The relationship between quality of life and percentage of injury among posttraumatic stress disorder veterans

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Abstract

Introduction: War is an effective factor in incidence and promotion of psychological and behavioral problems such as post-traumatic stress disorder. This study aimed to determine the quality of life and its correlation with age and percent of injury in war veterans with post-traumatic stress disorder.

Methods and Materials: This was a cross-sectional study, which included 70 war veterans with post-traumatic stress disorder. This study focused on the quality of life with SF36.

Results: The results indicated that war veterans with post-traumatic stress disorder had the least scores in physical, emotional and social function subclasses of SF36 questionnaire. There was significant correlation between quality of life and percent of injury (p = 0/039) but no significant correlation between quality of life and age.

Conclusions: Post traumatic stress disorder results in low quality of life in war veterans. Percent of injury significantly reduces their quality of life.

Keywords: Quality of life, Percent of Injury, Posttraumatic stress disorder, War veterans.

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Introduction

War is among the event that leads to emergence of the numerous physical and psychological damages, each of which alone can be accompanied by the countless consequences. In fact, the war is considered as one of the factors affecting the rate of onset and the course of the mental and behavioral disorders. One of these disorders is post-traumatic stress disorder (1, 2). Post-traumatic stress disorder is a set of reactions that the person can show in the face of stress that can occur outside of his or her enduring strength. To diagnose the disorder based on the Diagnostic and Statistical Manual of Mental Disorders Fourth, people should have three main characteristics of re-experiencing the traumatic event, avoidance of the over-excitation pattern, and these symptoms must last a month (1).

According to the research conducted, post-traumatic stress disorder is depends on combat exposure, time period and duration of war (3-5). Since the Iran-Iraq war lasted eight years, these psychological pressures and irreversible injuries, such as the post-traumatic stress disorder, were imposed on the soldiers. This can seriously impair quality of life (QOL) for the veterans, families and communities. Studies suggest that post-traumatic stress disorder is associated with an impairment of the performance in several areas. These disorders include poor physical and mental health, violence and crime, and poor role performance (playing physical, mental and social roles) (6, 7). On this same basis, the war veterans and soldiers who are suffering from post-traumatic stress disorder, have serious problems in the mental - social, family and physical performances (8, 9). So, from the viewpoint, reduction of stress and improvement of health and QOL are important for the veterans. Stress control causes health improvement, prevention of disease, improvement of the QOL and reduction of the health care costs (10). As defined by the World Health Organization (WHO), the QOL is described as people's perception of their position in life (11). The QOL includes goals, expectations, standards and concerns in cultural context and value system; and it contains physical health, psychological state, independence level, social relationships and self-interest (12, 13).

Health-related quality of life, in fact, is an extraction of all objectives of health care, and evaluates the effect of health status on the performance of people in life. It also can be very effective as an indicator to assess status of a society and effectiveness of the health and rehabilitation care (14). Besides having several dimensions, the indicator is also affected by various variables, each of which by itself can cause damage to a person in ordinary life. Evaluation of factors associated with the QOL can offer solutions for the health plans (15).

Age is one factor that can cause a change in the quality of life. Several studies have been conducted in relation to the age and the QOL; But each of them has provided different results that in some cases they are contradictory (16, 17). The percentage of injury or disease severity in a veteran can also be considered as a factor affecting the QOL (3). Studies have been conducted about the relationship between the percentages of injury or post-traumatic stress disorder symptoms with the QOL (9, 17-19). But what is clear is that, despite the reviews and researches conducted, no study has been done in Iran on the QOL in the veterans with post-traumatic stress disorder and associated factors such as the age and percentage of injury with the QOL in these patients. Since the health-related QOL is discussed as an indicator for assessing the effectiveness of treatments and health programs (20, 21), this study examined the QOL, as well as the relationship between the age and the percentage of injury with the QOL in these veterans; having a knowledge of basic level of quality of life and a functional scope of the problems can help us detect needs of these patients in order to plan

interventions in health, treatment and particularly in rehabilitation in future.

Methods and Materials

This study was a cross-sectional descriptive study in which 70 patients with post-traumatic stress disorder were assessed in terms of the QOL. The convenience sampling was carried out for selecting the samples. Participants were veterans with post-traumatic stress disorder, who were treated in the psychiatric hospital of Bustan in Ahvaz City. It is noteworthy that the veterans with post-traumatic stress disorder in the Khuzestan Province are often referred to this hospital. All veterans who were treated in the hospital and had features of inclusion in this study were assessed. Ethically, the veterans became aware of the research and the confidentiality of all the information. Furthermore, samples were free to decide for participating in the study. After participating in the study, the inclusion criteria were as follows:

Onset of post-traumatic stress disorder was diagnosed by a psychiatrist after the events of the war, and inserted in medical records of veterans; such as absence of psychotic symptoms, including delusions and hallucinations; lack of other diagnoses with post-traumatic stress disorder, such as mood disorders (major depressive disorder and bipolar disorder); lack of substance abuse related disorders; an ability to communicate, understand and answer the questions.

Percentage of injury based on the psychiatric diagnosis was inserted in medical records of the veterans. The mean percentage of injury was 36.15. Range age in participants was between 40 to 56 years. Participants were first interviewed by a psychiatrist, and a diagnosis of post-traumatic stress disorder was carried out. Absence of other disorders and symptoms was examined by psychiatrists. The ability to communicate, understand and respond to questions was evaluated by an occupational therapist.

A *researcher-made questionnaire* of the profile (the age, marital status, education level, income level, and percentage of being a veteran) and the standard QOL questionnaire were used for the data collection. The questionnaire was a 36 Item Short Form Health Survey (SF36), and it assessed QOL in these categories; including Physical functioning, role limitations due to physical and emotional problems, social functioning, body pain, general health, energy/ fatigue, emotional well-being. Scores in each of these categories were calculated and reported as a percentage (22). Reliability and validity of the test were studied on 4800 samples. The permission for use of this test was taken from the interpreter via an email. Results of Montazeri et al.'s study showed that except the measure of energy/ fatigue, other measures of the Persian SF36 have a minimum reliability coefficient ranging from 0.77 to 0.90; and generally they reported reliability and validity of the Persian SF36 as appropriate and desirable (22). Eshaghi *et al.* have reported validity of this questionnaire using the internal consistency method of 0.70 and coefficient alpha 0.70 (23).

In this study after written informed consent was taken from the veterans, they were evaluated by a *researcher-made questionnaire* of the profile and SF36 questionnaire. Score of each of the dimensions of the QOL was graded and calculated based on grading guidelines of SF36. SPSS version 16 was used for analyzing the data of the study. Data analysis was performed by descriptive statistics, T-test and Pearson correlation test. Significance level was considered as 0.05.

Results

Participants were aged 40 to 59 years with a mean age, 46.52 ± 4.72 years. Mean of percentage of injury in these war veterans was 36.15±1.64. Demographic characteristics are shown in Table 1.

The veterans did not have physical disabilities, such as paralysis or amputation; but 56.43% of veterans had physical issues and pain from shrapnel in their body. Mean scores of the QOL, showed that there was no significant difference in the scale scores in terms of mental health and the QOL among this group of the veterans and people who did not have these problems.

In addition, during reviewing the QOL scores it was found that in the study, the veterans obtained the lowest score in playing the physical, emotional role and social functioning; the highest score was obtained in the physical functioning. Results relating to the mean scores of QOL of the veterans are displayed in table 2.

At the next phase of the study, we investigated the relationship between QOL with the age and percentage of injury. Significant and reverse relationship existed between percentage of injury and mental health scale scores (p=0.04, r= 0.19) and physical health scale of quality of life (p=0.021, r=-0.331); but no relationship was observed between age and mental health scale scores (p=0. 337, r=-0.147) and physical health scale of quality of life (p=0. 266, r=-0.172).

According to Table 3, a comparison of QOL of the veteran based on the percentage of injury showed that there was significant difference between different groups of veterans in the areas of physical functioning (p=0.036), emotional well-being (p=0.031), energy/ fatigue (p=0.031), general health (p=0.045), the mental health scale (p=0.044) and physical health scale of the QOL (p=0. 038); but no significant difference was observed between the different groups of veterans in the areas of the physical and emotional role, social functioning and body pain.

Table 1: The distribution of the patients according to the underlying variables

Variable		Number	Percentage
Age	40-49	47	67.14
	50-59	23	32.85
Percentage of injury	<25%	9	12.85
	25-49	40	57.14
	50-75	21	30
Educational status	Less than Diploma	45	64.29
	High School Diploma	25	35.71
Marital status	Single	26	37.14
	Married	30	42.86
	Divorced	14	20

Table 2: Mean scores of QOL in the veterans with the post-traumatic stress disorder diagnosed

Score	Mean	SD
Physical functioning	53.90	2.82
Role limitation due to physical problem	18.18	2.92
Role limitation due to emotional problem	19.30	3.11
Energy/ fatigue	42.15	2.75
Emotional well-being	45.45	2.61
Social functioning	34.60	2.63
Body pain	43.83	3.41
General health	44.99	2.85
Physical health scale	39.94	2.14
Mental health scale	35.38	1.82
The average scores	37.59	1.74

Table 3: Relationship between the scores of QOL with age and percentage of injury

Score	Percentage of injury	Mean	SD	P-value	F-value
Physical functioning	<25	58.50	25.17	0.036	4.36
	25-49	50.26	30.74		
	50-75	7.00	14.14		
Physical role limitation	<25	25.00	33.33	0.567	2.19
	25-49	18.26	30.46		
	50-75	6.11	12.22		
Emotional role limitation	<25	24.99	32.62	0.63	0.272
	25-49	16.65	30.17		
	50-75	16.35	23.54		
Energy/ fatigue	<25	41.50	14.76	0.037	3.02
	25-49	45.38	32.86		
	50-75	5.00	14.14		
Emotional well-being	<25	46.00	21.35	0.039	3.42
	25-49	50.30	28.78		
	50-75	11.00	16.97		
Social functioning	<25	45.00	31.29	0.401	0.939
	25-49	35.09	25.74		
	50-75	18.75	26.51		
bodily pain	<25	64.00	33.73	0.231	1.103
	25-49	43.80	32.15		
	50-75	26.25	8.83		
General health	<25	50.62	21.27	0.045	2.35
	25-49	42.88	28.78		
	50-75	17.50	3.53		

Discussion

War is considered as one of the factors affecting psychological and behavioral disorders, because participation in the war leads to accidental exposure to dangerous situations (1, 2). So, one of the consequences of the war, in addition to physical health problems and disabilities (20, 24), is injuries and mental health problems in the veterans and soldiers combat. The victims will be suffering from psychological trauma long after the war. In the study conducted by Hashemian, Ahmadi and Ahmadi among the Kurdish ethnicity victims of chemical warfare and with mean age of 45 years, it was found that prevalence of post-traumatic stress disorder, anxiety and depression symptoms among these individuals were 59%, 65% and 41%, respectively (25-27). In a descriptive study conducted on the basis of history and diagnosis inserted in the records of veterans in the psychiatric ward as well as the personal interviews by Borhani in 2001, over 80% of the veterans were with low to very high severity levels of post-traumatic stress disorder symptoms (28).

In a study among the U.S. troops in Iraq in the war, known as "*Operation Iraqi Freedom* (OIF)", Schnurr reported that prevalence of post-traumatic stress disorder in male and female soldiers was 14%. Also, he stated that military women in the war endured greater difficulties and pressures due to the exposure to the life-threatening conditions and war locations (12).

Health-related QOL is an efficient measure in the physical and mental health dimensions, which can be used as an indicator in evaluating the effectiveness of health program interventions (20, 21). In the present study, relationship between post-traumatic stress disorder and decreased quality of life in patients with this disorder has been reported. Most of these studies have assessed the QOL using a *36-item short-form* (*SF-36*) (29, 30).

Results of this study showed that veterans with post-traumatic stress disorder, did have not desirable health-related QOL, and their QOL in most areas obtained the scores lower than the average. Results showed that the veterans had the lowest score in the areas of physical and emotional roles, and social functioning and the highest scores in the area of physical functioning. Previous studies have confirmed the prevalence of disorders in physical and emotional well-being, emotional and physical performance roles, and social functioning role due to post-traumatic stress disorder (6-8). Results obtained in this study also confirmed the studies' results. Studies have been done on the QOL for veterans in the past, including Najafi in a comparison between the veterans with and without post-traumatic stress disorder in the Hamedan province showed that the lowest scores of QOL in the veterans with the post-traumatic stress disorder, were in the areas of physical role, emotional role, social functioning and body pain (17). Results were largely in line with our results in the present study.

Mousavi in a study of the QOL in the Iranian veterans with both lower extremity amputations indicated the veterans had the lowest scores in the areas of the bodily pain, and the highest score was in the social functioning area (31). Mousavi in 2007 also showed that the lowest scores on the QOL in the female veterans with spinal cord injury were related to the areas of physical functioning, and body pain (32). These studies showed that veterans with spinal cord injury and amputations got lower scores on the physical health scale.

Erbes in a comparison between the QOL for American troops present in Iraq, with or without post-traumatic stress disorder, showed that people with post-traumatic stress disorder obtained the lowest scores in the areas of physical role, emotional role, and social functioning (33). These results were consistent with our results in this study. Engelhard stated that Dutch

soldiers diagnosed with post-traumatic stress disorder, who participated in the Iraq war, according to their own reports, were faced with more failings and problems with work, doing chores and interpersonal communication compared with those without this disorder (34).

In the present study, the veterans did have no physical disabilities, such as a paralysis or a disability, only in some of them there were problems and pains caused by the shrapnel bullets or explosives in the body. These problems can lead to reduced QOL. But, studies showed that no significant difference existed between this group and the group without physical problems caused by the collision in terms of QOL scores. Most problems of veterans in the physical activities were related to the physical roles playing; and this suggests that the patients' mental and motivational symptoms and difficulties can hinder performance and play a role in the physical activities and reduction of QOL scores in this area.

In the present study we did not find a significant relationship between the age and QOL. However, the veterans who were addressed in this study were at an age range of 40 to 59 years (in the middle age). In a study conducted by Amini on the QOL of the blind veterans (less than 29 years to 50 years), results showed no significant relationship between the age and mental health scale of the QOL which was in line with our results in this study; but unlike the present study, an inverse and significant relationship was found between the QOL and physical health scale (35). One point that may justify it, is that Amini's study examines a wider age range. But in this study, a more limited age range was studied; it should be considered in future studies.

Relationship between QOL and percentage of injury showed that the percentage of injury or the severity of the illness symptoms is a factor affecting QOL for the veterans with post-traumatic stress disorder. In a study on National Guard troops in America, Ouimette observed that an inverse and significant correlation exists between post-traumatic stress disorder severity and mental health scale of QOL. This means that greater severity of the disorder causes these people to obtain scores lower than mental health scale, including the emotional role, social functioning, and emotional well-being. These results were consistent with results obtained in this study; but in contrast to results obtained in the present study, in Ouimette's study, no correlation existed between this disorder and low scores in physical health scale (36).

Cordova conducted a research on the severity of post-traumatic stress disorder symptoms and its relationship with QOL. In this study, an inverse and significant correlation was observed between the severity of symptoms and problems associated with impairment of QOL obtained through a questionnaire SF36 (18). A study done by Vasterling on the soldiers in the OIF, reported a reverse and significant correlation between the severity of post-traumatic stress disorder symptom and the physical functioning of the soldiers (9) that the findings were consistent with our findings in the present study.

Taylor investigated the relationship between changes in the special symptoms of patients with changes in the QOL, and stated that decreased symptoms were associated with the improved performance and QOL of the patients. Decreased sign severity of re-experiencing traumatic event was associated with the occupational, social and family performance. Decreased severity of the sign of avoidance was associated with improved social functioning; and decreased over-arousal sign severity was associated with improved occupational performance (19).

In the study conducted by Berahmani in 2004 on veterans injured by chemical warfare in Sardasht, a significant and reverse correlation between quality of life and percentage of injury and severity of symptoms was reported (37). These results

are also consistent with our results in this study. In examining and comparing the scores of QOL in different groups of veterans based on percentage of injury it was found that there was no significant difference between different groups of veterans in the areas of physical and emotional role and social functioning, and all veterans regardless of percentage of injury it received lower scores. The lower scores in these areas indicate that they have many problems related to the motivational issues, and they do not have the desire, determination and motivation and attention necessary to play the emotional, physical and social roles. So, in providing particular occupational rehabilitation services, special attention should be given to these areas. Since anxiety, low mood and sleep disorders are major problems in these patients, (1) and it is in turn a reason for the decreased motivation and the disruption in playing their role in various areas, therefore, these patients' performance must be improved by reducing symptoms in these patients and reinforcing their incentive in the various areas.

Conclusions

Based on the findings, the veterans diagnosed with post-traumatic stress disorder had lower QOL, especially in the area related to the physical and emotional roles and physical functioning, and this phenomenon may be partly due to their percentage of injury. The motivational issues, as well as problems in playing physical, emotional, and social roles are important subjects that should be considered in these veterans.

Since workers in the health-care and rehabilitation are responsible for promoting public health, and empowering this group of the patients, therefore, severity of symptoms and problems associated with the war should be reduced by promoting the health level, treatment and rehabilitation programs and attempt to reduce symptoms and problems associated with the veterans, allowing for support services to reduce the motivational and functional problems of these people in order to help them improve their QOL.

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References

1-Sadock BJ, Kaplan HI. Kaplan and Sadock's synopsis of psychiatry: behavioral sciences, clinical psychiatry. 9th ed. Philadelphia: Lippincott Wilkins; 2003.P.725.

2-Grieger TA , Cozza SJ , Ursano RJ, Hoge C, Martinez PE, PE, Engel CC, et al. Post -traumatic stress disorder and depression in battle-injured soldiers. Am J Psychiatry 2006;163(10): 1777-83.

3-Ahmadizadeh MJ, Ahmadi K, Eskandari H, MR Falsafinejad, Borjali A, Anisi J, et al. Improvement in quality of life after exposure therapy, problem solving and combined therapy in chronic war related war-related post -traumatic stress disorder: Exposure therapy, problem solving and combined therapy in war-related PTSD. Procedia Soc Behav Sci 2010;5: 262-66.

4-Herman N, Eryarec G. Post-traumatic stress disorder in institutionalized World War II veterans. Am J Geriatr Psychiatry 1994;2:324-31.

5-Spiro A, Schnurr PP, Aldwin CM. Combat-related posttraumatic stress disorder symptoms in older men. Psychol Aging 1994;9:17-26.

6-Zatzick DF, Marmar CR, Weiss DS, Browner WS, Metzler TJ, Golding JM, et al. Post-traumatic stress disorder and Functioning and quality of life outcomes in a nationally representative sample of male Vietnam veterans. Am J Psychiatry 1997;154(12): 1690-5.

7-Gudmundsdottir B, Beck JG, Coffey SF, Miller L, Palyo SA. Quality of life and post trauma symptomatology in motor vehicle accident

survivors: the mediating effects of depression and anxiety. Depress Anxiety 2004;20(4):187-9.
8-Renshaw KD, Rodrigues CS, Jones DH.Combat exposure, psychological symptoms and marital satisfaction in National Guard Soldiers who served in Operation Iraqi Freedom from 2005 to 2006. Anxiety Stress Coping 2009;22(1): 101-15.
9-Vasterling JJ, Schumm J, Proctor SP, Gentry E, King DW, King LA. Post-traumatic stress disorder and health Functioning in a non-treatment-seeking sample of Iraq war veterans: prospective analysis. J Rehabil Res Dev 2008;45(3): 347-58.
10-Smeltzer SC, Bare BG, Brunner LS, Suddarth DS, eds Brunner and Suddrath's textbook of medical-surgical nursing. 10th ed. Philadelphia: Lippincott Williams & Wilkins; 2002. P. 419.
11-Johnston MV, Miklos CS. Activity-related quality of life in rehabilitation and traumatic brain injury. Arch Phys Med Rehabil 2002;83(12Suppl2): S26-38.
12-Schnurr PP, Lunney CA, Bovin MJ, Marx BP. Posttraumatic stress disorder and quality of life: extension of findings to veterans of the wars in Iraq and Afghanistan. ClinPsychol Rev 2009; 29(8):727-35.
13-Mogotsi M, Kaminer D, Stein DJ. Quality of life in the anxiety disorders. Harv Rev Psychiatry 2000; 8(6):273-82.
14-Jackwski D, Guyatt G. A guide to health measurement. Clin Orthop Relat Res 2003;(413):80-9.
15-Kazis LE, Miller DR, Clark J, Skinner K, Lee A, Rogres W, et al. Health-related quality of life in patients served by the Department of Veterans Affairs: results from the Veterans Health Study.Arch Intern Med 1998;158(6):626-32.
16-Alonso J, Ferrer M, Gandek B, Ware JE Jr, Aaronson NK, Mosconi P, et al. Health-related quality of life associated with chronic conditions in eight countries: results from the International Quality of Life Assessment (IQOLA) Project. Qual life Res 2004; 13(2): 283-89.
17-Najafi M, Mohammadi Far MA, Dabiri S, Kamari AA. [The comparison of the quality of life in veterans with and without post-traumatic stress disorder][In Persian]. Iran J War Public Health 2011;3 (11):2-35.
18-Cordova MJ, Andrykowski MA, Kenady DE, McGrath PC, Sloan DA, Redd WH. Frequency and correlates of posttraumatic- stress- disorder-like symptoms after treatment of breast cancer. J Consult Clin Psychol 1995;63(6):981-6.
19-Taylor S, Wald J, Amundson GJG. Factors associated with occupational impairment in people seeking treatment for posttraumatic stress disorder. Can J Commandment Health 2006;25:289-301.
20-Taghipour H, Moharamzad Y, Mafi AR, Amini A, Naghizadeh MM, Soroush MR, et al. Quality of life among veterans with war-related unilateral lower extremity amputation: a long-term survey in a prosthesis center in Iran. J Orthop Trauma 2009; 23 (7):525-30.
21-Kempen GI, Ormel J, Brilmam EI, Relyveld J. Adaptive responses among Dutch elderly: the impact of eight chronic medical conditions on health-related quality of life. Am J Public Health 1997; 87(1):38-44.
22-Montazeri A, Goshtasebi A, Vahdaninia M, Gendek B. The Short Form Health Survey (SF-36):translation and validation study of the Iranian version. Qual Life Res 2005; 14(3):875-82.
23-Eshaghi R, Ramezani MA, Shahsanaee A, Pooya A. Validity and reliability of the Short Form36 Items Questionnaire as a measure of quality of life in elderly Iranian population. Am J Appl Sci 2006; 3: 1763 - 6.
24-Yazelkucuk K, Taska Y, Mehmet A, Guzelkucuk U, Tugeu L. Effect of playing football (soccer) on balance strength, and quality of life in unilateral below knee amputees. Am J Phys Med Rehabil 2007; 86(10): 800-5.
25-Hashemian F, Khoshnood K, Desai MM, Falahati F, Kasl S, Southewick S. Anxiety, depression, and posttraumatic stress in Iranian survivors of chemical warfare. JAMA 2006; 296(5):560-6.
26-Ahmadi K, Fathi-Ashtiani A, Zareir A, Arabnia A, Amiri M. Sexual dysfunctions and marital adjustment in veterans with PTSD. Arch Med Sci 2006; 4: 280-5.
27-Ahmadi K, Ranjbar-Shayan H, Raiisi F. Sexual dysfunction and marital adjustment among the chemically injured veterans. Indian J Urol 2007; 23(4): 377-82.
28-Borhani H. Study of mental health in family of war veterans with psychiatric disease in Qom[dissertation]. Tehran: Shahid Beheshti University; 2001.
29-Malik ML, Connor KM, Sutherland SM, Smith RD, Davison RM, Davidson JRT. Quality of life and post traumatic stress disorder: a pilot study assessing changes in SF-36 scores before and after treatment in a placebo-controlled trial of Fluoxetine. J Trauma Stress 1999; 12(2): 387-93.
30-Schnurr PP, Friedman MJ, Green BL. Posttraumatic stress disorder among World War II mustard gas test participants. Mil Med1996; 161(3): 131-6.
31-Mousavi B, Mirsalimi F, Soroush MR, Masumi M, Montazeri M. [Quality of life in the Iranian war related bilateral amputees][In Persian]. Payesh J 2009; 8 (3):303-10.
32-Mousavi B, Montazeri A, Soroush MR. [Quality of life in women war veterans with spinal cord injury][In Persian]. Payesh J 2007; 7 (1): 75-81.
33-Erbes C, Westermeyer J, Engdahl B, Johnson E. Post-traumatic stress disorder and service utilization in a sample of service members from Iraq and Afghanistan. Mil Med 2007; 172(4):359-63.

34-Engelhard IM, van den Hout MA, Weerts J, Arntz A, Hox JJ, McNally RJ. Deployment-related stress and trauma in Dutch soldiers returning from Iraq. Br J Psychiatry 2007; 191: 140-5.
35-Amini R, Haghani H, Masoumi M. Quality of life in the Iranian Blind War Survivors in 2007: a cross- sectional study. BMC Int Health Huma Rights 2010; 10:21.
36-Ouimette P, Coolhart D, Sugarman D, Funderburk JS, Zelman RH, Dornan C. A pilot study of posttraumatic stress and associated performance of Army National Guard following exposure to Iraq war zone trauma. Traumatology 2008;14:51-6.
37-Berahmani G, Abed saeidi J, Kheiri AA. [Study of quality of life in Sardasht chemical warfare][In Persian]. Tabriz Med Sci Univ J 2004; 62: 9-13.