PSYCHOLOGICAL AND SOMATIC HEALTH PROBLEMS IN BOSNIAN REFUGEES: A THREE YEAR FOLLOW-UP

Sarajlić Vuković, Iris; Jovanović, Nikolina; Kolarić, Branko; Vidović, Vesna; Francis Mollica, Richard

Source / Izvornik: **Psychiatria Danubina, 2014, 26, 442 - 449**

Journal article, Published version
Rad u časopisu, Objavljena verzija rada (izdavačev PDF)

Permanent link / Trajna poveznica: https://urn.nsk.hr/urn:nbn:hr:184:595276

Psychiatria Danubina, 2014; Vol. 26, Suppl. 3, pp 442-449 *Original paper*

PSYCHOLOGICAL AND SOMATIC HEALTH PROBLEMS IN BOSNIAN REFUGEES: A THREE YEAR FOLLOW-UP

Iris Sarajlić Vuković[1], Nikolina Jovanović[2,3], Branko Kolarić[4,5], Vesna Vidović[6] & Richard Francis Mollica[7]

[1]*Department of Mental Health and Addiction Prevention, Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia*
[2]*Department of Psychiatry, Clinical Hospital Center Zagreb, Croatia*
[3]*Department of Psychiatry, School of Medicine, University of Zagreb, Croatia*
[4]*Department for Social Medicine and Epidemiology, School of Medicine, University of Rijeka, Croatia*
[5]*Public Health, Social Medicine and Gerontology Service, Zagreb County Institute of Public Health, Croatia*
[6]*Department of Psychological Medicine, Clinical Hospital Center Zagreb*
[7]*Harvard Program in Refugee Trauma, Department of Psychiatry, Massachusetts General Hospital, Cambridge, USA*

SUMMARY

Background: *Aim of this study was to explore association between psychiatric disorders (PTSD and depression) and chronic medical illnesses in a group of Bosnian refugees followed up for three years (1996-1999).*

Subjects and methods: *Study was conducted in refugee camps in Varaždin, Nbaseline=534, Nendpoint=376 (70.4%). The interviews were conducted in Bosnian, data on depression and PTSD were collected using the Hopkins Symptom Checklist-25 and Harvard Trauma Questionnaire, respectively. Medical conditions were self-reported.*

Results: *Most important findings: 1) Half of the sample at both study points reported no psychiatric problems (N=294, 55% vs. N=225, 59%), others suffered from depression (N=99, 18.5% at both times), PTSD (N=30, 5.6% vs. N=15, 4%), and depression + PTSD (N=129, 24.2% vs. N=114, 30.3%); 2) A total of 15 medical conditions were identified, and most frequently present were high blood pressure (N=201, 37.6%) and heart disease (N=167, 31.3%); 3) Occurrence of medical conditions was related to the clinical group – they were more frequent in subjects diagnosed with depression and depression + PTSD, than in those who were asymptomatic or suffering from PTSD only.*

Conclusions: *Our data indicate the persistence of both psychological and somatic health problems in Bosnian refugees involved in this study over time. Holistic approach and avoiding of mind-body dualism might be beneficial for the care and long-term prognosis of these people.*

Key words: *posttraumatic stress disorders – depression - medical illnesses – refugee - longitudinal study*

* * * * *

INTRODUCTION

United Nations Convention Relating to the Status of Refugees (1951) defines a refugee as "someone who is unable or unwilling to return to their country of origin owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group, or political opinion". What characterizes life of refugees are traumatic experiences and violence connected to war in countries of their origin, together with cultural shock, problems with adaptation as well as acculturation after arriving to host countries (Ferren 1999).

Due to all these facts, there is a large interest for psychological sequelae of war, such as posttraumatic stress disorder and possible comorbidity with other psychiatric disorders as well as different medical conditions in population exposed to war trauma. PTSD is an anxiety disorder, characterised by intrusive re-collections, emotional numbing, avoidance behavior, and symptoms of vegetative hyperarousal, developed after exposure to extrem traumatic events (APA 1994, WHO 1994). As war is one of the most horrific human experiences characterized with long lasting and complex traumas and multiple losses (home, loved ones and ideals), PTSD is often accompanied by prolonged grief, and at the end with depression (Momartin et al. 2004). During clinical treatment of patients with PTSD, high incidence of other disorders were observed which encouraged investigation of comorbid conditions (Kozarić-Kovačić et al. 2000, Mollica et al. 1993, Mollica et al. 1997, Mollica et al. 1988). These investigations showed that depressive disorder, bipolar disorder, and other anxiety disorders as well as abuse of alcohol are most common diagnoses that accompany PTSD. Comorbidity of PTSD and depression was shown in studies of the refugee adult population (Mollica et al. 1999, Mollica et al. 2001, Klarić et al. 2007, Momartin et al. 2004), as well as in refugee children during and in the post-war period. (Stein et al. 1999, Thabet et al. 2004, Hasanović et al. 2006). There is a large interest in investigating comorbidity of PTSD and physical health problems, as well as comorbidity of depression and physical health problems. There is a growing literature on impact of extended stress on physical health in refugees (Kinzie et al. 1990, Kinzie et al. 2008, Gregurek et al. 1998, Kadojić et al. 1999) as well as in general population (Goodwin & Davidson 2005, Hezler et al. 1987), and it

is more and more obvious that there is a connection between diagnosed PTSD and somatic disorders, as well as with depression (Miranda et al. 2002). Kadojić et al. (1999) investigated the impact of traumatic experience of war sufferers on cerebrovascular disease and found that total risk for stroke was higher in the exposed group. Gregurek et al. (1998) investigated change in pulse rate among civilians during air-raid and concluded that there was no adaptation to a traumatic war situation, as civilians reacted with incrised pulse frequency at every moment of the air-raid sound. In their retrospective study Bergovac and al. (2005) examined the effects of war in Bosnia and Herzegovina on the occurrence of acute coronary syndrome among civilians. Results had shown that in five year period during the war, the common population had increased numbers of acute myocardial infarction and unstable angina pectoris cases. In the long term follow-up of the prevalence of essential hypertension in the family members of soldiers killed during the war in Bosnia and Herzegovina, Šantić et al. (2006) showed higher rates than in the families without killed relatives.

Due to the war in Bosnia and Herzegovina, a large number of refugees came to the Republic of Croatia in the course of 1992 to 1995. In the summer of 1991, the number of displaced persons and refugees in Croatia was 90.000, and in October the same year it was 400.000 (Lang 1993). There are studies dealing with PTSD and its sequelae on Bosnian refugees. In 1996, we reported initial findings of a study of Bosnian refugees, demonstrated an association between psychiatric disorders (depression and posttraumatic stress disorder) and disability in a refugee population (Mollica et al. 1999). The goal was to assess the degree of disability associated with trauma and other risk factors, the relationship between psychiatric symptoms (depression and PTSD) and disability, and the relation between chronic medical illnesses and disability. In 1999, those who were still living in the region and the families of those who died were re-interviewed, and the next report was done. That report investigated the association between psychiatric disorders (depression and PTSD), disability, and other baseline risk factors with follow up status, chronicity of psychiatric disorders and disability and their relationship at both points in time, and risk adjusted association of psychiatric disorders and disability with the likelihood of mortality and emigration (Mollica et al. 2001).

In this study, our aim is to explore the association between psychiatric disorders (PTSD and depression) and chronic medical illnesses in a group of Bosnian refugees who were followed up over three years.

SUBJECTS AND METHODS

In 1992, Croatian government established, among others, refugee camps in Varaždin, Northeastern Croatia. In the same year, NGO Ruke from Zagreb, Croatia began providing counseling and other psychosocial services to camp residents.

In 1996, Ruke and the Harvard Program of Refugee Trauma interviewed 573 adults from families, totaling 1275 people, living in Varaždin camps. In 1999, the Harvard Program in Refugee Trauma and 9 members of the original interviewing staff located and re-interviewed all the original respondents still living in the region and families of the deceased. The re-interview followed procedures established in the baseline study (Mollica et al. 1999). Study design and inform consent procedure was approved by the Human subjects committee of the Harvard Medical School as well as by Ethical Committee, Clinical Hospital Center Zagreb. The interviews were conducted in Bosnian, took approximately 90 minutes per person and they consisted of interviewers explaining the purpose of the study, together with reading the text with an explanation of confidentiality, anonymity and voluntary participation. The participants were told that they could choose not to answer specific questions. Each interview included the Hopkins Symptom Checklist 25 (HCSL 25) (Mollica et al. 1987) and Bosnian version of the Harvard Trauma Questionnaire (HTQ) (Mollica et al. 1992, Oruc et al. 2008).

The HCSL 25 is a 15 item scale used to assess depressive symptoms, and the HTQ contains a scale consisting of 16 of 17 diagnostic criteria for PTSD as defined in DSM IV. As described in previous reports, scale cutoff points have not been established in this population, and an algorithm method was selected that replicated DSM IV criteria for diagnosis of depression (HCSL 25) and PTSD (HTQ) (Mollica et al. 1987, Mollica et al. 1992, Oruc et al. 2008, Klejin et al. 2001).

We required a positive response, three or four on the HCSL 25, on either depressed mood or diminished interest or pleasure, and at least four of six DSM IV Criterion A symptoms (significant weight loss or change in appetite, insomnia or hypersomnia, fatigue or loss of energy, feelings of worthlessness, diminished ability to think or concentrate, and recurrent thoughts of death) (APA 1994). Observable psychomotor agitation or retardation, which is also criterion A symptom, was omitted because interviewers did not conduct a mental status examination in this study. For PTSD, the DSM IV algorithm included a positive response, 3 or 4 on the HTQ, on at least 1 of the re-experiencing symptoms from criterion B, at least 3 of the 7 avoidance and numbing symptoms from criterion C, and at least 2 of the 5 arousal symptoms from criterion D. Exposure to a traumatic event, which is criterion A, was deemed to have been met by all respondents (Mollica et al. 1999, Mollica et al. 2001).

Medical conditions for this study are defined as self-reported history of high blood pressure, heart disease, stroke, cancer, anemia, tuberculosis, diabetes, arthritis, duodenal or ventricular ulcer, asthma, cirrhosis or liver disease, alcohol or drug abuse, gynecological disorder, epilepsy. The subjects were asked in the (self-report)

questionnaire if their doctor ever told them that they suffered from any of the listed conditions, due to the fact that at that point of time they could not have medical records.

For statistical analysis, SPSS version 17.01 (SPSS, Inc., Chicago, IL) (1998) software was used. Chi-square test was used to compare differences between groups of nominal variables and Mann Whitney U or Kruskal-Wallis for assessing differences between ordinal variables. The level of statistical significance was set to α=0.05.

RESULTS

Study sample consists of 534 subjects (Nbaseline = 534, Nendpoint =376, 70.4%), mostly women (N=315, 59%) in 35-54 age group (N=181, 33.9%), married (N=252, 47.2%), unemployed (N=315, 83.3%) and without formal education (N=197, 36.9%). General characteristics are given in Table 1. The endpoint sample differs only in age due to the fact that population was older after three years (chi square=12.38, df=3, p=0.006).

Baseline data (year 1996) suggests that half of the sample had did not qualify for any psychiatric disorder (N=294, 55%), while 99 subjects (18.5%) met criteria for the diagnosis of depression and 30 subjects (5.6 %) for PTSD. A total of 110 respondents (20.6%) were diagnosed with both, depression and PTSD. In 1999 the results were very similar - 225 subjects (59%) were asymptomatic, 86 (22.8%) met criteria for the diagnosis of depression and 15 for PTSD (4.0%). A total of 52 respondents (13.8%) met criteria for the both, depression and PTSD (Table 2). Our results indicate that large proportion of our sample suffered from comorbid medical conditions. A total of 15 medical conditions were identified, and most frequently present were high blood pressure (N=201, 37.6%) and heart disease (N=167, 31.3%). Their distribution across the four clinical groups (asymptomatic, depression, PTSD, depression + PTSD) does not follow a normal distribution (e.g. blood pressure, Kolmogorov-Smirnov=0.41; df=529; p<0.01). Our results indicate that number of medical conditions is related to the clinical group (Kruskal Wallis =95.8; df=3; p<0.01), separate Mann Whitney U tests show the difference and direction of difference between groups: medical conditions were more frequent in subjects diagnosed with depression, and depression together with PTSD, than in those who were asymptomatic or suffering from PTSD only. For details see Table 3.

Table 1. Study sample, N (%)

	Baseline N=534 (100%)	Endpoint N=376 (70.4%)	Statistics
Gender (F/M)	315 (59.0)/219 (41.0)	266 (63.0)/156 (37.0)	χ^2=1.62; p=0.203
Age categories (years)			
18-34	105 (19.7)	49 (13.0)	
35-54	181 (33.9)	137 (36.2)	χ^2=12.36; p=0.006
55-64	137 (25.7)	85 (22.5)	
65+	111 (20.8)	107 (28.3)	
Marital status			
married	252 (47.2)	179 (47.4)	
separated/divorced	65 (12.2)	34 (9.0)	χ^2=5.27; p=0.153
widowed	118 (22.1)	100 (26.5)	
never married	91 (17.0)	52 (13.8)	
Ethnicity			
Bosnian Muslim	320 (59.9)	210 (55.9)	χ^2=3.69; p=0.158
Croat	180 (33.7)	148 (39.4)	
Other	33 (6.2)	17 (4.5)	
Education			
no formal education	197 (36.9)	150 (39.9)	
primary school (8 yrs.)	113 (21.2)	90 (23.9)	χ^2=3.16; p=0.368
high school (12 yrs.)	148 (27.7)	89 (23.7)	
university (14 yrs. or more)	76 (14.2)	47 (12.5)	

Table 2. Psychiatric disorders*, N (%)

	Baseline N=534 (100%)	Endpoint N=376 (70.4%)	Statistics
No symptoms	294 (55.1)	225 (59.5)	χ^2=2.061; p=0.151
Depression	99 (18.5)	86 (22.8)	χ^2=2.558; p=0.110
PTSD	30 (5.6)	15 (4.0)	χ^2=1.245; p=0.265
Depression + PTSD	110 (20.6)	52 (13.8)	χ^2=6.910; p=0.009

* Algorithm method was selected that replicated DSM IV criteria for diagnosis of depression (HCSL 25) and PTSD (HTQ) (ref 26, 27, 28)

Table 3. Difference in total number of clinical conditions due to respondent's psychical symptoms

Clinical groups - tested pairs	Z	P	Mean rank (1)	Mean rank (2)
Asymptomatic-depression	-7.30	<0.001	asymp 173.36	dep 267.21
Asymptomatic –depression and PTSD	-8.17	<0.001	asymp 174.18	dep&ptsp 278.19
Depression - PTSD	-3.01	0.003	dep 70.39	ptsp 47.22
PTSD - depression and PTSD	-3.36	0.001	ptsp 48.68	dep&ptsp 76.45
Asymptomatic - PTSD	-1.64	0.101	asymp159.87	ptsp 188.23
Depression – depression and PTSD	-0.54	0.588	dep 102.64	dep&ptsp 107.13

Table 4. Depression and asymptomatic respondents*

	Baseline N=534 (100%)				Endpoint N=376 (70.4%)			
Comorbid medical conditions	Depression 99 (18.5)	Asymptomatic 294 (55.0)	χ^2	P	Depression 86 (22.8)	Asymptomatic 294 (55.0)	χ^2	P
High blood pressure	53 (53.5)	80 (27.2)	22.92	<0.001	56 (65.1)	61 (27.4)	37.62	<0.001
Heart disease	45 (45.5)	51 (17.3)	31.70	<0.001	45 (52.3)	49 (22.0)	27.01	<0.001
Anemia	36 (36.4)	42 (14.3)	22.69	<0.001	26 (30.2)	40 (17.9)	5.59	0.018
Arthritis	32 (32.3)	48 (16.3)	11.69	0.001	44 (51.2)	57 (25.6)	18.49	<0.001
Kidney disease	23 (23.2)	36 (12.2)	7.01	0.008	25 (29.1)	32 (14.3)	8.94	0.003
Asthma	24 (24.2)	33 (11.2)	10.12	0.001	17 (19.8)	20 (9.0)	6.87	<0.009
Ulcer	26 (26.3)	29 (9.9)	16.55	<0.001	10 (11.6)	8 (3.6)	7.31	0.007
Stroke	14 (14.1)	14 (4.8)	9.85	0.002	3 (3.5)	5 (2.2)	0.38	0.536
Diabetes	12 (12.1)	14 (4.8)	6.49	0.011	14 (16.3)	10 (4.5)	12.05	0.001
Liver cirrhosis	7 (7.1)	14 (4.8)	0.78	0.377	3 (3.5)	3 (1.3)	1.50	0.221
Gynecological	11 (11.3)	21 (7.1)	1.71	0.191	7 (10.9)	12 (9.0)	0.20	0.658
Tuberculosis	3 (3.0)	7 (2.4)	0.13	0.723	5 (5.8)	5 (2.2)	2.53	0.112
Cancer	3 (3.0)	5 (1.7)	0.66	0.418	2 (2.3)	4 (1.8)	0.09	0.761
Seizure	6 (6.1)	4 (1.4)	6.60	0.010	1 (1.2)	4 (1.8)	0.16	0.694

*Psychiatric status was determined by the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition algorithm as described in the text. Medical conditions for this study are defined as self -reported history as described in the text

Table 5. PTSD and asymptomatic respondents*

	Baseline N=534 (100%)				Endpoint N=376 (70.4%)			
Comorbid medical conditions	PTSD 30 (5.6)	Asymptomatic 294 (55.0)	χ^2	P	PTSD 15 (4.0)	Asymptomatic 294 (55.0)	χ^2	P
High blood pressure	9 (30.0)	80 (27.2)	2.89	0.089	4 (26.7)	49 (22.0)	0.18	0.672
Heart disease	12 (40.0)	51 (17.3)	2.19	0.139	6(40.0)	61(27.4)	1.11	0.292
Anemia	4 (13.3)	42 (14.8)	0.18	0.671	4(26.7)	57 (25.6)	0.09	0.924
Arthritis	4 (13.3)	48 (16.3)	0.02	0.887	3 (20.0)	40 (17.9)	0.04	0.841
Kidney disease	5 (16.7)	36 (12.2)	0.48	0.488	4 (26.7)	32 (14.3)	1.66	0.197
Asthma	6 (20.0)	33 (11.2)	1.98	0.159	4 (26.7)	20 (9.0)	4.86	0.028
Ulcer	5 (17.2)	29 (9.9)	7.43	0.006	0 (0.0)	5 (2.2)	0.34	0.560
Stroke	1 (3.3)	14 (4.8)	1.38	0.240	1 (6.7)	8 (3.6)	0.37	0.545
Diabetes	1 (3.3)	21 (7.1)	0.13	0.723	2 (13.3)	3 (1.3)	9.81	0.002
Liver cirrhosis	1 (3.3)	14 (4.8)	0.13	0.723	1 (6.7)	10 (4.5)	0.15	0.697
Gynecological	3 (10.0)	21 (7.1)	0.32	0.569	0 (0.0)	12 (9.0)	0.59	0.443
Tuberculosis	0 (0.0)	7 (2.4)	0.52	0.472	0 (0.0)	4 (1.8)	0.27	0.601
Cancer	0 (0.0)	5 (1.7)	0.73	0.393	1 (6.7)	5 (2.2)	1.12	0.290
Seizure	0 (0.0)	4 (1.4)	0.41	0.520	0 (0.0)	4 (1.8)	0.27	0.601

*Psychiatric status was determined by the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition algorithm as described in the text. PTSD indicates posttraumatic stress disorder. Medical conditions for this study are defined as self -reported history as described in the text

Table 6. PTSD + Depression and asymptomatic respondents*

Comorbid medical conditions	Baseline N=534 (100%)				Endpoint N=376 (70.4%)			
	PTSD + Depression 110 (20.6)	Asymptomatic 294 (55.0)	χ^2	P	PTSD + Depressio 52 (13.8)	Asymptomatic 294 (55.0)	χ^2	P
High blood pressure	61 (55.5)	80 (27.2)	58.02	<0.001	27 (51.9)	49 (22.0)	18.91	<0.001
Heart disease	55 (50.0)	51 (17.3)	18.68	<0.001	27 (51.9)	61 (27.4)	11.70	0.001
Anemia	50 (45.5)	42 (14.8)	36.97	<0.001	35 (67.3)	57 (25.6)	33.01	<0.001
Arthritis	48 (43.6)	48 (16.3)	39.83	<0.001	16 (30.8)	40 (17.9)	4.28	0.039
Kidney disease	32 (29.1)	36 (12.2)	16.22	<0.001	13 (25.0)	32 (14.3)	3.50	0.062
Asthma	27 (24.5)	33 (11.2)	11.23	0.001	16 (30.8)	20 (9.0)	17.62	<0.001
Ulcer	16 (14.7)	29 (9.9)	1.86	0.173	6 (11.8)	8 (3.6)	5.73	0.012
Stroke	16 (14.5)	14 (4.8)	11.15	0.001	5 (9.6)	5 (2.2)	6.54	0.011
Diabetes	14 (12.8)	21 (7.1)	8.03	0.005	4 (7.7)	3 (1.3)	6.85	0.009
Liver cirrhosis	12 (10.9)	14 (4.8)	5.02	0.025	15 (28.8)	10 (4.5)	30.28	<0.001
Gynecological	8 (7.3)	21 (7.1)	0.00	0.564	9 (22.0)	12 (9.0)	5.02	0.025
Tuberculosis	7 (6.4)	7 (2.4)	6.04	0.014	1 (1.9)	4 (1.8)	0.00	0.950
Cancer	4 (3.6)	5 (1.7)	0.48	0.490	0 (0.0)	5 (2.2)	1.19	0.276
Seizure	1 (0.9)	4 (1.4))	0.13	0.715	0 (0.0)	4 (1.8)	0.93	0.335

* Psychiatric status was determined by the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition algorithm as described in the text. PTSD indicates posttraumatic stress disorder. Medical conditions for this study are defined as self - reported history as described in the text

At baseline half of depressed subjects suffered from high blood pressure (N=53, 53.3%) and heart disease (N=45, 45.5%), and when compared to asymptomatic subjects, the difference reached the level of statistical significance (chi square=22.92, df=1, p<0.001; chi square=31.70, df=1, p<0.001). Furthermore, depression was significantly more associated with eight other medical conditions such as anemia, arthritis, kidney disease, asthma, duodenal or ventricular ulcer, stroke, diabetes and epilepsy. Three years later, depression was still significantly associated with all the above mentioned conditions except stroke (chi square=0.38, df=1, p=0.536) and epilepsy (chi square=0.16, df=1 p=0.694). Data in details are given in Table 4.

Table 5 shows associations between PTSD and medical conditions at baseline and endpoint. Again, at baseline PTSD was statistically significantly more frequently (p<0.05) associated with subjects′ reports of being diagnosed with heart disease, and stroke. At endpoint, subjects suffering from PTSD were more frequently suffering from asthma and liver cirrhosis.

Apart from looking at PTSD and depression separately, we also analyzed subjects who suffered from these two psychiatric disorders at the same time (N baseline=110, 20.6%, N endpoint=52, 13.8%, chi square =6.910, df=1, p=0.009). At baseline, this group was characterized with significantly more cases of heart disease, high blood pressure, arthritis, anemia, kidney disease, asthma, stroke, liver cirrhosis, diabetes and cancer. Three years later subjects reported following comorbid medical conditions - heart disease, high blood pressure. arthritis, asthma, anemia, stroke, liver cirrhosis, duodenal or ventricular ulcer, diabetes and gynecological conditions were more frequently present in this group. Data in details are given in Table 6.

DISCUSSION

In this study we aimed to explore the relationship between psychological and somatic health problems in Bosnian refugees in a three year follow-up study. Our major finding is that medical conditions were more frequent in subjects who suffered from PTSD co-morbid with depression and depression alone, than in subjects who were asymptomatic or suffered only from PTSD.

It has been already reported that people who suffer from PTSD have more medical problems. However, only two studies were performed among civilians. Breslau & Davis et al. (1992) reported that young adults who suffered from PTSD for more than one year, unlike those who suffered from it for a shorter period of time, had more medical conditions. Sareen et al. (2007) examined the prevalence and correlates of PTSD in large population-based study and showed that physical health problems were more prevalent among respondents with PTSD compared to those without PTSD. Significantly more studies were performed among combat veterans. For example Shalev and colleagues (1990) found that veterans more frequently reported cardiovascular, hematological, gastrointestinal, audiological difficulties as well as headaches and lower back pain problems when compared to the control group. Similarly, Wolf and collaborators (1994) found that PTSD is connected to increased likelihood of cardiovascular, gastrointestinal, gynecological, ophthalmological/otolaryngological, dermatological illnesses as well as pain. In another study, Kadojić et al. (1999) showed that a group of displaced persons at the time of study exhibited significantly higher rates of arterial hypertension, hyperlipidemia and obesity than subjects in the control group. Long and coauthors (1992) also

reported that PTSD was associated with increased numbers of both: symptoms and chronic disorders. Interestingly, there are only few studies that looked into this problem from the point of trauma exposure (number of lifetime traumas or traumatic events). For example, Cloitre et al. (2001) examined the relationship between the number of lifetime traumas, PTSD, and physical health among women with history of a childhood abuse. Their results suggested that number of interpersonal traumas was a significant predictor of physical health problems diagnosed by physicians, not the symptoms of PTSD. This study suggested that the cumulative burden of traumas may lead to medical problems independent of PTSD symptomatology. Since refugees are more likely to have experienced a great number of traumas, cumulative trauma may be an important cofounder in the relationship between PTSD and chronic medical conditions as it had been shown in work of Sledjeski et al. (2008).

Our results indicate that in our longitudinal study almost all subjects with PTSD were also suffering from both depression and chronic medical conditions. This is interesting, especially in the relation to the above-mentioned studies because it clearly shows what happens when depression is "added" to the equation. Depression is often chronic medical condition and depressed people usually report more physical complaints and use more medical treatment than non-depressed individuals. Depression is often comorbid with other medical conditions, such as diabetes, hypertension, and arthritis and it often worsens their associated health outcomes (Ciechanowski et al. 2000, Moussavi et al. 2007). Yates and colleagues (2004) in their large depression treatment study have shown that 53% of depressed patients had significant medical comorbidity. In our study, at baseline, 18.5% of our subjects had depression, and approximately half of depressed subjects suffered from high blood pressure and heart disease. Compared to asymptomatic subjects, the difference was statistically significant. Also, depression was significantly more associated with anemia, arthritis, kidney disease, asthma, ulcer, stroke, diabetes and seizure. At the end point 22.8% of subjects had depression, which was still significantly associated with all of the above mentioned conditions except stroke and seizure. Research done on the general population has shown that 60-65% subjects with current major depression also had at least one more psychiatric diagnosis (De Graaf et al. 2002, Rush et al. 2005). Blanchard et al. (1998) examined data from 107 motor-vehicle accident victims and their results indicated that PTSD and major depression were correlated but independent responses to trauma, and that those who suffered from PTSD and depression were more distressed. Depression is a common comorbid condition among individuals with PTSD. Southwick, Yehuda and Giller (1991) found that 53.4% of the Vietnam veterans suffering from PTSD had comorbid major depression. In civilian population, Breslau et al. (1992) in their study of young urban adults who went through various traumas, found that 9.2% had developed PTSD and that 36.6% of those with PTSD met the criteria for major depression. In their research of consequences of PTSD and depression as different disorders, Blanchard at al. (1998) found that the only difference is that those who have more depressive symptoms are more likely to endorse worthlessness and suicidal ideation. Another study by Miranda et al. (2002) supported the hypothesis that depression would mediate the relationship between PTSD and subjective reports of poor physical health. This study examined the role of comorbid depression in somatic complaints of 32 individuals with civilian-based PTSD and found that the relationship between PTSD severity and physical symptom reports was no longer significant if depressive symptoms were included.

Limitations of our study are primarily related to the war and early post-war time in which the study was conducted, so applied study design was only possible to carry through with this, in that period of time, highly vulnerable refugee population. The variables are based on self-reported data: measures of trauma and health status. Physical examinations were not conducted due to the facts explained previously. Secondly, in this study we did not control for cumulative burden of traumas (number of traumatic events) which may also be considered as a limitation.

The accuracy of reporting of trauma events by refugees themselves has been shown in previous reviews (Mollica & Caspi-Yavin 1991, Willis 1998). We did not use structured clinical interviews and it was unclear to what extent the rates of self-reported symptoms for PTSD and depression on HTQ and HCSL-25, respectively, would match clinical diagnosis. HTQ and HCSL-25 have been validated against a clinical criterion standard in other refugee settings (Smith Fawzi et al. 1997, Oruc et al. 2008), supported by cross-validation that links checklist positive diagnosis and disability (Mollica et al. 1999). DSM-IV multidimensional algorithm was also used in the large scale epidemiological study with Kosovo Albanians (Cardozo et al. 2000). Evidence for medical illnesses came from self-reports. Even if those self-reports may not always provide valid information about health status, as they can be strongly influenced by psychological states and processes, they cannot be neglected as completely non-valid, because they can be valid indicators of physical status to some extent. McHorney et al. (1992) and Piljs et al. (1993) have shown that in their work.

CONCLUSIONS

In conclusion, this study of Bosnian refugees performed in three years follow-up reveals a continued high level of psychiatric morbidity, and somatic morbidity connected to them. It is equally important that mental health practitioners, as well as general practitioners, recognize this problem. The general practitioners are usually the first ones in touch with traumatized persons.

It is important for them to monitor medical complaints and consider the possibility that their patients' physical status might be related to psychical one. With that approach we can avoid, a paradigm of mind-body dualism that is still influential in our practice of health services delivery, and give opportunity for better detection and treatment of PTSD and/or depression co-morbidity related to medical conditions of traumatized persons.

Acknowledgements:

Source(s) of research support: This study was supported by grant MH57806-02 from the National Instiute of Mental Health, Bethesda, Md.
We are thankful to all participants for sharing their most intimate experiences with us. We acknowledge interviewers, many themselves at that time refugees, who made the data collection possible.

Conflict of interest : None to declare.

References

1. *American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition. Washington, DC: American Psychiatric Association, 1994.*
2. *Bergovec M, Heim I, Vasilj I, Jembrek-Gostovic M, Bergovec M, Strnad M: Acute coronary syndrome and the 1992-1995 war in Bosnia and Herzegovina: a 10-year retrospective study. Mil Med 2005; 170:431-4.*
3. *Blanchard EB, Buckley TC, Hickling EJ, Taylor AE: Post-traumatic Stress Disorder and Comorbid Major Depression: Is Correlation an Illusion? J Anxiety Disord 1998; 12:21-37.*
4. *Breslau N, Davis GC: Posttraumatic stress disorder in an urban population of young adults: risk factor for chronicity. Am J Psychiatry 1992; 149:671-5.*
5. *Cardozo BL, Vergara A, Agani F, Gotway CA: Mental health, social functioning, and attitudes of Kosovo Albanians following the war in Kosovo. JAMA 2000; 284:569-77.*
6. *Ciechanowski PS, Katon WJ, Russo JE: Depression and diabetes: Impact of depressive symptoms on adherence, function and costs. Arch Intern Med 2000; 160:3278-85.*
7. *Cloitre M, Cohen LR, Edelman RE, Han H: Posttraumatic stress disorder and extent of trauma exposure as correlates of medical problems and perceived health among woman with childhood abuse. Women Health 2001; 34:1-17.*
8. *De Graaf R, Bijl RV, Smith F, Vollebergh WAM, Spijker J: Risk factors for 12-month comorbidity of mood, anxiety, and substance use disorder: findings from Netherlands Mental Health Survey and Incidence Study. Am J Psychiatry 2002; 159:620-29.*
9. *Ferren PM: Comparing Percived Self-Efficacy Among Adolescents Bosnian and Croatian Refugees with and without Posttraumatic Stress Disorder. J Trauma Stress 1999; 12:405-20.*
10. *Goodwin RV, Davidson JR: Self-reported diabetes and posttraumatic stress disorder among adults in the community. Am J Med 2005; 40:570-4.*
11. *Gregurek R, Vukusic H, Tocilj-Simunkovic G: Change in pulse rate among civilian population during air-raid alerts in the city of Zagreb. Mil Med 1998; 168:850-2.*
12. *Hasanović M, Sinanović O, Selimbašić Z, Pajević I, Avdibegović E: Psychological Disturbances of War-traumatized Children from Different Foster and Familiy Settings in Bosnia and Herzegovina. CMJ 2006; 47:85-94.*
13. *Hezler JE, Robins L, Mc Evoy L: Post-traumatic stress disorder in the general popultion. N Eng J Med 1987; 317:1630-34.*
14. *Kadojić D, Demarin V, Kadojić M, Mihaljević I, Barac B: Influence of Prolonged stress on Risk Factors for Cerebrovascular Disease. Coll Anthropol 1999; 23:213-9.*
15. *Kinzie JD, Boehnien JK, Leung P, Moore L, Riley C, Smith D: The prevalence of posttraumatic stress disorder and it's clinical significance among Southeast Asian Refugees. Am J Psychiatry 1990; 147:913-7.*
16. *Kinzie JD, Krystal R, McFarland B, Hayes M, Boehnlein J, Leung P, Adams G: High Prevalence Rates Diabetes and Hypertension Among Refugee Psychiatric Patients. J Nerv Ment Dis 2008; 196:108-12.*
17. *Klarić M, Klarić B, Stevanović A, Grković J, Jonovska S: Psychological Consequences of War Trauma and Postwar Social Stressors in Woman in Bosnia and Herzegovina. CMJ 2007; 48:167-76.*
18. *Klejin WC, Hovens JE, Rodenburg JJ: Posttraumatic stress symptoms in refugees: assessment with the Harvard Trauma Questionnaire and the Hopkins Symptom Checklist-25 in different languages. Psych Rep 2001; 88:527-32.*
19. *Kozarić-Kovačić D, Ljubin T, Grappe M: Comorbidity of Posttraumatic Stress Disorder and Alcohol Dependence in Displaced Persons. CMJ 2000;41:173-8.*
20. *Lang S: The third Balkan war: Red-cross bleeding. CMJ 1993; 34:5-20.*
21. *Long N, Chamberlain K, Vincent C: The health and mental health of New Zeland Vietnam war veterans with posttraumatic stress disorder. N Z Med J 1992; 105:417-9.*
22. *Mc Horney CA, Ware JE, Rogers W, Raczek AE, Lu JFR: The validity and relative precision of MOS short-and long-form-health status scales and –Darmouth COOP charts. Med Care 1992; 30:MS253-MS265.*
23. *Miranda RJr, Meyerson LA, Marx BP, Tucker PM: Civilian-Based Posttraumatic Stress Disorder and Physical Complaints: Evaluation of Depression as a Mediator. J Truma Stress 2002; 15:297-301.*
24. *Mollica RF, Caspi-Yavin Y: Measuring torture and torture-related symptoms. Psych Assess 1991; 3:1-7.*
25. *Mollica RF, Caspi-Yavin Y, Bollini P, Truong T, Tor S, Lavelle J: The Harvard Trauma Questionnaire: validating a cross-cultural instrument for measuring torture, trauma, and posttraumatic stress disorder in Indochinese refugees. J Nerv Ment Dis 1992; 180:111-6.*
26. *Mollica RF, Donelan K, Tor S: The effect of Trauma and confinement on functional health status of Cambodians living in Thailand-Cambodia border camps. JAMA 1993; 270:581-6.*
27. *Mollica RF, Mc Innes K, Sarajlic N, Levelle J, Sarajlic I, Massagli MP: Disability Associated With Psychiatric Comorbiditiy and Helath Status in Bosnian Refugees Living in Croatia. JAMA 1999; 282:433-48.*
28. *Mollica RF, Poole C, Son L, Murray C, Tor S: Effects of war trauma on Cambodian refugee adolescents functional*

health and mental health status. J Am Acad Child Adolesc Psych 1997; 36:1018-106.

29. *Mollica RF, Poole C, Tor S: The dose-effect relationship of trauma to symptoms of depression and posttraumatic stress disorder among Cambodian survivors of mass violence. Br J Psychiatry 1988; 173:482-8.*
30. *Mollica RF, Sarajlic N, Chernoff M, Lavelle J, Vukovic Sarajlic I, Massagli MP: Longitudinal Study of Psychiatric Symptoms, Disability, Mortality, and Emigration Among Bosnian Refugees. JAMA 2001; 286:546-54.*
31. *Mollica RF, Whyshak G, de Marneffe D, Khuon F, Lavelle J: Indochinese version of the Hopkins Symptom Checklist-25: a screening instrument for the psychiatric care of refugees. Am J Psychiatry 1987; 144:497-500.*
32. *Momartin S, Silove D, Manicavasager V, Steel Z: Complicated Grief in Bosnian Refugees: Association with Posttraumatic Stress Disorder and Depression. Compr Psychiat 2004; 45:475-82.*
33. *Moussavi S, Chatterji S, Verdes E, Tandon A, Patel V, UStun B: Depression, chronic diseases, and decrements in health: results from World Health Survey. Lancet 2007; 370:851-58.*
34. *Oruc Lj, Kapetanovic A, Poljskic N, Miley K, Forstbauer S, Mollica RF et al.: Screening for PTSD and depression in Bosnia and Herzegovina: Validating the Harvard Trauma Questionnaire and the Hopkins Symptom Checklist. Int Jour of Culture and Mental Health 2008; 1:105-16.*
35. *Piljs LTK, Feskens EJM, Kromhout D: Self-rated health, mortality, and chronic diseases in elderly men: The Zupthern Study, 1985-1990. Am J Epidemiol 1993; 138:840-8.*
36. *Rush AJ, Zimmerman M, Wisniewski SR, Fava M, Hollon SD, Warden D, Biggs MM, Shores-Wilson K, Shelton RC, Luther JF, Thomas B, Trivedi MH: Comorbid psychiatric disorders in depressed outpatients: demographic and clinical features. J Affect Disord 2005; 87:43-55.*
37. *Sareen J, Cox BJ, Stein MB, Afifi TO, Fleet C, Asmundson GJ: Physical and mental comorbidity, disability, and suicidal behavior associated with posttraumatic stress disorder in a large community sample. Psychosom Med 2007; 69:242-8.*
38. *Shalev A, Bleich A, Ursano R: Posttraumatic stress disorder: somatic comorbidity and effort tolerance. Psychosomatics 1990; 31:197-203.*
39. *Sledjeski EM, Speisman B, Dierker LC: Does number of lifetime traumas explain the relationship between PTSD and chronic medical conditions? Answer from the National Comorbidity Survey-Replication (NCS-R). J Behav Med 2008; 31:341-9.*
40. *Smith Fawzi MC, Murphy E, Pham T, Lin L, Poole C, Mollica RF: The validity of screening for posttraumatic stress disorder and major depression among Vietnamese former political prisoners. Acta Psychitr Scand 1997; 95:87-93.*
41. *Southwick SM, Yehuda R, Giller EL: Characterization of depression in war-related posttraumatic stress disorder. Am J psychiatry 1991; 148:179-83.*
42. *SPSS Instruction Manual: University of Waterloo, Department of Statistics and Actuarial Science 1998. URL: http://glimo.vub.ac.be/downloads/eng_spss_basic.pdf.*
43. *Stein B, Comer D, Gardner W, Kelleher K. Prospective study of displaced children's symptoms in wartime Bosnia. Soc Psychiatr Epidemiol 1999; 34:464-9.*
44. *Šantić Z, Lukić A, Sesar D, Miličević S, Ilakovac V: Long-term Follow-up of Blood Pressure in Family Members of Soldiers Killed During the War in Bosnia and Herzegovina. CMJ 2006; 47:416-23.*
45. *Thabet AA, Yehia A, Vostanis P: Comorbiditiy of PTSD and depression among refugee children during war conflict. J Child Psychol Psychiatr 2004; 45:533-42.*
46. *United Nations Convention Relating to the Status of Refugees. New York. NY: United Nations Publications, 1951. URL: http://unhcr.ch/refworld/legal/instrume.asylum/1951eng.html*
47. *Willis GB: Methodological issues in the use of survey questionnaires to assess the health effects of torture. J Nerv Ment Dis 1998; 186:283-89.*
48. *Wolfe J, Schnurr PP, Brown PJ, Furey J: PTSP and war-zone exposure as correlates of percived health in femail Vietnam veterans. J Consult Clin Psychol 1994; 62:1234-40.*
49. *World Health Organization: The ICD-10 classification of mental and behavioural disorders. WHO Geneva 1994.*
50. *Yates W, Mitchell J, Rush AJ, Trivedi MH, Wisniewski SR, Warden D, Hauger RB, Fava M, Gaynes BN, Husain MM, Bryan C: Clinical features of depressed outpatients with and without co-occuring general medical conditions in the STAR*D. Gen Hosp Psychiat 2004; 26:421-29.*

Correspondence:

Iris Sarajlić Vuković, MD
Department of Mental Health and Addiction Prevention
Andrija Stampar Teaching Institute of Public Health
Mirogojska cesta 16, HR-10 000 Zagreb, Croatia
E-mail: isarajlic26@gmail.com