Anxiety, depression and health-related quality of life in those injured by landmines, Ilam, Islamic Republic of Iran

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القلق والاكتئاب وجودة الحياة المتعلقة بالصحة لدى المصابين بالألغام في إيلام، جمهورية إيران الإسلامية

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الخلاصة: وقد قيَّم الباحثون القلق والاكتئاب وجودة الحياة في ما يتعلَّق بالصحة لدى 137 حالة من المصابين بالألغام في ولاية إيلام في جمهورية إيران الإسلامية، باستخدام مقياس القلق والاكتئاب في المستشفيات والنموذج المختصر 36 للاستبيان. وقارنوا بين ما حصلوا عليه من أحراز لدى مجموعة شاهدة من غير المصابين وعددهم 360. وتبيَّن أن معظم المصابين هم من الذكور (93.4٪)، ومن الأميِّين (54.7٪)، وكانت لديهم عواقب لا رجعة فيها (86.9٪). وقد أحرز 69.3٪ من المشاركين المصابين على وجه الإجمال درجات عالية على سُلَّم القلق والاكتئاب. وكان مستوى القلق والاكتئاب أعلى بقدر يُعْتَدُّ به إحصائياً لدى المصابين الأكبر عمراً، ولدى من لم يتحقَّق له التعافي الكامل بالمقارنة مع من تعافى، ولدى من تعرَّض لبتر الأطراف بالمقارنة بمن لم يتعرَّض لذلك. وكان لدى المصابين أحراز منخفضة بقدر يُعْتَدُّ به إحصائياً في جميع بنود الاستبيان مقارنة بما لدى المجموعة الشاهدة. واستنتج الباحثون أن الإصابات بالألغام تقلل من جودة حياة الأفراد، ولابُدَّ من رَصْدها رصداً متوصلاً لتشخيص القلق والاكتئاب ومعالجتها في أبكر وقت ممكن.

ABSTRACT We assessed depression, anxiety and health-related quality of life (HRQOL) in 137 cases of landmine injury in Ilam province, using the Hospital Anxiety & Depression Scale (HADS) and the Short Form Health Survey (SF36) questionnaires. We also compared their scores with an uninjured control group (*n* = 360). Most of the injured were male (93.4%) and illiterate (54.7%) with some irreversible sequelae (86.9%). Overall, 69.3% of the injured participants scored high for both anxiety and depression. The level of anxiety and depression was significantly higher in older cases, those not completely recovered compared with recovered cases and those with amputation compared with those without amputation. The injured also had significantly lower mean scores in all HRQOL components than the control group. Landmine injured should be monitored for early identification and treatment of depression and anxiety.

Anxiété, dépression, et qualité de vie liée à la santé chez les personnes blessées par des mines terrestres, Ilam, République islamique d'Iran

RÉSUMÉ Nous avons évalué la dépression, l'anxiété, la qualité de vie liée à la santé (QVLS) dans 137 cas de dommages corporels par les mines terrestres dans la province d'Ilam, en utilisant l'échelle HAD (*Hospital Anxiety & Depression*) et les questionnaires du *Short Form Health Survey* (SF36). Nous avons également comparé leurs scores avec un groupe témoin non blessé (n = 360). La plupart des personnes blessées étaient de sexe masculin (93,4 %) et illettrées (54,7 %) et présentaient des séquelles irréversibles (86,9 %). Globalement, 69,3 % des participants blessés présentaient des scores élevés pour l'anxiété et la dépression. Le niveau d'anxiété et de dépression était nettement supérieur dans les cas plus anciens, chez ceux qui n'étaient pas totalement rétablis par rapport à ceux qui l'étaient et ceux qui avaient été amputés par rapport à ceux qui ne l'avaient pas été. De même, les personnes blessées avaient des scores moyens pour toutes les composantes de la QVLS nettement inférieurs à ceux du groupe témoin. Les dommages corporels par les mines terrestres doivent être surveillés pour identifier et traiter rapidement la dépression et l'anxiété.

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Introduction

The widespread use of landmines in military conflicts around the world and their continuing legacy for the civilian population in injuries, amputations, disabilities and economic costs is recognized as a major problem. Around 70 countries are contaminated with almost 60–70 million landmines [1], which cause almost 800 deaths and 1200 injuries each month [2,3]. Children are more likely to die from landmine injuries than adults [4].

Governments have responded to the humanitarian crisis caused by landmines and explosive remnants of war in different ways, such as banning anti-personnel mines in the 1997 Ottawa Convention and assigning the responsibilities for removing explosive remnants of war [5]. In an effort to prevent and address the human suffering caused by landmines, more than 750 nongovernmental organizations in 44 countries have joined together to form the International Campaign to Ban Landmines (ICBL) [6]. Enough investment for minesweeping soon after a war and public education for taking precaution against accidents are the other measures to prevent landmine injuries.

The Islamic Republic of Iran is one of the most landmine-contaminated countries in the world. During the 8-year war with Iraq (1980–88), vast areas of the Islamic Republic of Iran were polluted with landmines. These areas are mostly sited in the western and south-western provinces of Kerman Shah, Kurdistan, Ilam, West Azerbaijan and Khuzestan. Up to 16 million landmines and other unexploded ordnances (UXOs) cover a surface area of about 4000 hectares of these 5 provinces [7]. Grazing livestock, farming and mine-detecting are the most common activities which lead to mine explosions in these areas [8].

People who survive a mine explosion sustain some irreversible consequences, such as amputations, burns and blindness, and they may lose their role in their family, community, society and economic state. Therefore, they are highly prone to experience psychological disorders. Social stigmatization, rejection and unemployment are common psychosocial risks they face [9].

Post-traumatic stress disorder, acute stress reaction, anxiety disorder and depression have been found to be very significantly higher in those injured by landmines than in the general population. There are also remarkable changes in the areas of functional ability, religious practice, use of alcohol and social relationships [10,11]. Landmine injury has been found as one of the psychosocial risk factors for poorer mental health and social functioning outcomes [12].

Landmine victims' psychological recovery is greatly influenced by the individual's resilience characteristics, social support, medical care, economic situation and societal attitudes toward them [13].

Ilam, in the west of the Islamic Republic of Iran, is the province with the second greatest landmine pollution in the country. Because of the seriousness of psychological disorders among mine victims and the few previous studies available, we aimed to assess the symptoms, severity and prevalence of anxiety and depression disorders among mine victims in this province, and to evaluate their quality of life taking different parameters into account. Measuring the quality of life, when the resources are limited, can be helpful to assign priorities for health planning and estimate the burden of diseases.

Methods

This was a cross-sectional study conducted at Ilam during 2007–2008. Landmine victims were from different landmine-infested areas of Ilam such as Mehran, Dehloran, Chalab, Changooleh and Salehabad.

The records of those injured by landmines registered in Ilam provincial governors' register (n = 160) were selected by simple random sampling. Each registered person has a unit number. Unit numbers were selected according to a table of random numbers. After locating the injured through their addresses (147 out of 160), the purpose and the methods of the study were explained and informed consent obtained from the individuals. Demographic information including age, sex, marital status, education level, type of injury, possible disability, length of time since the injury, recovery status and past medical history were asked in a face to face interview. Then, 36 questions of the Persian Short Form 36 (SF36) questionnaire for evaluation of the health-related quality of life (HRQOL) [14] and 14 questions of Persian Hospital Anxiety & Depression Scale (HADS) [15] were completed by the participants under supervision of a trained nurse. If the respondent was illiterate, the questionnaire was read to him/her by an interviewer. By using a face to face interview, there were few missing data and the problem of illiterate individuals was not encountered. To eliminate any selection bias, patients with specific life events during the preceding 6 months, such as bereavement, psychotic illness or substance abuse and another concurrent active chronic illness, were excluded (n = 10).

A group of non-injured controls (n = 360) also completed the SF36 questionnaire. They were drawn from individuals referred to Ilam medical clinics for family planning or for other non-curative purposes. They were selected randomly from different clinics. They did not have any significant past history of chronic medical or psychological illness. Subjects and controls were matched on age and sex so there were not significant differences between them with respect to these two variables.

HADS

The questionnaire from the Persian adapted version of the HADS was used;

it has been shown to be both valid and reliable [15]. HADS is a rapid self-report questionnaire which measures depression and generalized anxiety. The term Hospital in its title suggests that it is only valid in such a setting but many studies conducted throughout the world have confirmed that it is valid when used in community settings and primary care medical practice [16]. HADS comprises statements that the patient rates based on their experience over the past week. The 14 statements are relevant to generalized anxiety (7 statements) or depression (again 7), the latter being largely (but not entirely) composed of reflections of the state of anhedonia. Each question has 4 possible responses, which are scored on a scale of 3 to 0. HADS is divided into 3 [normal (0–7), borderline (8–11), caseness (11–21)] or 4 [normal (0–7), mild (8–10), moderate (11–15) and sever (16–21)] ranges. The maximum score is therefore 21 for depression and 21 for anxiety [17].

SF36

The questionnaire from the Persian adapted version of SF36, which has been shown to be both valid and reliable, was used [14]. This questionnaire is a multi-purpose, short-form health survey with only 36 questions. It yields an 8-scale profile of scores: physical functioning (PF), 10 items; role physical (RP), 4 items; bodily pain (BP), 2 items; general health (GH), 5 items; vitality (VT), 4 items; social functioning (SF), 2 items; role emotional (RE), 3 items; and mental health (MH), 5 items. Each item has response categories describing the level of functioning of the patient from normal to severely impaired. All but one of the 36 items (self-reported health transition) is used to score the 8 SF-36 scales. Each item is used in scoring only one scale. The SF-36 subscales are standardized to a 0–100 point scale, and higher scores represent better quality of life [18,19].

SF-36 is a generic measure, as opposed to one that targets a specific age, disease, or treatment group. Studies demonstrate that the SF-36 is very useful for documenting differences between sick and well people in order to evaluate a wide range of different treatments and for estimating the relative burden of different medical conditions [19,20].

Statistical analysis

HADS analysis: The one-way analysis of variance (ANOVA) and independent samples *t*-test were performed to compare anxiety and depression with regard to the sociodemographic characteristics of the injured. In addition, logistic regression analysis was carried out to examine which factors show the strongest association with anxiety and depression. For the purpose of the analysis relative to the recommended cut-off points, patients were divided into 2 groups: those who scored 0 to 7 as normal and those who scored 8 and above as probable cases.

SF-36 analysis: Results were expressed as frequencies, means and standard deviations (SDs). SF-36 subscale scores for the participants in this study were compared across the 2 groups of study using nonparametric tests. Two independent sample test (Mann–Whitney U test) and the chi-squared test were also used to explore the impact of the sociodemographic factors on the HRQOL among the injured.

Bivariate Pearson and Spearman correlations were used to determine any correlation between anxiety and depression.

Data were analysed with *SPSS*, version 16.

Results

Characteristics of the landmine victims

Of the total number of the injured (160) selected randomly, 147 people were found and 137 were included in the study (85.6%). Their mean age was 38.1 (SD 12.8) years; most of the injured were male (93.4%), married (75.2%) and illiterate (54.7%). Of the 137 participants, 58 (42.3%) had at least one type of amputation and 86.9% of cases had sustained irreversible consequences, such as amputations and burns. They were considered as not completely recovered cases. The mean length of time since the injury (time of explosion) was 12.7 (SD 7.6) years. The demographic characteristics of the injured are shown in Table 1.

Anxiety and depression

On the basis of the results of HADS, 95 of the 137 injured (69.3%) scored high (caseness ≥ 11) for both anxiety and depression (77.4% for anxiety and 79.6% for depression) and 5.8% were within the normal range (0–7) for both (10.2% for anxiety and 8% for depression). The mean anxiety score was 13.0 (SD 3.9) and for depression this was 13.2 (SD 3.9). Anxiety and depression correlated significantly (r = 0.7, $P < 0.01$).

Anxiety level

Of the participants, 14 people had a normal score, 17 were borderline and 106 were categorized as cases of anxiety.

The level of anxiety was significantly lower in participants who were considered to have recovered from their injury (mean score of 10.4) compared with those without complete recovery (mean score of 13.4) ($P = 0.002$).

There was no significant association of age, gender, marital status, educational level and presence of amputation with the anxiety level.

Depression level

Of the participants, 11 had a normal score, 17 were borderline and 109 were categorized as cases of depression.

The level of depression was significantly lower in participants considered to have recovered from their injury (mean score of 9.5) compared with

those without complete recovery (mean score of 13.7) ($P < 0.0001$).

No significant differences were found between demographic features and depression.

On regression analysis, both anxiety and depression showed the strongest association with recovery status [odds ratio (OR) for anxiety = 0.21, 95% confidence interval (CI): 0.06–0.73, $P = 0.01$]; OR for depression = 0.13, 95% CI: 0.03-0.51, $P = 0.003$. No other variables showed statistically significant association.

Quality of life (SF36)

For evaluation of the injured mean scores in SF 36 subscales, we used age- and sex-matched controls from the same geographical area. Comparison of their age, gender and educational level are presented in Table 1.

The mean scores measured for each of the SF 36 subscales for both the landmine victims and the controls are listed in Table 2. The minimum score for the injured was 18.7 (SD 21.0) for RP subscale (role limitations due to physical problems) and the maximum score was 37.4 (SD 27.4) for SF.

Table 2 shows that those injured by landmines had significantly worse mean scores in all HRQOL dimensions when compared with data from the control group. The most striking differences were observed in the BP subscale (22.6 vs 67.3) and PF (34.6 vs 78.8). The smallest differences, although still statistically significant, were for VT (30.3 vs 60.7) and SF (37.4 vs 67.9). The overall test statistic was statistically significant ($P < 0.0001$) for the 8 subscales indicating that there was a relationship between group membership and HRQOL.

We examined the association between the demographic characteristics of the injured and the scores measured for the 8 subscales (Tables 3–6). The Older injured had significantly lower scores in all measures as expected

Table 1 Characteristics of those injured by landmines and the control group

Variable	Cases (n = 137) No. (%)	Controls (n = 360) No. (%)
Sex		
Male	128 (93.4)	284 (78.9)
Female	9 (6.6)	76 (21.1)
Marital status		
Single	34 (24.8)	NA
Married	103 (75.2)	NA
Educational level		
Illiterate	75 (54.7)	167 (46.4)
Primary to intermediate	37 (27)	83 (23.0)
High school	18 (13.1)	72 (20.0)
Above high school	7 (5.1)	38 (10.6)
Recovery status		
Recovered from injury	18 (13.1)	–
Not completely recovered	119 (86.9)	–
Amputation		
Yes	58 (42.3)	–
No	79 (57.7)	–
Age (years)		
Mean (SD)	38.1 (12.8)	33.6 (15)
Range	8–75	13–77
Length of time since accident (years)		
Mean (SD)	12.7 (7.6)	–
Range	0.5–30	–

NA = not available; SD = standard deviation.

Table 2 Comparison of SF-36 subscales between the landmine injured and control groups

SF-36 subscale	Group	Mean	SD	P–value[a]
Physical functioning (PF)	Injured	34.6	27.4	< 0.0001
	Controls	78.8	23.0	
Role physical (RP)	Injured	18.7	21.0	< 0.0001
	Controls	52.9	34.3	
Bodily pain (BP)	Injured	22.6	26.0	< 0.0001
	Controls	67.3	22.3	
General health (GH)	Injured	24.6	20.7	< 0.0001
	Controls	60.0	20.2	
Vitality (VT)	Injured	30.3	18.5	< 0.0001
	Controls	60.7	19.7	
Social functioning (SF)	Injured	37.4	26.4	< 0.0001
	Controls	67.9	23.4	
Role emotional (RE)	Injured	20.7	22.6	< 0.0001
	Controls	52.6	35.8	
Mental health (MH)	Injured	32.5	20.7	< 0.0001
	Controls	63.8	18.6	

[a]*Mann–Whitney U test.*
SD = standard deviation

Table 3 Comparison of the SF-36 scores for the landmine injured by age group

SF-36 subscale	Age group (years)					*P*-value[a]
	15–24	25–34	35–44	45–54	≥ 55	
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	
Physical functioning (PF)	40.0 (33.9)	40.0 (28.2)	33.4 (24.2)	27.7 (25.7)	24.0 (24.4)	< 0.0001
Role physical (RP)	27.9 (27.7)	23.2 (20.4)	16.4 (23.4)	13.3 (12.9)	11.4 (12.7)	< 0.0001
Bodily pain (BP)	36.8 (29.5)	28.0 (29.3)	20.5 (24.8)	14.8 (16.5)	11.5 (17.6)	< 0.0001
General health (GH)	37.2 (30.1)	23.2 (21.2)	26.1 (18.0)	19.8 (14.8)	18.7 (15.7)	< 0.0001
Vitality (VT)	41.2 (21.8)	30.3 (19.5)	30.0 (17.1)	30.6 (15.4)	22.9 (15.9)	< 0.0001
Social functioning (SF)	41.1 (27.5)	39.9 (27.5)	37.8 (26.7)	34.8 (24.9)	29.1 (25.2)	< 0.0001
Role emotional (RE)	29.4 (26.0)	29.2 (21.3)	14.0 (21.4)	17.7 (24.7)	12.5 (16.4)	< 0.0001
Mental health (MH)	45.1 (25.3)	31.2 (21.9)	34.8 (17.2)	26.1 (19.7)	25.8 (15.6)	< 0.0001

[a]*Chi-squared test.*
SD = standard deviation.

(Table 3). There were only a few female injured in our study ($n = 9$) and gender was not related to any of the subscales. Marital status was significantly related to BP subscale ($P = 0.004$) as the injured who were single had a higher mean score than married injured (32.7 vs 19.3). All scales except RP and RE had significantly higher mean scores in recovered cases against not completely recovered cases (Table 4). As expected, PF, RP and BP were considerably lower in the injured with any type of amputation compared to those without amputation (Table 5). The level of education was also related to all of the scales; those with a higher level of education had higher mean scores, i.e. better HRQOL (Table 6).

Discussion

We found that those injured by landmines experience high scores for both anxiety and depression. Furthermore, anxiety and depression were correlated, i.e. patients with high scores for anxiety had high scores for depression too. Landmine accidents not only cause physical impairments in the survivors, but also psychological trauma, such as post-traumatic stress disorder, depression and anxiety, all of which may affect their quality of life. Denial of new body image, indeterminate future and loss of confidence may increase continuous anxiety and depression [21].

Sinici et al. showed high anxiety levels in more than 90% of landmine-injured patients in Turkey who had post-traumatic stress disorder [10]. In Sri Lanka, Gunaratnam et al. also reported a high percentage of mine victims with anxiety disorder and depression [11]. A population-based mental health survey by the Center for Disease Control and Prevention in Afghanistan found that landmine injuries (in non-disabled respondents) were associated with a higher prevalence of anxiety symptoms [22].

Personal factors such as intelligence, socioeconomic level, gender, age, level of education, past experiences and environmental elements, such as type of trauma, intensity, treatment and rehabilitation after trauma, may determine the level of anxiety and depression [23]. In our study, the level of anxiety and depression was significantly lower in participants with recovered in-

Table 4 Comparison of the SF-36 scores for the landmine injured by recovery status

SF-36 subscale	Recovered	Not completely recovered	*P*-value[a]
	Mean (SD)	Mean (SD)	
Physical functioning (PF)	52.5 (30.2)	31.8 (26.0)	0.006
Role physical (RP)	27.7 (31.9)	17.3 (18.7)	0.3
Bodily pain (BP)	44.1 (34.7)	19.3 (22.9)	0.005
General health (GH)	41.7 (22.5)	22.0 (19.1)	< 0.0001
Vitality (VT)	43.8 (21.6)	28.2 (17.2)	0.004
Social functioning (SF)	55.5 (21.5)	34.6 (26.1)	0.001
Role emotional (RE)	25.9 (29.2)	19.9 (21.4)	0.5
Mental health (MH)	50.6 (23.7)	29.7 (18.8)	< 0.0001

[a]*Mann–Whitney U test.*
SD = standard deviation.

Table 5 Comparison of the SF-36 scores for the landmine injured by amputation status

SF-36 subscale	Amputated (any type) Mean (SD)	Without any amputation Mean (SD)	*P*-value[a]
Physical functioning (PF)	29.0 (25.5)	38.8 (28.2)	0.03
Role physical (RP)	12.9 (16.3)	23.0 (23.2)	0.008
Bodily pain (BP)	17.7 (23.7)	26.3 (27.2)	0.03
General health (GH)	23.6 (21.4)	25.4 (20.2)	0.4
Vitality (VT)	29.3 (17.5)	31.1 (19.4)	0.7
Social functioning (SF)	35.3 (28.4)	38.9 (24.9)	0.3
Role emotional (RE)	19.5 (22.5)	21.6 (22.7)	0.5
Mental health (MH)	31.6 (19.2)	33.1 (21.8)	0.9

[a]*Mann–Whitney U test.*
SD = standard deviation.

jury in comparison with those without complete recovery.

Assessing the health-related quality of life, it seems that patients with landmine injuries experience a lower quality of life as compared to the general population. Age, educational level, marital status, recovery status and presence of amputation may affect different aspects of quality of life. Landmine accident victims with high levels of anxiety and subsequent negative feelings may not feel that they are as positive as before. In a survey of mental health outcomes and social functioning of refugees living in Thai–Burmese border camps, landmine injury was found as one of the psychosocial risk factors for poorer mental health and social functioning outcomes [12].

Poor quality of life has been stated in different veterans of the Iran–Iraq war. For instance, 85% of patients affected by mustard gas in Sardasht, Islamic Republic of Iran, had lower quality of life and physical health was the major cause [24]. A study of the quality of life in Iranian females with spinal cord injury that occurred during the Iran–Iraq war or post-war landmine accidents demonstrated significantly lower mean scores in all subscales of SF36 compared to the normal population [25]. The same results have been seen in the veterans of other wars like the 1990–91 Persian Gulf War; veterans experienced poorer health on most subjective outcomes than non-deployed military personnel [26]. Likewise, functional health status was significantly lower in the Persian Gulf War veterans compared with published United States population norms for each of the SF36 subscales [27].

Dougherty determined that transtibial amputees from the Vietnam War (65% of the injuries were due to tripping a landmine or booby trap) led relatively normal lives after sustaining the amputation. However, addition of another major injury had significant long-term consequences with regard to SF-36 scores and resulted in a need for psychological care [28].

Our study shows people injured by landmines are at risk of psychological ill health. Thus such injured individuals need close observation to determine and treat increased anxiety and depression which worsens the quality of life. Special attention should be paid to appropriate psychological rehabilitation throughout their treatment plan.

As in this study only a part of those injured by landmines registered in Ilam were evaluated, additional studies are needed to include participants of all landmine polluted geographical areas

Table 6 Comparison of the SF-36 scores for the landmine injured by educational level

SF-36 subscale	Illiterate Mean (SD)	Primary/Intermediate Mean (SD)	High school Mean (SD)	Above high school Mean (SD)	*P*-value[a]
Physical functioning (PF)	28.4 (24.5)	37.4 (27.8)	45.2 (31.6)	57.1 (24.8)	< 0.0001
Role physical (RP)	15.7 (15.8)	19.5 (22.1)	25.0 (28.8)	26.3 (31.4)	< 0.0001
Bodily pain (BP)	13.9 (18.4)	30.7 (29.2)	34.4 (20.3)	36.4 (35.0)	< 0.0001
General health (GH)	19.3 (14.6)	28.0 (24.5)	33.8 (17.6)	35.7 (27.7)	< 0.0001
Vitality (VT)	26.2 (15.6)	31.7 (20.3)	35.7 (19.0)	41.9 (21.2)	< 0.0001
Social functioning (SF)	37.1 (25.4)	32.7 (27.2)	44.6 (24.8)	45.1 (29.4)	< 0.0001
Role emotional (RE)	14.8 (23.4)	20.7 (22.7)	21.9 (22.3)	23.8 (25.1)	< 0.0001
Mental health (MH)	28.3 (17.0)	31.3 (22.7)	40.5 (24.1)	48.6 (21.8)	< 0.0001

[a]*Chi-squared test.*
SD = standard deviation.

to obtain comprehensive data. Based on comprehensive results, national programmes should be set up for early identification and subsequent referral for treatment of depression and anxiety. This may decrease the likelihood of these conditions affecting long-term quality of life so negatively.

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