

# Quality of Life and Related Factors Among People With Spinal Cord Injuries in Tehran, Iran

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Received: April 5, 2014; Revised: January 14, 2015; Accepted: January 18, 2015

**Background:** Spinal Cord Injury (SCI) is one of the biggest health problems. Disabilities resulting from injuries such as spinal disability requires special attention because of their potential reduced to cause adverse effects in different systems of the body. Today, improving the Quality of Life (QOL) in patients with SCIs is an important goal of treatment.

**Objectives:** The purpose of this study was to determine the QOL and related factors among people with SCIs.

**Patients and Methods:** In this cross-sectional descriptive study, 106 patients with SCI were selected through sampling based on census. Data were collected using a demographic questionnaire and a Short-Form 36 (SF-36) health survey questionnaire for measuring the QOL among patients. Data were analyzed using SPSS 14 software and descriptive and inferential statistics.  $P < 0.05$  was considered statistically significant.

**Results:** The mean QOL in these patients was  $37.1 \pm 1.7$  years (21 - 65 years) and mean disease duration was  $7.3 \pm 6$  years. The most common injury was paraplegia. Most of the patients have moderate QOL (54.7%). The results showed a significant relationship between QOL and marital status and employment status ( $P < 0.05$ ). Also, results showed a significant relationship between QOL and education levels ( $P = 0.002$ ), age ( $P = 0.001$ ), and duration of illness ( $P = 0.001$ ). The highest and lowest scores were  $64 \pm 7.1$  and  $36 \pm 5.3$  for understanding General Health (GH) and role physical, respectively.

**Conclusions:** The results show that patients with SCI have a moderate health-related QOL. Determining the QOL is needed to focus on the strengths and weaknesses of patients with spinal cord injuries. Planning principles is recommended in order to reform the disability.

**Keywords:** Spinal Cord Injuries; Quality of Life; Questionnaire; Iran

## 1. Background

Spinal Cord Injury (SCI) is considered as one of the biggest problems and catastrophic events related to the health of people (1, 2). Spinal cord injuries are one the health problems of human societies leading to numerous physical and mental problems for disabled person and his family. The prevalence of SCI globally worldwide is between 15 - 40 people per million persons (3). Incidence rate ranges between 10.4 and 83 cases per million in one year, worldwide. In Europe, the incidence is from 10.4 per million per year to 29.7 per million per year, while 27.1 was reported in Asia; recently published data indicate the incidence of 10.5 per million per year in Tehran, Iran (3).

Quality of Life (QOL) is defined as individuals' perception of their own position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns; it is a broad ranging concept, incorporating in a complex way the persons' physical health, psychological state, level of

independence, social relationships and personal beliefs (4, 5). Quality of life is a multidimensional construct that involves self-perception, composed of multiple positive, negative and bidirectional dimensions such as physical function, emotional and social well-being (6). Quality of life is multidimensional concept, which is physical, mental, social and spiritual functioning of the people and depends on their political, cultural, economic and spiritual beliefs (7).

The proposed definitions of QOL in health care and treatment are divided into five areas of ordinary life, happiness and satisfaction, achieving personal goals, benefiting the society and natural capacity rate. In other words, the QOL can be considered as an interface between the health status on one hand, and the ability to pursuit of life goals (as values to promote the physical life) on the other hand. Thus, the fulfillment of basic human needs and priorities plays an important role in the QOL. The

uses such as clinical purposes, evaluation of health policies as well as research and studies on general population have proven their efficiency (8). Quality of life is the people understanding of their situation in the life regarding cultural and evaluation systems, and is in relation with their goals, aspirations and standards (9).

Currently, QOL is considered as one of the main concerns for health professionals and is known and used as an index to measure health status in health research that can be reduced subsequent complications such as anxiety and depression (10). Achieving the QOL not only is a solution for more effective treatments and future developments, but also would be very effective in promoting the rehabilitation support programs. Due to the importance of QOL, most relevant studies have been conducted in developed countries.

## 2. Objectives

The purpose of this study was to determine the QOL and related factors among people with SCIs.

## 3. Patients and Methods

In this cross-sectional descriptive study, 106 patients with SCI referred to Imam Khomeini Hospital Complex were selected through census sampling from January 2012 to March 2013. This complex is the largest educational and therapeutic center of Tehran university of medical sciences, which accommodates more than 1300 hospital beds and includes three independent hospitals and a joint emergency department for those three hospitals. Participation in the study was voluntary. Inclusion criteria were as follow: traumatic SCI, age range of 18 - 65 years and ability to speak and understand Persian language fluently. Exclusion criteria were as follow: existence of cognitive impairment, history of mental diseases, and coincidental chronic diseases. In this method, the researcher referred to the studied center and after stating the purpose of the study and obtaining a written informed consent from the patient and his/her announcement of readiness to answer the questions, the data were collected.

### 3.1. Measurements

Data were collected using the socio-demographic questionnaire, including age, year, education level, occupation, marital status, frequency of hospitalization, insurance status and duration of illness and the short-form 36 (SF-36) QOL questionnaire. Short-form 36 questionnaire is an instrument that has been frequently used to evaluate the QOL among chronic patients in recent 2 decades (11). The QOL questionnaire included the following components: general health (GH): 6 questions; physical health (PH): 10 questions; mental health (MH): 6 questions; social function (SF): 2 questions; body pain (BP): 2 questions; Physical health role in limiting the activities (RP): 4 questions; emotional health role in causing activity limitation (RE): 3 questions; Vital-energy (VT): 3 ques-

tions (12-15). The SF-36 questionnaire has been previously translated, validated, and standardized for the Iranian people (Persian version) by Montazeri et al (16).

In this questionnaire, some of questions are scored according to the 1 - 5 Likert scale, some according to 1 to 3 and some other questions according to 1 - 2 Likert scale and the total score was analyzed based on score 100. In negative questions, the scores were reversed. Scores for each subtitle range from 0 to 100, which 100 representing the best Health-Related QOL (HRQOL) and 0 representing the worst. The scores of the questionnaire were analyzed in three low (0 - 33), moderate (34 - 66) and high levels (66 - 100) (16, 17).

### 3.2. Statistical Analysis

Data were analyzed using SPSS v. 16.0 software (SPSS Inc. Chicago, USA) and P values less than 0.05 were considered statistically significant. Data analyses were performed using descriptive statistics (frequency, mean and standard deviation for each variable) and analytical statistics (ANOVA, t-test, chi-square test, and Pearson and Spearman correlation coefficient).

### 3.3. Ethical Notes

All participants were informed about the purposes and methods of the study. They were also informed that participation in the study is voluntary; so, they could refuse to participate or withdraw from the study at any time and they were ensured about confidentiality and privacy of information.

## 4. Results

Mean age of the patients was  $37.1 \pm 1.7$  years (age range, 21 - 65). Most of the subjects (42.2%) were married and 82.1% were men. The duration of the disease for most of the patients (43.93%) was between 1 - 5 years. The time since injury ranged from 3.2 to 25 years, with a mean of 6 and mean disease duration was  $7.3 \pm 6$  years (SD 7.3) years. Other demographic information is illustrated in Table 1.

According to the results of the present study, QOL of most of the study subjects (54.7%) was in a moderate level (34 - 66), 30.18% in a poor level (0 - 33) and finally 12.42% in a good level (> 66).

Table 2 shows mean and SD of the scores related to dimensions of QOL in patients with SCI. As also indicated in Table 2, the highest and lowest scores were  $64 \pm 7.1$  and  $36 \pm 5.3$  for understanding general health and role physical, respectively. Results showed a significant relationship between QOL and marital status ( $f = 0.34$ ;  $P = 0.001$ ) and employment status ( $f = 1.07$ ;  $P = 0.003$ ). Moreover, the results showed a significant relationship between QOL and education levels ( $P = 0.002$ ), age ( $P = 0.001$ ), and the duration of illness ( $P = 0.001$ ). However, no significant differences were observed between the QOL and insurance income ( $P = 0.09$ ) as well as between QOL and gender ( $P = 0.07$ ).

**Table 1.** Demographic Characteristics of the Study Subjects With Spinal Cord Injury

| Demographic Variables         | Values <sup>a</sup> |
|-------------------------------|---------------------|
| <b>Age, y</b>                 |                     |
| Less than 30                  | 33.3 (36)           |
| 31 - 40                       | 50.9 (54)           |
| 41 - 50                       | 13 (13)             |
| Over 50                       | 2.83 (3)            |
| <b>Education level</b>        |                     |
| Illiterate                    | 26.4 (28)           |
| Primary and elementary school | 32 (34)             |
| High school                   | 33.9 (36)           |
| BA and higher                 | 7.5 (8)             |
| <b>Gender</b>                 |                     |
| Male                          | 82.1 (87)           |
| Female                        | 17.9 (19)           |
| <b>Employment status</b>      |                     |
| Employed                      | 548.1 (51)          |
| Unemployed                    | 51.8 (55)           |
| <b>Marital Status</b>         |                     |
| Single                        | 57.5 (61)           |
| Married                       | 42.2 (45)           |
| <b>Duration of illness</b>    |                     |
| Less than 1 year              | 8.4 (9)             |
| 1.1 - 3                       | 21.6 (23)           |
| 3.1 - 5                       | 39.6 (42)           |
| 5.1 - 7                       | 23.5 (25)           |
| Over 7 years                  | 6.6 (7)             |
| <b>Insurance status</b>       |                     |
| Have                          | 85.8 (91)           |
| Have not                      | 14.1 (15)           |

<sup>a</sup> Data are presented as No. (%).

**Table 2.** Frequency Distribution, Mean and Standard Deviation of the 8 Quality of Life Dimensions in Study Subjects With Spinal Cord Injury<sup>a</sup>

| Dimensions of QOL | QOL Status (%) |          |       | Mean ± SD |
|-------------------|----------------|----------|-------|-----------|
|                   | Poor           | Moderate | Good  |           |
| PF                | 24.5           | 66.9     | 8.4   | 58 ± 8.4  |
| RE                | 33.9           | 49       | 16.9  | 36 ± 15.3 |
| RP                | 31.1           | 45       | 25.4  | 42 ± 6.5  |
| BP                | 34.5           | 33.9     | 31.1  | 49 ± 4.1  |
| SF                | 36.7           | 42.4     | 20.7  | 38 ± 11.9 |
| MH                | 19.8           | 58.4     | 21.6  | 54 ± 0.3  |
| VA                | 17.9           | 63.2     | 18.8  | 51 ± 15.2 |
| GH                | 14.1           | 68.8     | 16.03 | 64 ± 7.1  |

<sup>a</sup> Abbreviations: BP, bodily pain; GH, general health; MH, mental health; PF, physical functioning; QOL, quality of life; RE, role emotional; RP, role physical; SF, social functioning; VA, vitality.

The patients in response to the first question of the questionnaire asked, "How do you evaluate your health status in general?" mostly (86%) expressed their health status as good. Regarding the second question, "How do you evaluate your health status compared with the last year?" the majority (92%) described their health status somewhat better.

## 5. Discussion

Health-related QOL is one of the issues that play an important role in QOL of SCI patients and many studies have been created to assess this important component of QOL in such individuals (11). The findings indicated that the QOL in SCI who live in Tehran city of Iran has been affected seriously by their disease.

In this study, most study participants had suffered the SCI in the age range from 21 - 65 years old and most of them were men. This finding is in line with results from a study in Hu (Hong Kong) (18). Kreuter et al. found that age was not significantly correlated with global QOL (19). Edwards et al. found that the age of patients was negatively correlated with SF-36 scores, although not significantly (20). A study by Kemp et al. (2001) showed that QOL is not dependent to age, and it basically depends on social participation (21). Karbalaee Esmaili et al. in their study on female veterans with SCI, indicated that most or all of them were doing their personal and daily activities personally (22). Whatever patient's age at the time of injury is increased her capacity to deal with the injury will be less and having older age will have a negative impact on patient's recovery. Westgren and Levi were compared between the two groups that at the time of injury one of them who were under 20 years of age and others more than 20 years. They found that younger people have the highest scores in terms of PF, RP, BP, GH and SF, respectively (23).

Our findings also indicated that QOL in patients with SCI had no significant relationship with patients' sex. Such a high rate of daily and personal activities by themselves may be due to Iranian women society culture, since usually, Iranian women not only do their personal activities, but also perform the affairs related to home and the family (22). Sex emphasizes different aspects of their lives when evaluating their level of QOL and life satisfaction. Women with SCI are overrepresented in the group suffering from psychiatric ill health (24). Women with SCI put themselves in groups that suffer from mental and psychological disorders. Westgren and Levi reported the gender differences based on vitality and mental health where scores were lower in women than in men (23). However, Oh and colleagues showed that based on the grades of the patients who used clean intermittent catheterization, there was no significant difference between men and women (25).

Like most previous studies, our results confirmed that marital status is a significant predictor for QOL. Westgren et al. and DeVivo et al showed that when evaluating

the impact of marital status on QOL, single individuals scored significantly lower when compared with the married/cohabitating group (23-26). However, marital status was not significantly correlated with global HRQOL in the study performed by Kreuter et al. (19).

The results imply that SCI have a low HRQOL. Focusing on empowering the patients to do personal care, improve mental status, physical, social mobility, employment and job training as well as efforts to improve the present situation in the surrounding environment are among factors that can increase the possibility of returning to life after SCI (27). Quality of life is needed to focus on the strengths and weaknesses of planning principles in order to address and correct these principles.

One of the research findings was a significant relationship between employment status and QOL. Employment is considered an important indicator for good HRQOL, although this variable is strongly influenced by economic and social opportunities (25). Many of these people have no certain jobs after their disabilities. While many of these individuals consider themselves with no certain and specific job after their disabilities, they are able to return to work and satisfy their occupational or recreational activities (28-30). Leduc et al. found that employed subjects reported significantly higher scores for all eight of the SF-36 domains when compared to the non-employed subjects (31). A number of studies have shown that a higher education is associated with higher employment rates among SCI individuals (32).

The results showed that patients with SCI have a moderate HRQOL, particularly patients with lower education. Quality of life is known and used as a valuable index for measuring the health status in medical and public health studies. The results imply that SCI have a low HRQOL. Determining the QOL is needed to focus on the strengths and weaknesses of patients with SCI. Also, systematic planning is recommended to address and reduce disabilities in such patients.

### 5.1. Study Limitations

First limitation of the study is the small sample size of patients with SCIs and lack of participation of the entire community with SCI. It is recommended that the study be performed in larger sample sizes. Second, this study was a cross-sectional study. Thus, the causal relationship cannot be established on the basis of study results. Future longitudinal studies should be conducted and modeling analysis (e.g. path analysis) should be used to examine the causal relationships between those significant factors and QOL. Finally, there is a lack of important variables such as ethnic and cultural contexts in SCI patients.

### Acknowledgements

We would like to thank all patients who participated in this study.

### Authors' Contributions

Study design: Esmaeil Mohammadnejad and Maryam Moghimian. Data collection: Esmaeil Mohammadnejad. Data analysis and interpretation of data: Maryam Moghimian and Fahimeh Kashani. Drafting of the manuscript: Mohammad Ali Cheraghi and Esmaeil Mohammadnejad. Critical revision of the manuscript for important intellectual content: Maryam Moghimian, Fahimeh Kashani and Esmaeil Mohammadnejad. Study Supervision: Mohammad Ali Cheraghi and Esmaeil Mohammadnejad.

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