Quality of Life among the Traumatic Spinal Cord Injured Patients

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Objectives: *To study the quality of life among the traumatic spinal cord injured patients and to identify the factors related with the quality of life in the good level of such patients,*

Material and Method: *The traumatic SCI patients who had been treated in the Department of Rehabilitation Medicine, Siriraj Hospital, Bangkok, Thailand from January 2003 until August 2009 were interviewed for the demographic data. The injury related data were obtained from the medical records. The WHOQOL-BREF-Thai was used to acquire the QOL score, which would be interpreted as poor, fair, and good QOL level according to the questionnaire. The Center for Epidemiologic Studies Depression scale and the modified Barthel Index (BI) were used to assess depression, and functional disability respectively. The median split method was used to divide the participants into two groups as good and poor QOL groups. The Chi-square and Independent Sample t-test were performed to determine the difference between these two groups and multivariate logistic regression was used to analyze the factors associated with the good QOL. P-value < 0.05 was accepted as statistical significance.*

Results: *Sixty-seven patients (49 males and 18 females) with a mean age 36.54 $\pm$ 11.46 years old participated the present study. They suffered from traffic accident 67.2%, gunshot 16.4%, fall from a height 11.9%, and others 4.5%. The injury levels were cervical 31.3%, thoracic 50.7%, and lumbosacral 18%. Most of them (60.6%) had incomplete lesion. Eighteen patients (26.1%) reported depression. The mean BI score was 69.71 $\pm$ 29.42. Three (4.5%), forty-nine (73.1%), and fifteen (22.4%) participants reported their QOL score in the range of poor, fair, and good levels respectively. Using the median split method, participants with a score over 82 were classified as having good QOL groups and the rest were classified as having poor QOL group. When considering the score in each domain of the WHOQOL questionnaire, the differences between the good and poor QOL groups had statistical significance. The sufficient income (OR 13.67, 95% CI: 3.1-60.22, p = 0.001), having no depression (OR 7.6, 95% CI: 1.17-49.22, p = 0.033), and being employed (OR 6.88, 95% CI: 1.44-32.94, p = 0.016) were significantly related with the good QOL.*

Conclusion: *Most of the SCI patients determined their QOL as fair level. Sufficient income, having no depression, and being employed were associated with the good QOL.*

Keywords: *Depression, Income, Quality of life, Spinal cord injury, Work*

J Med Assoc Thai 2011; 94 (10): 1252-9
Full text. e-Journal: *http://www.mat.or.th/journal*

Traumatic spinal cord injury (SCI) usually occurs in the working age group. The average age of injured victims in Thailand was 32.8 years old[1]. The consequences of injury were impacts on multi-dimensions of life such as physical, functional, vocational, recreational, emotional, and social aspects. Since the advance of medical and surgical management for SCI patients, the quality of care has been improved. After that, they have to live their lives that have been changed enormously from the pre-injury status. Yet, the quality of their remaining lives has not been studied in Thailand. Although health related quality of life has been extensively studied in Western countries, the results might not be completely generalized to Thai people. There are a number of different factors between Thailand and Western countries and that could affect the quality of life. For instance, the way of living as an extended family could be a good support to the injured victims. Thai society is agricultural by based, therefore, returning to work might not be as competitive as the industrial society. However, some of them reside in the suburbs, which are not equipped with barrier free facilities and a public transportation network. That

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might increase the mobility difficulty and restrict the community participation. In addition, the public health care in Thailand is not able to provide rehabilitation. For the follow-up, the patients have to come to the center. Since the transportation fee cannot be reimbursed from any sources, some of them are not able to come for follow-up due to the financial constraint. The social welfare for the disabled is very limited and not enough for the basic living. With these differences, the QOL of Thai people with SCI should be studied in order to represent the Thai situation. Although a number of factors have been found associated with the QOL of SCI patients in some studies for instance, duration of injury[2,3], age[4,5], motor level[4], completeness of injury[4,5], ambulatory ability[4,6], employment status[4], perceived health status[3,6], and community participation, the various results of each study partly came from the different varieties among countries. In the present study, the authors would like to explore the quality of life among the Thai people with traumatic SCI in the community setting and address the associated factors of the good QOL.

Material and Method

The people with SCI who have been treated at the Department of Rehabilitation Medicine, Faculty of Medicine Siriraj Hospital between January 1, 2003 and August 31, 2009 were recruited to the present study. The inclusion criteria were age 18 to 60 years old and having been injured from a traumatic cause. The people who had impaired cognition and communication were excluded from the present study.

Sample size calculation was performed by one sample mean method. Sixty-seven patients were enrolled in the present study. The informed consents approved by the IRB of the hospital were obtained before undertaking the present study.

When the patients came for a follow-up visit, the demographic related data such as age, gender, marital status, education level, vocational status, and income were obtained by interviewing. The injury related data such as cause, duration, level, and pathology of injury were collected from the medical records. Three sets of questionnaires were also used in the present study. Firstly, the World Health Organization Quality of Life (WHOQOL-BREF) questionnaire which was developed by the WHO to assess an international cross-culturally-comparable QOL[7]. This instrument was developed collaboratively in a number of centers worldwide, and has been translated into many languages. The Thai version of WHOQOL (WHOQOL-BREF-Thai) is composed of 26 items, which measure four domains, (i) physical health, (ii) psychological health, (iii) social relationship, and (iv) environmental relationships. The total score in each domain and the total QOL score were classified into "poor", "fair", and "good" QOL according to the cut-off scores determined by the World Health Organization (WHO). The cut-off points of poor, fair and good QOL are 7 to 16, 17 to 26, and 27 to 35 for physical domain, 6 to 14, 15 to 22, and 23 to 30 for psychological domain, 3 to 7, 8 to 11, and 12 to 15 for social relationship, and 8 to 18, 19 to 29, and 30 to 40 for environmental domain, respectively. The cut-off points of the total QOL score were 26 to 60 (poor), 61 to 95 (fair), and 96 to 130 (good)[8]. The WHOQOL-BREF-Thai questionnaire (26 items) has been used to study the HRQL in several groups of Thai population[9-11]. Secondly, the Center for Epidemiologic Studies of Depression scale (CES-D) was used for assessing depression[12]. Score of 19 or higher was indicative of depression with 93.3% sensitivity and 94.2% specificity[13]. It has been used in several groups of people for example, nursing student[14], spinal cord injured patients[15], and stroke patients[16]. Thirdly, the Modified Barthel Index (BI) used for assessing functional disability[17]. For the patients that could not come, a phone call was made to inform about the research project and ask for the consent prior to sending all the documents via mail.

Statistical analysis

The descriptive statistics were performed to report the QOL score and classified the participants as having poor, fair, and good QOL level according to the questionnaire. Then using the split half method to divide those participants into two groups as good and poor QOL groups. The Chi-square test was used to analyze the categorical data such as gender, marital status, education level, vocational status, income, cause, level, and pathology of injury. The Independent Sample t-test was used to analyze the continuous data such as age, duration of injury, and score obtained from the CES-D scale and the BI respectively. The Multiple Logistic Regression Analysis was used to address the factors associated with the good QOL in term of odd ratio (OR) with 95% confidence interval 95% CI). The p-value < 0.05 was considered statistical significance.

Results

Forty-nine males and 18 females with mean age 36.5 ± 11.5 years old had participated in the present

study. Forty-five participants (67.2%) could come for follow-up at the clinic. The rest of the participants (32.8%) were not able to come and received the documents via mail. When dividing the participants into three groups according to the level of total score, three (4.5%), forty-nine (73.1%), and fifteen (22.4%) participants reported their QOL score in the range of poor, fair, and good levels respectively (Table 1). Mean of the total QOL score and mean score of each four domain are reported in Table 2. All of the value fell into the range of fair level. The median split score was 83. The participants who scored over 82 were defined as having good QOL group, and the other was having poor QOL group. The total score as well as mean score in each of four domains of the good QOL group were significantly higher than the poor QOL group ($p < 0.001$) (Table 2).

The demographic and injury related characteristics including score from the CES-D scale and BI of the participants with good and poor QOL groups are shown in Table 3. According to the marital status, six participants reported about changing the marital status. Five of them were separated or divorced and one of them got married. For the vocational status, 66 participants (98.5%) had worked before the injury. After injury, 42 participants (62.7%) were unemployed. Regarding the income, only four participants (6%) had more income than before, the rest (94%) had less income. From the univariate analysis between the good and poor QOL groups, the vocational status, income, community ambulation ability and having depression showed statistical significance between the two groups (Table 3). All these factors then entered the multivariate logistic regression analysis, the odds ratio of associated factors were reported (Table 4). Sufficient Income, having no depression and being employed were significantly associated with the good QOL with odds ratio being 13.67 [95% CI: 3.1, 60.2], 7.6 [95% CI: 1.2, 49.2], and 6.9 [95% CI: 1.4, 32.9] respectively.

Table 1. Level of quality of life among the traumatic SCI patients (n = 67)

Domains of WHOQOL-BREF	Poor n (%)	Fair n (%)	Good n (%)
Physical	9	85.1	6
Psychological	10.4	59.7	29.9
Social	14.9	73.1	11.9
Environmental	4.5	68.7	26.9
Total	3 (4.5)	49 (73.1)	15 (22.4)

Discussion

This is the first study in Thailand exploring the quality of life among the people with traumatic SCI in the community phase. Since the rehabilitation center for SCI patients in Thailand is not enough for the demand, inpatient rehabilitation is not a direct process after stabilizing all the medical problems in the acute phase. Some patients might be referred for inpatient rehabilitation. Some might have to be discharged home with a home therapy program from the informal caregivers. Some might have never been informed or advised about SCI rehabilitation services. Hence, the duration of injury in the present study was not homogeneous in both groups. However, the median duration of both groups was very close and that made no difference between the two groups. Initially, neurological recovery occurred according to the time since injury. After that, the functional recovery and adaptation would continue. The longer the time since injury, the better the QOL has been found in some studies[2,3]. Yet, time since injury has been a contradicted factor associated with quality of life in people with SCI[18]. For the impairment after injury; the completeness and level of injury, they do not affect the well-being of people with SCI directly but rather through their impact on activities and

Table 2. The comparison of QOL score between good and poor QOL groups

WHOQOL score	Range of score	Group Mean Score	Good QOL (n = 34)	Poor QOL (n = 33)	p-value
Total	53-108	83.48 ± 13.17	93.79 ± 7.73	72.85 ± 8.1	<0.001*
Physical domain	13-29	20.34 ± 4.15	23.90 ± 2.7	18.90 ± 2.8	<0.001*
Psychological domain	9-28	21.42 ± 3.75	23.10 ± 2.6	17.50 ± 3.5	<0.001*
Social domain	5-15	9.39 ± 1.9	10.20 ± 3.9	8.60 ± 1.8	<0.001*
Environmental domain	16-39	26.01 ± 4.96	29.40 ± 3.9	22.50 ± 3.2	<0.001*

* Significant at p value < 0.05

Table 3. The characteristics of participants with good and poor QOL

Variables	Good QOL, n = 34 (%)	Poor QOL, n = 33 (%)	p-value
Demographic related data			
Gender			
Male	24 (49)	25 (51)	0.8
Female	10 (55.6)	8 (44.4)	0.2
Age	31.3 ± 11.9	34.7 ± 10.9	
Marital status			
With spouse	14 (56)	11 (44)	0.7
No spouse	20 (47.6)	22 (52.4)	
Educational level			
Less than bachelor degree	21 (44.7)	26 (55.3)	0.21
Bachelor degree & higher	13 (65)	7 (35)	
Vocational status			
Employed	20 (80)	5 (20)	<0.001*
Unemployed	14 (33.3)	28 (66.7)	
Income			
Sufficient	27 (73)	10 (27)	<0.001*
Insufficient	7 (23.3)	23 (76.7)	
Injury related data			
Duration of injury (years)***	4.6 [0.2, 20]	3.5 [0.2,16]	0.7
Causes of injury			
Traffic accident	27 (60)	18 (40)	NA**
Gun shot	2 (18.2)	9 (81.8)	
Fall from height	3 (37.5)	5 (62.5)	
Others	2 (66.7)	1 (33.3)	
Levels of injury			
Cervical	7 (33.3)	14 (66.7)	0.06
Thoracic	18 (52.9)	16 (47.1)	
Lumbosacral	9 (75)	3 (25)	
Pathology			
Complete	11 (42.3)	15 (57.7)	0.45
Incomplete	22 (55)	18 (45)	
Community ambulation ability			
Independent	24 (75)	8 (25)	<0.001*
Dependent	9 (25.7)	26 (74.3)	
Presence of depression			
Yes	3 (16.7)	15 (83.3)	0.002*
No	31 (63.3)	18 (36.7)	
Modified barthel index	75.5 ± 26	62.4 ± 31.9	0.07

* Significant at $p < 0.05$, ** Not applicable, *** Median [min,max]

participation[19,20]. Hence, these factors were not associated with the quality of life. The findings from the present study were found in accordance with the previous studies. Likewise, the Barthel index score from both groups did not find significant difference. Functional disability has been inconsistently associated with the quality of life[19,21,22] since the disability has an indirect effect on the participation. It cannot be extrapolated that more participation is attributable from less disability. Regarding the community ambulation ability, most people with SCI rely on their wheelchair to engage in many of life's activities. Wheelchairs are used to enhance function, to improve independence, and to enable a person to successfully live at home and in the community[23,24]. Richard et al[25] reported that environmental access increases the likelihood that a person with SCI will engage in a variety of meaningful activities. It has also been shown that wheelchair skills

Table 4. The associated factors of the good QOL by multivariate logistic regression (adjusted with age and duration of injury)

Variables	Crude OR	Adjusted OR	p-value
Income			
Insufficient	1.0	1.0	
Sufficient	8.87 (2.91, 27.04)	13.67 (3.10, 60.22)	0.001*
Depression			
Yes	1.0	1.0	
No	8.61 (2.19, 33.85)	7.60 (1.17, 49.22)	0.033*
Vocation			
Unemployed	1.0	1.0	
Employed	8.0 (2.47, 25.81)	6.88 (1.44, 32.94)	0.016*

OR = odds ratio (95% confidence interval)
* Significant at $p < 0.05$

of people with SCI predict their level of participation and quality of life[26]. In the present study, the community ambulation ability was a factor that revealed the significant difference between the SCI participants with good and poor QOL groups. In addition, having depression was associated with poor QOL. The Center for Epidemiologic Studies Depression Scale was employed in the present study to address the depression. Eighteen people with SCI (27%) were found having depression. Craig et al estimated the rate of significant depressive symptoms in people with SCI living in the community lies between 25-30%[27]. Depression is one of the psychological problems in people with SCI living in the community[28]. Although the people with SCI were found to have seven times the risk of psychological morbidity than the able-bodied controls[29], the study exploring the associated factors of depression among this group of people is still sparse. As for the vocational perspective, people with SCI reported that vocational situation was one of the most dissatisfying domains in their lives[30]. Returning to work is regarded as one of the most important outcomes of reintegration in the society[22]. There is an overall agreement that being employed influences life satisfaction and well being positively[6,31] and persons with SCI who are not working report lower overall satisfaction including income[32]. Therefore, the vocational status is one of the factors associated with quality of life of the SCI participants. Employment means a lot to independent adult living, independent functioning, socialization, self-esteem, and financial independence. However, it is not a direct process that people with SCI could work right away after recovery from the injury. There are barriers to employment. Spasticity, chronic pain problem, and access to public transportation were barriers of returning to work among Thai people with traumatic SCI[33]. In order to enhance the quality of life, the rate of return to work must be improved. However, some of the physical and environmental barriers might not be possible to overcome. Working at home with the use of assistive technology might be an option in the era of information technology. Along with being employed, income would be increased. It is not surprising that income was found associated with quality of life. In the present study, the number of unemployed people increased. Meanwhile, income was lessened. This finding was replicated in other studies. According to the national survey in 2001 by the National Statistical Organization[34], most of the disabled people who are employed can earn less than 5,000 baht (1USD = 32.89 baht)[35] per month. The disabled people were required to be registered as legally disabled according to the Rehabilitation of Disabled Persons Act. Then, they would be eligible to apply for either a 500 baht as a monthly pension or a 40,000 baht as a 2-year vocational loan without interest. If they are unemployed, their yearly income from the monthly pension was still less than the Thai GNIP (1,838.41 USD per person)[36]. Although a quarter of the disabled people in Thailand get the financial support from their families, it might be insufficient[34]. Thus, sufficient income was a factor associated with the good QOL in the present study.

Limitation of the study

The present study might not be well represented for all the Thai people with traumatic SCI

since the participants were recruited from the patients in Siriraj Hospital only.

Conclusion

The people with traumatic SCI rated their quality of life in the fair level according to the WHOQOL-BREF (Thai) questionnaire. Having sufficient income, having no depression, and being employed were associated with the good quality of life. This information would alert the health care professionals to pay attention to psychosocial well-being of the people with traumatic SCI in the community setting. Moreover, this information would enable the policy makers to set the healthcare policy facilitating the people with traumatic SCI to achieve good quality of life.

Acknowledgement

This study was supported by Research Development Fund, Faculty of Medicine Siriraj Hospital, Mahidol University. The authors wish to thank Mr. Sutthipol Udompanturak for his assistance in statistical analysis.

Potential conflicts of interest

None.

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คุณภาพชีวิตของผู้ป่วยบาดเจ็บไขสันหลังจากอุบัติเหตุ

ปิยะภัทร เดชพระธรรม, รัชริน คงคะสุวรรณ

วัตถุประสงค์: *เพื่อศึกษาคุณภาพชีวิตของผู้ป่วยบาดเจ็บไขสันหลังจากอุบัติเหตุ และหาปัจจัยที่มีความสัมพันธ์กับคุณภาพชีวิตที่ดี*

วัสดุและวิธีการ: *ทำการสัมภาษณ์ผู้ป่วยบาดเจ็บไขสันหลังจากอุบัติเหตุที่เคยเข้ารับการฟื้นฟูสภาพแบบผู้ป่วยในที่ภาควิชาเวชศาสตร์ฟื้นฟู โรงพยาบาลศิริราช ตั้งแต่ มกราคม พ.ศ. 2546 ถึง สิงหาคม พ.ศ. 2553 ด้วยแบบสอบถาม ได้แก่ แบบสอบถามข้อมูลทั่วไป แบบสอบถาม WHOQOL-BREF (Thai) ซึ่งใช้ประเมินคุณภาพชีวิต แบบสอบถาม The Center for Epidemiologic Studies-Depression scale ซึ่งใช้ประเมินภาวะซึมเศร้า และแบบประเมิน Modified Barthel Index (BI) ซึ่งใช้ประเมินเกี่ยวกับความสามารถในการประกอบกิจวัตรประจำวัน สำหรับข้อมูลที่เกี่ยวข้องกับการบาดเจ็บนั้น ได้จากเวชระเบียนผู้ป่วย การวิเคราะห์ทางสถิติทำโดยใช้วิธี median split แบ่งผู้ป่วยเป็น 2 กลุ่ม ได้แก่ กลุ่มที่มีคุณภาพชีวิตดีและกลุ่มที่มีคุณภาพชีวิตไม่ดี แล้วใช้ Chi-square และ Independent sample t-test มาทดสอบความแตกต่างระหว่าง 2 กลุ่ม และหาปัจจัยที่มีความสัมพันธ์กับการมีคุณภาพชีวิตที่ดีโดยใช้การวิเคราะห์ multivariate logistic regression ทั้งนี้ค่า $p < 0.05$ ถือว่ามีนัยสำคัญทางสถิติ*

ผลการศึกษา: *ผู้ป่วย 67 คน (ชาย 49 คน และหญิง 18 คน) อายุเฉลี่ย 36.54 $\pm$ 11.46 ปี ได้รับอุบัติเหตุจากการจราจร 67.2% ถูกยิง 16.4% ตกจากที่สูง 11.9% และจากสาเหตุอื่น 4.5% ได้รับบาดเจ็บที่ระดับคอ 31.3% อก 50.7% เอว และกระเบนเหน็บ 18% ผู้ป่วยส่วนมาก (60.6%) มีการบาดเจ็บแบบไม่เต็มส่วน ผู้ป่วย 18 คน (26.1%) มีภาวะซึมเศร้า ค่าคะแนน BI เฉลี่ยเท่ากับ 69.71 $\pm$ 29.42 ผู้ป่วย 3 คน (4.5%), 49 คน (73.1%) และ 15 คน (22.4%) รายงานว่ามีคุณภาพชีวิตไม่ดี ปานกลางและดีตามลำดับ เมื่อใช้วิธี median split พบว่าผู้ป่วยที่มีค่าคะแนนคุณภาพชีวิตสูงกว่า 83 จัดอยู่ในกลุ่มที่มีคุณภาพชีวิตดีและต่ำกว่า 83 จัดอยู่ในกลุ่มที่มีคุณภาพชีวิตไม่ดี โดยคะแนนรายด้านของทั้ง 2 กลุ่มมีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติพบว่าปัจจัยที่มีความสัมพันธ์กับการมีคุณภาพชีวิตระดับดีอย่างมีนัยสำคัญทางสถิติ ได้แก่ การมีรายได้ที่เพียงพอ (OR 13.67, 95% CI: 3.1-60.22, $p = 0.001$) ไม่มีภาวะซึมเศร้า (OR 7.6, 95% CI: 1.17-49.22, $p = 0.033$) และการมีงานทำ (OR 6.88, 95% CI: 1.44-32.94, $p = 0.016$)*

สรุป: *ผู้ป่วยบาดเจ็บไขสันหลังจากอุบัติเหตุส่วนใหญ่มีคุณภาพชีวิตอยู่ในระดับปานกลาง ปัจจัยที่มีความสัมพันธ์กับการมีคุณภาพชีวิตที่ดี ได้แก่ รายได้ที่เพียงพอ ไม่มีภาวะซึมเศร้า และการมีงานทำ*