

# Marital Relationship and Its Associated Factors in Veterans Exposed to High Dose Chemical Warfare Agents

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## Abstract

**Objective:** The aim of this study was to determine the associates of marital relationship in mustard exposed veterans.

**Materials and Methods:** Two hundred ninety two married Iranian mustard exposed veterans, who had been exposed to single high dose mustard gas in Iraq-Iran war, were assessed for marital adjustment with Revised Dyadic Adjustment Scale (RDAS). Census sampling was done. The patients' quality of life (SF-36), spirometric measures and war related data were also extracted.

**Results:** A total of 189 subjects (65%) completed our study. The mean ( $\pm$ SD) of the RDAS Total score, RDAS Dyadic Consensus, RDAS Affectional Expression, RDAS Dyadic Satisfaction, and RDAS Dyadic Cohesion were 50.61 (8.16), 16.67 (2.77), 7.62 (1.84), 14.76 (3.39), and 11.54 (3.79), respectively. RDAS Dyadic satisfaction was correlated with SF-36 and all its sub-scores ( $p < 0.05$ ). RDAS total score showed significant correlation with SF-36 total score and most of its sub-scores ( $p < 0.05$ ). RDAS affective expression was significantly correlated with role limitation, social function, general mental health, vitality, General health perceptions, physical composite score (PCS) and mental composite score (MCS) ( $p < 0.05$ ). RDAS dyadic consensus was not correlated with any SF-36 sub-scores.

**Conclusion:** Veterans health team including physicians, psychologists and/or psychiatrists should know that poorer marital satisfaction is linked with lower quality of life scores, late after mustard exposure, although marital relationship is independent of spirometric findings, age, duration from exposure and comorbidity score.

**Key words:** Marital relationship, Chemical warfare, Mustard gas, Quality of life, Spirometry, War

## Introduction

Chronic illnesses may affect several aspects of

patients and their families' life (1, 2). Some conditions such as cancer or coronary heart disease beget marital discord and its concomitant morbidity and mortality (3, 4). These undesirable ramifications of marital discord in chronic illnesses render familial support importance (5). When marital adjustment is poor, poor quality of life, sexual functioning and medication compliance are expected (6).

Sulfur mustard seldom affects longevity of their

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**Table 1:** Mean age, spirometric findings, duration from exposure and Revised Dyadic Adjustment Scale (RDAS) and its subscales in study population

	Mean $\pm$ SD	Minimum	Maximum
Age (year)	45.49 $\pm$ 7.21	27	70
Duration from exposure (year)	22.16 $\pm$ 1.57	20	26
RDAS Total score	50.61 $\pm$ 8.16	21	66
RDAS Dyadic Consensus score	16.67 $\pm$ 2.77	6	20
RDAS Affectional Expression score	7.62 $\pm$ 1.84	1	10
RDAS Dyadic Satisfaction score	14.76 $\pm$ 3.39	1	20
RDAS Dyadic Cohesion score	11.54 $\pm$ 3.79	2	19
FVC (percent)	66.8 $\pm$ 4.9	16.2	86.4
FEV <sub>1</sub> (percent)	74.3 $\pm$ 5.0	16.8	96.7
FEV <sub>1</sub> /FVC (percent)	78.2 $\pm$ 6.7	8.2	86.3

exposed veterans, if they survive early exposure and acute conditions (7-9), so lets them being married and have a family life also. However several other aspects of disease have been assessed in these populations (10-12), familial adjustment as an important issue in chronic conditions (13-15) has been less studied. This study was designed to look at the sociodemographic, respiratory, and well being associated with marital relationship in this group of patients.

### Materials and Methods

In this cross-sectional study, 292 married subjects who had been exposed to a single time high dose exposure to sulfur mustard in Iraq-Iran war were asked to complete Revised - Dyadic Adjustment Scale (RDAS) (16). Census sampling was done. The inclusion criteria were marriage, and being married at least 1 year prior to this study. All subjects gave informed consent and study was approved by the Ethics Committee of the Janbazan Medical and Engineering Research Center (*JMERC*), Tehran, Iran.

Family income, educational level, and living place (urban/rural) were registered. The decompensation rate was also registered which is routinely determined by veterans affair commission physicians who are familiar with chronic complications of sulfur mustard exposure, namely trained and experienced dermatologists, pulmonologists, ophthalmologist, and psychiatrists. The patients' health-related quality of life (QOL) (Short Form-36 or SF-36), and somatic comorbidities (Ifudu Comorbidity Scale) were also assessed.

### Pulmonary Function Test

Respiratory measurements were available on each veteran and included forced vital capacity (FVC) and

forced expiratory volume in 1 second (FEV<sub>1</sub>). The tests were performed by experienced lung function technicians under the direction of licensed physicians using a standard spirometer (Multi-Functional Spirometer HI-801, Chest M.I., INC, Tokyo, Japan). All the patients were familiar with the equipment and very experienced in performing the maneuvers. While seated with a nose clip in place, subjects were asked to perform at least three forced expiratory maneuvers with verbal encouragement to blow maximally throughout until they felt there was no air to expel.

### Instruments

**The Revised Dyadic Adjustment Scale (RDAS)** consists of 14 items that provides a total score (RDAS-T) and 4 sub-scores of dyadic consensus (RDAS-DC, measuring the degree to which couples agree on matters of importance to their relationship), affective expression (RDAS-AE, measuring the degree of the demonstration of affection and sexual relationships), dyadic satisfaction (RDAS-DS, measuring the degree to which couples are satisfied with their relationship), and dyadic cohesion (RDAS-DCh, measuring the degree of closeness and shared activities experienced by couples). RDAS scores range from 0-69, with "distressed relation" having the lowest score. The instrument has high internal consistency (alpha coefficient = 0.90) and construct validity (19). RDAS has been previously widely used in Iranian subjects (21-23). In this study, Cronbach alpha was between 0.7 and 0.8 in different sub-scores of RDAS.

**The Short Form-36 (SF-36)**, a generic multidimensional measure of health-related quality of life (HRQoL), contains eight subscales representing physical functioning, social functioning, role limitations

due to physical health problems, role limitations due to emotional problems, mental health, vitality, bodily pain, and general health perceptions. Subscale scores are transformed to 0–100 scales, with higher scores indicating better HRQoL (19). The physical and mental components of the eight scales are combined into a physical composite score (PCS) and a mental composite score (MCS). The SF-36 has been widely used in Iranian subjects (24, 25).

**Ifudu comorbidity index** is a numerical scale which measures comorbidity in patients and has 14 components for evaluation of 14 main body systems. The systems evaluated in this scale are as follows: 1) stable angina or myocardial infarction (ischemic heart diseases), 2) other cardiovascular problems (hypertension, congestive heart failure, cardiomyopathy, and other non-ischemic diseases), 3) chronic respiratory diseases including asthma or COPD, 4) autonomic neuropathy (gastroparesis, diarrhea, cystopathy, obstipation, orthostatic hypotension), 5) other neurologic problems (including cerebrovascular accidents or brain attacks), 6) neuromuscular disorders (as well as musculoskeletal diseases), 7) infections including HIV, 8) pancreas and biliary diseases (hepatitis, hepatic disorders, pancreatic enzyme defect), 9) hematological disorders (excluding anemia), 10) low back pain, spine or joint disorders, 11) visual disorders (decreased visual acuity up to complete blindness), 12) limb amputation (from fingers to lower extremities), 13) mental or emotional illness, and 14) genitourinary diseases. Each component takes a score ranging from 0 (absence of comorbidity) to 3 (presence of severe comorbidity).

Total comorbidity score would be the sum of scores gained from each of the above components, while higher scores represent greater comorbidity (17). Given that our patients had chronic pulmonary condition, the third component of the Ifudu questionnaire was not considered for the evaluation of comorbidities. This measure has been previously used in Iranian patients with lung disease (19).

### Statistical analysis

Data were analyzed with SPSS software version 13 (SPSS Inc, Chicago IL). Means and standard deviations of the RDAS total and subscales were reported. Mann-Whitney test was applied for comparison of RDAS scores to educational level, income and other baseline categorical data. Also, the Pearson correlation coefficient was used to study the correlation between RDAS and age, quality of life and

**Table 2:** Frequency of socioeconomic and clinical data in study population

	n	%
<b>Educational level</b>		
Illiterate	3	1.58
Read and Write	6	3.17
Primary school	47	24.86
Elementary school	37	19.57
Diploma	52	27.70
Upper diploma	12	6.34
BSc	27	14.28
MSc	4	2.11
PhD, Doctrate	1	0.52
<b>Living place</b>		
Urban	176	93.3
Rural	13	6.7
<b>Housing</b>		
Own	147	77.7
Rental	42	22.3
<b>Job</b>		
Employed	40	21.2
Jobless	149	78.8
<b>Income level</b>		
Low	20	10.5
Moderate	98	51.8
High	45	23.8
Very high	26	13.7
<b>Diagnosis</b>		
Bronchiolitis	65	34.4
Chronic Bronchitis	60	31.7
Bronchectasis	21	11.1
Asthma	24	12.7

other numeric data. P-values less than 0.05 were considered significant.

### Results

From a total of 292 patients, 189 (64.7%) completed the questionnaires. All were male. Mean age was 45±7 years. Most participants were educated, lived in urban area and had the diagnosis of bronchiolitis obliterans (Tables 1 and 2).

The mean (±SD) of the RDAS total score, dyadic consensus, RDAS affectional Expression Point, were 50.61 (±8.16), 16.67 (±2.77), 7.62 (±1.84), 14.76 (±3.39), and 11.54 (±3.79), respectively (Table 1). Furthermore, total RADS and Dyadic Consensus, Dyadic Satisfaction, and Dyadic Cohesion scores were not significantly correlated with age, spirometric findings, comorbidity score, and duration from exposure (p>0.05) (Table 3).

RDAS Dyadic satisfaction was correlated with

**Table 3:** Correlation coefficient between Revised Dyadic Adjustment Scale (RDAS) and its subscales with different quantitative variables

Variables	RDAS Total score	RDAS Dyadic Consensus	RDAS Affective Expression	RDAS Dyadic Satisfaction	RDAS Dyadic Cohesion
<b>Quality of life</b>					
Physical function	<b>0.160*</b>	0.111	0.087	<b>0.186*</b>	0.054
Role limitations	0.143	0.142	<b>0.147*</b>	<b>0.148*</b>	0.000
Body pain	0.120	0.069	0.075	<b>0.213**</b>	-0.019
Social function	<b>0.216**</b>	0.110	<b>0.145*</b>	<b>0.295***</b>	0.050
General mental health	<b>0.257***</b>	0.116	<b>0.192**</b>	<b>0.305***</b>	0.103
Role limitations due to emotional problem	<b>0.161*</b>	0.071	0.114	<b>0.244***</b>	0.021
Vitality energy or fatigue	<b>0.207**</b>	0.056	<b>0.184*</b>	<b>0.274***</b>	0.070
General health perceptions	<b>0.178*</b>	0.072	<b>0.164*</b>	<b>0.216**</b>	0.058
Physical health	<b>0.223**</b>	0.141	<b>0.174*</b>	<b>0.268***</b>	0.052
Mental health	<b>0.264***</b>	0.107	<b>0.204**</b>	<b>0.360***</b>	0.069
SF-36 Total score	<b>0.258***</b>	<b>0.144*</b>	<b>0.197**</b>	<b>0.327***</b>	0.062
<b>Spirometric findings</b>					
FVC	0.019	0.120	0.103	-0.038	-0.061
FEV1	0.003	0.093	0.069	-0.034	-0.061
FEV1/FVC	0.079	0.112	0.135	0.034	-0.008
<b>Comorbidity score</b>					
	0.078	-0.019	0.118	0.138	0.002
<b>Age</b>					
	-0.029	0.071	-0.041	0.009	-0.104
<b>Disease duration</b>					
	-0.082	-0.000	-0.128	0.034	-0.143

\* p&lt;0.050 , \*\* p&lt;0.010 , \*\*\* p&lt;0.001

SF36 and all its sub-scores ( $p<0.05$ ). RDAS total score showed significant correlation with SF-36 total score and most of its sub-scores including physical function, social function, general mental health, role limitations due to physical health problems, role limitations due to emotional problems, vitality, general health perception, physical composite score (PCS) and mental composite score (MCS) ( $p<0.05$ ). RDAS affective expression was significantly correlated with role limitation, social function, general mental health, vitality, general health perceptions, physical composite score (PCS) and mental composite score (MCS) ( $p<0.05$ ). RDAS dyadic consensus was not correlated with any SF-36 sub-scores ( $p>0.05$ ) (Table 3).

## Discussion

In this study we found that marital adjustment measured by RDAS and its subscales namely dyadic consensus, affective expression and dyadic satisfaction and dyadic cohesion are independent of age, spirometric findings, comorbidity and exposure duration. Also, we found a correlation between total score of RDAS and Dyadic Satisfaction in mustard exposed

veterans with high quality of life with unknown causal effect on each other.

Regarding the relation between marital adjustment and QOL, similar results have been reported in other chronic conditions (13, 14, 26). However in those studies, marital relationship and quality of life have been assessed using different measures.

In our study, age was not associated with marital adjustment. There are investigations suggesting a curvilinear course in marital satisfaction, with satisfaction being high in young adulthood, declining in middle age, and increasing with age thereafter (29-31). However earlier cross-sectional researches have found evidence of declining marital satisfaction during the first 10 years of marriage (27, 28).

The cross-sectional design of the present study did not permit us to determine a causal relationship between marital relationship and quality of life. QOL and marital relationship which were associated with each other may have a causal impact on the other ones.

If further studies confirm an impact of marital relationship on QOL, it will mean that that augmen-



ting marital adjustment in sulfur mustard veterans may pave the way for an improvement in quality of life. The review of the literature shows that marital adjustment can be improved by some interventions such as enriching sexual relationship (32, 33) or alleviating psychological disorders (34).

Although in present study, the association between marital relation and coping with illness was not assessed, it is possible that improving familial support may enhance one's ability to cope with disease and its complications (35). The results of this study may help health system planners in their approach to familial health issues of mustard exposed veterans. In the approach to the marital life, we failed to reveal any baseline data associated with marital adjustment.

There are more than 40,000 mustard exposed veterans in Iran (7), marital satisfaction may be as a possible important target for rehabilitation. There is, however, a body of literature and techniques which focus on the task of changing the nature and quality of intimate relationships (36). Marital therapy should be considered as a possibility. After conducting trials in this population, as in other conditions, research has shown a satisfying result for applying marital therapy to those with marital discord (37). Not only can such interventions improve the treatment outcome of patients (4) but they can also have a great impact on child adjustment, helping their children grow in a more comfortable environment (38).

The plausible conclusion that follows is that marital relationship of veterans is not linked with their demographic and respiratory and exposure data, however its linkage with quality of life may seem as an important issue in their welfare considerations.

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