# HEALTH RELATED QUALITY OF LIFE IN PATIENTS WITH TRAUMATIC SPINAL CORD INJURY

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I hereby declare that the material in this thesis is my own except for quotations, excerpts, equations, summaries and references, who have been duly acknowledged.

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# CERTIFICATION

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# ABSTRACT

Traumatic spinal cord injury (SCI) is a devastating trauma that can cause temporary or permanent disabilities. The objectives of this study were to determine the health related quality of life, level of handicap/participation restriction and satisfaction of life, and to identify the correlation of demographic and clinical data with the quality of life, level of handicap and life satisfaction of the persons with traumatic SCI, and correlation among three questionnaires. This was a cross sectional study. It includes 54 patients with traumatic spinal cord injury with more than six months post-injury and 18 years of age and above, who attended Rehabilitation Medicine Specialist Clinic, Queen Elizabeth Hospital, Kota Kinabalu. Patients with traumatic SCI with history of traumatic brain injury and psychiatric illness were excluded. World Health Organization Quality of Life - BREF (WHOQOL-BREF), Craig Handicap and Assessment Reporting Technique - Short Form (CHART-SF) and Satisfaction with Life Scale (SWLS) were used to assess quality of life, handicap/participation restriction level and life satisfaction of these patients. Thirty-one patients with paraplegia and 23 tetraplegia were included. The descriptive results for WHOQOL-BREF domains of physical health (Mean=12.06, *SD* =2.85), psychological (Mean=11.93, *SD* =2.72), social relationship (Mean=12.59, *SD* =2.80) and environment (Mean=13.31, *SD*=2.80) showed that patients with traumatic SCI have lesser quality of life. Handicap/participation restriction in physical independence dimension was found in 59.3% of participants, 81.5% in mobility; 75.9% in occupation and 46.3% in social integration. The SWLS revealed that 75.4% of the patients was not satisfied with their life ranged from slightly dissatisfied (16.7%), dissatisfied (42.6%) and extremely dissatisfied (16.7%). There is a significant negative linear relationship of patients' age with physical health, psychological and social relationship domains in WHOQOL-BREF. There was a significant relationship of clinical data (type of impairment, completeness of injury, duration of post injury, presence of pressure ulcers and history of urinary tract infection) with handicap/participation restriction level measured by CHART-SF. There was a significant relationship of WHOQOL-BREF domains with CHART-SF dimensions and SWLS. Prevention program of causes of traumatic SCI, team-based care approach, psychosocial rehabilitation, return to work program in accordance with patients' level of education aimed at improving health related quality of life and life satisfaction, and to increase level of participation in activities of daily living, work and community reintegration of patient with traumatic SCI. Special attention to rehabilitation program for older adults with traumatic SCI, and training to improve clinical competency in rehabilitation professionals.

# *ABSTRAK*

## *KUALITI KEHIDUPAN BERKAITAN DENGAN KESIHATAN BAGI PESAKIT KECEDERAAN SARAF TUNJANG TRAUMATIK*

*Kecederaan saraf tunjang traumatik merupakan trauma yang boleh menyebabkan kecacatan sementara atau kekal. Objektif kajian ini adalah untuk menentukan tahap kualiti hidup berkaitan dengan kesihatan, ketidakupayaan (sekatan penyertaan) dan kepuasan hidup serta untuk mengenalpasti korelasi data demografi dan klinikal dengan kualiti hidup, tahap ketidakupayaan dan kepuasan hidup bagi orang yang mengalami kecederaan saraf tunjang traumatik. Korelasi antara tiga jenis borang soal selidik juga telah dibincangkan. Ini merupakan kajian keratan rentas. Kajian ini melibatkan 54 pesakit kecederaan saraf tunjang traumatik yang mempunyai kecederaan melebihi enam bulan, berusia 18 tahun dan keatas yang hadir ke Klinik Pakar Perubatan Rehabilitasi, Hospital Queen Elizabeth, Kota Kinabalu. Pesakit saraf tunjang traumatik dengan sejarah kecederaan otak traumatik dan penyakit psikiatri adalah dikecualikan. "World Health Organization Quality of Life - BREF (WHOQOL-BREF)", "Craig Handicap and Assessment Reporting Technique - Short Form (CHART-SF)" dan "Satisfaction with Life Scale (SWLS)" telah digunakan untuk menilai kualiti hidup, tahap ketidakupayaan dan kepuasan hidup pesakit ini. Subjek adalah terdiri daripada 31 pesakit "paraplegia" dan 23 pesakit "tetraplegia". Hasil kajian deskriptif untuk domain kesihatan fizikal dalam WHOQOL-BREF adalah (Mean = 12.06, SD = 2.85), psikologi (Mean = 11.93, SD = 2.72), hubungan sosial (Mean = 12.59, SD = SD = 2.80), dan persekitaran (Mean=13.31, SD=2.80) menunjukkan pesakit saraf tunjung traumatik mempunyai kualiti kehidupan yang lebih rendah. Didapati 59.3% subjeks mempunyai ketidakupayaan dalam dimensi keberdikarian fizikal, 81.5% dalam mobiliti, 75.9% dalam pekerjaan dan 46.3% dalam integrasi sosial. SWLS menunjukkan 75.4% pesakit adalah tidak berpuas hati dengan kehidupan mereka, iaitu 16.7% kurang berpuas hati, 42.6% idak berpuas hati dan 16.7% yang sangat tidak berpuas hati. Terdapat hubungan linear negatif yang signifikan pada usia pesakit dengan kesihatan fizikal, hubungan psikologi dan hubungan sosial dalam WHOQOL-BREF. Terdapat hubungan yang signifikan dalam data klinikal, iaitu jenis ketidakupayaan, jenis kecederaan, tempoh selepas kecederaan, terdapat kudis tekanan dan sejarah jangkitan saluran air*

*kencing dengan tahap ketidakupayaan yang diukur menggunakan CHART-SF. Terdapat hubungan yang signifikan antara domain WHOQOL-BREF dengan dimensi CHART-SF dan SWLS. Program pencegahan penyebab kecederaan saraf tunjung traumatik, pendekatan penjagaan berasaskan pasukan, pemulihan psikosososial, program kembali ke pekerjaan berpandukan kepada tahap pendidikan pesakit bertujuan untuk meningkatkan kualiti hidup berkaitan dengan kesihatan, kepuasan hidup dan meningkatkan tahap penyertaan dalam aktiviti harian hidup, kerja dan reintegrasi komuniti pesakit kececedaran saraf tunjang traumatik. Perhatian khusus kepada program pemulihan bagi pesakit kecederaan saraf tunjang traumatik yang lebih tua, dan latihan untuk meningkatkan kecekapan klinikal ahli profesional rehabilitasi.*

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| | | |
|---|---|---|
| **ADL** | - | Activities of daily living |
| **AIS** | - | ASIA Impairment Scale |
| **ASIA** | - | American Spinal Injury Association |
| **CHART-SF** | - | Craig Handicap and Assessment Reporting Technique - Short Form |
| **ICF** | - | Intenational Classification of Functioning, Disability and Health |
| **SCI** | - | Spinal Cord Injury |
| **WHO** | - | World Health Organization |
| **WHOQOL-BREF** | - | World Health Organization Quality of Life - Abbrevated Vision |
| **SWLS** | - | Satisfaction with Life Scale |

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# CHAPTER 1

# INTRODUCTION

## 1.1 Introduction and Background

Patients with traumatic spinal cord injury (SCI) are living longer than before with the advancement of medical care and rehabilitative management that leads to delayed mortality and improved morbidity. There is also a trend towards an increasing number of incomplete lesions, possibly the result of changes in causes and improved treatment at the site of injury by the emergency response team and subsequent immediate care (Sisto *et al.,* 2009).

A longitudinal investigation showed that as the life span of the population increases, causes of morbidity and mortality had moved away from the traditional SCI related causes of death, such as kidney disease, and begin to parallel those of the able-bodied population. However, for patients with traumatic SCI, illnesses that lead to deaths, still occur at an earlier age than would be expected in the general population (Whiteneck, 1992).



Extended life spans and living with a disability can lead to multitude of complications associated with morbidity and mortality. Persons with SCI probably experience varying degree of impairment due to loss of body function that may result in handicap/participation restriction and activity limitations that will affect their quality of life [QOL] (Charlifue *et al.,* 2012).

Traumatic SCI affects the conduction of motor and sensory impulses along the site of the lesion, as well as the autonomic nervous system. SCI can affect the motor, sensory or autonomic functions such as breathing, and bowel and bladder control. Therefore, SCI do not only affect on the physical aspect of the patients, but also affects on their psychological and social wellbeing that lead to significantly impaired in patients' ability to perform activities of daily living, resulting in 53.2% of

# CHAPTER 2

# LITERATURE REVIEW

Comprehension of basic anatomy of the vertebral column, the spinal cord and its associated nerves is crucial to understanding the mechanisms of SCI. In addition, knowledge of the autonomic nervous system is essential to recognize the impairments to the multiple body system that is controlled by the spinal cord (Sisto *et al.*, 2009).

## 2.1 Anatomy of Spine and Spinal Cord

### 2.1.1 Vertebral Column

The vertebral column and the skull are part of the axial skeleton and (Figure 1) is divided into 5 segments: cervical (C), thoracic (T), lumbar (L), sacral (S), and coccygeal. These segments comprising of seven cervical vertebrae (C1 - C7), twelve thoracic vertebrae (T1 - T12), five lumbar vertebrae (L1 - L5), five fused sacral vertebrae and four coccygeal vertebrae that are fused together (Derrikson *et al.,* 2016).



The vertebral column functions as a strong, flexible structure than allowed forward, backward, lateral, and rotation movement. Vertebrae in the different regions of the column vary in size, shape, and detail. A vertebra typically comprises of a vertebral of a body, located anteriorly, a vertebral arch, and seven processes (Figure 3). The cervical, thoracic, and lumbar vertebrae are separated by the intervertebral discs, and are connected and stabilized by the ligaments. Injuries to any of these ligaments or boney structure will result in vary degree of instabilities of the spine. The vertebral foramina encompass the spinal cord, the intervertebral foramina provide spaces through which spinal nerves exit the vertebral column (Derrikson *et al.,* 2016).

# CHAPTER 3

# METHOD

## 3.1 Study Design

This was a cross sectional hospital based analytical study.

## 3.2 Sample size calculation

Sample size for this study was calculated by Epi-Info version 3.4.3. The study population, traumatic SCI who were admitted to Queen Elizabeth Hospital, Kota Kinabalu during 2011 - 2013 were about 108 patients. Assuming 67.0% of the patients with SCI will return to work (based on experience) with the worst acceptable level 57% and level of precision (95.0% confidence interval + or - 10.0%), the calculated sample size is 48 patients. However, in order to increase precision, we decided to collect the data from all patients with 54 traumatic SCI who attended rehabilitation medicine specialist clinic, Queen Elizabeth Hospital, Kota Kinabalu in the period of data collection (2014 - 2016) and fulfilled the selection criteria.



During the study period, there were 54 eligible patients with traumatic SCI falls into inclusion and exclusion criteria of this study. The investigator had taken all of the patients (Table 7).

**Table 7: Representation of the sample**

| | | |
|---|---|---|
| Total number of SCI patients reviewed in the Rehabilitation Medicine Clinic (2014 - 2016) | : | **105** |
| Traumatic SCI | : | **54** |
| Non-traumatic and paediatric SCI | : | **44** |
| Patient refused to participate | : | **1** |
| Patients excluded from study | : | **6** |

# CHAPTER 4

# RESULTS

A total of 54 persons with traumatic spinal cord injury (SCI) participated in this study (Table 6). Descriptive analysis was used to analyze the demographic and clinical data, World Health Organization Quality of Life - Bref (WHOQOL-BREF), Craig Handicap assessment and Reporting Technique - Short Form (CHART-SF) and Satisfaction with Life Scale (SWLS) and was tabulated using SPSS version 23.0 (for Windows). Reliability analysis was done to determine the internal consistency (Cronbach's alpha coefficient [$\alpha$]) of WHOQOL-BREF, CHART-SF and SWLS. Shapiro-Wilk test was used to test for normality for the three-dependent variable, namely WHOQOL-BREF, CHART-SF and SWLS. Pearson's correlation was used to determine relationship among the four domains of WHOQOL-BREF. Spearman's correlation coefficient was used to determine the level of agreement among different dimensions of CHARF-SF and SWLS due to the results was not normally distributed. Nonparametric method using Mann-Whitney U-Test and Kruskal Wallis H-Test was used to determine correlation between the independent variables, and three dependent variables because of small sample size and the data was not normally distributed.



## 4.1 Demographic Data

### 4.1.1 Age

The age range was 19 to 70 years old with the mean of 39.8 years old and standard deviation of 12.87. Participants were categorized by age into adolescents (10 to 19 years), adults (20 to 39 years), middle age (40 to 64 years) and older adults (65 years and more) [Figure 16].