

# Correlation Between Health-Related Quality of Life in Veterans With Chronic Spinal Cord Injury and Their Caregiving Spouses

Mohammad Hosein Ebrahimzadeh<sup>1</sup>; Farideh Golhasani-Keshtan<sup>1,\*</sup>; Bibi Soheila Shojaee<sup>1</sup>

<sup>1</sup>Orthopedic Research Center, Qaem Hospital Medical School, Mashhad University of Medical Sciences, Mashhad, IR Iran

\*Corresponding author: Farideh Golhasani-Keshtan, Orthopedic Research Center, Qaem Hospital Medical School, Mashhad University of Medical Sciences, Mashhad, IR Iran. Tel: +98-9153024084, E-mail: golhasanifi@mums.ac.ir

Received: December 9, 2013; Revised: October 25, 2014; Accepted: November 10, 2014

**Background:** Recently, investigations have indicated that caring of a chronically ill family member strongly influences the health status and the quality of life (QOL) of the caregiving family members.

**Objectives:** The purpose of this study was to examine the relationship between health-related QOL of veterans with chronic spinal cord injury and their caregiving spouses.

**Patients and Methods:** We designed a cross-sectional study including two groups; veterans with chronic spinal cord injury and their caregiving wives who were living in the city of Mashhad, Iran. The patients with spinal cord injury were veterans from the Iran-Iraq war (1980-1988). All the participants filled out the short form 36 (SF-36) health survey questionnaire. A Pearson correlation coefficient was calculated for the scales of the two groups.

**Results:** The mean age and standard deviation of veterans and their spouses were  $48.5 \pm 5.9$  and  $44.8 \pm 7.2$ , respectively and their number of children ranged between 0-6. Our data analysis showed that there was a significant difference between the two groups in some domains of the SF-36, including PF, MH, PCS, MCS, BP and GH ( $P < 0.05$ ), but there was no significant difference in RP, VT, SF and RE between the two groups.

**Conclusions:** The results indicate that a decrease in health status level of veterans, physically and mentally, can affect the health-related QOL of their caregiving spouses.

**Keywords:** Spinal Cord Injury; Veterans; Caregiving; Quality of Life; Iran

## 1. Background

Quality of life (QOL) is defined as a multidimensional construct which includes health, functional, psychological, emotional and spiritual aspects, as well as socioeconomic and family status (1-4). Many recent investigations have indicated that caring for a chronically ill family member strongly impacts the health status and QOL of the caregiving family member (1-8); some factors such as education about patients with spinal cord injury and their psychological status affects their caregivers' health status (9-13). Spinal cord injury affects different aspects of a patient's life, and hence, causes different physical and mental changes associated with the individual's situation (14, 15). In chronic diseases and disabilities, these conditions affect not only the QOL of those people with the morbidities, but also the family members who take care of them for a long time (1-8). Some studies have claimed that there is a direct relationship between health and QOL of individuals with chronic disabilities and their caregivers (16, 17). The main concern is that the physical and emotional health of family caregivers may impact the health status and welfare of their patients (1-6).

## 2. Objectives

The purpose of this study was to examine the relation-

ship between health-related QOL in veterans with chronic spinal cord injury and their caregiving spouses.

## 3. Patients and Methods

We designed a cross-sectional study with two groups of people; veterans with chronic spinal cord injury and their caregiving wives. The study was performed at the Orthopedic Research Center, Mashhad University of Medical Sciences, Mashhad, Iran, in 2011. It was approved by the Committee of Ethical Affairs in Research of our institution. Fifty male veterans with long-standing war-related spinal cord injuries from the Iran-Iraq war (1980-88) and their wives, who were living in the city of Mashhad, Iran, were invited to participate in this survey. A total of 37 (74%) couples participated in this study in 2012. Before conducting the survey, all the individuals were informed about the nature of the study, and then, they all signed a consent form agreeing to participate in the study. Afterwards, we took the medical history of all the veterans and their caregiving wives and they were asked to fill out the related questionnaires. Although all the participants were literate, those who had difficulties with writing received assistance by a nurse to fill out the forms. We collected demographic data and medical his-

tory of the couples and conducted a physical examination on them.

### 3.1. Measurements

The medical outcomes study short form 36 (SF-36) was provided to the veterans and their spouses. The SF-36 health survey, which is called health-related QOL assesses mental and physical health in eight aspects: physical function (PF), social functioning (SF), role physical (RP), role emotional (RE), mental health (MH), vitality (VT), bodily pain (BP), and general health (GH). In addition to these items, it includes two general measures involved with physical and mental component summaries (PCS and MCS, respectively). Since its introduction in 1996, SF-36 has been used in numerous studies for evaluating the health status, QOL and clinical outcomes of treatment and health care around the world (18). The psychometric properties of SF-36 have been tested for many musculoskeletal disorders including spinal cord injury, assessing the patients and their caregivers (19-22). SF-36 has also been studied in terms of validity and reliability in many languages and cultures (23-25). The Persian translation of SF-36 has been reported as valid and reliable among the Farsi-speaking population in 2005 (26).

### 3.2. Statistical Analysis

To carry out a comparison between various dimensions of the SF-36 questionnaire among veterans and their caregiving wives; the Pearson correlation was applied. A P value of less than 0.05 was considered significant in all of our data analyses. We used SPSS software version 11.5, (SPSS, Inc., Chicago, IL, USA), for data analysis.

## 4. Results

### 4.1. Demographic Data of the Participants

A total of 37 couples participated in the study including 37 patients with spinal cord injury and their 37 spouses. The mean age of the veterans was  $48.5 \pm 5.9$  and their wives  $44.8 \pm 7.2$ . The range of the number of children was from 0 to 6 with an average of  $2.25 \pm 1$ ; 14 (37.8%) veterans had been married before and 23 (62.2%) had got married after their spinal cord injuries sustained. The education status in veterans and their spouses was high school and diploma (45.9%) and higher education levels (16.2%). Regarding their employment situations, 29 (78.4%) of the veterans and 33 (89.2%) of their caregiving wives were unemployed, meaning that less than 25% of both group were employed (Table 1).

### 4.2. The Study Short Form 36 Scores

The mean and SD of MCS in the veterans with spinal cord injury was  $50.8 (11.8)$  and in their spouses  $37.7 \pm 14.5$ . However, the mean and SD for PCS were  $31.7 \pm 14.1$  and  $41.2 \pm 13.3$ , respectively. These results are summarized in Table 1.

**Table 1.** Demographic Variables of the Cohort Groups <sup>a,b</sup>

Characteristics	Values
<b>Caregiving wives</b>	
<b>Gender, %</b>	
Male	0
Female	100
<b>Age</b>	44.84 $\pm$ 7.2
<b>Education level</b>	
Below high school diploma	28 (75.8)
High school diploma and higher	6 (16.2)
<b>Employment status</b>	
Not working	33 (89.2%)
Working	4 (10.8%)
<b>SF-36</b>	
MCS	37.7 $\pm$ 14.5
PCS	41.2 $\pm$ 13.3
<b>Veterans with spinal cord injury</b>	
<b>Gender, %</b>	
Male	100
Female	0
<b>Age</b>	48.5 (5.9)
<b>Education level</b>	
Below high school diploma	20 (54.1)
High school diploma and higher	17 (45.9)
<b>Employment status</b>	
Not working	29 (78.4)
Working	8 (21.6)
<b>Duration of spinal cord injury</b>	26.4 $\pm$ 2.5
<b>Number of children</b>	2.25 (1.5)
<b>Married before spinal cord injury</b>	14 (37.8)
<b>Married after spinal cord injury</b>	23 (62.2)
<b>Duration of spousal Life</b>	23.9 $\pm$ 4.0
<b>SF-36, average</b>	
MCS	50.08 $\pm$ 11.8
PCS	31.7 $\pm$ 14.1

<sup>a</sup> Abbreviations: MCS, mental component summary; PCS, physical component summary; SF-36, study short form-36.

<sup>b</sup> Data are presented as No. (%) or mean  $\pm$  SD.

### 4.3. Comparison of Health-Related Quality of Life in Veterans With Spinal Cord Injury and Their Spouses

When the two groups were compared, data analysis demonstrated that there was a significant difference ( $P < 0.01$ ) in some domains of the SF-36 health survey, including PF, MH, BP, GH, PCS and MCS, between veterans with spinal cord injury and their caregiving spouses. However, there was no significant difference between RE, VT and SF (Table 2 and Figure 1).

values of different domains of SF36- in veterans and their caregivers

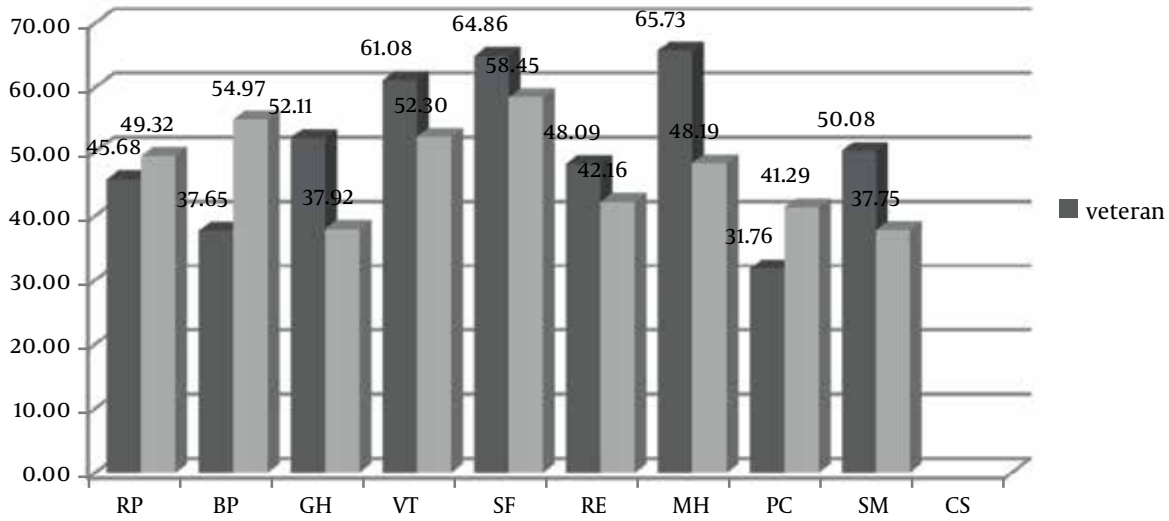


Figure 1. Value of Different Domains of Study Short Form36 in Veterans and Their Caregiving wives

Table 2. Comparison of Health-Related Quality of Life in Veterans With Spinal Cord Injury With Caregiving Spouses (N = 28)<sup>a</sup>

SF-36	Mean ± SD	P Value
<b>PF</b>		< 0.05 <sup>b</sup>
Veteran	19.72 ± 26.4	
Caregiving spouse	63.78 ± 24.4	
<b>RP</b>		0.7
Veteran	45.67 ± 40.6	
Caregiving spouse	49.32 ± 49.4	
<b>BP</b>		0.017 <sup>c</sup>
Veteran	37.64 ± 26.6	
Caregiving spouse	54.97 ± 33.9	
<b>GH</b>		0.026 <sup>c</sup>
Veteran	52.10 ± 24.8	
Caregiving spouse	37.91 ± 28.7	
<b>VT</b>		0.097
Veteran	61.08 ± 21.0	
Caregiving spouse	52.29 ± 23.8	
<b>SF</b>		0.36
Veteran	64.86 ± 23.7	
Caregiving spouse	58.44 ± 36.3	
<b>RE</b>		0.57
Veteran	48.08 ± 43.0	
Caregiving spouse	42.16 ± 47.4	
<b>MH</b>		0.002 <sup>b</sup>
Veteran	65.72 ± 18.7	
Caregiving spouse	48.18 ± 27.8	
<b>PCS</b>		0.004 <sup>b</sup>
Veteran	31.75 ± 14.1	
Caregiving spouse	41.2 ± 13.3	
<b>MCS</b>		< 0.05 <sup>b</sup>
Veteran	50.08 ± 11.8	
Caregiving spouse	37.75 ± 14.5	

<sup>a</sup> Abbreviations: SF, social functioning; PF, physical function; RP, role physical; BP, bodily pain; GH general health; VT, vitality RE, role emotional; MH, mental health; PCS, Physical component summary; MCS, mental component summary; SF-36, study short form-36.

<sup>b</sup> Statistically significant at the 0.01 level.

<sup>c</sup> Statistically significant at the 0.05 level.

#### 4.4. Correlation of the Quality of Life Between Veterans With Spinal Cord Injury and Their Caregiving Wives

Comparison of different items of the SF-36 between the veterans with spinal cord injury and their spouses illustrated that there was a significant positive correlation between PF of the caregiving wives and RE ( $P = 0.045$ ) and MH ( $P = 0.046$ ) of the veterans. The same results were ob-

served between VT of the spouses and PF ( $P = 0.022$ ) of the veterans. In addition, there was a significant negative correlation between SF of the spouses and BP of the veterans ( $P = 0.032$ ), as well as a significant negative correlation between RE of the spouses and GH of the veterans ( $P = 0.041$ ). There was also a significant positive correlation between MH of the spouses and PF of the veterans ( $P = 0.038$ ) as well as a significant negative correlation between MH of the spouses and GH of the veterans ( $P = 0.042$ ) (Table 3).

**Table 3.** Correlation of the Quality of Life Between the Veteran and Their Spouses <sup>a</sup>

QOL in spouses	QOL in Veterans									
	PF	RP	BP	GH	VT	SF	RE	MH	PCS	MCS
<b>PF2</b>										
r	0.258	0.188	-0.116	-0.039	0.266	0.202	0.332 <sup>b</sup>	0.330 <sup>b</sup>	-0.028	0.287
p	0.129	0.265	0.494	0.819	0.112	0.230	0.045	0.046	0.871	0.085
<b>RP2</b>										
r	0.232	0.170	-0.119	0.188	0.144	0.157	0.246	0.244	-0.085	0.256
p	0.173	0.316	0.482	0.264	0.394	0.354	0.141	0.146	0.616	0.127
<b>BP2</b>										
r	0.230	0.068	0.002	-0.140	0.034	0.085	0.266	0.200	-0.072	0.176
p	0.178	0.689	0.992	0.409	0.841	0.619	0.111	0.236	0.672	0.297
<b>GH2</b>										
r	0.157	-0.221	-0.299	-0.042	-0.077	-0.025	0.122	0.041	-0.243	0.160
p	0.360	0.189	0.072	0.806	0.651	0.885	0.471	0.811	0.148	0.343
<b>VT2</b>										
r	0.381 <sup>b</sup>	0.015	-0.232	-0.227	0.000	0.269	0.235	0.049	0.015	0.084
p	0.022	0.931	0.166	0.176	0.998	0.107	0.162	0.772	0.928	0.620
<b>SF2</b>										
r	0.251	0.038	-0.353 <sup>b</sup>	-0.068	0.137	0.172	0.303	0.323	-0.149	0.320
p	0.140	0.822	0.032	0.690	0.419	0.308	0.068	0.051	0.378	0.054
<b>RE2</b>										
r	0.157	-0.091	-0.132	-0.338 <sup>b</sup>	0.014	-0.118	0.063	-0.171	-0.012	-0.051
p	0.359	0.590	0.435	0.041	0.933	0.488	0.712	0.312	0.943	0.762
<b>MH2</b>										
r	0.348 <sup>b</sup>	0.031	-0.225	-0.336 <sup>b</sup>	-0.055	0.154	0.287	0.149	0.074	0.075
p	0.038	0.856	0.180	0.042	0.744	0.364	0.085	0.380	0.661	0.658
<b>PCS2</b>										
r	0.188	0.106	-0.093	0.161	0.154	0.135	0.252	0.272	-0.169	0.300
p	0.271	0.534	0.585	0.341	0.363	0.427	0.132	0.103	0.317	0.072
<b>MCS2</b>										
r	0.316	-0.033	-0.281	-0.362	0.044	0.018	0.284	-0.024	-0.084	0.100
p	0.108	0.867	0.147	0.058	0.825	0.927	0.143	0.905	0.670	0.612

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

<sup>b</sup> Correlation is significant at the 0.05 level (two-tailed).

## 5. Discussion

The influence of caregiving to patients with chronic spinal cord injury has not been well documented yet. Furthermore, there are a few reports on the relationship between the caregivers' health status and the QOL of patients with chronic diseases; thus, the bilateral effects of health status of patients with chronic spinal cord injury and their caregiving spouses need to be investigated (3, 27, 28). Spinal cord injury can affect the health status and QOL, both physically and emotionally. Therefore, in this study, we compared the health-related QOL between patients with chronic spinal cord injury and their caregiving spouses using the SF-36 health survey form. Spinal cord injury can cause important changes to physical, psychological, emotional and social health of a person. In fact, some of these physical changes involve sensory dysfunction and disability in bladder, bowel and sexual function (29). Evidences demonstrated that primary caregivers of a patient with chronic spinal cord injury will have a lower level of health-related QOL (7). Similar to these findings were achieved in our study, confirming the burden and effect of caregiving and nursing for husbands with chronic spinal cord injury on the health-related QOL of their spouses. The comparison of the averages of SF-36 domains indicated that PF in caregiving spouses was significantly higher than veterans; conversely, the MH scale was in a higher level in veterans compared to their wives ( $P = 0.002$ ). These findings were similar to those of Setsuko et al. who examined health-related QOL among patients with chronic peritoneal dialysis and their caregiving family members in Japan. This study showed that a chronic illness affected the emotions and mental health status of caregiving family members more than those of the patients (30). In our survey, PCS was a competent of SF-36, which was significantly lower in veterans ( $P = 0.004$ ) than their caregiving spouses. In fact, spinal cord injury can greatly reduce the physical health level; therefore, a reduction of QOL in veterans would be expectable. BP was another dimension which showed to be significantly different between the veterans and their wives ( $P = 0.017$ ). Other studies have shown that increased body pain can cause emotional issues in people with chronic illnesses (31). This result was in contrary with the findings of our study, since the average BP score in veterans was lower than their spouses and even lower than the normal Iranian population (32). Regarding this issue, we can comprehend that veterans with spinal cord injury in our country have had a high level of coping with their disability after three decades of their war-related morbidities. On the other hand, providing care for these chronically ill and disabled individuals has increased the load of affective responsibility and stress for their spouses, which can influence the psychological wellbeing of their care providers (5). Similar to this, in the current study, we observed a poorer mental health dimension in spouses, which was significantly

lower compared with the veterans. In accordance to the findings of Setsoku et al. who indicated that there was a significant correlation between mental health and physical health, we reached to the same point by finding the negative effect of physical disability on PF. In addition, there was a significant correlation between PF of the spouses and MH of the veterans ( $P = 0.046$ ). Similarly, Setsoku et al. illustrated the positive correlation between the emotional status of caregiver (mental health domain) and physical functioning of care receiver (31). Westphal-Guitti et al. claimed that three parameters of the SF-36, including MH, VT and RE, can influence the emotional wellbeing of primary caregivers and finally affect their QOL (33). Furthermore, in a research conducted by Unalan et al. they indicated that there were significant differences between caregivers and the control group in seven items of SF-36, including PF, PR, VT, GH, MH, RE, and SF-36 (7). In another report, the results were conclusive of effectiveness of factors such as the duration of caring and being worried about the patient on QOL of care providers (33). In our study, the results indicated that there was a significant correlation between some items of SF-36 in the two groups, and finally, there was a significant mutual correlation in comparison of the QOL of veterans and their loved families. Generally, the results confirmed that a lower health status level, physically and mentally, can affect the health-related QOL of their caregiving spouses.

## Acknowledgements

This research was conducted in cooperation with veterans with spinal cord injury and their spouses in Khorasan Razavi province (Mashhad, Iran). Without their assistance, we would not be able to do this study. We should thank the veterans and their spouses for their patience and cooperation. In addition, we would like to thank Mashhad University of Medical Sciences for their help to continue the survey.

## References

1. Steele A, Maruyama N, Galynker I. Psychiatric symptoms in caregivers of patients with bipolar disorder: a review. *J Affect Disord.* 2010;**121**(1-2):10-21.
2. Alshubaili AF, Ohaeri JU, Awadalla AW, Mabrouk AA. Family caregiver quality of life in multiple sclerosis among Kuwaitis: a controlled study. *BMC Health Serv Res.* 2008;**8**:206.
3. Blanes L, Carmagnani MI, Ferreira LM. Health-related quality of life of primary caregivers of persons with paraplegia. *Spinal Cord.* 2007;**45**(6):399-403.
4. Hagberg K, Branemark R, Gunterberg B, Rydevik B. Osseointegrated trans-femoral amputation prostheses: prospective results of general and condition-specific quality of life in 18 patients at 2-year follow-up. *Prosthet Orthot Int.* 2008;**32**(1):29-41.
5. Puhan MA, Behnke M, Frey M, Grueter T, Brandli O, Lichtenschopf A, et al. Self-administration and interviewer-administration of the German Chronic Respiratory Questionnaire: instrument development and assessment of validity and reliability in two randomised studies. *Health Qual Life Outcomes.* 2004;**2**:1.
6. Lapham-Randlov N. How the family copes with spinal cord injury: a personal perspective. *Rehabil Nurs.* 1994;**19**(2):80-3.

7. Unalan H, Gencosmanoglu B, Akgun K, Karamemetoglu S, Tuna H, Ones K, et al. Quality of life of primary caregivers of spinal cord injury survivors living in the community: controlled study with short form-36 questionnaire. *Spinal Cord*. 2001;**39**(6):318-22.
8. Demet K, Martinet N, Guillemin F, Paysant J, Andre JM. Health related quality of life and related factors in 539 persons with amputation of upper and lower limb. *Disabil Rehabil*. 2003;**25**(9):480-6.
9. Dasch KB, Russell HF, Kelly EH, Gorzkowski JA, Mulcahey MJ, Betz RR, et al. Coping in caregivers of youth with spinal cord injury. *J Clin Psychol Med Settings*. 2011;**18**(4):361-71.
10. Arango-Lasprilla JC, Plaza SL, Drew A, Romero JL, Pizarro JA, Francis K, et al. Family needs and psychosocial functioning of caregivers of individuals with spinal cord injury from Colombia, South America. *NeuroRehabilitation*. 2010;**27**(1):83-93.
11. Kelly EH, Anderson CJ, Garma SI, Russell HF, Klaas SJ, Gorzkowski JA, et al. Relationships between the psychological characteristics of youth with spinal cord injury and their primary caregivers. *Spinal Cord*. 2011;**49**(2):200-5.
12. Hui SK, Elliott TR, Shewchuk R, Rivera P. Communal Behaviors and Psychological Adjustment of Family Caregivers and Persons With Spinal Cord Injury. *Rehabil Psychol*. 2007;**52**(1):113-9.
13. Dreer LE, Elliott TR, Shewchuk R, Berry JW, Rivera P. Family Caregivers of Persons With Spinal Cord Injury: Predicting Caregivers at Risk for Probable Depression. *Rehabil Psychol*. 2007;**52**(3):351-7.
14. King C, Kennedy P. Coping effectiveness training for people with spinal cord injury: preliminary results of a controlled trial. *Br J Clin Psychol*. 1999;**38** ( Pt 1):5-14.
15. Ebrahimzadeh MH, Soltani-Moghaddas SH, Birjandinejad A, Omidi-Kashani F, Bozorgnia S. Quality of life among veterans with chronic spinal cord injury and related variables. *Arch Trauma Res*. 2014;**3**(2).
16. Chang HY, Chiou CJ, Chen NS. Impact of mental health and caregiver burden on family caregivers' physical health. *Arch Gerontol Geriatr*. 2010;**50**(3):267-71.
17. Hughes SL, Giobbie-Hurder A, Weaver FM, Kubal JD, Henderson W. Relationship between caregiver burden and health-related quality of life. *Gerontologist*. 1999;**39**(5):534-45.
18. Bergfeldt U, Skold C, Julin P. Short Form 36 assessed health-related quality of life after focal spasticity therapy. *J Rehabil Med*. 2009;**41**(4):279-81.
19. Wolf AC, Tate RL, Lannin NA, Middleton J, Lane-Brown A, Cameron ID. The World Health Organization Disability Assessment Scale, WHODAS II: reliability and validity in the measurement of activity and participation in a spinal cord injury population. *J Rehabil Med*. 2012;**44**(9):747-55.
20. Kosinski M, Keller SD, Hatoum HT, Kong SX, Ware JE, Jr. The SF-36 Health Survey as a generic outcome measure in clinical trials of patients with osteoarthritis and rheumatoid arthritis: tests of data quality, scaling assumptions and score reliability. *Med Care*. 1999;**37**(5 Suppl):MS10-22.
21. Anderson PA, Puschak TJ, Sasso RC. Comparison of short-term SF-36 results between total joint arthroplasty and cervical spine decompression and fusion or arthroplasty. *Spine (Phila Pa 1976)*. 2009;**34**(2):176-83.
22. Ebrahimzadeh MH, Makhmalbaf H, Birjandinejad A, Keshtan FG, Hoseini HA, Mazloumi SM. The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) in Persian Speaking Patients with Knee Osteoarthritis. *Arch Bone Jt Surg*. 2014;**2**(1):57-62.
23. Thumboo J, Wu Y, Tai ES, Gandek B, Lee J, Ma S, et al. Reliability and validity of the English (Singapore) and Chinese (Singapore) versions of the Short-Form 36 version 2 in a multi-ethnic urban Asian population in Singapore. *Qual Life Res*. 2013;**22**(9):2501-8.
24. Salazar FR, Bernabe E. The Spanish SF-36 in Peru: Factor Structure, Construct Validity, and Internal Consistency. *Asia Pac J Public Health*. 2012.
25. Sinha R, van den Heuvel WJ, Arokiasamy P. Validity and Reliability of MOS Short Form Health Survey (SF-36) for Use in India. *Indian J Community Med*. 2013;**38**(1):22-6.
26. Montazeri A, Vahdaninia M, Ebrahimi M, Jarvandi S. The Hospital Anxiety and Depression Scale (HADS): translation and validation study of the Iranian version. *Health Qual Life Outcomes*. 2003;**1**:14.
27. Ebrahimzadeh MH, Shojaei BS, Golhasani-Keshtan F, Soltani-Moghaddas SH, Fattahi AS, Mazloumi SM. Quality of life and the related factors in spouses of veterans with chronic spinal cord injury. *Health Qual Life Outcomes*. 2013;**11**:48.
28. Nogueira PC, Rabeh SA, Caliri MH, Dantas RA, Haas VJ. Burden of care and its impact on health-related quality of life of caregivers of individuals with spinal cord injury. *Rev Lat Am Enfermagem*. 2012;**20**(6):1048-56.
29. Chappell P, Sheila W. Quality of life following spinal cord injury for 20-40 year old males living in Sri Lanka. *Asia Pac Disabil Rehabil J*. 2003;**14**:162-78.
30. Shimoyama S, Hirakawa O, Yahiro K, Mizumachi T, Schreiner A, Kakuma T. Health-related quality of life and caregiver burden among peritoneal dialysis patients and their family caregivers in Japan. *Perit Dial Int*. 2003;**23** Suppl 2:S200-5.
31. Buijck BI, van Eijk MS, Zuidema SU, Gerritsen DL, Koopmans RT, van der Linde H. Determinants of quality of life in older adults after lower limb amputation and rehabilitation in skilled nursing facilities. *J Am Geriatr Soc*. 2012;**60**(4):796-8.
32. Montazeri A, Goshtasebi A, Vahdaninia M, Gandek B. The Short Form Health Survey (SF-36): translation and validation study of the Iranian version. *Qual Life Res*. 2005;**14**(3):875-82.
33. Westphal-Guitti AC, Alonso NB, Migliorini RC, da Silva TI, Azevedo AM, Caboclo LO, et al. Quality of life and burden in caregivers of patients with epilepsy. *J Neurosci Nurs*. 2007;**39**(6):354-60.