

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

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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 ± 5.9 and 44.8 ± 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 ± 5.9 and their wives 44.8 ± 7.2 . The range of the number of children was from 0 to 6 with an average of 2.25 ± 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 ± 14.5 . However, the mean and SD for PCS were 31.7 ± 14.1 and 41.2 ± 13.3 , respectively. These results are summarized in Table 1.

Table 1. Demographic Variables of the Cohort Groups ^{a,b}

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

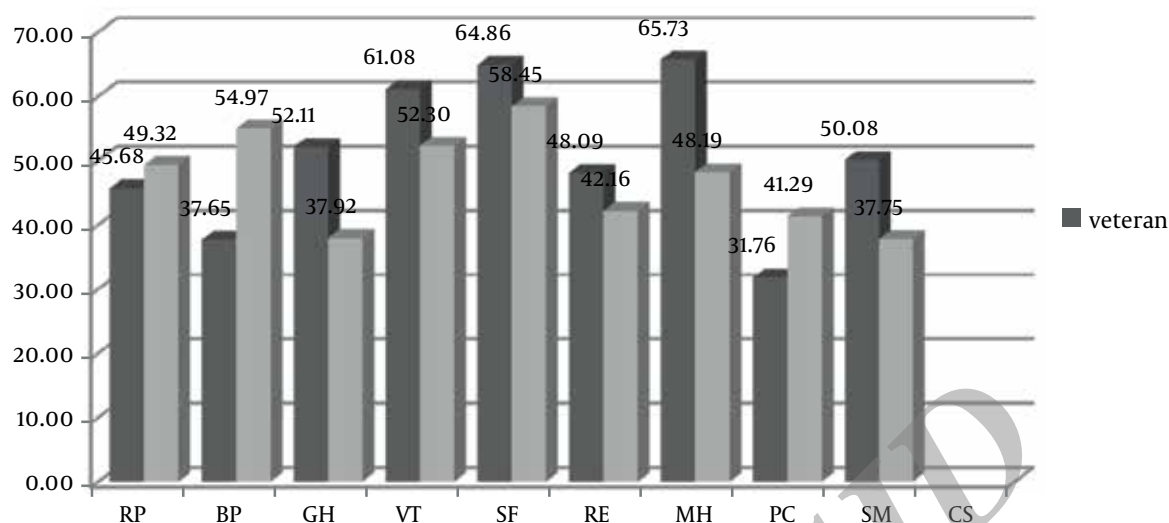
^a Abbreviations: MCS, mental component summary; PCS, physical component summary; SF-36, study short form-36.

^b 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)^a

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

^a 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.

^b Statistically significant at the 0.01 level.

^c 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 ^a

QOL in spouses	QOL in Veterans									
	PF	RP	BP	GH	VT	SF	RE	MH	PCS	MCS
PF2										
r	0.258	0.188	-0.116	-0.039	0.266	0.202	0.332 ^b	0.330 ^b	-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
RP2										
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
BP2										
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
GH2										
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
VT2										
r	0.381 ^b	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
SF2										
r	0.251	0.038	-0.353 ^b	-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
RE2										
r	0.157	-0.091	-0.132	-0.338 ^b	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
MH2										
r	0.348 ^b	0.031	-0.225	-0.336 ^b	-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
PCS2										
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
MCS2										
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

^a 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.

^b 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 theses 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.

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