ORIGINAL SCIENTIFIC PAPER

Exploring associations between psychosocial parameters and quality of life in patients with spinal cord injury

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Abstract

Spinal Cord Injury (SCI) is a devastating condition causing profound life changes for millions of people around the world as it typically causes paralysis, and permanent disability. The aim of this study was to ascertain the quality of life (QoL) of the patients with SCI and to correlate it with psychosocial variables (age, sex, source of income, level of education, independence level, ambulatory status and depression). A cross-sectional survey design was employed with 22 SCI patients constituting the sample size. World Health Organization Quality of Life Questionnaire–BREF and Patient's Health Questionnaire (PHQ) were the instruments used for data collection. The instruments were administered directly and data was analyzed using descriptive statistics of frequency counts, percentage, mean, standard deviation and Spearman rho correlation statistics. The findings of this study showed that majority of the respondents were male (68.2%) and they were mostly dependent in ambulation (68.2%) with the use of wheelchair as the most common assistive device (85.7%). Their QoL ranged from very poor to average (72.7%) and most of them found it very difficult to move around (59.1%). The physical health domain also had the least score on PHQ (38.36±19.52) and most of them were minimally depressed. There was no significant correlation between QoL and physical function, but there was significant negative correlation between depression and physical function. Conclusively, the findings of this study have shown that recovery of physical function in SCI patients is inversely related with the level of depression experienced.

Keywords: Quality of life, Depression, Physical function

Introduction

Spinal Cord Injury (SCI) is a condition resulting in devastating alterations in the life of several people worldwide (Wyndaele & Wyndaele, 2006). In the United States alone, an estimated 262,000 are living with SCI. Over 80% are male, with an average age of about 40 years and most frequent causes of injuries include motor vehicle accidents, violence, falls and recreational accidents (Mcdonald & Sadowsky, 2002).

A retrospective hospital-based study done in the South-East, Nigeria showed that over 80% are males while just 11% are females, and the incidence of traumatic spinal cord injury are relatively low in the children and adolescent population (Chima, Anthony, Chibuzo, Ngozi, Robinson & Ebere, 2014). SCI results in diminished mobility, reduced functional independence, difficulties with socialization and employment (Craig, Tran & Middleton, 2009). Many individuals will also experience serious complications including decubitus ulcers, pneumonia, deep venous thrombosis, spasticity and pain (Johnson, Gerhart, Mcgray, Menconi & Whiteneek, 1998). Some patients also experience serious psychosocial and neurobehavioral issues and are at increased risk of developing anxiety disorders, substance abuse problems, feelings of helplessness, poor coping skills, low self -esteem and depression (Craig, Tran & Middleton, 2009). Acute SCI is typically marked by weight loss, disruptions in appetite, sleep cycles, physical sensations, energy levels and mobility

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problems. These symptoms are also symptomatic of depressive conditions (Frank, Elliot, Corcoran & Wonderlich, 1987).

Depression is the most common psychological issue associated with SCI (Craig, Tran & Middleton, 2009). It reportedly affects 30% of patients and is generally characterized by depressed mood and diminished pleasure over a two-week span accompanied by issues including energy loss, concentration difficulties and sleep or appetite disturbances (American Psychiatric Association, 1994). Depression severity ranges from minor depression to adjustment disorders, and major depressive episodes. The type, duration, pervasiveness of symptoms and effect on functions varies (Judd, Paulus, Wells & Rapaport, 1996).

Quality of life (QoL) has been defined in many ways. As a dynamic concept, it has been defined as different things to different people at different times in their lives and these definitions reflect both the dynamic nature and multidimensionality of QoL and its inherent subjectivity as a self-report concept (Tate, Kalpakjian, & Forchheimer, 2002). QoL refers to the physical, social, psychologic, and existential aspects of well-being that might be affected by disease, disability and its treatments (Schumaker, Anderson, & Czajikowski, 1990). The heightened stress levels in individuals with SCI further decrease QoL (Ditor, Latimer, Ginis, Arbour, MCcartney & Hicks, 2003). The changes in resilience as a result of the SCI are believed to have correlation with satisfaction of life, onset of depression and functional independence during inpatients rehabilitation after an SCI (White, Driver & Warren, 2010). Whalley (2006) showed that QoL was found to be diminished by problems associated with the impaired body and by a sense of loss. SCI usually results in loss of motor function, faecal and urinary incontinence, impaired skin sensation as well as sexual challenges. These symptoms impact these individuals and their families mentally, physically emotionally and financially resulting in a negative effect on their QoL. However, there is limited work in the literature on the relation between psycho social parameters and QoL in patients with SCI. Hence, the objective of this study was to evaluate if QoL and level of depression are related to the psycho social parameters of the patients with spinal cord injury.

Methodology

This study utilized a cross-sectional research design and it was carried out in the University of Benin Teaching Hospital (UBTH), Benin City, Edo State. The research population included all patients with spinal cord injury that were receiving care (in-patients and out-patients) at UBTH. A sample of 22 respondents (18-65 years) participated in the study using convenience non–probability sampling technique. Participants were admitted patients who were willing to participate in this study and were at least 3 weeks post-injury during the period of this study. Ethical approval was sought and obtained from the Research and Ethics committee of UBTH (ADM/E 22/A/VOL.II/14830976). Informed consent of each respondent was also obtained before commencement.

The research instruments for this study are: World Health Organization Quality of Life Questionnaire –BREF (WHOQOL-BREF) and Patient's Health Questionnaire (PHQ – 9). The WHOQOL-BREF was developed in the context of the four domains defining the QoL, physical, social and environmental which has 26 questions. Higher scores implied better life satisfaction. The PHQ -9 measures the level of depression and it comprises of 9 questions. Lower scores were interpreted to mean lower level of depression.

All the participants were given routine physical and neurological examination by the research team using International Standard for Neurological Classification of Spinal Cord Injury developed by the American Spinal Cord Injury Association (ASIA). The questionnaires were administered to the respondents and a guide on how to fill was provided (in English and Bini language). Those who were unable to fill the questionnaire due to poor motor control were assisted by the researchers. The questionnaires were returned to the researchers.

Descriptive statistics of frequency and percentage were used to analyze the participants' demographic data. The relationship between quality of life and psychosocial variables (age, sex, source of income, highest level of education, self-ambulant and depression) of patients with spinal cord injury was analyzed using Spearman's correlation coefficient with the significance level set at $p \leq 0.05$. The statistical analysis was done using Statistical Package for Science (SPSS) version 23.0.

Results

Table 1 summarized the demographic details of study respondents; which shows that a total of 22 respondents completed the survey, and they were mainly males (n=15). Those aged 35-54 years constituted the majority (n=12, 54.5%). They were predominantly married (n=16). Over 50% of the respondents (n=13) had

Table 1. Demographic and Clinical Characteristics of Respondents

Variable	Frequency	Percentage
Age (years)		
15-34	4	18.2
35-54	12	54.5
55-64	4	18.2
65 and above	2	9.1
Gender		
Male	15	68.2
Female	6	27.3
Marital Status		
Single	5	22.7
Married	16	72.7
Widowed	1	4.5
Change of occupation after injury		
Yes	7	33.3
No	14	66.7

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Variable	Frequency	Percentage
Highest level of education received		
Primary	2	9.1
Secondary	7	31.8
Tertiary	13	59.1
Source of income		
Family	3	14.3
Self	14	66.7
Government	4	19.0
Onset of Injury		
0-6 weeks	15	71.4
7-12 weeks	1	4.8
13-36 weeks	2	9.5
Above 36 weeks	3	14.3
Level of Spinal cord injury affectation		
C4	4	25
C5	1	6.3
T2	1	6.3
T6	1	6.3
T7	1	6.3
T10	1	6.3
L2	4	25.0
L3	3	18.8
Self-ambulant		
Yes	7	31.8
No	15	68.2
Assistive devices		
Wheelchair	18	85.7
Walking frame	2	9.5
Walking sticks	1	4.8

tertiary education and the major source of income was self-generated. The onset of injury was mostly between 0-6 weeks (n=15, 71.4%), three of the respondents have had their injury for over 36 weeks. The level of spinal cord injury affectation was mainly in the lumber region (n=7), followed by cervical region (n=5), and then the thoracic region (n=4). Only 7 (31.8%) of the respondents

Table 2. Quality of life of respondents

Variable	Frequency	Percentage (%)
How would you rate your quality of life?		
Very poor	3	13.6
Poor	5	22.7
Neither poor nor good	8	36.4
Good	6	27.3
Very good	-	-
How well are you able to get around?		
Very poor	13	59.1
Poor	5	22.7
Neither poor nor good	4	18.2
Good	-	-
Very good	-	-

are self-ambulant, wheelchair was the major ambulatory device (n=18, 85.7%). Walking frames and sticks were used only by two and one respondents, respectively. After their injury, 33.3% (n=7) has changed their occupation.

Table 2 shows that Quality of life of respondents which was assessed using the WHOQOL_BREF revealed 13.6% (n=3) of them rated their quality of life as very poor, 22.7% (n=5) as poor, 36.4% (n=8) was neither poor nor good, and 27.3% rated as good. None of the respondents rated their quality of life as very good. On how

they are able to get around, majority of the respondents (n=13, 59.1%) indicated very poor, 22.7% (n=5) indicated poor while the rest indicated neither poor nor good.

Table 3 shows that among the four domains of quality of life, the mean score for social domain was the highest (56.82±22.66), followed by the psychological health domain (50.09±15.67), and the environmental health domain (42.45±13.93). The physical health domain had the least mean score (38.36±19.52).

Table 3. WHOQOL-BREF score of respondents

Variable	Mean	SD	Min	Max
Qol	2.77	1.02	1	4
Getting around	1.59	0.80	1	3
Physical pain	2.91	1.38	1	5
Medical treatment	2.27	0.77	1	3
Energy	2.91	1.38	1	5
Health satisfaction	2.59	1.01	1	4
Sleep	2.73	1.42	1	1
Activity	2.27	1.16	1	5
Working skills	2.00	1.11	1	5
Physical health domain	38.36	19.52	0	69
Enjoy life	2.59	1.10	1	5
Meaning	3.09	1.02	1	5
Concentration	2.86	1.39	1	5
Body aspect	2.64	1.53	1	5
Self-satisfaction	3.23	1.11	1	5
Blue feelings	3.68	0.89	2	5
Psychological health domain	50.09	15.67	19	75
Daily life safety	3.05	1.13	1	5
Environment safety	2.86	1.21	1	5
Money	2.27	1.45	1	5
Information	2.27	1.12	1	5
Leisure	1.91	1.02	1	4
Place	2.91	1.19	1	5
Health services	3.36	1.00	1	5
Transports	2.36	1.05	1	4
Environmental domain	42.45	13.93	13	63
Personal relationship	3.36	1.18	1	5
Sexual life	3.14	1.24	1	5
Friendship	3.27	1.55	1	5
Social domain	56.82	22.66	19	100

Table 4. Respondents' Depression Severity

Variable	Frequency	Percentages (%)
Depression Severity		
Minimal depression	9	40.9
Mild depression	5	22.7
Moderate depression	7	31.8
Moderately severe depression	1	4.5
Severe depression	-	-

Table 4 shows that out of the 22 respondents that completed the survey, 40% were minimally depressed, 22.7% mildly depressed, 31.8% were moderately depressed, 4.5% were moderately severely depressed. There was no severe depression among the study sample.

The result presented in table 5 shows that there was no significant correlation between the QoL and the levels of depression; quality of life and physical function. However, there was a significant negative correlation between the levels of depression and physical function.

Table 5. Relationship between QoL, level of depression, and physical function of respondents (Pearson Correlation [r] analysis)

Variable	Quality of life	Level of depression	Physical function
Quality of life	1	-0.27	0.40
Level of depression	-0.27	1	-0.46*
Physical function	0.40	-0.46*	1

*= p-value is less or equal to 0.05

Discussion

The study carried out assessed the relations between physical function and quality of life and depression, in patients with spinal cord injury in University of Benin Teaching Hospital. Main findings indicate that QoL was not significantly related to the levels of depression and physical function. However, there was a significant negative correlation between the levels of depression and physical function. Findings from the study also indicate that men were more prone to SCI. This could be attributed to the fact that they are more involved in violence, motorcycle usage, dangerous driving and reckless decisions when compared to their female counterpart (Saunders, 2021). This is also in line with the findings of O'Connor (2005) which showed a higher prevalence in men's susceptibility to SCI than women. The study by Kang et al. (2018) also revealed that men are more likely to be involved in SCI. Further findings from the study revealed that cervical spine is the most susceptible to injury and this could be due to its anatomy and flexibility (Torhincasi & Waseem, 2021). This finding backs up the study carried out by Miyakoshi et al. (2020) which showed a higher prevalence in cervical injury when compared to other spines. The study of Kang et al. (2018) and Dahlberg et al. (2005) also revealed a higher prevalence in cervical injury.

Quality of life of patients with spinal cord injury

The result from this study reviewed that amongst the four domains of WHOQOL-BREF (Physical Health, psychological Health, Social Health and Environmental Health Domain), Social health ranked the highest with 56.82 + 22.66 followed by psychological health domain which is 50.09+15.67. This finding supports the study carried out by Jang et al. (2004) which also showed that social health ranks the highest. Chang et al (2012) also reported a higher percentage in social health as compared to other domains. This finding could be attributed to the fact that recovery of SCI patients is based on social support. According to Müller et al. (2012), social support in SCI patients can help to overcome discomfort and stigmatization and as well enhance integration into the social environment. Furthermore, in a study carried out by Kreuter et al. (2005) in Australia and Sweden, it was reported that social aspects received lowest average score which was attributed to SCI patient's dissatisfaction because they consider themselves at a social disadvantage.

Depression severity among patients with spinal cord injury

Literature relating depression and SCI shows that psychological mobility is not an inevitable consequence of SCI. However, much of this research is characterized by methodological inadequacies and the conclusions are therefore tenuous (Hancock et al., 1993). The result of this study showed that 90% of the participants had significant depression level. On account of the severity of depression, 40% indicated minimal depression, 22% were mildly depressed, while moderate depression indicated a score of 31.8%, and finally 4.5% were moderately severely depressed. In comparison with the result of this study, a similar questionnaire-based survey study by Shin et al. (2012), measured depression in SCI patients on admission using Beck Depression Inventory (BDI). Shin et al. (2012) used the cut-scores according to Kendall et al. (2010) with 0-9 indicating normal, 10-19 indicating mild depression, 20-30 indicating moderate depression, and 31-63 indicating severe depression. Of the 36 participants who participated in the survey, the average BDI score was 13.8±8.4. The study showed that there was a higher rate of depression with patient suffering from SCI (63.9%) as seen also in this study, though the study did not give specific severity scores.

Relationship between QoL, level of depression, and physical functioning of respondents.

This study shows that the QoL when correlated with the levels of depression and physical function has no significant correlation among them. However, there was a significant negative correlation between the levels of depression and physical function. Contrary to this work's finding, a study by Polat et al (2018) demonstrated that depression was associated with lower QoL in patients with SCI and the same study also concluded that depression correlates with gender, pain, sleep deprivation and type of caregiver. This variation in findings could be attributed to the use of different instruments in the assessment of QoL as well as a larger sample size, though the population in both studies was quite similar in terms of age distribution and gender.

Conclusion

In conclusion, the participants who were predominantly on admission at the study setting rated their quality of life mainly as poor or neither poor nor good. The participants posted the highest mean scores in the social domain of the WHOQOL-BREF questionnaire while the least mean scores were obtained for the physical health domain. The participants did not have major problem with depression, and none recorded severe depression. Analysis of the relationship between variables showed that quality of life did not significantly correlate with depression severity and physical function. However, there was a negative correlation between depression severity and physical function.

It is therefore recommended that rehabilitation for spinal cord injured patients should focus on the physical healthcare needs of the patients as this might be significant to their overall psychological well-being. Also, further studies should further explore the association between QoL, depression severity, and physical functioning of patients with spinal cord injury using a larger sample.

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