

Psychiatric Heredity and Posttraumatic Stress Disorder: Survey Study of War Veterans

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> **Received:** December 13, 2007

> **Accepted:** March 7, 2007

> **Croat Med J. 2007;48:146-56**

Aim To explore the prevalence of psychiatric heredity (family history of psychiatric illness, alcohol dependence disorder, and suicidality) and its association with the diagnosis of stress-related disorders in Croatian war veterans established during psychiatric examination.

Methods The study included 415 war veterans who were psychiatrically assessed and diagnosed by the same psychiatrist during an expert examination conducted for the purposes of compensation seeking. Data were collected by a structured diagnostic procedure.

Results There was no significant correlation between psychiatric heredity of psychiatric illness, alcohol dependence, or suicidality and diagnosis of posttraumatic stress disorder (PTSD) or PTSD with psychiatric comorbidity. Diagnoses of psychosis or psychosis with comorbidity significantly correlated with psychiatric heredity ($\phi = 0.111$; $P = 0.023$). There was a statistically significant correlation between maternal psychiatric illness and the patients' diagnoses of partial PTSD or partial PTSD with comorbidity ($\phi = 0.104$; $P = 0.035$) and psychosis or psychosis with comorbidity ($\phi = 0.113$; $P = 0.022$); paternal psychiatric illness and the patients' diagnoses of psychosis or psychosis with comorbidity ($\phi = 0.130$; $P = 0.008$), alcohol dependence or alcohol dependence with comorbidity ($\phi = 0.166$; $P = 0.001$); psychiatric illness in the primary family with the patients' psychosis or psychosis with comorbidity ($\phi = 0.115$; $P = 0.019$); alcohol dependence in the primary family with the patients' personality disorder or personality disorder with comorbidity ($\phi = 0.099$; $P = 0.044$); and suicidality in the primary family and a diagnosis of personality disorder or personality disorder with comorbidity ($\phi = 0.128$; $P = 0.009$).

Conclusion The study confirmed that parental and familial positive history of psychiatric disorders puts the individual at higher risk for developing psychiatric illness or alcohol or drug dependence disorder. Psychiatric heredity might not be necessary for the individual who was exposed to severe combat-related events to develop symptoms of PTSD.

There are several risk factors associated with the development of posttraumatic stress disorder (PTSD), such as factors related to cognitive and biological systems and genetic and familial risk (1), environmental and demographic factors (2), and personality and psychiatric anamnesis (3).

They are usually grouped into three categories: factors that preceded the exposure to trauma or pre-trauma factors; factors associated with trauma exposure itself; and post-trauma factors that are associated with the recovery environment (2,4).

There are many studies which support the hypothesis that pre-trauma factors, such as ongoing life stress, psychiatric history, female sex (3), childhood abuse, low economic status, lack of education, low intelligence, lack of social support (5), belonging to racial and ethnic minority, previous traumatic events, psychiatric heredity, and a history of perceived life threat, influence the development of stress related disorders (6). Many findings suggest that ongoing life stress or prior trauma history sensitizes a person to a new stressor (2,7-9). The same is true for the lack of social support, particularly the loss of support from significant others (2,9-11), as well as from friends and community (12-14). If the community does not have an elaborated plan for providing socioeconomic support to the victims, then the low socioeconomic status can also be an important predictor of a psychological outcome such as PTSD (2,10,15). Unemployment was recognized as a risk factor for developing PTSD in a survey of 374 trauma survivors (16). It is known that PTSD commonly occurs in patients with a previous psychiatric history of mental disorders, such as affective disorders, other anxiety disorders, somatization, substance abuse, or dissociative disorders (17-21). Epidemiological studies showed that pre-existing psychiatric problems are one of the three factors that can predict the development of PTSD (2,22). Pre-existing anxiety disorders, somatoform disorders, and depressive disorders can significantly increase the risk of

PTSD (23). Women have a higher vulnerability for PTSD than men if they experienced sexually motivated violence or had pre-existing anxiety disorders (23,24). A number of studies have examined the effects of gender differences on the predisposition for developing PTSD, with the explanation that women generally have higher rates of depression and anxiety disorders (3,25,26). War-zone stressors were described as more important for PTSD in men, whereas post-trauma resilience-recovery factors as more important for women (27).

Lower levels of education and poorer cognitive abilities also appear to be risk factors (25). Golier et al (25) reported that low levels of education and low IQ were associated with poorer recall on words memorization tasks. In addition, this study found that the PTSD group with lower Wechsler Adult Intelligence Scale-Revised (WAIS-R) scores had fewer years of education (25). Nevertheless, some experts provided evidence for poorer cognitive ability in PTSD patients as a result or consequence rather than the cause of stress-related symptoms (28-31). Studies of war veterans showed that belonging to racial and ethnic minority could influence higher rates of developing PTSD even after the adjustment for combat exposure (32,33). Many findings suggest that early trauma in childhood, such as physical or sexual abuse or even neglect, can be associated with adult psychopathology and lead to the development of PTSD (2,5,26,34,35). Surveys on animal models confirm the findings of life-long influences of early experience on stress hormone reactivity (36).

Along with the reports on the effects of childhood adversity as a risk factor for the later development of PTSD, there is also evidence for the influence of previous exposure to trauma related events on PTSD (9,26,28). Breslau et al (36) reported that previous trauma experience substantially increased the risk for chronic PTSD.

Perceived life threats and coping strategies carry a high risk for developing PTSD (9,26). For

instance, Ozer et al (9) reported that dissociation during trauma exposure has high predictive value for later development of PTSD. Along with that, the way in which people process and interpret perceived threats has a great impact on the development or maintenance of PTSD (37,38).

Brewin et al (2) reported that individual and family psychiatric history had more uniform predictive effects than other risk factors. Still, this kind of influence has not been examined yet.

Keeping in mind the lack of investigation of parental psychiatric heredity on the development of stress-related disorders, the aim of our study was to explore the prevalence and correlation between the heredity of psychiatric illness, alcohol dependence, suicidality, and the established diagnosis of stress-related disorders in Croatian 1991-1995 war veterans.

Subjects and methods

Subjects

The study included 415 war veterans, 405 men and 10 women (Table 1). The subjects were selected from the total number of 1055 war veterans who had undergone an expert examination for the purposes of compensation seeking to confirm the diagnosis of stress-related disorders. Only veterans who were examined by a single psychiatrist were included in the study to avoid possible inconsistencies between various clinical assessors. Mean age \pm standard deviation of subjects was 44.2 ± 7.50 (range 29 to 75). Mean duration of their combat activity was 28.9 ± 20.22 months (range 1-70 months). Mean duration of outpatient psychiatric treatment was 4.3 ± 3.47 years.

Most participants had at least some secondary education (63%) and were married (77.1%). More than a half of subjects were retired (55.4%). The majority of the individuals started with outpatient treatment in the period after the war

Table 1. Socio-demographic characteristics of the war veterans (n = 415)

Characteristic	No. (%) of veterans
Sex:	
men	405 (97.6)
women	10 (2.4)
Education:	
partial primary school	21 (5.1)
primary school	104 (25.1)
vocational school	230 (55.4)
secondary school	34 (8.2)
college	12 (2.9)
university education	14 (3.4)
Employment status:	
unemployed	73 (17.6)
medical leave	23 (5.5)
social care	20 (4.8)
employed	69 (16.6)
retired	230 (55.4)
Marital status:	
married	320 (77.1)
unmarried	45 (10.8)
divorced	34 (8.2)
unmarried but live with a partner	13 (3.1)
widowed	3 (0.7)
Beginning of the outpatient treatment:	
before the war	13 (3.1)
during the war	56 (13.5)
after the war	346 (83.4)
Physical injury in the war:	
yes	81 (19.5)
no	334 (80.5)

(83.4%) and 19.5% of them were physically disabled veterans.

Method

The survey was conducted in the Regional Center for Psychotrauma of University Hospital Dubrava in Zagreb from June 2002 to December 2004. Data were collected during the expert examination process. The following variables were evaluated: age, education, employment, marital status, duration of combat activities, duration and the start of outpatient treatment, status of combat-related physical disability, diagnosis established during the exam and heredity of psychiatric illness, alcohol dependence, and suicidality. The PTSD diagnosis, comorbid diagnoses, and other established diagnoses, were made according to the criteria of the International Classification of Disorders (ICD-10) (39). We also took into account the diagnosis of partial PTSD which includes the presence of one or two subscales of PTSD symptoms (reexperiencing,

avoidance, and hyperarousal subscale of PTSD symptoms are not fully presented).

Data collection

Data were collected using a structured diagnostic procedure. The participants were first subjected to a structured clinical interview, which included socio-demographic data: age, sex, education, working and marital status, and data on family history of psychiatric disorders. Family was defined as the patient's mother and father, and primary family included all other first degree blood relatives. Data about former and current psychiatric symptoms were collected using the following instruments: Clinician Administered PTSD Scale (CAPS) (40), Clinical Global Impression (CGI) (41) scale, the Trauma Questionnaire (42), Mississippi Scale for Combat-related PTSD (43), and Minnesota Multiphasic Personality Inventory 2 (44).

Data from military service and previous medical documentation were also collected.

Statistical analysis

The variables were evaluated descriptively and the correlations between the established diagnoses of stress-related disorders and data on parents' and primary family psychiatric history were analyzed. Psychiatric illness, alcohol dependence, and suicidality were analyzed each variable independently and all together as one variable, using Cramer phi-coefficient for dichotomous variables. Statistical analyses were performed using the Statistical Package for the Social Sciences, version 9.0 (SPSS Inc., Chicago, IL, USA). $P < 0.05$ was considered statistically significant.

Results

We explored whether PTSD and other stress-related disorders with comorbidity are associated with psychiatric heredity, such as psychiatric illness, alcohol dependence, and suicidality in parents and primary family members.

The diagnosis which was most frequently established without comorbidity was PTSD (10.3%), followed by mixed anxiety and depressive disorder, depressive disorder, somatoform, and adjustment disorder (7.0%) (Table 2). Taking into account the comorbid diagnoses, most patients met the criteria for anxiety and depressive disorder, depressive disorder, somatoform, and adjustment disorder comorbid with another psychiatric disorder (35.2%) (Table 2). PTSD and PTSD with comorbidity were less frequent (33.5%). Other comorbid diagnoses in combat-experienced soldiers with posttraumatic stress disorder are listed in Table 2. Partial PTSD or partial PTSD with comorbid diagnoses were found in 10.8% of our patients; 8.2% of patients were diagnosed with personality disorder or personality disorder with comorbidity; 2.9% with psychosis or psychosis with comorbidity; and 1.9% with alcohol dependence disorder or alcohol dependence disorder with comorbid diagnoses. Other diagnoses were established in 7.5% ($n = 415$) subjects (Table 2).

Table 2. Diagnoses established during expert examination for compensation seeking

Diagnoses	No. (%) of patients	
	with comorbid diagnosis	without comorbid diagnosis
PTSD*	139 (33.5)	43 (10.3)
Partial PTSD†	45 (10.8)	5 (1.2)
Anxiety-depressive disorders‡	146 (35.2)	29 (7.0)
Personality disorders§	34 (8.2)	1 (0.2)
Psychosis¶	12 (2.9)	8 (1.9)
Alcohol dependence¶	8 (1.9)	1 (0.2)
Other diagnoses	31 (7.5)	0 (0.0)

*Diagnosis PTSD includes posttraumatic stress disorder and posttraumatic stress disorder with comorbid diagnosis.

†Partial PTSD includes partial posttraumatic stress disorder and partial posttraumatic stress disorder with comorbid diagnosis.

‡Anxiety depressive disorders with or without comorbid diagnosis, depressive disorder with or without comorbid diagnosis, somatoform disorder with or without comorbid diagnosis, adjustment disorder with or without comorbid diagnosis.

§Primary personality disorder with or without comorbid diagnosis.

¶Psychotic disorders with or without comorbid diagnosis.

¶Alcohol dependence with or without comorbid diagnosis.

Data on family history of psychiatric disorders were based on patients' self report. They were asked whether any of the following three were different psychiatric problems/disorders diagnosed to their mother, father, or someone else

in their primary family: psychiatric illness, alcohol dependence, and suicidality. Because all three hereditary characteristics can be observed as psychopathology, we took them as a representation of psychiatric heredity. We grouped all three hereditary characteristics (psychiatric illness, suicidality, and alcohol dependence disorder) in a single variable that represented family psychiatric history, in order to investigate if there was a significant association between psychiatric heredity and stress-related disorders. There was no significant association between psychiatric heredity and diagnosis of PTSD or PTSD with comorbidity. The same was true for other diagnoses, with the exception of psychosis or psychosis with comorbidity, which was significantly associated with psychiatric heredity ($P=0.023$) (Table 3). There were significant correlation between psychosis or psychosis with comorbid diagnoses and psychiatric heredity ($\phi=0.111$).

We explored whether there was a significant correlation between stress-related disorders and the psychiatric illness of the mother, father, or someone else in the primary family. There was a statistically significant association between maternal psychiatric illness of and partial PTSD or

partial PTSD with comorbidity ($P=0.035$) established during the expert examination (Table 4). The phi-coefficient indicated a significant correlation ($\phi=0.104$) between maternal psychiatric illness and the development of partial PTSD or partial PTSD with comorbid diagnoses.

A statistically significant association was found between maternal psychiatric illness and the patient's psychosis or psychosis with comorbidity ($P=0.022$) (Table 4). The phi-coefficient indicated a correlation of 0.113 between individuals whose mother had a psychiatric illness and individuals who developed psychosis or psychosis comorbid with other diagnoses.

Further analyses showed a statistically significant association between paternal positive history of psychiatric illness and the patients' diagnoses of psychosis or psychosis with comorbidity ($P=0.008$) and alcohol dependence or alcohol dependence with comorbidity ($P=0.001$) (Table 4). There was a significant correlation ($\phi=0.13$) between positive parental history of psychiatric illness and the development of psychosis, as well as a significant correlation ($\phi=0.166$) between positive parental history of psychiatric illness and

Table 3. Correlation between positive psychiatric heredity (mother, father, primary family) and diagnoses established during expert examination

Diagnoses established during expert examination	Psychiatric heredity (No., %)		Φ	P
	yes	no		
PTSD and PTSD with comorbidity:				
yes	31 (7.5)	108 (26.0)	0.009	0.839
no	64 (15.4)	212 (51.1)		
Partial PTSD and partial PTSD with comorbidity:				
yes	12 (2.9)	33 (8.0)	0.031	0.523
no	83 (20.0)	287 (69.2)		
Mixed anxiety and depressive disorder and mixed anxiety and depressive disorder with comorbidity; depressive disorder and depressive disorder with comorbidity; somatoform disorders and somatoform disorders with comorbidity; adjustment disorders and adjustment disorders with comorbidity:				
yes	35 (8.4)	111 (26.7)	0.019	0.699
no	60 (14.5)	209 (50.4)		
Personality disorders and personality disorders with comorbidity:				
yes	4 (1.0)	30 (7.2)	0.079	0.107
no	91 (21.9)	290 (69.9)		
Psychosis and psychosis with comorbidity:				
yes	6 (1.4)	6 (1.4)	0.111	0.023
no	89 (21.4)	314 (75.7)		
Alcohol dependence and alcohol dependence with comorbidity:				
yes	2 (0.5)	6 (1.4)	0.007	0.886
no	93 (22.4)	314 (75.7)		
Other diagnoses:				
yes	5 (1.2)	26 (6.3)	0.045	0.352
no	90 (21.7)	294 (70.8)		

Table 4. Correlation between positive family history (mother, father, primary family) of psychiatric illnesses and diagnoses established during expert examination

Diagnoses established during expert examination	Psychiatric illnesses (No., %)											
	mother				father				primary family			
	yes	no	Φ	P	yes	no	Φ	P	yes	no	Φ	P
PTSD and PTSD with comorbidity:												
yes	0	139 (33.5)	0.078	0.110	0	139 (33.5)	0.070	0.154	4 (1.0)	135 (32.5)	0.036	0.463
no	5 (1.2)	271 (65.3)			4 (1.0)	272 (65.5)			12 (2.9)	264 (63.6)		
Partial PTSD and partial PTSD with comorbidity:												
yes	2 (0.5)	43 (10.4)	0.104	0.035	0	45 (10.8)	0.034	0.483	2 (0.5)	43 (10.4)	0.011	0.828
no	3 (0.7)	367 (88.4)			4 (1.0)	366 (88.2)			14 (3.4)	356 (85.8)		
Mixed anxiety and depressive disorder and mixed anxiety and depressive disorder with comorbidity; depressive disorder and depressive disorder with comorbidity; somatoform disorders and somatoform disorders with comorbidity; adjustment disorders and adjustment disorders with comorbidity:												
yes	2 (0.5)	144 (34.7)	0.011	0.820	1 (0.2)	145 (34.9)	0.021	0.668	5 (1.2)	141 (34.0)	0.017	0.737
no	3 (0.7)	266 (64.1)			3 (0.7)	266 (64.1)			11 (2.7)	258 (62.2)		
Personality disorders and personality disorders with comorbidity:												
yes	0	34 (8.2)	0.033	0.502	1 (0.2)	33 (8.0)	0.060	0.218	1 (0.2)	33 (8.0)	0.014	0.773
no	5 (1.2)	376 (90.6)			3 (0.7)	378 (91.1)			15 (3.6)	366 (88.2)		
Psychosis and psychosis with comorbidity:												
yes	1 (0.2)	11 (2.7)	0.113	0.022	1 (0.2)	11 (2.7)	0.130	0.008	2 (0.5)	10 (2.4)	0.115	0.019
no	4 (1.0)	399 (96.1)			3 (0.7)	400 (96.4)			14 (3.4)	389 (93.7)		
Alcohol dependence and alcohol dependence with comorbidity:												
yes	0	8 (1.9)	0.015	0.752	1 (0.2)	7 (1.7)	0.166	0.001	1 (0.2)	7 (1.7)	0.063	0.200
no	1.2(5)	402 (96.9)			3 (0.7)	404 (97.3)			15 (3.6)	392 (94.5)		
Other diagnoses:												
yes	0	31 (7.5)	0.031	0.523	0	31 (7.5)	0.028	0.568	1 (0.2)	30 (7.2)	0.009	0.850
no	5 (1.2)	379 (91.3)			4 (1.0)	380 (91.6)			15 (3.6)	369 (88.9)		

the development of alcohol dependence disorder.

We also found a statistically significant association between a positive history of psychiatric illness in the primary family and the patients' psychosis or psychosis with other comorbid diagnoses ($P=0.019$) (Table 4).

There was no statistically significant correlation between maternal or paternal positive history of alcohol dependence and any diagnosis established during the expert examination (Table 5).

According to the phi-coefficient ($\phi=0.099$), the diagnoses of personality disorder or personality disorder with comorbidity established during the expert examination were significantly associated ($P=0.044$) with a positive history of alcohol dependence in the primary family.

There was no significant correlation between maternal or paternal positive history of suicidality and the patients' diagnoses, but we found a

statistically significant association between a positive history of suicidality in the primary family and a diagnosis of personality disorder or personality disorder with comorbidity ($P=0.009$) (Table 6). The phi-coefficient indicated the correlation of 0.128 between individuals with a positive history of suicidality in the primary family and individuals who developed a personality disorder or personality disorder with other comorbid diagnoses as a result of stress-related experience.

Discussion

Our results showed that one third of the war veterans who underwent an expert psychiatric examination had a diagnosis of PTSD or PTSD comorbid with other psychiatric disorder. These results are higher than in the population of 3016 male Vietnam War veterans, in which 15% had PTSD and an additional 11% had partial PTSD (45), but they are similar to an earlier Croatian

Table 5. Correlation between positive family history (mother, father, primary family) of alcohol dependence and diagnoses established during expert examination

Diagnoses established during expert examination	Alcohol dependence (No., %)											
	mother				father				primary family			
	yes	no	Φ	<i>P</i>	yes	no	Φ	<i>P</i>	yes	no	Φ	<i>P</i>
PTSD and PTSD with comorbidity:												
yes	4 (1.0)	135 (32.5)	0.000	0.990	24 (5.8)	115 (27.7)	0.008	0.878	27 (6.5)	212 (27.0)	0.011	0.816
no	8 (1.9)	268 (64.6)			46 (11.1)	230 (55.4)			51 (12.3)	225 (54.2)		
Partial PTSD and partial PTSD with comorbidity:												
yes	1 (0.2)	44 (10.6)	0.014	0.777	9 (2.2)	36 (8.7)	0.029	0.552	10 (2.4)	35 (8.4)	0.031	0.533
no	11 (2.7)	359 (86.5)			61 (14.7)	309 (74.5)			68 (16.4)	302 (72.8)		
Mixed anxiety and depressive disorder and mixed anxiety and depressive disorder with comorbidity; depressive disorder and depressive disorder with comorbidity; somatoform disorders and somatoform disorders with comorbidity; adjustment disorders and adjustment disorders with comorbidity:												
yes	5 (1.2)	141 (34.0)	0.023	0.633	26 (6.3)	120 (28.9)	0.018	0.706	29 (7.0)	117 (28.2)	0.020	0.682
no	7 (1.7)	262 (63.1)			44 (10.6)	225 (54.2)			49 (11.8)	220 (53.0)		
Personality disorders and personality disorders with comorbidity:												
yes	0	34 (8.2)	0.052	0.294	2 (0.5)	32 (7.7)	0.088	0.074	2 (0.5)	32 (7.7)	0.099	0.044
no	12 (2.9)	369 (88.9)			68 (16.4)	313 (75.4)			76 (18.3)	305 (73.5)		
Psychosis and psychosis with comorbidity:												
yes	0	12 (2.9)	0.030	0.544	4 (1.0)	8 (1.9)	0.076	0.122	4 (1.0)	8 (1.9)	0.064	0.191
no	12 (2.9)	391 (94.2)			66 (15.9)	337 (81.2)			74 (17.8)	329 (79.3)		
Alcohol dependence and alcohol dependence with comorbidity:												
yes	0	8 (1.9)	0.024	0.622	1 (0.2)	7 (1.7)	0.016	0.739	1 (0.2)	7 (1.7)	0.023	0.645
no	12 (2.9)	395 (95.2)			69 (16.6)	338 (81.4)			77 (18.6)	330 (79.5)		
Other diagnoses:												
yes	2 (0.5)	29 (7.0)	0.060	0.219	4 (1.0)	27 (6.5)	0.030	0.540	5 (1.2)	26 (6.3)	0.019	0.693
no	10 (2.4)	374 (90.1)			66 (15.9)	318 (76.6)			73 (17.6)	311 (74.9)		

study where 34% war veterans had the diagnosis of PTSD or PTSD with a comorbid diagnosis (46). The reason for the discrepancy between Croatian and Vietnam War veterans may lie in the characteristics of the samples. Our sample was selected from veterans who requested an expert evaluation for the purposes of compensation seeking. It means that all of the participants had a diagnosis of PTSD or PTSD comorbid with other psychiatric disorder previously established by local psychiatrists, while the study of Vietnam veterans was not conducted on the clinical population of war veterans. Another reason may be that the time passed between the combat exposure and the examination was shorter in our study than in the Vietnam study (on average 8 years after the combat in our study, compared with 20 years in the Vietnam study). A variety of different settings and methodologies are available for investigating the prevalence of PTSD and future studies need to examine a larger sample (47).

Epidemiological surveys indicate that approximately 80% of individuals with PTSD meet the criteria for at least one of the other psychiatric diagnoses (17). It is because some PTSD patients developed other problems secondary to the development of PTSD, in efforts to cope with PTSD symptoms (18).

In many studies, including an earlier Croatian study (46), the most common diagnoses comorbid with PTSD were depressive disorders, anxiety disorder, and alcohol dependence/abuse (17,19,21,48-51).

Other diagnoses with comorbidities, except PTSD, were anxiety and depressive disorders, major depressive disorders, somatoform, and adjustment disorders (35.2%), followed by other diagnoses (20.5%). In the earlier Croatian study, the most common comorbid disorder was major depression, followed by alcohol dependence/abuse, dysthymic disorder, and personality disorder (21,51).

Table 6. Correlation between positive family history (mother, father, primary family) of suicidality and diagnoses established during expert examination

Diagnoses established during expert examination	Suicidal attempts (No., %)											
	mother				father				primary family			
	yes	no	Φ	<i>P</i>	yes	no	Φ	<i>P</i>	yes	no	Φ	<i>P</i>
PTSD and PTSD with comorbidity:												
yes	2 (0.5)	137 (33.0)	0.014	0.781	3 (0.7)	136 (32.8)	0.062	0.206	1 (0.2)	138 (33.3)	0.032	0.520
no	5 (1.2)	271 (65.3)			2 (0.5)	274 (66.0)			4 (1.0)	272 (65.5)		
Partial PTSD and partial PTSD with comorbidity:												
yes	1 (0.2)	44 (10.6)	0.014	0.768	0	45 (10.8)	0.039	0.433	0	45 (10.8)	0.039	0.433
no	6 (1.4)	364 (87.7)			5 (1.2)	365 (88.0)			5 (1.2)	365 (88.0)		
Mixed anxiety and depressive disorder and mixed anxiety and depressive disorder with comorbidity; depressive disorder and depressive disorder with comorbidity; somatoform disorders and somatoform disorders with comorbidity; adjustment disorders and adjustment disorders with comorbidity:												
yes	1 (0.2)	145 (34.9)	0.057	0.243	2 (0.5)	144 (34.7)	0.011	0.820	2 (0.5)	144 (34.7)	0.011	0.820
no	6 (1.4)	263 (63.4)			3 (0.7)	266 (64.1)			3 (0.7)	266 (64.1)		
Personality disorders and personality disorders with comorbidity:												
yes	1 (0.2)	33 (8.0)	0.029	0.553	0	34 (8.2)	0.033	0.502	2 (0.5)	32 (7.7)	0.128	0.009
no	6 (1.4)	375 (90.4)			5 (1.2)	376 (90.6)			3 (0.7)	378 (91.1)		
Psychosis and psychosis with comorbidity:												
yes	1 (0.2)	11 (2.7)	0.089	0.070	0	12 (2.9)	0.019	0.698	0	12 (2.9)	0.019	0.698
no	6 (1.4)	397 (95.7)			5 (1.2)	398 (95.9)			5 (1.2)	398 (95.9)		
Alcohol dependence and alcohol dependence with comorbidity:												
yes	0	8 (1.9)	0.018	0.708	0	8 (1.9)	0.015	0.752	0	8 (1.9)	0.015	0.752
no	7 (1.7)	400 (96.4)			5 (1.2)	402 (96.9)			5 (1.2)	402 (96.9)		
Other diagnoses:												
yes	1 (0.2)	39 (7.2)	0.034	0.489	0	31 (7.5)	0.031	0.523	0	31 (7.5)	0.031	0.523
no	6 (1.4)	378 (91.1)			5 (1.2)	379 (91.3)			5 (1.2)	379 (91.3)		

In our study, psychiatric heredity was defined as having a positive family history of psychiatric illnesses. We found that 7.5% of veterans with PTSD self-reported psychiatric illness in their family, which is comparable to another Croatian study where 5.9% of veterans with PTSD had a positive family history of psychiatric illness (21).

Since the information about psychiatric heredity was based on patients' self-reporting, we could not make a definite assessment of psychiatric illnesses in the family. In the present study we found that partial PTSD with or without comorbid diagnoses was significantly correlated with maternal psychiatric illness, while a full PTSD diagnosis was not related to a positive psychiatric heredity. One possible explanation for this is that severe combat-experience can lead to a development of PTSD symptoms without pretraumatic vulnerability.

It is known from a number of other studies that there are numerous factors acting together

in the development of PTSD (50-53). These studies emphasize that family history of psychiatric illness, in combination with other risk factors, is of great importance for the development of PTSD. Furthermore, people who have PTSD are at increased risk for the development of other psychiatric disorders (54). It is possible that the lack of a universal response to highly stressful events (55) accounts for the complexity of PTSD.

We found a significant correlation between diagnosis of psychosis and psychosis with comorbidity with psychiatric illness of the mother, father, or other members of the primary family. Again, data about psychiatric heredity in the family were based on the patients' self-reporting, and we assumed that in the past only "serious" psychiatric illnesses, such as psychotic disorders, had been referred for medical treatment. Our results are in line with the studies which show that psychotic disorders may be caused by an interac-

tion of biological and psychosocial factors, and that the genetic component in those types of psychiatric disorders accounts for a much higher prevalence among first degree relatives for developing psychiatric illness than in the general population (56,57).

Furthermore, in our patients paternal positive history of psychiatric illness was significantly associated with alcohol dependence disorders. It is known that individuals with parental and familial positive history of psychiatric disorders are at higher risk for developing psychiatric illness or substance abuse disorder sometimes in their life (58). This correlation is especially interesting in Croatian cultural and social background, which is very tolerant of the consumption of alcohol beverages (59).

Our data showed that the presence of suicidal behavior in the primary family was significantly associated with a diagnosis of personality disorder. This finding can be interpreted as a result of dysfunctional family relationships and disturbances in the family dynamics, such as child neglect and attachment problems. This could also predispose the individual to antisocial behavior (60-62). Many studies suggest that individuals at risk for suicidal behavior and personality disorders have higher rates of affective disorders (depression or bipolar illness) and/or suicide in the family (63,64).

The main limitation of this study is a lack of medical documentation on the data related to the family history of psychiatric illnesses. We suspect that we may have underestimated the number of examinees with a positive family history. Therefore, it is important to emphasize that our findings cannot be generally applied to all Croatian war veterans.

In conclusion, the study confirmed that parental and familial positive history of psychiatric disorders puts the individual at higher risk for developing psychiatric illness or alcohol or drug dependence disorder. Psychiatric heredity might not be necessary for the individual exposed to se-

vere combat-related events to develop symptoms of PTSD.

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