

## Original Article

**Evaluation of quality of life among patients referring for kyphoplasty due to vertebral fractures**Bahar Heidarinia<sup>1</sup>, Mahmoud Mahmoudi<sup>2</sup>, Alireza Teimouri<sup>3</sup>, Hesam Abdolhoseinpour<sup>3\*</sup><sup>1</sup> Department of General Medicine, School of Medicine, Tehran Medical Sciences Branch, Islamic Azad University, Tehran, Iran<sup>2</sup> Department of Health Services Administration, Science and Research Branch, Islamic Azad University, Tehran, Iran<sup>3</sup> Department of Neurosurgery, School of Medicine AND Bou Ali Hospital, Tehran Medical Sciences Branch, Islamic Azad University, Tehran, Iran

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## ABSTRACT

**Background & Aim:** Quality of life (QOL) is one of the important health components, indicating physical, social, and mental health. Vertebral fracture causes acute and chronic low back pain (LBP), physical disability and decreased QOL, and kyphoplasty is one of the effective methods for treating these types of fractures .

**Methods & Materials:** This descriptive cross-sectional study was performed on 48 patients with vertebral fractures who referred for kyphoplasty surgery. Data were collected using two questionnaires, one including demographic information and the other consisting of 36 questions regarding QOL. Data was analyzed using chi-Square and Fisher's exact tests in the SPSS software.  $P < 0.050$  was considered as the significance level.

**Results:** Of 48 patients, 28 and 20 were women and men, respectively, with a mean age of  $64.12 \pm 16.99$  years. The mean QOL score of patients was 38.28 and 45.8% of the patients had moderate QOL. The mean score for physical and mental health subscales was 30.30 and 50.66, respectively.

**Conclusion:** The mean of total score, the scores of 2 subscales of physical and mental health, and 8 dimensions of the questionnaire were higher among men compared to women. There were significant differences between the two sexes in 2 subscales of physical functioning and health-related disorder. The results of this study showed that LBP and physical dysfunction affected mental health of patients and psychiatric dimensions of the questionnaire.

**Introduction**

Vertebral compression fracture (VCF) is a major problem associated with pain and functional impairment (1), which causes disabling and severe back pain, impairing the patients' quality of life (QOL) and affecting

their physical activity, psychosocial efficacy, mental health, and survival (2).

Thoracolumbar vertebral fracture occurs secondary to high volume trauma among young individuals and secondary to mild trauma or spontaneously among the elderly (3). In the United States, more than 1.5 million vertebral fractures occur annually and 40% of individuals older than 80 years experience such an injury that threatens their QOL and increases mortality rates (4). Acute lumbar pain seems to be the most important factor in decreasing QOL among patients with vertebral fractures (5). VCFs occur

\* Corresponding Author: Hesam Abdolhoseinpour, Postal Address: School of Medicine, Tehran Medical Sciences Branch, Islamic Azad University, Khaghani Street, Shariati Avenue, Tehran, Iran  
 Email: abdolhoseinpour@yahoo.com

at thoracolumbar junction (TLJ) and collapses the vertebral body; Vertebroplasty or kyphoplasty is used as the treatment in this case (6). Kyphoplasty is a safe and effective therapeutic method for VCFs that improves patients' physical activity, reduces pain, and corrects the spinal deformity (kyphosis) (7). Kyphoplasty is also considered the least aggressive treatment for these types of fractures (8). Measuring the health level is one of the very important subjects in clinical and health care (9). The world health organization (WHO) has defined QOL as the individual's perception of his/her position in life in the cultural context and the value system of the community, and the individual's goals, expectations, and standards (10). About 40 years ago, QOL was introduced in the United States, and social sciences were responsible for its design and measurement. Over time, especially in the last decade, many efforts have been made to assess QOL in medical sciences, especially in clinical trials (11). Gradually, researchers realized that QOL can be one of the important consequences in health evaluation. Studies on QOL and its various dimensions are of interest to researchers, as the studies regarding health-related quality of life (HRQOL) increased from 21% to 76% since 1985 to 1995 (12). The QOL Short Form-36 questionnaire (SF-36) is the most popular and most commonly used instrument for measuring QOL. This questionnaire has been translated into several languages worldwide and its validity and reliability have been confirmed in numerous studies inside Iran and abroad (13). Accordingly and considering the significance of this issue, the aim in this study was determining QOL of patients referring for kyphoplasty due to vertebral fractures.

## Methods

In this descriptive cross-sectional study, 48 patients with vertebral fractures hospitalized in 3 hospitals in Tehran, Iran, for kyphoplasty from 2016-2017, were included. All patients were visited by the researcher before surgery and the researcher explained the study objectives to the patients, who were recruited after signing

the written consent from. Then, the participants completed two questionnaires: the first one containing the patients' demographics, underlying diseases related to osteoporotic fractures, related drugs, patient's chief complaint (CC), duration of low back pain (LBP) and radiculopathy, and other spinal diseases, in addition, the second questionnaire included 36 questions on QOL. The 36 questions in this questionnaire consisted of 8 dimensions, including physical functioning, physical role due to health problems, emotional role due to health problems, energy and fatigue, emotional well-being, social functioning, bodily pain, and general health, and combination of these dimensions led to 2 subscales of physical and mental health. The scoring system was based on standard criteria assessment for SF-36 questionnaire.

Data were analyzed using chi-Square and Fisher's exact tests in SPSS software (version 21, IBM Corporation, Armonk, NY, USA) in order to determine the relationship between the variables. Moreover, the t-test was used to compare the means at the significance level of  $P < 0.050$ .

## Results

Out of 48 patients, 28 (58.3%) and 20 (41.7%) patients were women and men, respectively and the mean age of the patients was  $64.12 \pm 16.99$  years (age range of 19-89 years). Of 28 women, 27 were postmenopausal with the mean age of menopause at  $49.62 \pm 4.46$  years.

Most patients (77.5%) were married and 94.4% lived with their family. 10 patients reported current or previous smoking. Demographic characteristics of patients are shown in table 1.

The most common causes of fracture included spontaneous, trauma, falling, and lifting a heavy object with rates of 41.5%, 19.5%, 14.6%, and 9.8%, respectively. Additionally, a number of patients had broken their vertebrae following an accident, exercise, seizure, sneezing, and coughing. The most common complaint of patients was LBP and the mean duration of fracture-related pain was 126 days (ranging 6-730 days).

**Table 1.** Demographic information

Characteristic	Sex	Female		Men		Total	
		Number	Percent	Number	Percent	Number	Percent
Marital status	Single	10	71.43	4	28.57	14	100
	Marries	19	55.88	15	44.12	34	100
Education	Illiterate	7	70	3	30	10	100
	Cycles	9	69.24	4	30.76	13	100
	Diploma	9	64.28	5	35.72	14	100
Occupational status	Higher education	4	36.36	7	63.64	11	100
	Employed	1	7.15	13	92.58	14	100
Smoking	Unemployed	28	82.36	6	17.64	34	100
	Yes	5	50	5	50	10	100
Alcohol drinking	No	23	60.53	15	39.47	38	100
	Yes	1	16.66	5	83.34	6	100
	No	27	64.28	1515	35.72	42	100

4 patients mentioned a history of kyphoplasty or vertebroplasty for other vertebrae. 18 patients had underlying diseases. 2, 1, 2, 5 patients suffered from rheumatic disease, advanced heart disease, had a history of cancer and chemotherapy outside spine, and had a history of radiotherapy outside the spine, respectively. In addition, 3 patients suffered from diabetes mellitus (DM) and 5 patients suffered from 2 or 3 diseases at the same time. Moreover, 8 patients reported a history of using steroid, of which 4 and 4 used it for more and less than 3 months, respectively. Furthermore, 5 and 2 patients had a history of use of anticoagulant and anticonvulsive drugs, respectively.

The QOL of all patients was obtained as 38.28 according to SF-36 scoring. The QOL of all patients was categorized into 3 groups of good, moderate, and poor with score ranges of 66-100, 33-66, and less than 33, respectively; 5 (10.4%), 22 (45.8%), and 21 (43.8%) patients had a good, moderate, and poor level of QOL, respectively. The mean score of physical health

and mental health subscales was 30.30 and 50.66, respectively.

The mean of total score, the score of 2 subscales of physical and mental health, and 8 dimensions of SF-36 questionnaire were higher among men in comparison to those of women and there was a significant difference between sex and physical function and also health-related disorders ( $P = 0.005$ ) and ( $P = 0.025$ ), respectively, however the difference in other dimensions was not statistically significant between men and women. The mean total scores and the scores of each dimension of the questionnaire are shown in table 2.

## Discussion

The results of this study showed that, given the maximum score of 100 obtained in each dimension of QOL, this scale for all patients (38.28) was moderate and total mean QOL and all its dimensions was higher among men than those of women.

**Table 2.** Dimensions of quality of life (QOL)

SF-36	Men	Women	P-value	Total
	Mean $\pm$ SD	Mean $\pm$ SD		Mean $\pm$ SD
Total	46.18 $\pm$ 18.08	32.64 $\pm$ 14.95	0.302	38.28 $\pm$ 17.49
Physical health subscale	38.99 $\pm$ 20.13	23.63 $\pm$ 15.31	0.116	30.03 $\pm$ 18.89
Mental health subscale	56.98 $\pm$ 18.47	46.16 $\pm$ 20.06	0.513	50.66 $\pm$ 19.95
Physical functioning	45.00 $\pm$ 27.38	23.39 $\pm$ 22.93	0.005	32.39 $\pm$ 26.85
Role limitations due to physical health	15.00 $\pm$ 23.13	1.88 $\pm$ 9.91	0.025	7.35 $\pm$ 17.77
Role limitations due to emotional problems	63.33 $\pm$ 38.84	42.85 $\pm$ 38.33	0.078	51.38 $\pm$ 39.47
Energy/fatigue	51.50 $\pm$ 20.20	41.07 $\pm$ 17.86	0.072	45.41 $\pm$ 19.37
Emotional well-being	61.60 $\pm$ 20.28	54.42 $\pm$ 18.99	0.222	57.41 $\pm$ 19.65
Social functioning	46.87 $\pm$ 21.79	40.62 $\pm$ 27.55	0.385	43.22 $\pm$ 25.25
Pain	24.37 $\pm$ 20.16	21.16 $\pm$ 14.24	0.520	22.50 $\pm$ 16.83
General health	52.00 $\pm$ 20.86	42.50 $\pm$ 22.29	0.138	46.45 $\pm$ 21.99

In the study by Stoffel et al. on patients candidate for kyphoplasty due to vertebral fractures, the scores of the subscales of mental health and pre-operative physical health of patients was 43 and 24, respectively. In the present study, the score of the mental health subscale of patients was greater than that of the physical health subscale (14).

In a study conducted by Hadi and Malek Makan, studying QOL among teachers in Shiraz, Iran, showed that men had a higher physical and mental health scores compared to women, which is consistent with the results of the present study (15).

In cross-sectional studies, women's scores are lower than that of men, while in longitudinal studies, there was no such difference between the two sexes. The present cross-sectional study also recorded such a conclusion (16).

The study on validity and reliability of the SF-36 questionnaire by Montazeri et al., showed that women had significantly lower QOL than men. In the present study, in all dimensions, women had a lower QOL and there was a significant difference between two dimensions of physical functioning and health-related disorders (17).

A study by Habibi et al. on the elderly also revealed that QOL score of men was significantly higher than that of women, which is consistent with the results of the present study (18).

In a study by Nasiry Zarrin Ghabaee et al., there was a weak association between QOL and mental health of patients with heart failure (HF). The results showed that QOL of most participants was moderate and low. In the present study, mean QOL of 89.6% of patients was moderate and poor (19).

Since patients with vertebral fractures suffer from severe LBP, the pain causes physical dysfunction, impairs their physical well-being, and induces a reciprocal effect on their mental health. Therefore, severe LBP causes the patients to feel incapable and desperate that would justify the low score of mental health and psychiatric dimensions of this questionnaire.

The most important limitation of the present study, like other studies using questionnaire, was that some participants in the study responded

with inattention to the last questions, because of tiredness due to the high number of questions. Another limitation was using the instruction for data collection, which may lead to bias in data collection due to the conditions of some patients, like old age and lack of understanding of the questions due to low educational level. It is suggested that this study be performed with a larger sample size and with a randomized design.

## Conclusion

The mean of total score, the scores of 2 subscales of physical and mental health, and 8 dimensions of the questionnaire were higher among men compared to women. There were significant differences between two sexes in 2 subscales of physical functioning and health-related disorder. The results of this study showed that LBP and physical dysfunction affected mental health of patients and psychiatric dimensions of the questionnaire.

## Conflict of Interests

Authors have no conflict of interests.

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