

## NEUROTICISM AND POSTTRAUMATIC STRESS DISORDER IN BOSNIAN INTERNALLY DISPLACED AND REFUGEE ADOLESCENTS FROM THREE DIFFERENT REGIONS AFTER THE 1992-1995 BOSNIA-HERZEGOVINA WAR

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**Objective** - To estimate neuroticism and its relationship with psychological trauma and posttraumatic stress disorder (PTSD) among Bosnia-Herzegovina (BH) refugee and internally displaced adolescents after the 1992-1995 war.

**Subjects and methods** - A sample of 217 pupils (108 females and 109 males) aged  $15.1 \pm 2.1$  years was divided into three groups from the north-eastern BH regions: Srebrenica ( $n=69$ ), Zvornik ( $n=79$ ), and Bijeljina ( $n=69$ ), who were exposed to the trauma of the 1992-1995 war and became refugees or internally displaced persons for the duration of the whole war and after it were evaluated for assessment of war trauma, the presence of PTSD, neuroticism, and its associations. Data collection took place in June 1999 in the classrooms of the adolescents' schools, with the written permission of the Tuzla Canton Ministry for Culture, Sport and Education.

**Results** - Srebrenica pupils were significantly more introverted. The prevalence of PTSD differed statistically significantly between the groups: Srebrenica (73.9%), Zvornik (60.8%) and Bijeljina (47.6%) (Chi-square=9.854,  $df=2$ ,  $p=0.007$ ). The PTSD prevalence, PTSD symptoms and social dysfunction were the most severe in Srebrenica, then in Zvornik and finally in the Bijeljina group. In the Srebrenica group neuroticism was significantly associated with PTSD cluster symptoms and problems in social functioning. Adolescents with PTSD, in all three groups and in the whole sample, were more neurotic. Loss of father significantly increased introversion of the adolescents in all three groups, and decreased the adolescents' sociability in Zvornik and Bijeljina.

**Conclusions** - Refugee and internally displaced adolescents from Bosnia-Herzegovina suffered very frequently from PTSD 3.5 years after war. The PTSD prevalence is highly reported and differed significantly between groups. PTSD associated positively with neuroticism and introversion. Loss of father significantly increased the adolescents' introversion in all three groups, and it decreased the adolescents' sociability in Zvornik and Bijeljina.

**Key words:** Bosnia-Herzegovina ■ Adolescents ■ Refugees ■ Neuroticism ■ PTSD

## Introduction

War affects both the soldiers fighting on the ground and the civilian population amongst whom they fight. Recent conflicts, including those in the Balkans, Libya and Syria, have involved much fighting within highly populated urban areas. In the large civilian populations caught up in these conflicts, children are most vulnerable (1).

This research is the second part of a comprehensive survey on the psychological and functional consequences for internally displaced and refugee adolescents from three different regions after the 1992-1995 war in Bosnia and Herzegovina, so that the description of the adolescents, their social-demographic characteristics, frequency of trauma experiences and severity of posttraumatic stress disorder (PTSD) symptoms were already published in our previous article (2).

The latter part of the twentieth century has seen increased concern for the implications of war for civilian populations, and more attention has been given to research into the psychosocial consequences in children and adolescents from living through a war and political violence, with the experience of being uprooted and displaced, together with the life threatening circumstances of the war (3, 4). The beginning of the twenty-first century is no better in terms of the continuity of wars involving civilians as major casualties with the youngest population as an inevitable part in exposure to horror and sufferings (5). This extremely vulnerable population is exposed to extreme threats and intense feelings of helplessness together with adults. These long-term traumatic and stressful experiences leave an imprint upon the survivors' inner lives and take a long time to heal (6). During the 1992 to 1995 war in Bosnia and Herzegovina (BH) its population experienced one of the most horrible wars seen in Europe at the end of the 20th century (7). Bosnian Genocide (8) was a brutal campaign of ethnic

cleansing — in which one million Bosniaks were displaced; half a million were permanently removed from their ancestral land, and 65,000 to 75,000 Bosniak civilians and poorly armed defenders were killed during the 1992-95 international conflict that took place on a territory of Bosnia-Herzegovina (9). It is well known that Srebrenica was the site of a systematic massacre of the gravest import, both in terms of the consequences for the local population, who lost thousands of fathers and sons, and in terms of the failure of the United Nations Protection Force (UNPROFOR) to actually provide protection to the inhabitants of Srebrenica. These consequences are still being discussed at the International Criminal Tribunal for the former Yugoslavia at The Hague, and have been said to have led to the development of a view in international law that if a country is in a position to protect a civilian population which is at risk, then it is obliged to do so - a view which has been quoted to justify the defense of the Libyan population of Benghazi by NATO air forces in 2011 (5).

There were regional variations in the fighting (2, 3, 10-15). Despite Srebrenica being a United Nations (UN) safe zone, the murder of 7 000-8 000 Bosniak men was not prevented. Some were killed after surrendering, believing the UN would protect them. Others were hunted down while attempting to escape into Bosnian government-held territory. Some committed suicide, unable to endure the harrowing trek to safe ground (14). The use of violence against civilians in times of war has been one of this century's most alarming military developments, creating increasing numbers of displaced persons and refugees in the wake of regional and tribal conflict (5), usually from among the poorest of their communities, and largely women and children. Little is known about the intensity and prevalence of their experiences or about the influence of those experiences on distress symptoms (16). 'Loss of place',

acute and chronic trauma, family disruption and problems of family reunification have become issues of concern. The war in Bosnia was characterized by massive displacement, disruption and loss of life, relatives and property. Health and psychosocial well-being were affected in a number of ways (2, 3, 17).

Traumatic experience has overall far reaching consequences on personality. In particular, it has a significant impact on teenagers who are just approaching the phase of resolving their identity issues (18). The group having the most difficult time with postwar adjustment is young adults who were children, aged five to 12 years old, during the war. Their condition is the result of growing up in an environment without a sense of safety and security (e.g., they could not play outdoors, they were often confined to living in interior rooms) (6, 14). Exposure to war-related violence and social isolation is highly predictive of PTSD symptoms; depressive symptoms are accounted for primarily by exile-related stressors (19). A failure to resolve moderate to severe traumatic reactions may result in long-term consequences for the ability of adolescents to engage in productive behaviors and function adequately, whether socially, academically, professionally, or personally (16, 20).

All of Srebrenica's adolescents survived a very severe humanitarian catastrophe, being besieged without any form of normal life together with the danger of war they were exposed to, together with their families (21). Among these children there were dominant high Impact Events Scale (IES) scores and a high degree of distress (22), respiratory disease cases and untreated skin infections (23). During the research, some of them were in the process of repatriation to their home country after a certain period of life in exile (1995-1998), and others from the investigated group stayed in Bosnia and Herzegovina during and after the war as internally displa-

ced persons, without the possibility of returning to their place of origin despite the end of the war.

Our objectives were to establish the presence of neuroticism, sociability, activeness and introversion-extroversion and their relationship towards psychological trauma and posttraumatic stress disorder (PTSD) among Bosnia-Herzegovina (BH) refugee and internally displaced adolescents from Srebrenica and their peers from Zvornik and Bijeljina after the 1992-1995 war.

## Subjects and methods

### Subjects

The targeted population were elementary (7th grade) and secondary school (3rd grade) pupils, who survived the Srebrenica, Zvornik and Bijeljina massacres. This was a representative sample of participants chosen from available IDP and repatriated refugee pupils in one public elementary school and seven secondary schools, who agreed to participate voluntarily, with their parents who gave verbal permission, after they had been informed and asked to participate in this research.

We selected a single elementary school situated in the Tuzla suburban region where the concentration of IDP-s and repatriated families was densest, and the number of targeted pupils in the Tuzla municipality was greatest in this school. The selection of secondary schools depended on the availability of displaced and repatriated pupils, who were dispersed throughout all public secondary schools in the city of Tuzla. Primarily we collected data from 250 pupils regardless their prewar place of living, but we only considered data from those who originated from targeted three prewar regions. The final sample consisted of 217 pupils (86.8% of the tested population) (108 females) aged  $15.1 \pm 2.1$  years who were evaluated for assessment of war trauma, the presence of post-traumatic

stress disorder (PTSD), neuroticism, extroversion, activity and sociability. The sample consisted of three groups of participants originating from different geographical regions of north-eastern BH: Srebrenica (n=69; 36 girls), Zvornik (n=79; 35 girls), and Bijeljina (n=69; 37 girls), with no significant differences between the groups regarding the adolescents' gender and age.

Selection criteria were: a) participants had to be originally from these three BH geographical regions (Srebrenica, eastern mountain part of BH; Zvornik, eastern part of BH settled on the right bank of the River Drina, the natural border between BH and Serbia, and Bijeljina, north-eastern part of the plains of BH) with different experiences of the recent war, b) the adolescents had to have experienced war conditions at the beginning of the BH war, when they were forced to leave their homes under life threatening conditions, c) the adolescents were prevented from returning to their homes, which they had to leave because of danger to their lives and still could not return, and d) they should be healthy without a history of somatic or psychological problems treated in a medical institution.

All of these participants were currently living in the houses or apartments of their relatives or in the houses or apartments of Bosnian Serbs who left their property a few days before the war started and it was still abandoned.

## **Methods**

This was a cross-sectional study with a stratified sample. Data collection took place in June 1999 in the classrooms of the adolescents' schools in the town of Tuzla, Bosnia and Herzegovina. Data were collected for the master thesis that the author partially published in 2005 (6). After reconsideration of the subjects in the sample regarding geographical origin, three subgroups were defined which had had different traumatic experiences due to different historical circum-

stances. Therefore, due to the development of the post-war situation in Bosnia and Herzegovina in political, economic and security terms, the relationship was investigated between traumatic experiences and psychological outcomes among the young victims of the war, which have almost been forgotten in the literature. In view of the seriousness of the consequences of war trauma for the psychological development of young victims of war (1, 3-5), it was necessary to research it and to remind the scientific community that even though the war is over, we need to think of the young victims, who have become adults in the meantime and who are living with the psychological consequences, silently suffering and living with disturbances, beyond our attention.

## **Outcome measures**

To evaluate traumatic events, severity of trauma and the presence of PTSD, as well as the expression of PTSD symptoms, a modified culturally validated measure of posttraumatic stress disorder (PTSD): the Harvard Trauma Questionnaire (HTQ), Bosnia and Herzegovina Version (24, 25) was used.

To evaluate neuroticism and extroversion of adolescents as a consequence of exposure to trauma we used the HANES-scale: "The Hamburg scale of neuroticism and extroversion for children and adolescents." The scale was designed to determine the characteristics of children and adolescents aged from 8-16 years. It consists of two subscales for neuroticism and two subscales for extraversion-introversion (activity and sociability), measured on a 1-9 scale, together with a BIAS scale. The authors of this scale were Burgle and Baumgartel (1972). For the region of the former Yugoslavia it was adapted at the Center for psycho-diagnostical means, Ljubljana. The authors of the adaptation and publication were Bele-Potočnik et al. (26). The instrument is slightly old-fashioned, but

in postwar Bosnia-Herzegovina it was very difficult to find modern psychological tests which are very expensive to use. The study was ethically approved by the Human Research Ethics Board of the Tuzla University Clinical Center and from the Tuzla Canton Ministry for Culture, Sport and Education. During data collection, only the first author was together with the examinees, without the school authorities.

### Statistical analysis

The collected data were statistically analyzed using the Statistical Package for Social Sciences, version 10.0 (SPSS, Chicago, IL, USA). Statistical tests included t-test, ANOVA, Chi-square ( $\chi^2$ ) – test, Pearson's "r" and Spearman's "ρ" tests of correlations.  $p < 0.050$  was considered to be statistically significant.

### Results

The mean age of the examined participants when they were forcedly expelled from their homes was  $8.4 \pm 2.4$  years, ( $8.4 \pm 2.1$  for Srebrenica,  $8.5 \pm 2.4$  for Zvornik and  $8.2 \pm 2.7$  for the Bijeljina group) ( $F = 0.349$ ;  $p = 0.706$ ). Adolescents differed in terms of their refugee life experiences in a foreign country and experiences of returning to their homeland. From Srebrenica 20 (29.0%) of 69, from Zvornik 33 (41.8%) of 79, and from Bijeljina 53 (76.8%) of 69 adolescents returned from abroad ( $\chi^2$  test = 34.071,  $p < 0.001$ ).

### PTSD

As reported in the previous article (2), in this representative sample, 132 (60.8%) of the 217 participants reported symptoms that meet the DSM-IV criteria for PTSD; in the Srebrenica group 51 (73.9%) of 69 reported significantly more PTSD prevalence than those from Zvornik: 48 (60.8%) of 79; and the Bijeljina group: 33 (47.8%) of 69 participants ( $\chi^2$ -test = 9.854,  $p = 0.007$ ). Between the Srebrenica and Zvornik groups, and between the Zvornik and Bijeljina groups, the prevalence of PTSD did not differ significantly ( $\chi^2$ -test = 2.877,  $p = 0.09$ ,  $\chi^2$ -test = 2.487,  $p = 0.115$ , respectively), but the Srebrenica adolescents reported PTSD significantly more often than their peers from the Bijeljina group ( $\chi^2$ -test = 9.857,  $p = 0.002$ ).

### Neuroticism, activity, sociability, extroversion

The average severity level of neuroticism, sociability and activity (range 1-9) did not differ between the participants in the three investigated groups, but participants from Srebrenica were significantly more introverted (Table 1).

### Age, gender, refugee status, father loss and neuroticism

In the Srebrenica and Zvornik groups gender, refugee status and father loss did not have a significant influence on the neuroti-

**Table 1** Severity of Neuroticism, Activity, Sociability, Extroversion in 217 internally displaced and refugee adolescents from Bosnia-Herzegovina from three geographical regions: Srebrenica, Zvornik and Bijeljina

Parameters of HANES-scale* (Mean±SD)	Pre-war place of residence			F	p**
	Srebrenica n=69	Zvornik n=79	Bijeljina n=69		
Neuroticism	7.0±1.8	6.3±2.0	6.23±2.0	2.846	0.059
Sociability	6.5±1.8	6.9±2.0	7.1±1.9	1.925	0.148
Activity	3.8±1.4	3.8±1.6	2.3±1.5	1.930	0.148
Extroversion	4.8±1.7	5.1±1.7	5.6±1.7	3.724	0.026

\*The Hamburg scale of neuroticism and extroversion for children. \*\*ANOVA.

cism of participants; however in the Bijeljina group girls reported more severe neuroticism ( $6.7 \pm 2.0$ ) (mean  $\pm$  standard deviation) than boys ( $5.7 \pm 1.9$ ) ( $t$ -test=2.285,  $p=0.026$ ), internally displaced participants ( $7.2 \pm 1.8$ ) were significantly more neurotic than repatriated ones ( $5.9 \pm 2.0$ ) ( $t$ -test=-2.234,  $p=0.029$ ), while the loss of father did not influence neuroticism among these participants.

**Gender, refugee status, father loss and sociability, activity, extroversion**

Refugee status and gender did not have a significant influence on the severity of sociability, activeness and extroversion in Srebrenica adolescents, only adolescents who had lost their father reported significantly lower levels of

extroversion ( $4.3 \pm 1.7$ ) than their peers with both parents ( $5.2 \pm 1.6$ ) ( $t$ -test=2.16,  $p=0.034$ ). Refugee status and gender did not significantly influence the severity of sociability, activeness and extroversion in Zvornik adolescents, only adolescents who had lost their father reported significantly lower levels of sociability ( $6.0 \pm 2.3$ ) and extraversion ( $4.4 \pm 2.0$ ) than their peers with both parents ( $7.2 \pm 1.7$ ,  $t$ -test=2.71,  $p=0.008$ ;  $5.4 \pm 1.6$ ,  $t$ -test=2.221,  $p=0.029$ , respectively). In the Bijeljina group, participants who had lost their fathers reported significantly lower sociability ( $5.0 \pm 1.4$ ) and lower extroversion ( $3.25 \pm 1.3$ ) than their peers who had both parents ( $7.2 \pm 1.9$ ,  $t$ -test=2.283,  $p=0.026$ ;  $5.8 \pm 1.8$ ,  $t$ -test=2.801,  $p=0.007$ , respectively), while loss of father did not influence activeness in this group.

**Table 2** Parametric (Pearson's  $r$ ) correlation of severity of trauma experience, clusters of PTSD symptoms and social dysfunction with severity of parameters of HANES-scale in 217 internally displaced and refugee adolescents from three Bosnia-Herzegovina regions

Traumatic experiences and PTSD clusters of symptoms' severity	HANES-scale*	parameters [Pearson's $r$ ( $P$ )]		
		Sociability	Activity	Extraversion
<b>Zvornik</b>				
Trauma experiences	0.205 (0.090)	-0.076 (0.534)	0.109 (0.375)	-0.010 (0.932)
Re-experience	0.334 (0.005)	-0.207 (0.088)	0.099 (0.417)	-0.084 (0.495)
Avoidance	0.416 (<0.001)	-0.374 (0.002)	0.168 (0.167)	-0.135 (0.270)
Hyperarousal	0.567 (<0.001)	-0.379 (0.001)	0.247 (0.041)	-0.108 (0.377)
Level of social dysfunction	0.417 (<0.001)	-0.299 (0.013)	0.022 (0.856)	-0.211 (0.083)
<b>Bijeljina</b>				
Trauma experiences	0.385 (<0.001)	-0.186 (0.100)	-0.001 (0.990)	-0.138 (0.225)
Re-experience	0.541 (<0.001)	-0.348 (0.002)	0.094 (0.409)	-0.167 (0.142)
Avoidance	0.480 (<0.001)	-0.290 (0.010)	0.159 (0.161)	-0.113 (0.322)
Hyperarousal	0.567 (<0.001)	-0.053 (0.644)	0.173 (0.127)	0.108 (0.344)
Level of social dysfunction	0.433 (<0.001)	-0.262 (0.020)	0.373 (0.001)	0.008 (0.944)
<b>Srebrenica</b>				
Trauma experiences	0.508 (<0.001)	-0.152 (0.212)	0.205 (0.091)	0.034 (0.782)
Re-experience	0.506 (0.001)	-0.222 (0.066)	-0.011 (0.931)	-0.180 (0.138)
Avoidance	0.340 (0.004)	-0.147 (0.227)	-0.118 (0.332)	-0.153 (0.210)
Hyperarousal	0.574 (<0.001)	-0.235 (0.052)	0.211 (0.082)	-0.073 (0.553)
Level of social dysfunction	0.470 (<0.001)	-0.137 (0.261)	0.214 (0.077)	0.070 (0.566)

\*The Hamburg scale of neuroticism and extroversion for children and adolescents.

**Table 3** Non-parametric (Spearman's " $\rho$ ") correlation of PTSD prevalence with severity of neuroticism, sociability, activity and extraversion in 217 internally displaced and refugee adolescents from three Bosnia-Herzegovina regions

HANES-scale* parameters [Spearman's Rho $\rho$ ( <i>P</i> )]	Prewar place of living			Whole sample
	Srebrenica	Zvornik	Bijeljina	
Neuroticism	0.274 (0.022)	0.497 (<0.001)	0.293 (0.014)	0.388 (<0.001)
Sociability	-0.232 (0.055)	-0.316 (0.005)	-0.029 (0.814)	-0.220 (0.001)
Activity	0.123 (0.315)	0.133 (0.241)	-0.006 (0.960)	0.043 (0.531)
Extraversion	-0.187 (0.123)	-0.257 (0.022)	-0.023 (0.848)	-0.184 (0.006)

\*The Hamburg scale of neuroticism and extroversion for children and adolescents.

### Association of severity of trauma experiences, PTSD symptoms clusters and neuroticism, sociability, activity and extroversion

In the Srebrenica group, neuroticism did not correlate with severity of trauma experiences, but highly correlated with severity of PTSD cluster symptoms for re-experience, avoidance, hyper arousal and problems in social functioning. Level of sociability correlated highly negatively with severity of avoidance, hyper arousal and social disturbances; while the level of activity only highly correlated with hyper arousal severity. Extroversion was not associated with severity of trauma experiences, PTSD cluster symptoms, and social dysfunction in all three groups. Neuroticism in Zvornik and Bijeljina groups highly correlated with severity of trauma experiences, PTSD cluster symptoms, and social dysfunction. In the Zvornik group, level of sociability negatively associated with severity of PTSD cluster symptoms of re-experience, avoidance and with level of social dysfunction, while the level of activity only associated with severity of social dysfunction. In the Bijeljina group there were no associations between the level of sociability and activity with the severity of trauma experiences, all PTSD cluster symptoms and the level of social dysfunction (Table 2).

### Association of neuroticism, sociability, activity and extroversion with PTSD prevalence in groups

Neuroticism correlated highly positively with PTSD prevalence in all three groups and in the whole sample, while the sociability and extroversion correlated negatively with PTSD occurrence in Zvornik group and in whole sample. There was no correlation between activity and PTSD prevalence either in the investigated groups or in the whole sample (Table 3).

### Discussion

As emphasized at the beginning, this research is the second part of a comprehensive survey of the psychological and functional consequences for internally displaced and refugee adolescents from three different regions after the war 1992-1995 in Bosnia and Herzegovina, so that the description of the adolescents, their social-demographic characteristics, frequency of trauma experiences and severity of PTSD symptoms have already been published in our previous article (Tables 1-3 in the cited article) (2). Our study showed that in all three groups, regardless geographical region, the adolescents had been exposed to many different severe war traumas and reported a high level of traumatization more than three years after the

war (2, 3, 6, 7, 10-12). The prevalence and severity of traumatic experiences were significantly related to the region of their pre-war residence, because of the different characters of the course of the war in each part of BH. Therefore adolescents from the regions of Srebrenica and Zvornik reported a significantly higher prevalence and severity of traumatic war experiences (2). The scale and severity of these traumatic experiences appear to have been greater than those reported using a similar survey instrument with war-affected children in similar studies (16, 27, 28).

Adolescents from Srebrenica and Zvornik experienced separation from parent/s significantly more often than their peers from Bijeljina. Father loss and loss of immediate and/or extended family member/s were most frequent among adolescents from Srebrenica, then from Zvornik and finally from Bijeljina (6, 29-31). It is important to explain that loss of father because of the war implies he was missing or killed by the enemy. Those who were missing were those not buried at funerals by the day of the survey and the process of mourning was still open. There were no significant differences between adolescent refugees from the three observed regions regarding life in an inadequate home, in an inadequate and unsafe neighborhood, poor financial means, extreme poverty and lack of social support. Worse outcomes were observed for refugees living in institutional accommodation, experiencing restricted economic opportunities, displaced internally within their own country, and repatriated to a country they had previously fled from (11, 32, 33). Srebrenica and Zvornik participants survived significantly more catastrophic war related experiences, while participants from Bijeljina reported significantly more frequently traumatic experiences related to the process of exile and repatriation (6, 11, 32). Srebrenica participants survived significantly

more “running away in front of a threat to life”, “lost father in the war”, “shelling very close to me”, “killing of close relatives by enemy” and “starving” than their peers from Zvornik and Bijeljina, while Zvornik participants survived significantly more often “killing of the father by the enemy” than those from both Srebrenica and Bijeljina (29-31). We found that 43.5% of 69 participants from the Srebrenica region lost their father, which is significantly more than those from Zvornik and Bijeljina, while 39.2% of 79 Zvornik adolescents experienced the killing of their father by the enemy, which is significantly more than those from Srebrenica and Bijeljina. This is much more than the 28% of 95 Bosnian refugee children that Papa-georgiou et al. found in their research (29). Geltman et al. (34) found 71% of 31 Bosnian refugee children experienced the death of a close friend(s) or relative(s); Husain et al. (30) reported that 66% of 521 Sarajevo children lost a family member; in our previous study (3) we found 61.9% of 239 adolescents lost family members (34, 35).

PTSD prevalence between all three groups differed significantly, but when we compared the groups in couples we found that the Srebrenica group (73.9%) did not differ significantly from Zvornik (60.8%), and the Zvornik group did not differ when compared with the Bijeljina group, 33 (47.8%) of 69 participants, only the prevalence of PTSD in the Srebrenica group was significantly higher than in the Bijeljina group of respondents. PTSD prevalence was higher in all three groups than in other studies. Eytan et al. (36), in their study of Albanian Kosovar, found a 23.5% PTSD prevalence, but it was found in less than 94% of 364 IDP children from central Bosnia in the study by Goldstein et al. (16). The investigated groups did not differ in terms of the severity of neuroticism, sociability and activity, but participants from Srebrenica were significantly more introverted.



In the Srebrenica and Zvornik groups, gender, refugee status and father loss did not have a significant influence on the neuroticism of participants; meanwhile in the Bijeljina group the girls reported more severe neuroticism than the boys, and internally displaced participants were significantly more neurotic than repatriated ones, while the loss of father did not influence neuroticism among these participants (11, 32).

Refugee status and gender did not have a significant influence on the severity of sociability, activeness and extroversion in all three groups of adolescents. Loss of father significantly increased introversion in adolescents in all three groups, and in Zvornik and Bijeljina it significantly decreased their sociability. Father loss did not influence activeness in these groups.

In the Srebrenica group, neuroticism was significantly associated with all PTSD cluster symptoms and problems in social functioning, sociability was significantly negatively associated with avoidance, hyper arousal and social disturbance severity; while activity only correlated highly with hyper arousal severity. Neuroticism in the Zvornik and Bijeljina groups was significantly associated with the severity of trauma experiences, PTSD cluster symptoms, and social dysfunction. In the Zvornik group, sociability was negatively associated with the PTSD cluster symptoms of re-experience, avoidance and with the level of severity of social dysfunction, while the level of activity was only associated with social dysfunction severity. In the Bijeljina group there was no association of the level of sociability and activity with the severity of traumatic experiences, all PTSD clusters symptoms and with the level of social dysfunction.

Adolescents with PTSD, in all three groups and in the whole sample, were more neurotic; while in whole sample and in the Zvornik group only, adolescents with PTSD

were less sociable and more introverted. There was no correlation between activity and PTSD prevalence either in investigated groups or in the whole sample.

The examined BH adolescents are a multi-traumatized group (16, 28). Among these young people, who were displaced and exiled as a result of the war, virtually all were exposed to many different traumatic events and survival difficulties, and they persisted more than three years after the war (3, 6, 10, 12, 17, 31). All three groups demonstrated the persistence of psychological symptoms, indicating severe and chronic forms of these problems (10). The traumatic experiences and PTSD cluster symptoms and social dysfunction severity was positively associated with the level of neuroticism, but correlated negatively with sociability. Traumatic symptoms are related to harm avoidant personality traits (37, 38). Certain war experiences were also associated with greater symptomatology. The findings show that there may be very serious long-term psychological problems in young people who were forced to leave their property, original places, and country during wartime (21, 22, 39-41). There were regional variations in the warfare (3, 8, 9, 13). Youngsters who were forced to leave their homes, with or without their complete families, were likely to have had particularly harsh war experiences. Fighting without the classical limitation to the battlefield and the large numbers of families displaced by the war suggest that the findings of this study are likely to reflect the experience of a large population of Bosnian children and adolescents. It may be considered as a general characteristic of a society in war (18).

The results of this study document and extend our understanding of the relatively acute effects of war on young BH citizens in the midst of post war conflicts, and thus may be viewed differently from studies performed outside areas of conflict (16) and

immediately post conflict, where life conditions are not normal and the conditions for a realistic and complete return to their prewar property have not been established.

It is necessary to stress as a limitation of this study that the sample was not random, it was based on volunteers, which may have resulted in selection bias. Also it would be particularly helpful if we had an assessment of the children's status before exposure to war trauma or if we investigated a not-displaced control sample (16) for a more realistic assessment of the impact of war trauma on the psychosocial conditions observed in our study, but this proved impossible under the conditions of a total and unexpected war (32).

The long-term effects of trauma may evolve over time; we cannot say how long the posttraumatic symptoms had already persisted, and how long they would persist in the future (6, 32). In this study we cannot say if the reported PTSD symptoms were the results of war traumatization, the postwar transitional, unstable political and economic environment, or acculturation in exile or acclimatization during repatriation. This sample could not be followed up because of the current and planned migrations and new resettlement toward their original homes, which are unpredictable. Practically it is impossible to collect data from the same participants again to record additional psychosocial changes they will pass through during their developmental periods (32). This experience underscores the vulnerability of civilians in areas of conflict and the need to address the effects of war on the mental health of children (16) and adolescents (32).

The findings open the issue of the major challenges regarding repatriation and returning to one's own property and reconstruction. They highlight the importance of family reunification and facilitating of decision-making by the affected people themselves (42). In postwar Bosnia-Herzegovina, people who

survived the war are faced every day with problems associated with over-dependence on external assistance, so this study could highlight the need for people to be given the means of using their own skills and knowledge to control their day-to-day lives (32, 43-45).

This experience highlights the vulnerability of civilians in conflict zones and the need to direct attention towards the effects of war on the mental health of children (4) and adolescents (27, 30-33). It is very important to know what is happening today, more than fifteen years later. What is the damage to daily and social life? Several hundred thousand people still remain internally displaced in Bosnia-Herzegovina, living in camps and settlements. The public gaze of the media has long since moved on elsewhere and donors have shifted their resources. Displaced peoples bear specific burdens regarding their belongings, housing, occupation, welfare, security and loss of communities. The decision whether to return to their homes is complex, with local and international political pressure adding to their uncertainties and insecurities. All this has a profound impact on their health and well-being. Understanding these processes and the views of the chronically displaced people themselves should guide the policies of post-conflict management to plan for the longer-term and to be more focused on the human factors rather than simply rules and property (27). For that we need to do new research. In addition there is the impact of the war, the experiences of violence, remembering and issues of reconciliation, and a variety of mostly unevaluated psychosocial programs aimed at helping with these (27). Some nongovernmental organizations (NGOs) are trying to meet needs that unite the positive forces in Srebrenica, regardless of their ethnic, social or political background. The aim is to promote democratic processes, the civil society and the return of Bo-

sniaks to the Srebrenica municipality and the Srpska Republika, and also to return Serbs to the Federation of Bosnia and Herzegovina, but the current political establishment only strengthens the idea of the destructive inability to heal the wounds of war. They keep alive the dysfunctional political and economic system that prevents normal life. In such circumstances it is impossible to expect a significant recovery by the young generation, who are prevented from finding a job and become self-reliant after the completion of adequate education (2).

It is important that both military and political decision makers should bear in mind the potential mental health consequences of war, especially in urban areas. It is the responsibility of the medical profession to educate decision makers to consider the consequences of exposure of children to war trauma (1).

It would be important to undertake research as follow-ups, in perspective, in order to clarify the typical life-stories of traumatized adolescents. Since they are young adults now, it would be meaningful, if possible, to compare their personality features now with less exposed populations and emigrants, in order to identify the traumatizing and trauma-continuing factors, and to make a qualitative assessment of their life-stories.

### Conclusions

Bosnia-Herzegovina Bosniak refugee and internally displaced adolescents from north-eastern region, 3.5 years after war, suffer very frequently from PTSD. The level of PTSD symptoms and social dysfunction severity level and PTSD prevalence differs significantly:

the most severe was in Srebrenica, then in Zvornik and finally in the Bijeljina group. Significantly more adolescents from Srebrenica lost their father because of the war (missing and killed, those who were missing had not been buried at funerals, the process of mourning was still open), while the most Zvornik adolescents experienced the killing of their father by the enemy. The investigated groups did not differ in terms of the severity of neuroticism, sociability and activity, but participants from Srebrenica were significantly more introverted. In the Srebrenica group, neuroticism was significantly associated with all PTSD cluster symptoms and problems in social functioning, sociability was significantly negatively associated with avoidance, hyper arousal and social disturbance severity, while activity correlated highly with hyper arousal severity only. Adolescents with PTSD, in all three groups and in the whole sample, were more neurotic. Loss of father significantly increased introversion in the adolescents in all three groups, and in Zvornik and Bijeljina it significantly decreased their sociability.

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