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Original Article

The psychological morbidity in the long term after war related bilateral lower limb amputation

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ABSTRACT

Background: To determine the psychological morbidity in the long term after war related bilateral lower limb amputation.

Methods: Mental health status was determined by the Symptom Checklist-90-R (SCL-90-R) and a structured psychiatrist interview using Structured Clinical Interview for DSM Disorders-IV (SCID-IV) in 327 male amputees. The survey was 22.3 (SD = 3.9) years after amputation. A one-sample t-test was conducted to compare our results with a survey carried out in a rural Iranian population.

Results: The mean age of the participants was 42 years (SD = 6.3). Only 22 persons had psychiatric diagnosis and were under treatment. The most common problems on SCL-90-R were somatization, obsessive-compulsive, interpersonal sensitivity, anxiety, and depression. Global severity index (GSI) of the bilateral lower limb amputees (BLLA) (0.88 ± 0.63) was significantly higher than Iranian population (0.35 ± 0.28) ($p < 0.001$). BLLA had significantly higher scores in all subscales of Scl-90-R compared with general population ($p < 0.001$). Of the total amputees about 39.1% (128 out 327) diagnosed with at least one psychiatric disorder in psychiatrist interview. About 83.9% ($N = 115$) of the psychiatrist diagnosed disorders were new cases. Mood disorders 37.3% (depression 28.7%) and anxiety disorders 12.2% (obsessive compulsive disorder 9.8%) were the most common disorders in the study group. There was not any relationship between demographic variables and mental disorder ($p > 0.05$).

Conclusion: The high prevalence and especially the large proportion of undiagnosed mental disorders high-light the need for targeted and appropriate psychological interventions in this vulnerable population.

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Introduction

Individuals with limb amputation frequently experience various kinds of physical and psychosocial problems.^{1–9} Serious challenges with physical role functioning, physical appearance, employment status, body image, pain and limitation of daily activity usually happen as a result of amputation.^{1,2} An amputee may experience a grieving process similar to when a loved one dies.³ Previous limited studies have reported a high rate of anxiety, depression, hostility, interpersonal sensitivity and paranoia following amputation.^{4,5} Maladaptive responses with predomination of mood disorders due to severe somatic stress are reported in lower extremity amputees. These complications are more severe in multiple limb loss.⁶ Combatants with injuries appear particularly vulnerable to mental disorders especially when accompanied by major disabilities such as spinal cord injury, blindness or amputation.^{7,8} Moreover, quality of life in the amputees changes after major amputation.⁹ A study in war related amputees revealed that mental health mean score was significantly lower than the normal general population.⁹ The magnitude of the challenges will increase when the psychological morbidity impact the physical disability in amputees and eventually the impact will be greater in their spouses and family. In addition to research on medical aspects of bilateral limb amputation the mental health aspects have the potential to greatly impact outcomes. However this aspect appears less investigated at present.

More than 13,000 civilians and combats lived with amputation due to Iran-Iraq war. Of these, about 576 have bilateral lower limb amputation. The aim of this study was to determine the mental health outcomes and needs in the long-term war related bilateral lower limb amputees.

Materials and methods

This study was performed more than 20 years after amputation. List of all bilateral lower limb amputees was prepared using the database of Veterans and Martyr Affair Foundation (VMAF). In a period of two weeks, from all of 576 Iran-Iraq war related bilateral lower limb amputees (BLLAs) in 32 provinces of Iran, 327 males participated in the mental health monitoring program (Response Rate 56.7%). The participants were invited from all provinces and gathering all of them at the same time in one city was difficult for some of amputees. Written informed consent was obtained from all subjects before participating in the study.

Demographic data included age, education, employment, type and duration of amputation, history of outpatient psychiatrist consultation or hospitalization due to psychological morbidity.

The Symptom Checklist-90-R (SCL-90-R) questionnaire was used to determine the amputees' mental health. The forms were filled by two psychologists. Then, only those above the cut off of the Global severity index (GSI) (GSI equal or higher than 0.4) indicating caseness were evaluated by a Psychiatrist ($N = 206$). The GSI cut-off for this purpose was taken based on epidemiological study of psychological disorders on a rural area.¹⁰

The SCL-90-R is a multidimensional self-report symptom inventory designed to measure levels of symptomatic psychological distress. It has high validity and reliability and has been extensively used in studies of various mental disorders, in medical and psychiatric inpatients or outpatients, in clinical drug trials, and in community surveys.¹¹

The SCL-90-R was assessed on Iranian population in 1980. Results indicated acceptable reliability and validity levels as well as adequate sensitivity and specificity.¹⁰ This instrument indicates psychopathology by nine primary dimensions and three global indices of distress. The nine primary symptom constructs are somatization, obsessive compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, and psychoticism. Positive symptom totals (PST), global severity index (GSI) and positive symptom distress index (PSDI) are summary measures of the questionnaire. PST is a simple count of the number of symptoms reported as positive. GSI provides information concerning the combined numbers of symptoms as well as the intensity of distress, and a pure intensity measure is found in the PSDI. A discrete 5-point scale ranging from "not-at-all" (0) to "extremely" (4) represents distress for each item on the SCL-90-R, only 83 of the 90 items comprise the nine symptom dimensions. Seven additional items were introduced because they contributed significant discriminatory power in clinical situations. The published norms for the SCL-90-R are for psychiatric outpatients, psychiatric inpatients, adult non-patients, adolescent non-patient normal. Separate norms are available for men and women, they represent the raw score distributions of the nine symptom dimensions and three global indices in terms of area T-score.¹¹

A psychiatrist assessed their mental health status in an interview. Psychiatric disorders was assessed based on the Structured Clinical Interview for Diagnostic and statistical manual of mental disorders, fourth edition (DSM-IV).¹² SCID-IV is a diagnostic exam used to provide a comprehensive diagnosis that includes a complete picture of not only acute symptoms but also the entire scope of factors that comprise mental health.

Statistical processing of the data was performed by descriptive one sample t-test. Significance was considered at $\alpha < 0.05$.

Results

The mean age of the participants was 42 years ($SD = 6.3$ years). The mean time between injury and survey was 22.3 years ($SD = 3.9$). Of the participants 22 (6.7%) were civilians and 305 (93.3%) soldiers.

The most common level of the amputation was bilateral below knee 38.5% ($N = 126$), which was followed by both above knee 22.9% ($N = 75$) and one side below and the other side above knee 25.3% ($N = 83$). Other types of amputation were observed in 13.1% ($N = 43$). Two hundred twenty-four amputees 68.5% had additional war related injuries. Nearly two thirds 68.5% ($N = 223$) of survivors were unemployed and about one fourth 26.6% ($N = 87$) had higher education (>12 years). Demographic data are shown in [Table 1](#).

History of previous psychological problems was observed in 6.7% ($N = 22$). Mean and standard deviation of subscales of

Table 1 – Reported demographic variables of BLLAs (N = 327).

Demographic characteristics	Frequency	Percent
Age groups		
≤30	10	3.1
31–40	117	35.8
41–50	179	54.7
51–60	18	5.5
61–70	3	0.9
Marital status		
Single	6	1.8
Married	321	98.2
Education		
Less than diploma	136	41.6
Diploma	104	31.8
College education	87	26.6
Employment		
Unemployed	223	68.2
Employed	104	31.8
Level of amputation (N = 654)		
Below knee	363	55.5
Knee	43	6.6
Above knee	248	37.9

SCL-90-R in the participants and comparison with general population are shown in Table 2. As Table 2 shows bilateral lower limb amputees had significantly higher scores in all subscales ($p < 0.001$). GSI of the BLLAs (0.88 ± 0.63) was significantly higher than Iranian population (0.35 ± 0.28) ($p < 0.001$). Scores of Obsessive–compulsive, Interpersonal sensitivity and paranoia in war related amputees were three times higher than Iranian general population (Table 2). More than half of the amputees 63% (N = 206) had GSI equal or higher than 0.4 (these survivors were visited by psychiatrist).

Table 2 – Mean and standard deviation of subscales of Scl-90-R in the participants and comparison with general population (N = 327).

Subscales	Mean $\pm$ standard deviation		p
	Bilateral lower limb amputees (N = 327)	Iranian general population cut of point	
Somatization	1.02 ± 0.75	0.46 ± 0.32	*
Obsessive–compulsive	0.96 ± 0.71	0.35 ± 0.24	*
Interpersonal sensitivity	0.93 ± 0.76	0.32 ± 0.27	*
Anxiety	0.90 ± 0.76	0.46 ± 0.35	*
Depression	0.86 ± 0.78	0.49 ± 0.32	*
Hostility	0.85 ± 0.77	0.31 ± 0.28	*
Paranoia	0.76 ± 0.61	0.24 ± 0.24	*
Phobia	0.62 ± 0.56	0.30 ± 0.28	*
Psychoticism	0.62 ± 0.64	0.22 ± 0.22	*
GSI ^a	0.88 ± 0.63	0.35 ± 0.28	*
PST ^b	41.03 ± 22	17.65 ± 13.10	*
PSDI ^c	1.76 ± 0.49	1.35 ± 0.43	*

* $p < 0.001$.

^a Global severity index (GSI).

^b Positive symptom total (PST).

^c Positive symptom distress index (PSDI).

Table 3 – Psychiatric disorders in amputees based on psychiatric visits (N = 206).

Psychiatric disorders	Number	Percent
Cognitive disorder	2	0.9
Substance dependence	29	14.1
Psychotic disorder	10	4.8
Mood disorder	122	56.2
Anxiety disorder	40	19.4
Other	5	2.4

Of the total amputees about 39.1% (128 out 327) diagnosed with at least one psychiatric disorder. Considering the structured clinical interview 62.1% (128 out of 206 interviews) of the amputees identified to be suffering from a mental disorder. Notably 83.9% of those with a mental disorder were diagnosed for the first time. Mood disorders 37.3% and anxiety disorders 12.2% were the most common disorders in the study group. Types of psychiatric morbidity in the study group are demonstrated in Table 3. Mild to moderate depression was diagnosed in 15.9% (52 out 327), severe depression in 12.8% (42 out of 327), bipolar mood disorders in 6.7% (22 out of 327) and 5 (1.5%) suffered from PTSD. Obsessive compulsive disorder 9.8% (32 out of 327) was the most common anxiety disorder. More than half of the amputees who had previous psychological disorders 59.1% (13 out of 22) needed to changed their treatment strategies. There was not any relationship between demographic variables and mental disorder ($p > 0.05$).

Discussion

The results of the study revealed that the prevalence of mental disorders in survivors of war with bilateral lower limb amputation was high. The important finding was that the majority of the disorders were diagnosed for the first time and without any previous psychological morbidity in their medical history. The amputees screened to have a possible mental disorder based on their GSI scores were confirmed to have at least one psychiatric diagnosis after assessment by the Psychiatrist. This highlights the magnitude of the unmet needs of this population in the psychological domain. The high proportion of those with mental disorder and especially the large proportion of undiagnosed mental disorder in this population high-light the need for targeted and appropriate psychological interventions in this vulnerable population of war-related bilateral lower limb amputees.

Chronic pain and diseases,^{13,14} with higher rate of mental disorders can increase the level of the handicap and disability in amputees. Similar studies showed that chronic illnesses usually accompany with a higher rate of mental disorder.^{8,15} Chronic disability interactive and cumulative with other individual, psycho-social factors could have made them more vulnerable to mental disorders over the subsequent 20 years.

About two-thirds of cases suffered from at least one kind of psychological problem using SCL-90-R questionnaire. The means of all 9 dimensions of SCL-90-R in our cases were much higher than cut of point of Iranian normal population.¹⁰

The high mean of somatization demonstrates a functional etiology which may reflect true physical diseases.¹⁶ Severe disabilities explain the reason of high rate of somatization. Some studies revealed a high rate of cardiovascular disease and musculoskeletal disorders in amputees,^{13,14} which might lead to more psychological distress. Different studies reported different psychological problems including interpersonal sensitivity, hostility, paranoia, and psychosis by using SCL-90-R in lower limb amputees.^{17,18} In our study the mean scores of obsessive compulsive and interpersonal sensitivity were three times and the mean scores of anxiety and depression were two times higher than cut of point of the Iranian normal population.

War zone related disability is associated with higher rate of psychological morbidity and reported anxiety and depression as the most common problems. The prevalence of psychological morbidity in this study was much higher than other studies.^{19,20} The higher rate of psychological morbidity shows the magnitude of the burden on the amputees. So, it will be essential for clinicians to be careful of how war survivors present with symptoms in addition to how they consequently respond to normal treatments for the disorder. Education should also consider as an important factor in improving mental health among individuals with limb loss.²¹

This study revealed that more than half of the subjects, who were interviewed by the psychiatrist, were diagnosed with psychiatric disorder. Mood and anxiety disorders were found to be the most important disorders in the psychiatrist interviews. The prevalence of mental disorders diagnosed by the psychiatrist in total participants was 39.1%. The prevalence of mental health disorders in our amputees was similar to the other studies.^{22,23} Depression and anxiety were the most common disorders in our study as well as Mosaku et al. study.²⁴ Hashemian et al., in their study on chemical warfare survivors reported a higher rate of anxiety disorders and depression (65% and 41%, respectively).²⁵ The rate of unemployment in our subjects was higher compared to the similar studies.^{22,26} Although unemployment was accompanied with a higher rate of mental disorder in these two studies, but we did not observe any relationship between unemployment and mental disorder. The amputees who were less educated (less than 12 years) or had co morbidity suffered from more psychological burden.

Based on psychiatrist visit half of the amputees who had previously diagnosed for having psychological morbidity and were under treatment needed to change the strategy of treatment. More over there were some new cases that considered necessary for hospital admission. The high prevalence of mental disorders among war survivors has significant implications on how to deliver the medical services.²⁷

Historical reviews point out that the prevalence of combat-related mental disorder and symptoms can transform over time in population.²⁸ This study highlights first, the need for psychological support for this group then, the rehabilitation program. Rehabilitation program both physical and psychological in individuals with amputation, will improve the health status of the amputees. Teaching new skills and improving patient independence, returning to work and social activities may be very useful and can prevent more complications.

Amputees with high SCL-90-R scores would benefit from psychotherapy. Accessibility to psychological services and providing periodic visits both physical and psychological in the context of chronic ailments such as amputation which generates new stresses every day may be helpful. The nature of the conflicts in Iran-Iraq war constructs exclusive task challenges for the veterans.

Variations in symptom presentation can sequentially make difficult psychological health efforts to identify and properly address war-related public health concerns. The authors encourage ongoing consideration of the amputees and concern offered here to guarantee that they get mental health services that are appropriately tailored to their needs. The results of the study have wide implications for military health professionals and primary care and medical practice settings that serve and care for veterans.

There were some limitations to this study. First, we did not have any data on history of psychological status in the study population prior to the Iran-Iraq war or during it (1980–1988). Second, most of the amputees were studied and visited after more than two decades of the war. Third, we did not have control group to compare with other veterans with or without disability. Whether the high rate of psychological morbidity is caused by being in war zone or having any disabilities due to the war or other situations cannot conclude from this study. Moreover, the data on the prevalence and incidence of mental health disorders in all of Iranian war related survivors is limited, so comparison was accompanied with the some difficulties.

Because all BLLAs were informed using public invitation to all the provinces, some of them were not able to participate in this study due to long distances. However, the participants in this study were from all 32 provinces of Iran and more than half of the whole of war related BLLAs took part in this study.

It is recommended to carry out a study with the intention of evaluating the rate of psychological morbidity in groups of veterans with different major disabilities. Future studies should evaluate mental and physical status of amputees longitudinally and after intervention and rehabilitation. Since the caregivers and spouses who live with amputees may as well suffer from physical and mental problems due to care giving we also propose to accomplish studies to assess the mental health status of the caregivers or spouses.

Conclusion

This study revealed that majority of the amputee subjects suffered from poor mental health. The rate of new cases in this study was high. This showed a high rate of psychological unmet needs in war related bilateral lower limb amputees. Although further research is needed to find out the best service delivery strategies but accessibility to psychological services and providing periodic visits, both physical and psychological are recommended. The study indicates that evaluation for mental disorders in veterans who have served in combat and faces with significant physical symptoms should be done in order to provide services tailored to their needs.

Conflicts of interest

The authors have none to declare.

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