 years age group closely followed by (26%) in 26 – 35 years age group. Mean age was studied 46.2 ± 15.13 . Among the patients included in the study, lowest age was 23 yrs and the oldest age was 72 yrs. The age distribution was negatively skewed. 32 (64%) were males and 18 (37%) were females. Majority 30 (60%) were married [Figure 1].

Among the patients included in the study, majority 41(82%) were Hindus, 7(14%) were Christians and 2(4%) were Muslims. [Figure 2]. 18(36%) had alcohol addiction. [Figure 3]. Regarding the education status, majority (32%) studied upto high school and later graduated. 14 (28%) studied upto upper primary school, 4 patients studied and completed post-graduation. Regarding the employment status, 13(26%) were manual labourers; 7 females included were housewife, 10(20%) of the subjects were students; 8(16%) were doing business. [Table1]

b) Characteristics of the nature of spinal cord injury

Out of 50 patients, in 34% of patients, the cause of spinal cord injury was road traffic accident. Fall from height constitute (54%), followed by assault and sport injuries (6% each). [Figure 4]. 19(38%) of patients suffered complete spinal cord injury and 28(54.9%) were lucky to have sustained incomplete injury and 3 people had no neurological deficits [Figure 5].

Majority of the patients had injury at the cervical level 32 (64%), 8 patients had injury at higher cervical level, 15 patients (30%) had upper thoracic injury and 3(6%) had lower thoracic injury. [Figure 6]. 26 patients (52%) had quadriplegia (weakness of both upper and lower limb); 8 patient (16%) had paraplegia (weakness of both lower limbs, 4(8%) had suffered only monoparesis (weakness of one limb) and rest 2(4%) had paraparesis. 4 patient (8%) had no weakness of extremities. [Figure 7]

As per the ASIA impairment scale, majority belonged to type A 18 (36%) followed by C 12(23.5%), D 6(12%) and B 9(18%). [Figure 8]. The mean ASIA motor score was 53.16 ± 4.01 . 17(34%) of patients suffered moderately severe spinal cord injury, 9(18%) suffered mild spinal cord injury, 11(22%) suffered severe spinal cord injury. ASIA scoring in an important measure of severity of spinal cord injury. The total score varies from 0-100. The less the score the severe is the spinal cord injury.

Regarding the medical complication following spinal cord injury 16(32%) had pressure scores, & 8(16%) had recurrent urinary tract infection, 5(10

%) had deep vein thrombosis 13(26%) luckily escaped from the above complications. [Figure 9]

c) Hospital stay and duration

The mean duration of hospital study was 24 days ± 1.75 . Maximum duration of hospital stay was 60 days. Minimum duration of stay was 2 days. Regarding the monthly family income, 6 (12%) had monthly income between 2000 and 5000; 12(24%) had monthly income between 500 and 10,000 and 20(40%) had monthly income > 10,000. [Figure 10] Since majority of patients attending medical college hospital, Kottayam were below poverty line; the monthly income was categorized as < 2000; 2000-5000; 5000-10,000 and > 10,000. 25(50%) each opted for surgical intervention [Figure 11]

OVERALL QUALITY OF LIFE

When concerning the patient, only 2(4%) of spinal cord injury patients had a very good quality of life and 12(24%) had poor quality of life. [Figure 12]

INFERENTIAL STATISTICS

ASSOCIATION OF QUALITY OF LIFE WITH VARIOUS VARIABLES

a) Health Related Quality Of Life and Marital Status

As per our study the marital status affects Health related quality of life. (P=0.02) [Table 2]

b) Health Related Quality Of Life and Gender

Gender has no relation with HRQOL as per the present study. P value is .353 which is not significant at .05 or .01 level. [Table 3]

c) Health Related Quality Of Life and Education Status

There was significant difference in level of quality of life of spinal cord injury patients with respect to education status even though practically significant. (P=.03) [Table 4]

d) Health Related Quality Of Life And Mode Of Treatment

Early surgery definitely improved the Health related quality of life as per Mann-Whitney test (p=.0213) [table 5]

e) Health Related Quality Of Life And Completeness Of Injury

QOL is definitely decreased in patients with complete injury. [Table 5] The finding is statistically significant as per Kruskal wallis test. (P=.016) [Figure 12]

f) Health Related Quality Of Life And Alcohol Addiction

There was significant difference in quality of life score among alcoholic patients with spinal cord injury compared to non alcoholic as per our study. (p=0.0266) [Table 6]

g) Correlation between Quality of life and other parameters

There was definite negative co-relation between quality of life scores of spinal cord injured patients and age. (r= -.309, p=.029) As the age increases, the quality of life decreases. There was significant positive correlation with ASIA score (r=.496, p<.001) [Table 7]. As the duration of care increases the quality of life also increases (r=.077, p=.04). This might be due to significant coping mechanism on the part of caregivers in adjusting with the stress event. As duration of care increases, they can plan their activities in a beautiful way with social and emotional support from the society.

DISCUSSION AND REVIEW

In our cross sectional analytical survey, we studied the demographic profile of 50 patients with traumatic spinal cord injury and studied the factors influencing quality of life of patients.

a) Age of patient and relation with caregivers

We found that majority of caregivers were their own spouses who were in the 4th-6th decade of their life. This finding was in concordance with study by Riedijk et al (2006) where majority of caregivers were in their middle ages and age was an independent predictor of burden. Riedijk et al proposed that caregivers in their middle ages experience physical vulnerability caused by aging and greater burden. Our study needs to address further such problems of middle aged caregivers and the psychological, vocational and financial burdens faced by them. Peter et al (2011) in a meta analysis of 168 patients, studied patient caregiver relationship. Spouse caregivers reported more depressive symptoms and increased caregiver burden. Female caregivers get trapped in their social role, and are relatively more exposed to aggressive behavior of male counterparts. Our society still imposes caring role on women in terms of a family responsibility. In contrary to above finding, Thomas et al (1999) showed that spouse caregivers have reduced burden because they complain less. A large sample study addressing the above issue need to be initiated for precise information. Our study had limitation as it addressed only the demographic profile in a small population.

b) Patient education

As per our study, all the patients were literate. Vellone et al (1997) specified the importance of education. Patients who understand and realize the evolution of disease; who had searched information and assistance to cope with changes; had lesser burden. Available support programs, practical guidance can improve burden. In contrary, Arnerstedt DK (2006) proposed that even less educated people had reduced burden in terms of social support in contrast to nuclear families among people of higher economically forward strata. They also see life positively as they are unaware of future complications and had less future expectations. Psycho-educational interventions (counseling) and awareness regarding respite care services, where patient care is temporarily undertaken by official services, gives rest and reduce burden. These issues need to be studied further in an interventional study.

c) Patient Employment

As per our study, two thirds of the patients were employed. Participants stopped working after disability following spinal cord injury. Some reduced their working hours, changed to a more accommodating job. Some started their own business so they could work from home. The benefit of creating peer support groups for caregivers has been a useful addition to rehabilitation process. Helping caregivers anticipate problem areas such as potential conflicts between work and caregiver responsibility can reduce the burden. Further research on this area need to be done for precise information.

d) Mode of treatment

As per our study, there was significant difference in quality of life, whether the patient had undergone surgical treatment or conservative management in spinal cord injury. Psychological and pharmacological interventions reduced the symptoms and improve the quality of life, resulting in decreased burden and improved wellbeing of the patient. Early surgical treatment will help in early mobilization of patient and subsequently reducing cost and burden in caring such patients. The discordant finding may be due small sample size in our study.

e) Completeness of injury

Our study showed that completeness of spinal cord injury significantly reduce the quality of life. This finding is in concordance with other studies. Kurz et al (2002) observed higher burden with severe spinal cord injury due to the fact that functional disability of the patient and the dependency among from it increases the burden and reduce quality of life.

f) Alcohol addiction

Previous studies showed that alcoholism and mode of treatment adopted had significant bearing on quality of life of spinal cord injured patients and their caregivers. Our study is in concordance with the studies in literature.

g) Cost of care

According to our study, cost of care was high and varied according to treatment modality adopted. Several other studies support our finding. This accounted for the financial burden in the family. The annual recurring cost of caring in SCI patient is a large economic burden on health care system and family. Annual spinal cord injury cost were estimated to be 9.7 billion annually (Devivo, 1997, Dryden et al, 2005). As per Johnson RL (1996), the cost of adds to caregivers burden and reduced quality of life.

Limitations

The major limitation of the study was that it was conducted only on a limited number of patients in a single institution. Results would have been better if large sample was studied. The study might have been more valid and meaningful if the burden of caregivers were studied in early and late post spinal cord injury patients. Assessment was done with one time questionnaire only. Sample was non homogenous and gender inequality need to be addressed. A large sample interventional study on matched samples may be conducted so that the question of whether counseling and peer support group help in reducing burden can be addressed. This would provide useful information in addressing the problem of caregiver burden and in making recommendations for solving the issues. The result can also guide authorities in making health care policies in this field.

IMPLICATION OF THE STUDY

The present study has significant implication in the field of medical sciences, especially in rehabilitation of spinal and injury patients. The obtained result in the study has following implication.

1. Reduced quality of life which is often neglected and needs special attention
2. Alcohol addiction has important role in aggregating burden and reducing quality of life of both patient and caregivers
3. Prolonged rehabilitation is necessary for rehabilitation of spinal cord injury patients both physical and psychologically.
4. Major cause of spinal cord injury is road traffic accidents. Most affected ones are youngsters in their productive age. Preventive measures should be taken for safe driving (helmet, seat belt and avoidance of alcohol during driving). Present study has opened doors to new awareness for further researches also in this field

SUGGESTION FOR FUTURE RESEARCH

The following advises and suggestions may be considered while doing studies or research in related areas.

1. The study may be repeated in large number of patients on early burden and late burden.
2. The study may be repeated in large samples
3. The severity of spinal cord injury under mild, moderate, severe categories can be studied separately for caregiver burden and quality of life.

CONCLUSION

Spinal cord injury patients had significant reduction of quality of life. Complete spinal cord injury significantly reduces quality of life. Mode of treatment (surgical/conservative) adopted also influences the caregiver burden though not statistically significant. Thus to conclude the quality of life is an important area that need to be addressed and not neglected. The study will be an eye opener for health authorities in Kerala where there is no base line data addressing the issue of caregiver burden. We hope that though our study was a survey done on small size population attending a tertiary centre, this study will guide future experimental research which would be relevant in health policy making in Kerala as well as in India.

The result of the study will definitely help in providing early psychological intervention in the form of counselling and will lead to positive belief and attitude change among society and family members. The study results will also motivate the community in community based rehabilitation in the form of support groups which in turn reduces the economic and psychological burden

REFERENCES

1. Arnerstedt, L., Elmtahl, S. and Ingvald, B. (2006). Family care giving in dementia - An analysis of the caregiver's burden. *Scandinavian Journal of Public Health*, Vol:28, pp:23-31.
2. Devivo M.J., Fine P.R. (1985). Spinal cord injury: its short-term impact on marital status. *Archives of Physical Medicine and Rehabilitation*.; Vol:66(8), pp:501-504.
3. Dryden DM, Saunders LD, Jacobs P, (2005). et al. Direct health care costs after traumatic spinal cord injury. *J Trauma*.; Vol:59, pp:443-449.
4. Dumont RJ, Verma S, Okonkwo DO, (2001). et al. Acute spinal cord injury, part II: contemporary pharmacotherapy. *Clin Neuropharmacol*; Vol:24, pp:265-279.
5. Kurz X, Scuvee-Moreau J, Vernooij-Dassen M, Dresse (2002). A Cognitive impairment, dementia and quality of life in patients and caregivers. *Soc Psychiatry Psychiatr Epidemiol*. Nov; Vol:37(11), pp:510-8.
6. Mukherjee AK. (1999). Spine Injury and Disability Care. Vikas Publishing House Pvt Ltd., New Delhi,

7. Peter W New, MBBS and M ClinEpi, FAFRM (RACP);(2011)The Influence of Age and Gender on Rehabilitation Outcomes in Nontraumatic Spinal Cord Injury.
8. RA Cripps, B B Lee, P Wing, E Weerts, J Mackay and D Brown (2011). A global map for traumatic spinal cord injury epidemiology: towards a living data repository for injury prevention Spinal Cord Vol:49, pp:493–501
9. Riedijk SR, De Vugt ME, Duivenvoorden HJ, Niermeijer MF, Van Swieten JC, Verhey FR, Tibben (2006). A. Caregiver burden, health-related quality of life and coping in dementia caregivers: a comparison of frontotemporal dementia and Alzheimer's disease. Dement Geriatr CognDisord.; Vol:22(5-6), pp:405-12.
10. Thomas AJ, Nockels RP, Pan HQ, Shaffery CI, Chopp M. (1999). Progesterone is neuroprotective after acute experimental spinal cord trauma in rats. Spine; Vol:24, pp: 2134–2138.
11. Vellone E, Piras G, Talucci C, Cohen (1997). MZ,Quality of life for caregivers of people with Alzheimer's disease.J Health SocBehav. Sep; Vol:38(3), pp:275-97.

DECLARATION- This study has not received any financial support. Authors alone are responsible for the content of the paper. There are no conflicts of interest.

ACKNOWLEDGEMENT

I thank all colleagues of Neurosurgery Department, Medical college, Kottayam for helping me in this article.

ABBREVIATIONS

SCI -Traumatic spinal cord injury

RTA -road traffic accidents

HRQOL- Health related Quality of life

WHO- world health organization

ASIA- American spinal cord injury association

Table1:Demographic Profile Of Patients

| Variable | Frequency (N=50) | Percent |
|------------------------------|------------------|---------|
| Age of patient | | |
| 15- 25 | 3 | 6.0 |
| 26-35. | 13 | 26.0 |
| 36- 45. | 11 | 22.0 |
| 46-55 | 7 | 14.0 |
| 56-65 | 14 | 28.0 |
| 66-75 | 2 | 4.0 |
| Gender | | |
| Male | 32 | 64 |
| Female | 18 | 36 |
| Education of patient | | |
| Primary | 14 | 28.0 |
| High school | 16 | 32.0 |
| College graduate | 16 | 32.0 |
| Post graduate | 04 | 08.0 |
| Occupation of patient | | |
| Unemployed | 21 | 42.0 |
| Employed | 29 | 58.0 |
| Cost of care | | |
| 0-19999 | 11 | 22.0 |
| 20000-49999 | 20 | 40.0 |
| 50000-79999 | 16 | 32.0 |
| >80000 | 03 | 06.0 |
| Caregiver relation | | |
| Spouse | 34 | 17.0 |
| Parents | 22 | 11.0 |
| Children | 28 | 14.0 |
| Mother | 10 | 5 |
| Other Relative | 3 | 6.0 |

Table 2:Showing the association of quality of life and marital status.

| Marital status | | Quality of life | | | | Total |
|----------------|---|-----------------|------|------|-----------|-------|
| | | Poor | Fair | Good | Very good | |
| Married | % | 26.7 | 50.0 | 23.3 | 0.0 | 100.0 |
| Unmarried | N | 4 | 12 | 2 | 2 | 20 |
| | % | 20.0 | 60.0 | 10.0 | 10.0 | 100.0 |

| | | | | | | |
|---|-----------------|------|------|------|-----------|-------|
| Total | N | 12 | 27 | 9 | 2 | 50 |
| | % | 24.0 | 54.0 | 18.0 | 4.0 | 100.0 |
| $\chi^2=4.630$ df=3 p=0.0201 | | | | | | |
| Table 3: Showing association of quality of life and gender | | | | | | |
| Sex | Quality of life | | | | | Total |
| | | Poor | Fair | Good | Very good | |
| Male | N | 7 | 19 | 4 | 2 | 32 |
| | % | 21.9 | 59.4 | 12.5 | 6.3 | 100.0 |
| Female | N | 5 | 8 | 5 | 0 | 18 |
| | % | 27.8 | 44.4 | 27.8 | 0.0 | 100.0 |
| Total | N | 12 | 27 | 9 | 2 | 50 |
| | % | 24.0 | 54.0 | 18.0 | 4.0 | 100.0 |
| $\chi^2=3.262$ df=3 p=0.0353 | | | | | | |

| | | | | | | |
|--|-----------------|------|------|------|-----------|-------|
| Table 4: Showing association of quality of life and educational status. | | | | | | |
| Education of caregiver | Quality of life | | | | | Total |
| | | Poor | Fair | Good | Very good | |
| <High school | N | 6 | 5 | 3 | 0 | 14 |
| | % | 42.9 | 35.7 | 21.4 | 0.0 | 100.0 |
| High school | N | 31.3 | 43.8 | 12.5 | 12.5 | 100.0 |
| | % | 0.0 | 75.0 | 25.0 | 0.0 | 100.0 |
| College graduate | N | 0 | 12 | 4 | 0 | 16 |
| | % | 0.0 | 75.0 | 25.0 | 0.0 | 100.0 |
| Post graduate | N | 1 | 3 | 0 | 0 | 4 |
| | % | 25.0 | 75.0 | 0.0 | 0.0 | 100.0 |
| Total | N | 12 | 27 | 9 | 2 | 50 |
| | % | 24.0 | 54.0 | 18.0 | 4.0 | 100.0 |
| $\chi^2=14.844$ df=9 p=0.035 | | | | | | |

Table 5: Showing overall health related quality of life of patients with spinal cord injury according to the mode of treatment adopted.

| | | | | |
|--|---------------|------|--------|---------------------|
| Treatment | QOL (Patient) | | | |
| | Mean | Sd | Median | Interquartile range |
| Conservative | 31.5 | 25.3 | 25.0 | 37.5 |
| Surgical | 38.5 | 17.6 | 37.5 | 25.0 |
| Mann-Whitney U = 249.0 z=1.246 p=.0213 | | | | |

Table 6: Quality of life score were compared between those who were addicted to alcohol and these who were non alcoholics.

| | | | | |
|---|---------------|------|--------|---------------------|
| Addiction | QOL (Patient) | | | |
| | Mean | Sd | Median | Interquartile range |
| Yes | 29.9 | 20.6 | 37.5 | 28.1 |
| No | 37.9 | 22.3 | 37.5 | 25.0 |
| Mann-Whitney U = 234.0 z=1.113 p=0.0266 | | | | |

| | | | |
|--|--|---------------------|------|
| Table 7: Showing correlations between quality of life and other variables | | | |
| Correlation between Quality of life and other | | Pearson Correlation | |
| QOL | | r | p |
| Age | | -.309 | .029 |
| ASIA score | | .496 | .000 |
| Duration of care | | .077 | .045 |

Figure 1: Showing marital status of spinal cord injured patients

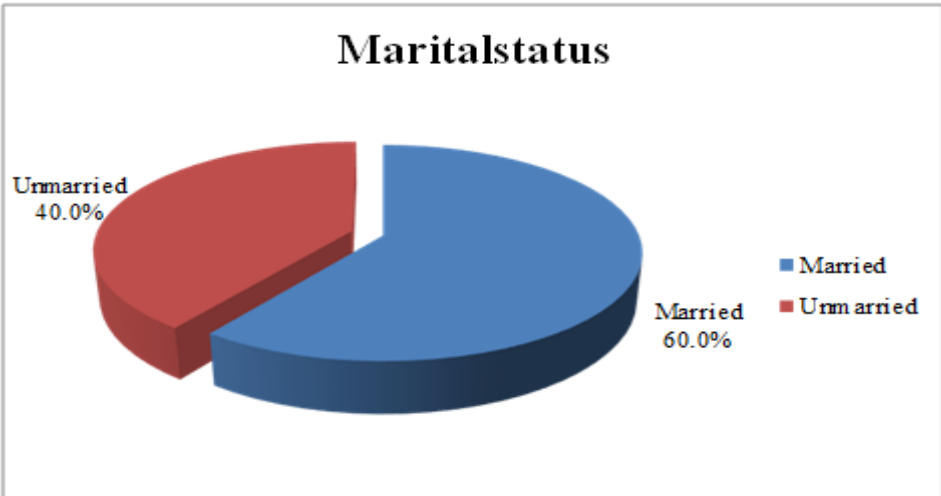


Figure 2: Showing religion of spinal cord injured patients

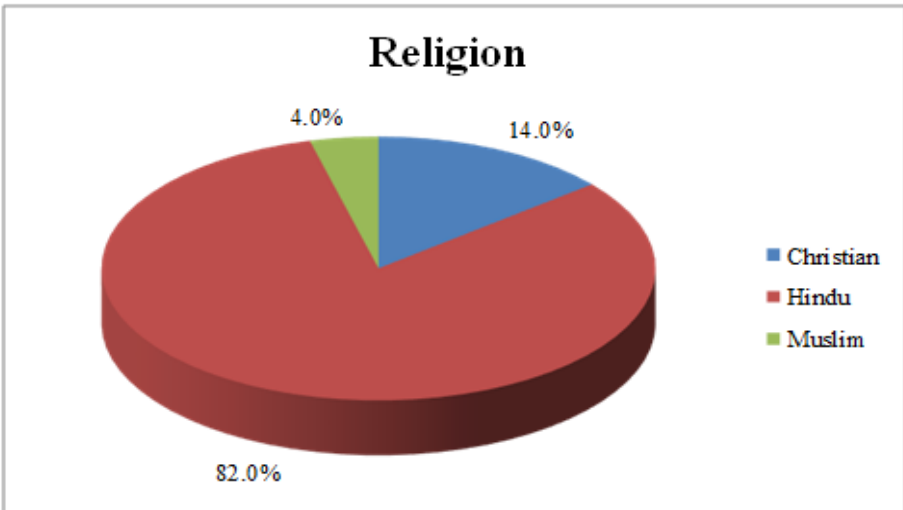


Figure 3 : Showing percentage of spinal cord injury patients who are addicted to alcohol

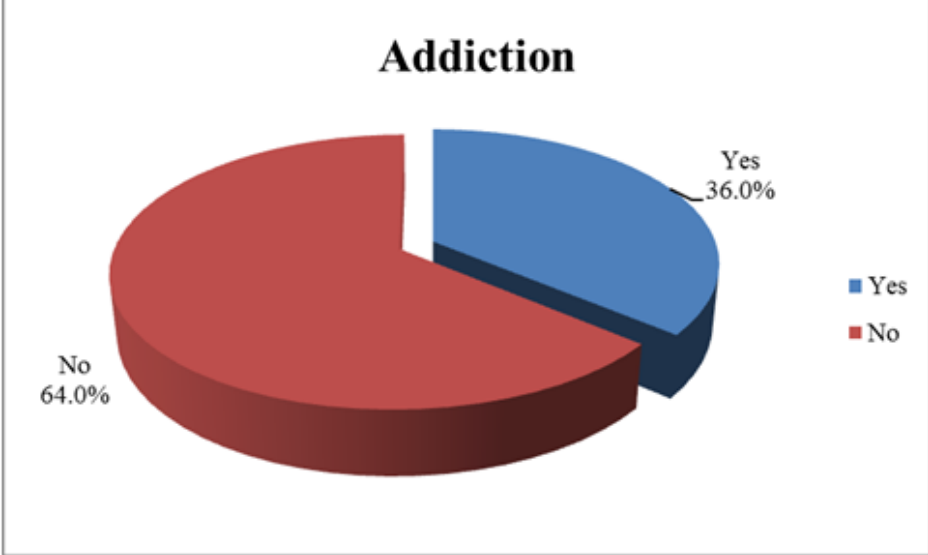


Figure 4: Showing the mode of injury of spinal cord injured patients

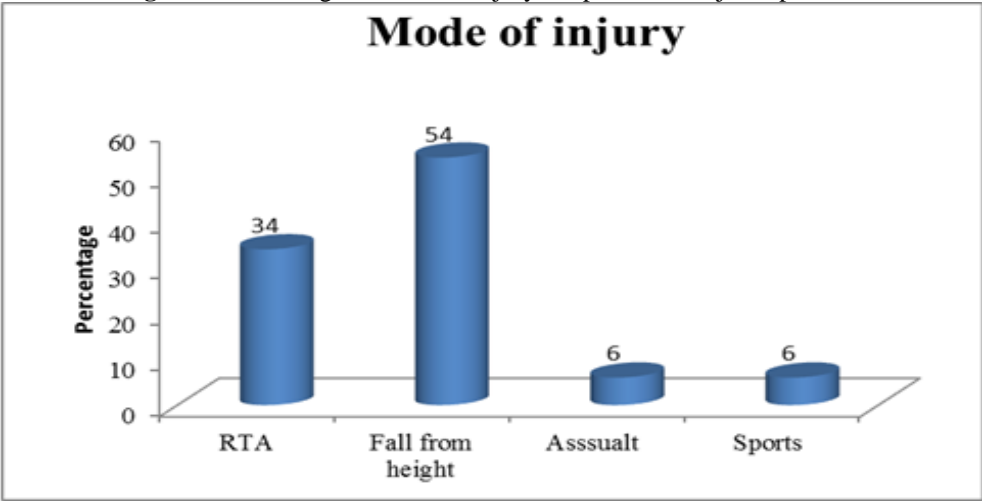


Figure 6: Showing the type of spinal cord injury

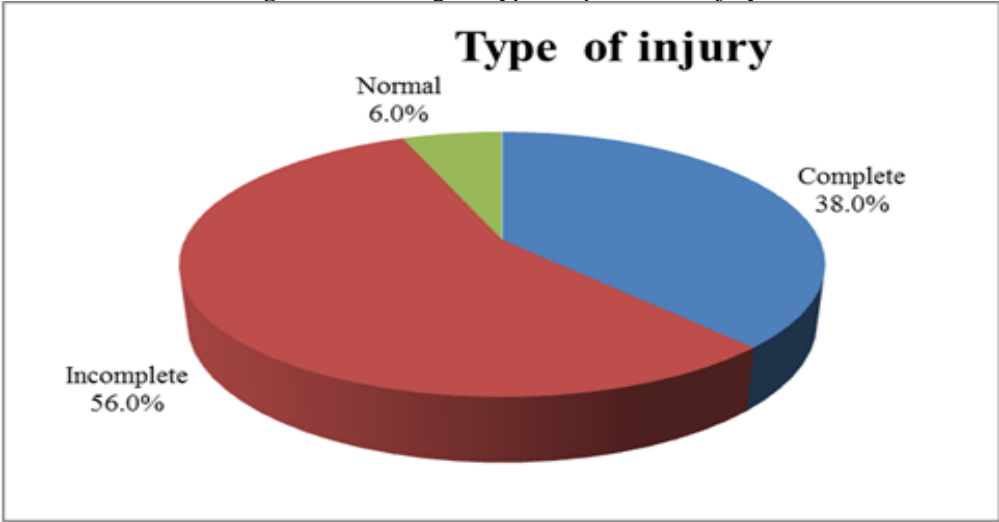


Figure 7: Showing the level of spinal cord injury patients.

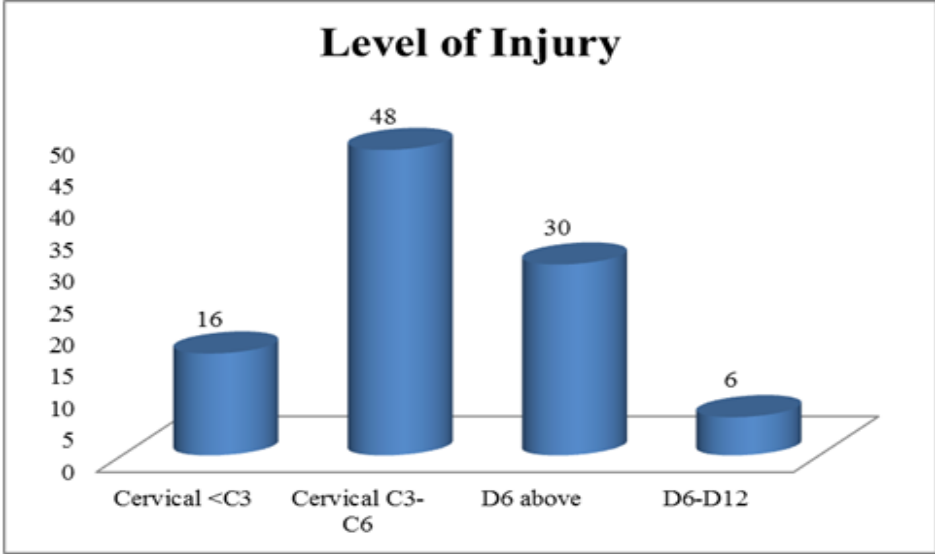


Figure 8: Showing the nature of weakness among spinal cord injured patients.

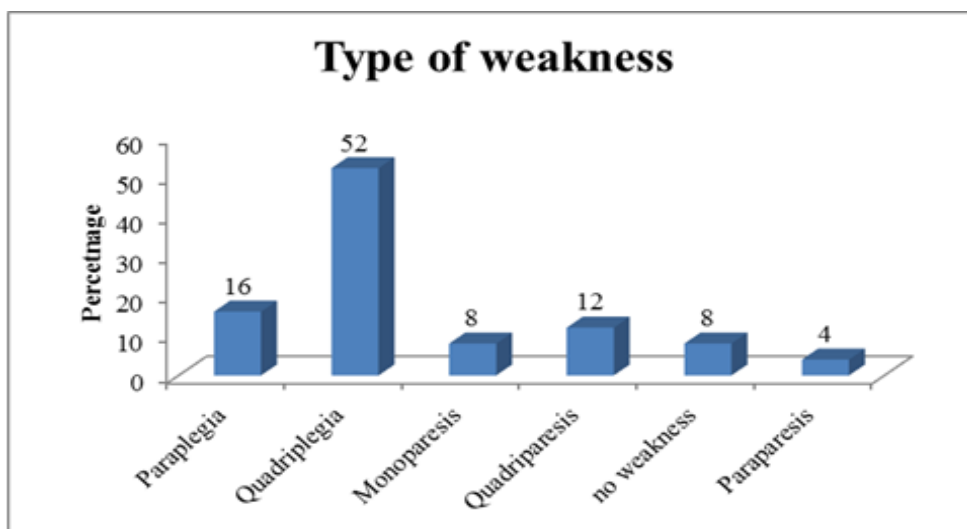


Figure 9: Showing the ASIA impairment scale of spinal cord injured patients

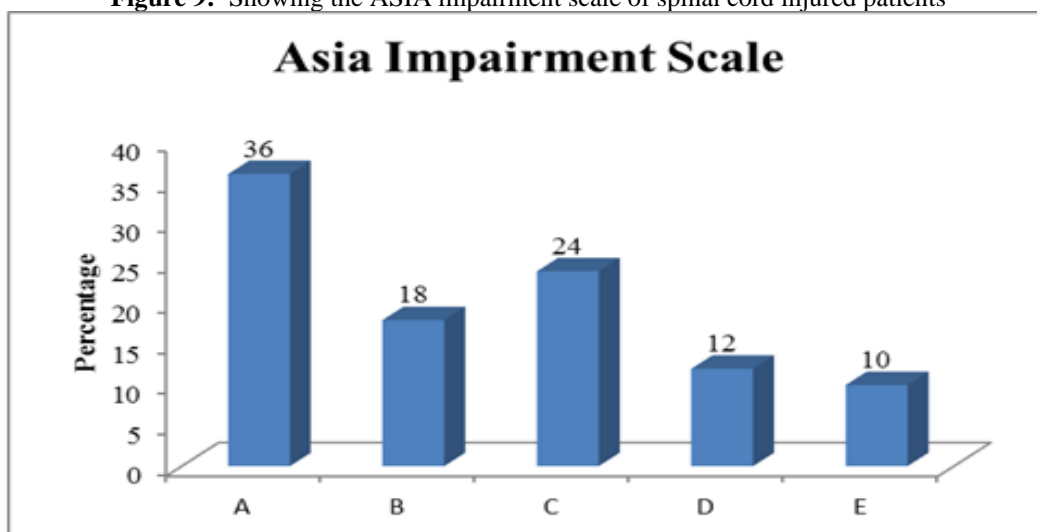


Figure 9: Showing the complications suffered following spinal cord injury

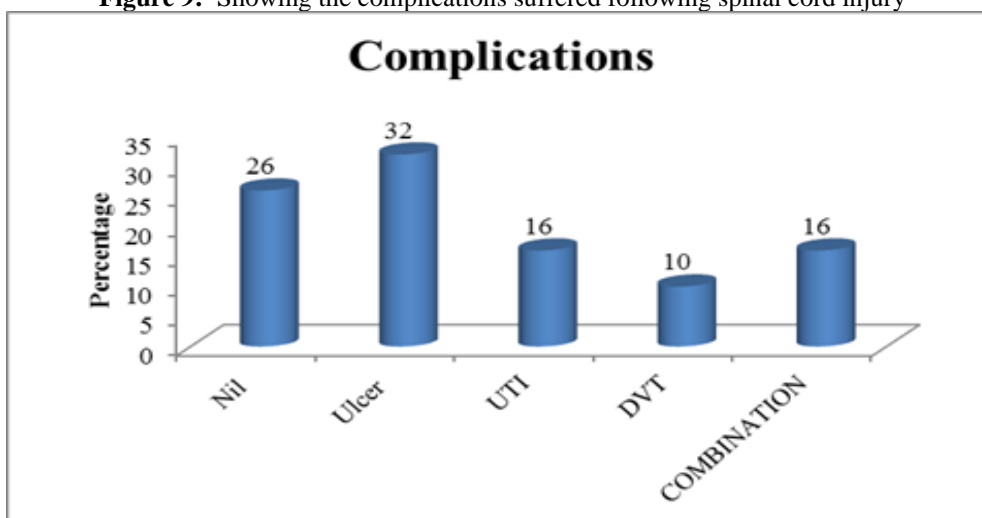


Figure 10: Showing the monthly family income of patients with spinal cord injury.

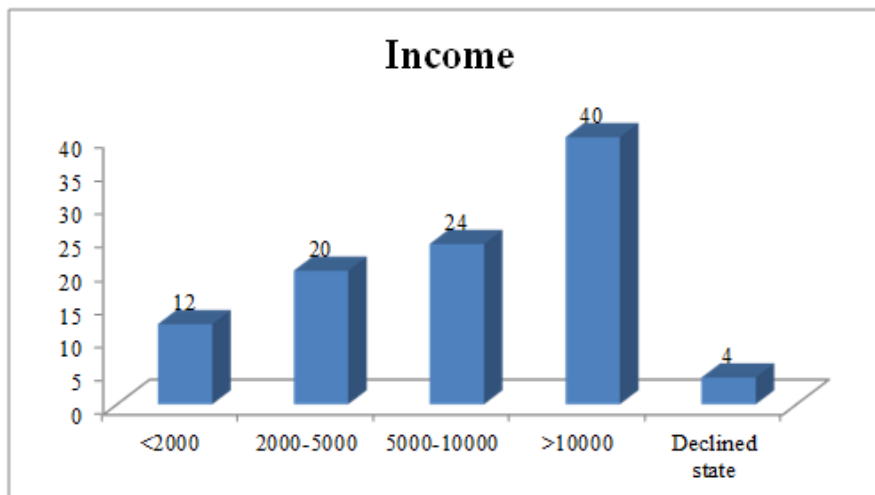


Figure 11: Pie chart showing the mode of treatment adopted by patients who suffered spinal cord injury.

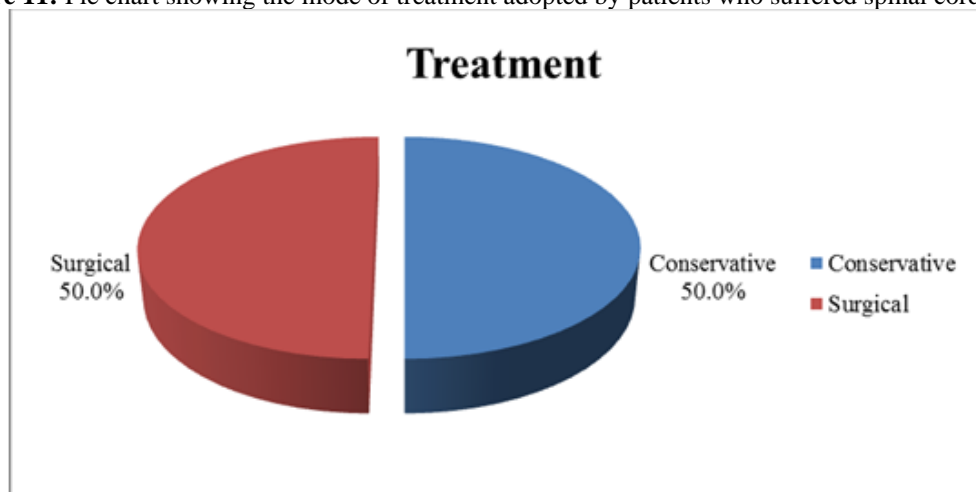


Figure 12: Showing quality of life of patients with spinal cord injury

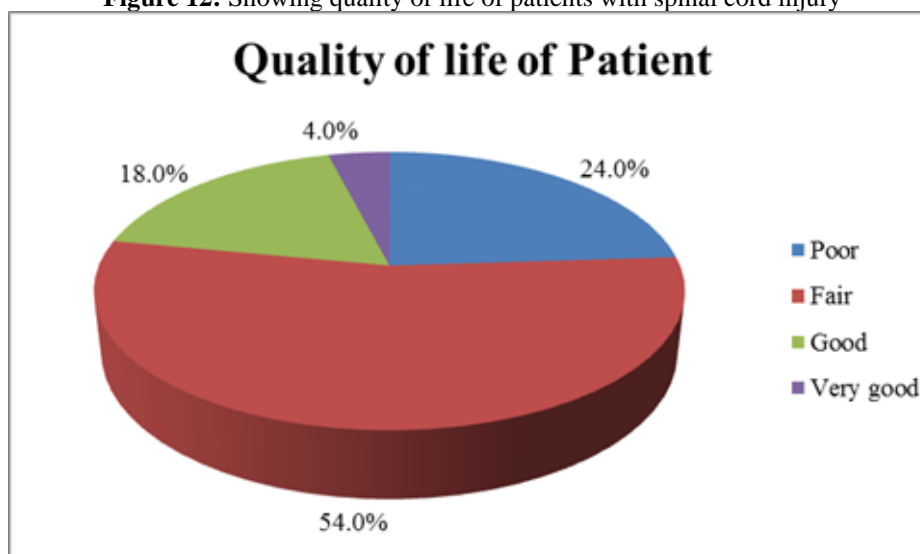


Figure 13: Box plot showing the relationship of completeness of injury with HRQOL

