



ORIGINAL ARTICLE

Psychiatric comorbidity and PTSD-related health problems in war veterans: Cross-sectional study



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Abstract

Background and objectives: PTSD rarely occurs on its own and opinions on the correlation between PTSD and its comorbidities are still divided.

Methods: To identify the comorbidity profile of psychiatric diagnoses in PTSD – affected war veterans and to determine the correlation with mental and health problems.

Participants and methods: The experimental group consisted of 154 war veterans with combat-related PTSD. The control group was made of 77 veterans without PTSD. The study applied a general demographic questionnaire, the Harvard Trauma Questionnaire – Bosnia and Herzegovina version and the MINI.

Results: A 97.4% of PTSD-diagnosed veterans satisfied criteria for other mental disorders and that 44.8% suffered chronic somatic problems. More frequently they suffered from current depressive episode (41.6%), past depressive episode (36.4%), depressive episode with melancholic features (36.4%), dysthymia (13.6%), panic disorder with agoraphobia (11.0%), generalized anxiety disorder (82.5%) alcohol abuse (34.4%) and suicidal ideation (26.0%).

Conclusion: The study showed that chronic PTSD in war veterans was almost always accompanied by multiple psychiatric and often somatic comorbidities.

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Introduction

Human reactions to traumatic stress can vary from mild distress to long-term changes and personality alterations.

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Although posttraumatic stress disorder is considered to be the most common psychiatric effect of traumatic experience, an increasing number of evidence shows that posttraumatic stress disorder (PTSD) as a concept and diagnosis includes only one part of the variation.^{1,2} Studies into the effects of military and civilian psychotraumatization agree that PTSD rarely occurs on its own in persons who were exposed to traumatic events.^{3,4} Moreover, we may say that psychiatric comorbidity in persons with PTSD is quite common.⁴ Earlier studies found that comorbid conditions were correlated with chronic course of PTSD;⁵ psychopathology in comorbid conditions were more complex^{5,6} and disability and dysfunctionality were more serious.^{5,7}

The most frequent comorbid disorders that PTSD patients suffer from are mood disorders and anxiety disorders. According to earlier studies, depression comorbidity rate in PTSD patients ranges from 21% to 94%,^{8–12} while anxiety rate ranges from 39% to 97%.^{7,10,12,13} A significant number of the patients (11–67%) satisfy the criteria for triple comorbidity at some point in their lives and apart from PTSD they experience depression and anxiety.^{12,14}

Other negative effects on health in PTSD – affected persons are behavioral disorders which occur in up to 43% of the patients, while comorbid alcohol abuse or addiction to alcohol and psychoactive drugs ranges from 35% to 52%.¹⁵ According to the latest studies, 20–40% of PTSD – diagnosed patients experience psychotic symptoms that may be as serious as the symptoms experienced by schizophrenic patients.^{16–18}

Apart from high rates of psychiatric comorbidity, persons suffering from chronic PTSD also present a significant prevalence of different somatic diseases (cardiovascular, endocrine, gastrointestinal, respiratory, musculoskeletal, dermal and venereal diseases) and medically explained and unexplained pain syndromes.^{19–21} Hypothesis of this study is that PTSD produce systemic effects on health of psychotraumatized persons and is a mediator between psychological trauma and psychophysical health.

The aim of the study was to determine the correlation of the comorbidity profile of PTSD and the accompanying mental and health problems in war veterans.

Material and methods

The study was conducted at the Mostar University Hospital, Department of Psychiatry, in 2015. It was approved by an ethics committee of the University hospital of Mostar before it is beginning. Participants were notified that they could withdraw their participation at any point in the study without any consequence. Participants were not paid for their participation in the study, therefore, remuneration was not a coercing factor influencing study participation.

To form the experimental group we contacted all veterans who had been treated with PTSD at the above-mentioned psychiatric department. The veterans were contacted in the order they had applied for the treatment. The veterans received written notification and consent form. The experimental group consisted of 154 veterans who were treated for war-related PTSD at the psychiatric department of the Mostar University Hospital. The inclusion criterion for the experimental group was PTSD caused by war trauma,

while the exclusion criterion were mental problems prior to the war. The control group was formed of 77 war veterans without PTSD, living in the West Herzegovina County and the Herzegovina-Neretva County. The exclusion criteria for forming the control group were mental disorders prior to the war. Of 317 veterans, 19 (6%) had psychiatric problems prior to the war and therefore could not participate in the study, while 144 (51.7%) refused to participate. Finally, experimental sample consisted of 154 (48.6%) veterans with PTSD.

The control group was formed by using the snowballing method.²² War veterans' associations were taken as the starting point in the process. Upon previous arrangement with two war veterans' associations, the principal investigator visited the associations' premises and approached the veterans who were present at the moment. The principal investigator gave them notification and consent forms, explained the aim of the study and asked if they were willing to take part. The veterans were also asked if they could pass the information on to their fellow soldiers and hand them the forms. Sometime later, the veterans who wanted to take part in the study telephoned the principal investigator and arranged either to visit the psychiatric department or to meet with the principal investigator at the associations' premises. All participants were asked again if they could pass the information to their fellow soldiers and ask them to participate too.

Veterans who had not had any psychiatric problems prior to the war and who gave their written informed consent for participation in the study responded to the HTQ (Harvard Trauma Questionnaire),²³ which was used to determine the presence of PTSD. The participants who did not satisfy the PTSD criteria according to the HTQ (total score < 2.5) continued with the participation and they responded to the same battery of tests as the experimental group. Of 86 respondents, 9 (10.46%) satisfied the criteria for PTSD according to the HTQ score and they were excluded from the study. The control group finally consisted of 77 veterans.

All participants could seek therapy and medical intervention or withdraw from the study at any time.

Instruments

General demographic data, social and material status and chronic somatic diseases were determined by using a general demographic questionnaire construed particularly for the aim of the study.

In order to establish the level of traumatization and determine the presence of posttraumatic symptoms we used the first and fourth module of the Harvard Trauma Questionnaire (HTQ), Bosnia and Herzegovina version.²³ The instrument was developed in 1998 by the Harvard Program in Refugee Trauma, associations for mental health protection and experts from BH and Croatia.

The version of HTQ is used in the form of a structured interview. The first module contains a list of possible traumatic events and experiences to which the population of BH was exposed during and after the war (war period, refugee period, and postwar period), presented in the form of 46 yes/no questions. This part of the questionnaire is not designed for scoring. The fourth module contains 40

Table 1 Sociodemographic characteristics and differences between experimental and control group.

Characteristic	Number (%) of participants		χ^2 test	p
	Experimental group(n = 154)	Control group(n = 77)		
<i>Education level</i>			5.846	0.054
Elementary	14 (9.1)	1 (1.3)		
Secondary	105 (68.2)	53 (68.8)		
Higher	35 (22.7)	23(29.9)		
<i>Employment status</i>			25.607	<0.001
Employed	44 (28.6)	48 (62.3)		
Unemployed	32 (20.8)	8 (10.4)		
Temporarily employed				
Retired	34 (22.1)	6 (7.8)		
	44 (28.6)	15 (19.5)		
<i>Economic status</i>			12.937	0.002
Low	43 (27.9)	6 (7.8)		
Medium	92 (59.7)	56 (72.7)		
Good	19 (12.3)	15 (19.5)		
<i>Chronic diseases</i>			17.988	<0.001
No	69 (44.8)	12 (15.6)		
Yes	85 (55.2)	65 (84.4)		

statements relating to psychosocial problems caused by trauma. The first 16 statements are derived from the DSM-IV criteria for PTSD and they are grouped around three symptom clusters: re-experiencing traumatic events, avoidance, and psychological hyperarousal. The rest of the statements refer to respondents' perception of the extent to which the trauma affected their functioning in everyday life. Answers to each question are rated on a four-point scale: 1 = not at all, 2 = very little, 3 = quite, 4 = very much. The total score is the mean value of all 40 statements, while the cut-off score for PTSD is derived from the first 16 statements and the mean value higher than 2.5 indicates the presence of PTSD. The HTQ has been widely used and has been particularly suitable for multicultural settings. The questionnaire has a sensitivity of 0.78, specificity of 0.65, and a positive predictive value of 0.75 (according to the sample of 91 Indochinese in 1995 and 1000 Cambodians in 1998).²⁴ Internal consistency reliability of the scales in the study was high (Cronbach's alpha ranged from 0.89 to 0.98).

The Mini International Neuropsychiatric Interview – MINI was used to establish mental disorders. It is a semi-structured psychiatric interview based on the DSM-IV and ICD-10 diagnostic criteria. It contains self-report yes/no questions relating to the diagnostic criteria.²⁵

Statistical analysis

Statistical analysis was conducted by using the Statistical Package for Social Science for Windows v.11 (SPSS Inc., Chicago, IL, USA) for Windows. Basic descriptive parameters (arithmetic mean \pm standard deviation) were determined for all the measures used in the study. Differences between the groups were established by using the χ^2 test. T-test was used for interval variables. The level of significance was set at 0.05.

Results

Demographic characteristics and differences between the control and the experimental group

There were no statistically significant differences between the groups regarding the age ($t=1.32$; $p=0.188$). The mean age of participants in the experimental group was 49.31 ± 9.07 , while the mean age in the control group was 47.36 ± 11.23 years.

The results in other sociodemographic variables indicated that the experimental and the control group differed significantly in terms of employment status ($\chi^2 = 25.61$; $p < 0.001$), economic status ($\chi^2 = 12.94$; $p = 0.002$) and chronic physical diseases ($\chi^2 = 17.99$; $p < 0.001$). The experimental group had a greater number of unemployed, temporarily employed and retired participants. In addition, the group had more participants with low economic status and a greater number of persons who reported chronic physical diseases. In contrast, the control group had a higher number of employed persons and persons with medium or good economic status (Table 1). Economic status was determined by participants' subjective assessment in the terms: low, medium or good economic status.

Results in the Harvard Trauma Questionnaire (HTQ)

The two groups of veterans differed significantly in all variables derived from the HTQ. The experimental group had significantly higher scores in the number of traumatic events, PTSD symptoms, personal functionality perception and traumatic symptoms (Table 2).

Table 2 Scores in the Harvard Trauma Questionnaire (HTQ) and differences between control and experimental group.

HTQ	No. (%)		T-test	p
	Experimental group(n=154)	Control group(n=77)		
Number of traumatic events	13.33 ± 6.63	8.45 ± 5.61	5.66	<0.001
PTSD symptoms	2.61 ± 0.63	1.41 ± 0.39	15.29	<0.001
Self-perceived functioning	2.25 ± 0.58	1.37 ± 0.31	12.49	<0.001
Traumatic symptoms	2.40 ± 0.57	1.38 ± 0.33	14.50	<0.001

Axis-I mental disorders according to the MINI

Differences between the groups regarding the MINI scores were tested by using the Chi-square test. The results include only the chi-square tests which showed statistically significant differences.

The experimental group had a significantly higher number of participants who satisfied the criteria for current depressive episode ($\chi^2 = 36.30$; $p < 0.001$), past depressive episode ($\chi^2 = 29.36$; $p < 0.001$) depressive episode with melancholic features ($\chi^2 = 29.36$; $p < 0.001$), dysthymia ($\chi^2 = 9.96$; $p = 0.002$) and suicidal ideation ($\chi^2 = 19.75$; $p < 0.001$). Further on, the experimental group had a significantly higher number of participants who satisfied the criteria for panic disorder with agoraphobia ($\chi^2 = 5.49$; $p = 0.019$), current PTSD ($\chi^2 = 102.02$; $p < 0.001$), generalized anxiety disorder ($\chi^2 = 89.75$; $p < 0.001$) and alcohol abuse ($\chi^2 = 15.83$; $p < 0.001$) (Table 3).

The classification of psychiatric morbidity according to the number of established diagnoses showed that 97.4% veterans with PTSD fulfilled the criteria for at least one Axis-I psychiatric disorder, as compared to 24.7% in the control group (Table 4). The differences between the groups in the number of disorders were tested with the chi-square test. The experimental group had a significantly higher number of persons with two ($\chi^2 = 5.698$; $p = 0.016$), three and more disorders ($\chi^2 = 101.93$; $p < 0.001$), while the control group had more participants with only one Axis-I disorder ($\chi^2 = 5.231$; $p = 0.022$) and without Axis-I disorders ($\chi^2 = 138.27$; $p < 0.001$) (Table 4).

Somatic comorbidity

Veterans diagnosed with PTSD reported more health problems (chronic somatic diseases) than veterans without PTSD ($\chi^2 = 17.99$; $p < 0.001$) (Table 1). The reported diseases were categorized according to body systems they affect, while less frequently reported diseases (urogenital, neurological, respiratory, hematological, dermatological and otorhinological) were classified as "other diseases". The most frequent somatic diseases that veterans with PTSD suffered from were pain syndromes and cardiovascular, gastrointestinal and endocrine diseases (Table 5).

The differences between the groups regarding the disease categories were examined by using the chi-square test. The veterans with PTSD reported significantly higher number of pain syndromes ($\chi^2 = 7.795$; $p = 0.005$), cardiovascular ($\chi^2 = 8.595$; $p = 0.003$) and endocrine diseases ($\chi^2 = 4.898$; $p = 0.027$), as well as other diseases ($\chi^2 = 5.741$; $p = 0.016$) (Table 5).

Discussion

Our study showed PTSD in war veterans is almost always accompanied by other psychiatric disorders and chronic somatic diseases. These results underline the gravity and the broad span of mental and health problems that PTSD-diagnosed war veterans face with and confirm the complexity and scope of mental and somatic effects of trauma.⁴ The findings in this study are comparable to findings produced by earlier studies of the effects of war trauma in veteran population,^{20,26} as well as findings that suggest that the range of posttraumatic reactions is much wider than the range of syndromes directly associated with psychotrauma according to classifications.^{4,19,20} Even though there is a wide range of disorders comorbid with PTSD and they are determined by effects of different factors (e.g. type of traumatic event, length of time following the trauma, instruments and methods used in treatment), our findings correspond to the majority of earlier studies.⁴ However, the high psychiatric comorbidity rate in our study (90.2%) was somewhat surprising. The rate was even higher than the rate of current PTSD (75.3%). This suggests that chronic PTSD sets off multiple comorbid disorders and causes a risk of psychiatric and somatic comorbidity.⁴

The complexity of multiple comorbidity in persons with PTSD suggests that instead of being a separate diagnostic entity, PTSD may be viewed as a posttraumatic spectrum disorder.^{1,2} According to the suggestion, the category would include several subtypes of PTSD, with PTSD with depressive features and PTSD with anxiety features as the two basic subtypes. The view is shared by O'Donnell who believes posttraumatic psychopathology is a factor of general traumatic stress characterized by various symptoms of PTSD and depression.²⁷ In their study on the relationship between PTSD and depression, O'Donnell et al. suggested that PTSD and depression differ only in the first three months after the trauma, but within twelve months they form a single general traumatic distress factor. Even though the above-mentioned possibility requires further investigation, findings of the majority of other studies indicate that PTSD is the basic reaction to traumatic stress and over time it becomes more stable than depressive and anxiety disorders.¹⁵ They also suggest that PTSD is a causal risk for development of psychiatric and somatic comorbidity.⁴

It is important to note that according to the MINI scores three veterans in the control group had PTSD (3.9%), although all veterans with PTSD based on the HTQ score were excluded from the study. The reasons for the discrepancy may primarily be methodological, since the instruments and their use are different.²⁸ The discrepancy may also arise

Table 3 Axis-I mental disorders in experimental and control group according to the MINI scores.

Axis-I mental disorders (MINI)	No. (%) participants		χ^2 test	p
	Experimental group (n = 154)	Control group (n = 77)		
Current depressive episode	64 (41.6)	2 (2.6)	36.297	<0.001
Past depressive episode	56 (36.4)	2 (2.6)	29.356	<0.001
Depressive episode with melancholic features	56 (36.4)	2 (2.6)	29.356	<0.001
Dysthymia	21 (13.6)	0 (0)	9.959	0.002
Suicide risk	40 (26.0)	1 (1.3)	19.753	<0.001
Hypomanic episode	2 (1.3)	0 (0)	0.063	0.802
Manic episode	5 (3.2)	0 (0)	1.252	0.263
Panic disorder without agoraphobia	2 (1.3)	0 (0)	0.063	0.802
Panic disorder with agoraphobia	17 (11.0)	1 (1.3)	5.490	0.019
Current agoraphobia	8 (5.2)	0 (0)	2.735	0.098
Social phobia	9 (5.8)	0 (0)	3.252	0.071
Obsessive-compulsive disorder	2 (1.3)	0 (0)	0.063	0.802
Current PTSD	116 (75.3)	3 (3.9)	102.018	<0.001
Alcohol addiction	23 (14.9)	8 (10.39)	0.707	0.400
Alcohol abuse	53 (34.4)	7 (9.1)	15.831	<0.001
Psychoactive substance addiction	1 (0.6)	0 (0)	0.000	1.000
Psychoactive substance abuse	0 (0)	0 (0)	-	-
Current psychotic disorder	2 (1.3)	0 (0)	0.063	0.802
Chronic psychotic disorder	3 (1.9)	0 (0)	0.380	0.538
Mood disorder with psychotic features	2 (1.3)	0 (0)	0.063	0.802
Anorexia nervosa	0 (0)	0 (0)	-	-
Bulimia nervosa	1 (0.6)	0 (0)	0.000	1.000
Anorexia nervosa – compulsive overeating	0 (0)	0 (0)	-	-
Generalized anxiety disorder	127 (82.5)	13 (16.9)	89.755	<0.001
Antisocial personality disorder	1 (0.6)	0 (0)	0.000	1.000

Table 4 Prevalence of axis-I comorbid mental disorders in experimental and control group.

Comorbid disorders according to MINI	Prevalence N (%) per group		χ^2 test	p
	Experimental group (n = 154)	Control group (n = 77)		
No	4 (2.6)	58 (75.3)	138.274	<0.001
One	11 (7.1)	13 (16.9)	5.231	0.022
Two	25 (16.2)	4 (5.2)	5.698	0.016
Three or more	114 (74.0)	2 (2.6)	101.926	<0.001
Total	154 (100.0)	77 (100.0)		

Table 5 Prevalence of comorbidity by the categories of somatic diseases in experimental and control group.

Somatic diseases	Prevalence N (%) per group		χ^2 test	p
	Experimental group (n = 154)	Control group (n = 77)		
Pain syndromes	29 (18.8)	4 (5.2)	7.795	0.005
Cardiovascular diseases	16 (10.4)	0	8.595	0.003
Gastrointestinal diseases	10 (6.5)	1 (1.3)	2.825	0.093
Hormonal diseases	10 (6.5)	0	4.898	0.027
Other diseases	21 (13.6)	3 (3.9)	4.383	0.036

as a result of differences in the instruments' scope. Apart from posttraumatic symptoms, the HTQ includes a self-assessment of personal functionality, which may reduce the score for PTSD, while the MINI centers directly around the PTSD symptoms. This fact, as well as the scores in the HTQ traumatic symptoms, suggests that a significant number of veterans in the control group had partial PTSD.

The study has several potential limitations. Relatively small number of participants and modest scope of the study limit the ability to generalize our data. These results can be

related only to those veterans with PTSD who sought treatment and who accepted participation in the study. As all participants are veterans with PTSD, who very often, especially in the initial phase of the treatment show high level of distrust and ineligibility, the fact that 51.7% of veterans with PTSD have refused participation, should not be surprising. Owing to the cross-sectional nature of the study, it is hard to reach causal conclusions. Generalization is also limited

by the sample inhomogeneity in two demographic variables (economic status and employment), which can act as mediators in the development of comorbid mental and somatic diseases. However, demographic differences between veterans with PTSD and veterans without PTSD were expected and they correspond to findings in many studies of PTSD in war veterans.²⁹ Economic status and employment are correlated and they are the effect of frequent professional dysfunction of veterans with PTSD. A series of studies show that veterans with PTSD are more often unemployed, and when they are employed, they often have lower salaries than veterans without PTSD (39). Frequent physical diseases also affect their work ability.³⁰

In spite of the limitations, we may suggest that there is a strong correlation between PTSD and health condition of war veterans. PTSD in war veterans is almost always accompanied by a range of psychiatric and somatic diseases. Furthermore, the rate of multiple psychiatric comorbidity in veterans with chronic PTSD is higher than the rate of single comorbidity and the rate of current PTSD. The finding may have clinical implications for the treatment.

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Conflict of interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership; employment; consultancies; stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements) or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

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