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Quality of life in war-related hip disarticulation in Iran

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Objective: The aim of the study was to evaluate health-related quality of life in veterans with hip disarticulation suffered during the Iran-Iraq War.

Methods: All war-related injured with hip disarticulation were invited to a 7-day recreational camp. Of 183 subjects, 76 participated in this study. The impact of hip disarticulation on quality of life was measured using the 36-item short form health survey and compared with the scores of the general public.

Results: Mean age at the time of interview was 44.1±6.98 years. The lowest score of health-related quality of life subscales was bodily pain (32.88±33.20). The health-related quality of life in veterans with hip disarticulation was significantly lower than the general public in all subscales ($p<0.05$), with the exception of vitality ($p=0.114$).

Conclusion: Veterans with hip disarticulation due to war suffer from poor health-related quality of life. Appropriate interventions and rehabilitation programs are recommended to enhance quality of life in such patients.

Key words: Disarticulation; health; hip; quality of life; veteran.

Veterans with battlefield limb losses experience additional problems from civilians with limb losses due to their initial injury and complications.[1] Between 1980 and 1988, Iran's human cost due to the Iran-Iraq War was more than 200,000 lives lost and more than 400,000 injured. Of these, more than 183 persons experienced hip disarticulation.[2]

Wartime broadly impacts the health and well-being of soldiers, veterans and civilian victims.[3] Veterans experience worse health conditions[3-5] and higher mortality rates from illnesses more than non-veterans.[3,5]

Health-Related Quality of Life (HRQoL) has been evaluated in different classifications of veterans.[3,6-12] According to Hagberg and Brånemark's 2001 study, non-vascular transfemoral amputees had significant problems and their quality of life (QoL) was markedly impacted by the amputation and prosthesis.[13] Different studies have reported decreased HRQoL in individuals with lower limb amputations.[12,14,15] One study reported that individuals with hip disarticulation and hemipelvectomy have a relatively high level of activity but experience limitations in walking, rising and sitting down and

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climbing stairs.[16] However, there is little evidence about the HRQoL of amputees with war-related hip disarticulation. Complete information about amputee needs is necessary in order to create an appropriate rehabilitation program. For this reason, the aim of this study was to assess the effects of amputation on HRQoL in veterans with hip disarticulation and to identify its determinants.

Patients and methods

The Veterans and Martyrs Affairs Foundation (VMAF) database provides a severity index (disability rate) to all civilians and veterans of the Iran-Iraq War, based on clinical problems and severity of injuries. Majority of the survivors are registered with the foundation and are provided with special services and facilities. Therefore, the VMAF database maintains demographic and clinical information of the injured survivors.

According to the VMAF database, 183 subjects had hip disarticulation. Patients over the age of 18 years with unilateral (right or left limb) disarticulation through the hip joint due to the 8-year Iran-Iraq War were included. Subjects with perceptual or cognitive impairments for unreliable answers were excluded. All subjects from 29 provinces of the country were invited to participate in a 7-day recreational camp. Seventy-six (41.53%) subjects participated and signed voluntarily informed consent. The remaining subjects (n=104) did not participate in the camp.

Semi-structured interviews were conducted for data collection by two trained interviewers. Face-to-face interviews were performed. Ethics approval was obtained by the ethics committee of the affiliated research center.

Demographic data were collected with regard to current age, age at the time of injury, marital status, level of education after injury, employment status after injury, sport activities, history of hospitalization during the preceding year of the study, additional war-related injuries, side of the amputation (right or left limb), and prosthetic use at the time of the study.

The Persian version of the 36-item Short Form Health Survey (SF-36) was used for QoL evaluation.[17] The questionnaire, a multidimensional generic tool for the general population and different groups of patients, consists of 36 questions measuring 8 health-related concepts.[18] The subscales involve physical function (PF: 10 items), role limitations caused by physical disability (RP: 4 items), bodily pain (BP: 2 items), general health perceptions (GH: 5 items), vitality (VT: 4 items), role limitations caused by emotional problems (RE: 3 items), mental health (MH: 5 items) and social function (SF: 1 item). The physical and mental components of the 8 subscales are summarized into a Physical Component Summary (PCS) and Mental Component Summary (MCS). Each subscale is scored from 0 to 100 with lower scores representing poor HRQoL and higher scores representing better HRQoL. The published averages of the SF-36 subscale score of the general male population in 2005 was used as a control group for comparison.[17]

Statistical analysis was performed using SPSS for Windows Release 18 (SPSS Inc., Chicago, IL, USA) software. Descriptive reports were given as frequency, percentage, mean and standard deviation (SD). Data normality was tested using the Kolmogorov-Smirnov test. The *t*-test was used to compare SF-36 scores, MCS

Table 1. Demographic characteristics of the participants with hip disarticulations (n=76).

Surveyed characteristics	Frequency	Percentage
Marital status		
Married	71	93.42
Single	5	6.58
Years of education		
<12	53	69.74
≥12	23	30.26
Employment status		
Employed	39	51.32
Unemployed	37	48.68
Sport activities		
Yes	42	55.26
No	34	44.74
History of hospitalization		
Yes	15	19.74
No	61	80.26
Side of hip disarticulation		
Left	32	42.11
Right	44	57.89
Prosthetic use		
Yes	23	30.26
No	53	69.74
Additional war-related injuries		
Upper extremity injuries		
Yes	21	27.63
No	55	72.37
Visceral injuries		
Yes	15	19.74
No	61	80.26
Face injuries		
Yes	13	17.11
No	63	82.89
Head injuries		
Yes	14	18.42
No	62	81.58

Table 2. Comparisons of SF-36 scores between participants with hip disarticulation and general male populations.

SF-36 Subscales	Population with Hip Disarticulation (n=76) Mean (SD)	General Male Population (n=1997) Mean (SD)	p
Physical functioning	49.21 (29.25)	87.8 (19.0)	<0.0001
Role physical	33.88 (31.54)	73.8 (36.4)	<0.0001
Bodily pain	32.88 (33.20)	82.7 (23.4)	<0.0001
General health	49.56 (30.11)	70.2 (19.6)	<0.0001
Vitality	64.80 (22.05)	68.9 (16.2)	0.114
Social functioning	64.34 (31.83)	78.0 (23.5)	<0.0001
Role emotional	53.77 (45.51)	70.1 (39.7)	0.003
Mental health	62.93 (25.50)	69.2 (17.1)	0.037
Physical Component Summary (PCS)	45.85 (21.56)	81.4 (21.8)	<0.0001
Mental Component Summary (MCS)	57.99 (25.20)	72.4 (21.9)	<0.0001

and PCS scores and the 8 health-related concepts. Bivariate Pearson's correlation was used to measure the strength and direction of association between PCS and MCS scores. Logistic regression analysis was performed to indicate variables that contribute to physical and mental health-related quality of life. Age, education, employment status, marital status, other war-related injuries, history of hospitalization, use of a prosthesis, side of hip disarticulation and sport activities were used as independent variables and PCS and MCS as dependent variables. P values of less than 0.05 were considered statistically significant.

Results

Mean age of the participants was 19.54±7.96 years at the time of injury and 44.1±6.98 years at the time of interview. Demographic data is provided in Table 1.

The majority of the scores regarding the 8 health-related concepts were significantly lower in participants with hip disarticulations than the general male population (Table 2).

Among all dichotomous demographic characteristics and SF-36 domains, only 3 determinants had a significant difference ($p<0.05$) (Table 3). Current education and employment status affected PCS and MCS scores the most. Employed subjects with higher education level had better HRQoL than unemployed subjects educated less than 12 years. The effect of higher education level (≥12 years) was statistically significant on two subscales of vitality and role limitations caused by emotional problems ($p=0.014$). In addition, the effect of employment was statistically significant on all subscales of HRQoL with the exception of physical function and role limitations (Table 3). The history of hospitalization had a significant effect on physical functioning ($p=0.004$).

A positive and statistically significant correlation was found between two summary measures of the SF-36, including PCS and MCS ($r=0.840$, $p<0.0001$). The association between PCS and MCS scores is shown in Figure 1. Logistic regression analysis indicated that none of the variables contributed to poor physical and mental HRQoL.

Discussion

Limb loss due to trauma on the battlefield is one of the most serious war-related injuries in some world regions, especially in the Middle East.[19] One of the most important aims in rehabilitative care of veterans is improving QoL. The current study used the HRQoL questionnaire to understand the status of QoL among veterans with hip disarticulations in order to improve the healthcare of service members. Demographic characteristics of veter-

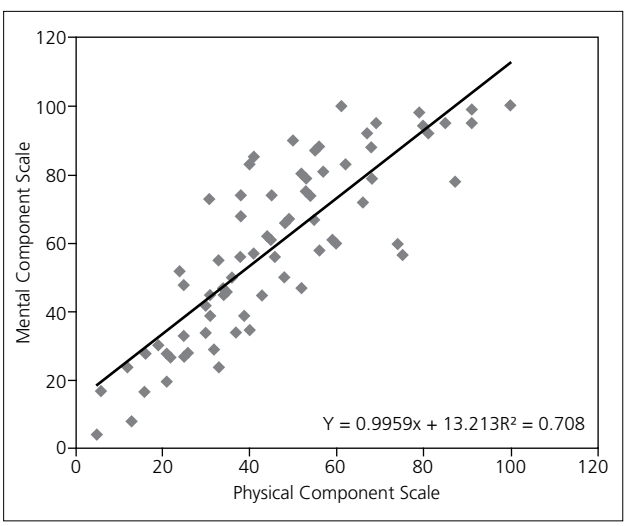

Fig. 1. Correlation between Physical Component Summary and Mental Component Summary scales in unilateral hip disarticulation (n=76).

Table 3. Surveyed characteristics affecting the HRQoL in patients with hip disarticulations.

		SF-36 Domains									
	Number of patients	**Mean PF score (SD)**	**Mean RP score (SD)**	**Mean BP score (SD)**	**Mean GH score (SD)**	**Mean VT score (SD)**	**Mean SF score (SD)**	**Mean RE score (SD)**	**Mean MH score (SD)**	**Mean PCS score (SD)**	**Mean MCS score (SD)**
Marital Status											
P value		0.337	0.806	0.912	0.981	0.894	0.758	0.836	0.929	0.834	0.934
Married	71	49.44 (29.23)	33.45 (31.04)	33.08 (32.83)	49.38 (29.92)	64.71 (22.11)	64.63 (32.28)	53.33 (45.92)	62.67 (25.47)	45.85 (21.60)	57.91 (25.08)
Single	5	35.00 (24.83)	37.50 (47.87)	35.00 (47.26)	49.75 (41.40)	66.25 (27.50)	59.50 (31.27)	58.25 (50.05)	64.00 (34.64)	43.50 (26.56)	56.67 (37.69)
Years of education (years)											
P value		0.246	0.116	0.128	0.396	0.014*	0.114	0.014*	0.133	0.041*	0.032*
<12	53	47.17 (27.73)	29.71 (30.25)	29.02 (29.46)	48.57 (30.64)	60.39 (21.58)	61.06 (31.82)	45.89 (44.95)	60.30 (26.13)	42.72 (20.51)	54.35 (24.77)
≥12	23	56.00 (31.48)	42.50 (31.52)	44.95 (41.57)	55.30 (28.33)	74.75 (21.30)	74.50 (32.46)	75.47 (41.33)	70.40 (23.05)	54.35 (22.82)	68.84 (24.15)
Employment status											
P value		0.221	0.081	0.002*	0.021*	0.001*	0.041*	0.013*	0.002*	0.002*	0.002*
Employed	39	53.38 (31.05)	40.54 (35.03)	45.35 (35.24)	58.00 (27.64)	73.47 (19.78)	72.56 (28.60)	67.58 (44.02)	72.00 (22.09)	54.05 (22.37)	67.68 (22.32)
Unemployed	37	45.13 (26.13)	27.70 (26.86)	21.92 (26.95)	42.00 (30.54)	57.08 (21.22)	57.32 (33.64)	41.43 (44.06)	54.22 (25.61)	38.50 (17.24)	49.20 (24.48)
Sport activities											
P value		0.11	0.746	0.328	0.145	0.094	0.560	0.194	.0971	0.145	0.274
Yes	42	53.54 (30.66)	34.76 (33.48)	36.63 (33.20)	54.05 (29.95)	68.75 (22.69)	66.34 (34.06)	60.00 (46.05)	62.80 (28.70)	49.10 (22.04)	60.95 (25.65)
No	34	42.79 (26.23)	32.35 (29.85)	29.02 (33.47)	43.79 (30.15)	60.00 (20.95)	61.97 (29.76)	46.06 (44.99)	62.59 (21.79)	41.63 (20.85)	54.30 (24.91)
History of hospitalization											
P value		0.004*	0.570	0.391	0.357	0.711	0.161	0.627	0.946	0.106	0.441
Yes	15	28.08 (21.46)	28.85 (33.61)	26.38 (29.66)	41.84 (27.90)	62.69 (25.22)	53.15 (23.56)	48.69 (46.41)	62.00 (30.05)	36.85 (15.72)	52.67 (24.99)
No	61	53.20 (28.90)	34.43 (31.68)	35.18 (34.07)	50.39 (30.62)	65.25 (21.90)	66.98 (33.45)	55.55 (45.81)	62.56 (25.02)	47.68 (22.61)	58.96 (25.72)
Additional war-related injuries											
P value		0.512	0.487	0.360	0.740	0.639	0.915	0.988	0.731	0.601	0.795
Yes	26	49.68 (29.19)	35.10 (31.99)	36.40 (36.52)	47.96 (29.77)	65.74 (22.07)	64.28 (30.16)	53.63 (45.82)	63.15 (26.27)	46.51 (22.43)	58.28 (24.77)
No	50	45.00 (28.77)	29.81 (29.17)	29.46 (27.13)	50.42 (31.17)	63.12 (22.35)	65.11 (34.77)	53.81 (46.29)	60.96 (24.47)	43.67 (19.84)	56.60 (25.92)
Side of hip disarticulation											
P value		0.849	0.111	0.669	0.652	0.205	0.874	0.442	0.398	0.413	0.674
Left	32	50.31 (28.65)	28.91 (27.76)	31.28 (32.62)	51.94 (30.29)	61.56 (23.84)	63.84 (33.32)	47.91 (43.98)	59.62 (26.89)	44.12 (21.83)	56.75 (26.59)
Right	44	48.92 (31.56)	41.22 (35.46)	34.86 (36.14)	48.54 (31.72)	68.47 (20.66)	65.08 (31.33)	56.47 (47.04)	65.00 (25.19)	48.58 (22.64)	59.41 (24.65)
Prosthetic use											
P value		0.896	0.782	0.718	0.640	0.572	0.463	0.581	0.093	0.563	0.759
Yes	23	49.13 (30.32)	31.52 (26.35)	29.52 (32.98)	46.48 (29.69)	61.96 (19.52)	60.56 (29.46)	57.96 (47.39)	69.56 (19.59)	43.22 (19.73)	59.35 (21.28)
No	53	50.11 (28.70)	33.69 (32.58)	32.52 (32.11)	50.02 (29.52)	65.11 (22.55)	66.50 (32.42)	51.43 (45.41)	59.64 (27.76)	46.27 (20.77)	57.37 (26.44)

BP: Bodily pain, GH: General health, MCS: Mental component summary, MH: Mental health, PCS: Physical component summary, PF: Physical functioning, RE: Role emotional, RP: Role physical, SF: Social functioning, VT: Vitality. *p<0.05.

ans were collected to determine factors with the greatest effect on HRQoL.

As expected, veterans with hip disarticulation had significantly lower HRQoL than the general population, with the exception of vitality. Therefore, limb loss through the hip joint is an effective factor associated with significantly lower HRQoL in veterans. Asadollahi et al. [7] reported that individuals injured by landmines had lower HRQoL than the general population. In addition, anxiety and negative feelings were reported in injured persons. Poor QoL has been reported in different classified veterans of the Iran-Iraq War.[10,12,20,21] Poorer health on most subjective outcomes were stated in veterans compared with non-deployed military personnel. [22] Veterans with hip disarticulation had better MCS scores than PCS scores generally in this study (Table 2). This finding was similar among different studies on Iran-Iraq War victims,[10,12] and might be explained by the fact that most Iranian war victims were volunteers with supportive families. However, anxiety disorders are significantly associated with poor QoL and disability.[23] In the current study, the subjects who perceived worse physical health status had more severe mental problems. Similar results were reported in a survey of health status of veterans in the New England region.[8]

The SF-36 PCS is an outcome measure that encompasses physical functioning, role limitation, energy, pain and perception of health.[24] According to a meta-analysis published in 2011, amputees with below knee amputation following trauma demonstrated a significantly better outcome than those with above knee amputation. [25] Additionally, SF-36 PCS scores were significantly superior in through-knee amputees than those with above knee amputation. Taghipour et al. evaluated HRQoL in 141 patients with transtibial and transfemoral amputations and knee disarticulations in a prosthesis center in Iran and reported lower PCS and MCS scores than in the 76 patients with hip disarticulations in this study.[12] One reason for this unexpected finding may be a sense of thankfulness for having survived. A similar finding was reported by Epstein et al. for individuals with multiple limb loss compared to unilateral lower limb amputees.[26]

Individuals with hip disarticulation often develop new viewpoints on life priorities and coping skills to overcome the disabilities caused by their injuries. In the current study, a higher education level and employment status were the only significant predictors of PCS and MCS scores (Table 3), while employment status and family support were not associated with QoL in the unilateral upper limb, unilateral lower limb and multiple limb loss groups.[26] Amputees without prostheses had higher PCS and MCS scores than amputees with prostheses, even though this difference was not statistically significant (Table 3). One reason for this unexpected result might be the fatigue caused the difficulty in mobility with the use of heavy prostheses in individuals with significant limb loss. While Gallagher and MacLachlan reported that age, gender and level of amputation had no significant effect on any domain of QoL, the length of time living with the prosthesis had a significance association with the social relationships domain of the World Health Organization QoL.[27] Asano et al. reported that social support and social functioning is associated with better QoL.(28) These results might be illustrated by the better QoL in employed subjects with higher levels of education (≥12 years). Further studies to evaluate these factors on the study population are recommended.

Limitations of this study include its descriptive nature and lack of causality. In addition, as only 42% of veterans with hip disarticulation participated in this study, the results might not be demonstrative of the population as a whole and cannot be generalized. Providing rehabilitative services during the long-term recovery period is clinically important for physicians, physical therapists, psychologists and prosthetists. To the best of our knowledge, no study has assessed HRQoL in patients with war-related hip disarticulations. Further investigations are recommended as the determination of factors that affect QOL in the long-term is important in order to decide compensation policies.

In conclusion, individuals with war-related hip disarticulation had significantly poorer HRQoL. The healthcare system should provide appropriate interventions and successful rehabilitation program in order to enhance QoL in veterans with hip disarticulations.

Conflicts of Interest: No conflicts declared.

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