ORIGINAL ARTICLE

Mental Disorders Following War in the Balkans

A Study in 5 Countries

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Context: War experience may affect mental health. However, no community-based study has assessed mental disorders several years after war using consistent random sampling of war-affected people across several Western countries.

Objectives: To assess current prevalence rates of mental disorders in an adult population who were directly exposed to war in the Balkans and who still live in the area of conflict, and to identify factors associated with the occurrence of different types of mental disorders.

Design, Setting, and Participants: War-affected community samples in Bosnia-Herzegovina, Croatia, Kosovo, the Republic of Macedonia, and Serbia were recruited through a random-walk technique.

Main Outcome Measure: Prevalence rates of mood, anxiety, and substance use disorders were assessed using the Mini–International Neuropsychiatric Interview.

Results: Between 637 and 727 interviewees were assessed in each country (N=3313). The prevalence rates were 15.6% to 41.8% for anxiety disorders, 12.1% to 47.6% for mood disorders, and 0.6% to 9.0% for substance use disorders. In multivariable analyses across countries, older age, female sex, having more potentially traumatic experiences during and after the war, and unemployment were associated with higher rates of mood and anxiety disorders. In addition, mood disorders were correlated with lower educational level and having more potentially traumatic experiences before the war. Male sex and not living with a partner were the only factors associated with higher rates of substance use disorders. Most of these associations did not significantly differ among countries.

Conclusions: Several years after the end of the war, the prevalence rates of mental disorders among war-affected people vary across countries but are generally high. War experiences appear to be linked to anxiety and mood disorders but not substance use disorders. Long-term policies to meet the mental health needs of war-affected populations are required.

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Although millions of people have been exposed to war in the 20th and the beginning of the 21st century, systematic studies on the long-term mental health consequences in war-affected communities are still rare. Most of the existing research evidence is on war veterans rather than civilians,[1,2] despite modern warfare threatening more civilians than soldiers.[3] Similarly, more studies assess refugees in Western countries rather than the people who stay in the area of conflict,[4-12] usually the vast majority of the affected population.

Long-term consequences of war in civilians have been studied in Lebanon, Algeria, Cambodia, Ethiopia, Rwanda, and Timor-Leste.[13-18] The findings suggest an association between war experience and increased levels of mental disorders several years later, particularly posttraumatic stress disorder (PTSD) and depression. Prevalence rates were usually higher than those found in samples not affected by war despite substantial differences between studies.[19-22] For example, de Jong et al[15] studied war-affected civilians in Algeria, Cambodia, Ethiopia, and Gaza using similar methods in each country and reported increased prevalence rates of PTSD (16%-37%), mood disorders (5%-23%), and anxiety disorders (10%-40%). Pham et al[17] found a 24.8% prevalence of PTSD among community samples in Rwanda, whereas Karam et al[13] reported lower rates in Lebanon, ie, 11% for anxiety disorders and 7% for mood disorders. Within Western countries, a study

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in the Netherlands showed that experiences in World War II may still negatively affect mental health even 50 years after the end of the war.[23] However, the study did not use a comprehensive diagnostic assessment of disorders beyond PTSD.

The collapse of Yugoslavia in the early 1990s precipitated the worst armed conflict in Europe since 1945. War activities occurred at different places in the former Yugoslavia between 1991 and 2001.[24] A few studies on long-term mental health consequences were conducted in the aftermath of the war and suggested higher levels of mental distress in war-affected groups. However, they recruited from clinical samples,[25] assessed only single-sex groups,[26] used nonrandom sampling methods,[27] had relatively small sample sizes,[28] or did not administer standardized instruments to establish mental disorders.[29]

In this study, we aimed to assess prevalence rates of mental disorders in people who experienced the war in the Balkans between 5 and 15 years previously and identify factors associated with the occurrence of different mental disorders. The study was designed to recruit people who had directly experienced at least 1 war-related potentially traumatic event and lived in regions that had been directly exposed to war activities. It was conducted in 5 countries: Bosnia and Herzegovina, Croatia, Kosovo (at the time of the data collection a province of Serbia and Montenegro), Republic of Macedonia, and Serbia.

METHODS

SAMPLING TECHNIQUES AND PARTICIPANTS

The study was conducted as a multicenter survey in 5 countries. The rationale and methods have been described in detail elsewhere.[30]

In each country, we selected interviewees using a multistage probabilistic sampling frame and random-walk technique. We first identified all administrative regions that had been directly exposed to war activities, including bombing, artillery shelling, or combat fire lasting at least 7 days. We then randomly chose approximately 20% of the identified regions, with a minimum of 2 administrative regions in each country. This resulted in selecting a total of 15 regions across all participating countries (Bosnia and Herzegovina: Bosnian Podrinje and Sarajevo regions; Croatia: Lika-Senj, Karlovac, and Sisak-Moslavina regions; the Republic of Macedonia: Skopje, Northeast, and Polog regions; Kosovo: Prishtina and Kosovan District of Mitrovica; and Serbia: Raska, Nis, Jablanica, Pcinj, and Belgrade regions). In each of these regions, 3 localities with a minimum population of 3000 each were randomly selected, resulting in a selection of 49 localities across all 5 countries. To limit oversampling from the largest localities, a maximum of 25% of the study sample in each country was recruited in 1 locality.

In each locality, streets were randomly identified. Every fourth household was selected until a maximum of 15 interviews for 1 street were completed. If there were several households in the same building, households were chosen randomly, but no more than 6 participants were interviewed per building. Advance notifications informing residents of the study purpose and planned visit were mailed where possible.

The interview was conducted with the eligible adult member of the household whose birthday was closest to the date of interviewing and who fulfilled the inclusion criteria: born within the territory of the former Yugoslavia; age between 18 and 65 years; experienced at least 1 war-related potentially traumatic event; experienced the last war-related event at age 16 years or older; no severe learning difficulty; and no mental impairment owing to a brain injury or other organic cause. The potentially traumatic experience was established using a screening list containing 20 stressful events that people may have experienced during wartime (eg, shelling, sexual assault, or combat). People who had not been in the Balkan countries during wartime and those who had experienced only secondary trauma (eg, hearing about the disappearance or murder of a family member or friend) were not included.

Researchers made up to 3 attempts at different times of the day and on different days of the week to interview eligible participants, after which a replacement participant from another household was identified following the same sampling procedure.

PROCEDURES AND MEASURES

All interviews were conducted face-to-face between January 15, 2005, and November 20, 2006. Participants' age, sex, marital status, educational level, and employment status were obtained on a brief structured questionnaire. The history of potentially traumatic experiences was assessed using a specifically amended version of the Life Stressor Checklist, Revised. The list is similar to other methods used to assess trauma exposure.[31,32] It assesses whether a participant had experienced any of 24 potentially traumatic events before, during, and after the war. Cumulative scores for prewar, war, and postwar experiences were calculated. For each event we recorded the year of the occurrence, or in the event of repeated experience, the year of the most stressful occurrence and the level of personal distress caused by the event at the time of the potentially traumatic event (on a 5-point Likert scale, ranging from 0, not at all, to 4, extremely).

Current mental disorders were assessed using the Mini–International Neuropsychiatric Interview (MINI),[33] a structured diagnostic interview assessing the symptom criteria used in the *Diagnostic and Statistical Manual of Mental Disorders,* (Fourth Edition[34]) with published translations for the languages used in this study. The MINI was validated by a cross-national study involving more than 600 participants.[33] The instrument has been found to be valid when measured against the longer Composite International Diagnostic Interview and the Structured Clinical Interview for *DSM-III-R* Patients.[35,36] The reliability of the interview has been shown in various cultures,[33,37-39] and its utility as a diagnostic tool to identify populations at risk in war-affected groups has been demonstrated previously.[28,40]

All those instruments for which there had been no validated translations in all languages were translated and back-translated into English. All 22 interviewers were either qualified psychologists or psychiatrists.

All interviewers were trained in the assessments used in the survey. Rating agreement among interviewers was assessed for the MINI in 2 mock interviews. An agreement on an item was reached when all interviewers gave it the same answer. Among 251 items, the mean agreement rate across 2 sessions was 90.2%. Written informed consent was obtained from all participants before the interview. The study was approved by the relevant national ethics committees.

STATISTICAL ANALYSIS

Descriptive statistics were used to report war experiences and characteristics of the samples in each country. The prevalence rates of mental disorders were calculated as percentages of participants with a positive diagnosis. Participant characteristics were compared between countries using x^2 tests and analyses

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of variance depending on the type of data. Prevalence rates are reported with standard errors.

In addition to the country, sociodemographic characteristics (age, sex, and educational level), the number of potentially traumatic experiences before the war, active combat involvement during the war, the number of potentially traumatic experiences during the war, the level of distress during the potentially most traumatic experience, the time since the potentially most traumatic event, the number of potentially traumatic experiences after the war, marital status, and employment status were considered as variables potentially associated with mental health outcomes. All these variables were associated with long-term mental sequelae of war in several other studies.[5-17,23,25-27,41]

A multivariable logistic regression analysis was used to examine how the variables were associated with the 3 most frequently expected types of disorders: any mood disorders (major depression, dysthymia, hypomania, or mania), any anxiety disorder (panic disorder, agoraphobia, social phobia, obsessive-compulsive disorder, PTSD, or generalized anxiety disorder), and any substance use disorder (alcohol abuse and dependence or drug abuse and dependence). Because of the particular interest in PTSD, the analysis was also conducted specifically for PTSD. Three categorical variables (educational level, marital status, and employment status) were collapsed into dichotomous ones according to model goodness-of-fit. Multicollinearity among potential predictor variables was assessed using the variance inflation factor statistic. A variance inflation factor exceeding 10 for a variable was regarded as indicating multicollinearity. Variables with sufficient variability and without collinearity with other variables were selected in the final model analysis and fitted simultaneously.

Table 1. Summary of Sample Selection by Country

	No. of People				
Country	Contacted	Did Not Meet Inclusion Criteria	Refused to Participate	Study Participants	Participation Rate, %
Bosnia and Herzegovina	1041	290	111	640	85.2
Croatia	1241	186	328	727	68.9
Kosovo	769	57	64	648	91.0
Republic of Macedonia	912	67	184	661	78.2
Serbia	1367	3	727	637	46.7
Total	**5330**	**603**	**1414**	**3313**	70.1

Table 2. Sociodemographic and Trauma-Related Characteristics of the Participants[a]

	Bosnia and Herzegovina	Croatia	Kosovo	Republic of Macedonia	Serbia	Country Comparison
Total No. of participants	640	727	648	661	637	x^2=16.5[b]
Female sex	345 (53.9)	393 (54.1)	369 (56.9)	313 (47.4)	363 (57.0)	
Age, y						F=6228.1[c]
Mean (SD)	46.2 (10.8)	45.8 (10.9)	39.4 (11.4)	40.1 (13.0)	39.9 (11.2)	
20-40	205 (32.0)	250 (34.4)	360 (55.6)	335 (50.7)	334 (52.4)	
41-65	435 (68.0)	477 (65.6)	288 (44.4)	326 (49.3)	303 (47.6)	
Education level attained						x^2=344.3[c]
None or primary education	208 (32.5)	164 (22.6)	273 (42.1)	306 (46.3)	56 (8.8)	
Secondary school	305 (47.7)	435 (59.8)	263 (40.6)	269 (40.7)	346 (54.3)	
Vocational/tertiary	127 (19.8)	128 (17.6)	112 (17.3)	86 (13.0)	235 (36.9)	
Marital/living status						x^2=168.5[c]
Married/cohabiting	423 (66.1)	526 (72.4)	490 (75.6)	507 (76.7)	381 (59.8)	
Single	98 (15.3)	96 (13.2)	129 (19.9)	116 (17.5)	167 (26.2)	
Divorced/separated	56 (8.8)	56 (7.7)	1 (0.2)	7 (1.1)	56 (8.8)	
Widowed	63 (9.8)	49 (6.7)	28 (4.3)	31 (4.7)	33 (5.2)	
Employment status						x^2=409.0[c]
Employed	237 (37.0)	280 (38.5)	169 (26.1)	193 (29.2)	311 (48.8)	
Unemployed	272 (42.5)	265 (36.5)	440 (67.9)	369 (55.8)	197 (30.9)	
Retired	119 (18.6)	174 (23.9)	18 (2.8)	65 (9.8)	63 (9.9)	
Training/education	12 (1.9)	8 (1.1)	21 (3.2)	34 (5.1)	66 (10.4)	
Combat involvement	215 (33.6)	234 (32.2)	25 (3.9)	46 (7.0)	58 (9.1)	x^2=389.9[c]
No. of potentially traumatic prewar events						F=84.01[c]
Mean (SD)	0.5 (0.8)	0.9 (1.1)	0.5 (0.8)	0.4 (0.7)	1.3 (1.4)	
0	424 (66.2)	350 (48.1)	452 (69.8)	453 (68.5)	217 (34.1)	
≥1	216 (33.8)	377 (51.9)	196 (30.2)	208 (31.5)	420 (65.9)	
No. of potentially traumatic war events						F=593.5[c]
Mean (SD)	6.9 (2.4)	4.6 (2.3)	5.1 (2.6)	1.9 (1.1)	2.4 (1.9)	
0-3	23 (3.6)	274 (37.7)	198 (30.6)	607 (91.8)	524 (82.3)	
≥4	617 (96.4)	453 (62.3)	450 (69.4)	54 (8.2)	113 (17.7)	
No. of potentially traumatic postwar events						F=62.0[c]
Mean (SD)	0.5 (0.7)	0.7 (0.8)	0.4 (0.7)	0.3 (0.5)	0.9 (1.0)	
0	372 (58.1)	362 (49.8)	455 (70.2)	499 (75.5)	281 (44.1)	
≥1	268 (41.9)	365 (50.2)	193 (29.8)	162 (24.5)	356 (55.9)	
Time since index war trauma, mean (SD), y[d]	11.3 (3.0)	11.9 (2.9)	6.7 (0.9)	4.0 (3.3)	6.3 (0.9)	F=6228.1[c]
Distress at index trauma, score 0-4, mean (SD)	4.0 (0.68)	3.88 (0.41)	3.98 (0.16)	3.75 (0.61)	3.48 (0.83)	F=116.4[c]

[a] Data are given as the number (percentage) of participants unless otherwise indicated.
[b] $P \leq .01$.
[c] $P \leq .001$.
[d] *Index trauma* is defined as the most traumatic war event.

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Table 3. Potentially Traumatic Events Experienced During War by Participants in Each Country[a]

Traumatic Event	Bosnia and Herzegovina (n=640)	Croatia (n=727)	Kosovo (n=648)	Republic of Macedonia (n=661)	Serbia (n=637)
Serious accident, fire, or explosion	26 (4.1)	59 (8.1)	80 (12.4)	10 (1.5)	25 (3.9)
Natural disaster	3 (1.2)	12 (1.7)	0	1 (0.2)	20 (3.1)
Nonsexual assault by someone they knew	20 (3.1)	37 (5.1)	7 (1.1)	6 (0.9)	9 (1.4)
Nonsexual assault by a stranger	48 (7.5)	63 (8.7)	86 (13.3)	25 (3.8)	19 (3.0)
Sexual assault by someone they knew	1 (0.2)	3 (0.4)	0	0	0
Sexual assault by stranger	5 (0.8)	3 (0.4)	0	0	0
Imprisonment	56 (8.8)	42 (5.8)	34 (5.2)	3 (0.5)	4 (0.6)
Life-threatening illness	32 (5.0)	34 (4.7)	20 (3.1)	4 (0.6)	15 (2.4)
Sudden death of a dear person	77 (12.0)	114 (15.7)	34 (5.2)	20 (3.0)	45 (7.1)
Lack of food or water	618 (96.6)	106 (14.6)	369 (56.9)	61 (9.2)	68 (10.7)
Ill without access to medical care	68 (10.6)	39 (5.4)	144 (22.3)	4 (0.6)	19 (3.0)
Lack of shelter	511 (81.4)	556 (76.9)	382 (59.0)	7 (1.1)	238 (37.4)
Expelled from home under threat	133 (20.8)	343 (47.2)	456 (70.4)	283 (42.8)	52 (8.2)
Combat	211 (33.0)	219 (30.3)	17 (2.6)	46 (7.0)	51 (8.0)
Shelling or bombardment	638 (99.7)	676 (93.6)	322 (49.8)	525 (79.4)	637 (100.0)
Mine explosion	57 (9.6)	84 (11.9)	33 (5.1)	33 (5.4)	26 (4.1)
Siege	628 (98.1)	157 (21.6)	460 (71.1)	52 (7.9)	32 (5.0)
Serious injury	112 (17.5)	65 (8.9)	34 (5.2)	3 (0.5)	12 (1.9)
Witnessed murder or death	342 (53.9)	174 (24.1)	176 (27.2)	31 (4.7)	68 (10.7)
Learned about murder or death of a dear person	437 (69.0)	287 (39.7)	288 (44.4)	52 (7.9)	123 (19.3)
Disappearance or kidnapping of a dear person	222 (34.7)	107 (14.7)	132 (20.4)	52 (7.9)	66 (10.4)
Torture	34 (5.3)	36 (5.0)	81 (12.5)	34 (5.1)	7 (1.1)
Being lost	107 (16.7)	83 (11.4)	85 (13.1)	2 (0.3)	10 (1.6)
Kidnapped	33 (5.2)	18 (2.5)	45 (6.9)	2 (0.3)	2 (0.3)

[a] Data are given as the number (percentage) of participants. Between 0.1% and 3.7% of participants had missing data for any given category.

To assess whether the same predictive models applied in all 5 countries, we randomly split the sample into two-thirds as a training data set and one-third as a validation data set. We used the estimated coefficients (ie, log odds from the logistic regression model) from the training data set to calculate the risk score for the validation data set and its resulting receiver operating characteristic (ROC) curve separately for each country. The ROC curve is summarized by the area under the curve (AUC). An ROC curve area of 0.5 indicates no discrimination and an area of 1.0, perfect discrimination. The AUCs were compared using a nonparametric approach as suggested by DeLong et al.[42]

We also calculated the prevalence rates for different categories of each of the factors that had been found significantly associated with the given type of disorder in the multivariable logistic regression analyses. For this, all factors were dichotomized. We calculated the observed and adjusted prevalence rates with standard errors using the total sample in each country.

Finally, we tested interactions between a country and each influential factor to assess whether the effects of the factors differed across countries. Interaction effects were fitted simultaneously with main effects in a multivariable logistic regression analysis. The analyses were based on the sample with the complete information on each variable. All analyses were done on unweighted data with SPSS statistical software, version 15 (SPSS Inc, Chicago, Illinois); STATA statistical software, version 11 (STATA Corp, College Station, Texas); and SAS statistical software, version 9.1 (SAS Institute Inc, Cary, North Carolina).

RESULTS

A total of 3313 participants were interviewed across the 5 countries. **Table 1** summarizes the selection processes for each country.

Across all countries, 70.1% of the eligible participants were interviewed (range, 46.7%- 91.0%). Of 5330 people contacted, 11.3% did not meet the inclusion criteria (4.9% because they had not experienced any potentially stressful war event).

Sociodemographic characteristics and trauma-related variables are reported in **Table 2**. All sociodemographic variables and trauma exposure varied across countries, and the differences were particularly marked for educational level, employment rates, and number of war-related potentially traumatic experiences.

The exposure to different war-related potentially traumatic events is shown in **Table 3** and varied across countries. Apart from Kosovo, shelling or bombardment was the most frequent war-related potentially traumatic experience.

PREVALENCE OF MENTAL DISORDERS

The prevalence rates of mental disorders by country are shown in **Table 4**. The overall prevalence of mental disorders was 44.8%. Rates of anxiety disorders ranged from 15.6% to 41.8% and those of mood disorders from 12.1% to 47.6%. Substance use disorders, somatization disorders, and psychotic disorders were less frequent across all countries. The most frequent individual disorders were PTSD (range, 10.6%-35.4%) and major depressive episode (4.1%-37.3%). The prevalence rates of most disorders showed substantial variation between the countries. Between 14.4% and 26.9% of the samples met the criteria for only 1 disorder, and between 7.1% and 35.3% met criteria for 2 or more disorders.

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Table 4. Observed Prevalence of Current Mental Disorders in Each Country[a]

Mental Disorder	No. of Participants With Valid Responses	Bosnia and Herzegovina	Croatia	Kosovo	Republic of Macedonia	Serbia
Any mood disorder	3275	22.7 (1.7)	25.9 (1.6)	47.6 (2.0)	12.1 (1.3)	35.9 (1.9)
MDE	3303	10.9 (1.2)	21.1 (1.5)	37.3 (1.9)	4.1 (0.8)	26.2 (1.7)
Recurrent MDE	3300	8.3 (1.1)	13.8 (1.3)	15.3 (1.4)	1.5 (0.5)	14.4 (1.4)
MDE with melancholic features	3288	4.4 (0.8)	12.2 (1.2)	20.6 (1.6)	1.8 (0.5)	13.5 (11.4)
Dysthymia	3285	11.4 (1.3)	4.3 (0.8)	8.7 (1.1)	8.0 (1.1)	4.1 (0.8)
Hypomanic episode	3306	0.3 (0.2)	0.8 (0.3)	3.4 (0.7)	0.0	5.7 (0.9)
Manic episode	3308	0.0	0.3 (0.2)	3.1 (0.7)	0.0	3.9 (0.8)
Any anxiety disorder	3307	41.5 (1.9)	30.1 (1.7)	41.8 (1.9)	15.6 (1.4)	39.7 (1.9)
Panic disorder	3312	3.3 (0.7)	6.1 (0.9)	3.9 (0.8)	1.5 (0.5)	10.0 (1.2)
Panic disorder with agoraphobia	3313	0.9 (0.4)	3.3 (0.7)	2.3 (0.6)	0.3 (0.2)	5.2 (0.9)
Agoraphobia without panic disorder	3313	0.2 (0.2)	3.0 (0.6)	13.0 (1.3)	0.5 (0.3)	5.5 (0.9)
Social phobia	3313	0.9 (0.4)	3.7 (0.7)	5.6 (0.9)	0.8 (0.3)	6.1 (1.0)
Obsessive-compulsive disorder	3310	1.1 (0.4)	3.0 (0.6)	4.2 (0.8)	0.2 (0.2)	6.3 (1.0)
Posttraumatic stress disorder	3311	35.4 (1.9)	18.0 (1.4)	18.2 (1.5)	10.6 (1.2)	18.8 (1.6)
Generalized anxiety disorder	3308	6.9 (1.0)	10.6 (1.1)	17.7 (1.5)	4.4 (0.8)	23.6 (1.7)
Any substance abuse disorder	3302	5.5 (0.9)	6.5 (0.9)	2.8 (0.7)	0.6 (0.3)	9.0 (1.1)
Alcohol dependence	3312	1.7 (0.5)	2.3 (0.6)	1.5 (0.5)	0.0	4.6 (0.8)
Alcohol abuse	3305	3.0 (0.7)	2.8 (0.6)	0.3 (0.2)	0.3 (0.2)	2.7 (0.6)
Substance dependence	3313	0.6 (0.3)	1.4 (0.4)	0.9 (0.4)	0.2 (0.2)	1.9 (0.5)
Substance abuse	3309	0.5 (0.3)	0.6 (0.3)	0.0	0.2 (0.2)	0.6 (0.3)
Psychotic disorder	3312	0.5 (0.3)	0.3 (0.2)	4.5 (0.8)	0.2 (0.2)	0.8 (0.3)
Somatization disorder	3312	1.3 (0.4)	0.4 (0.2)	0.3 (0.2)	0.0	0.6 (0.3)
Comorbidity						
Any mental disorder	3313	48.0 (2.0)	39.8 (1.8)	62.2 (1.9)	21.5 (1.6)	54.0 (2.0)
One mental disorder	3313	22.8 (1.6)	18.2 (1.4)	26.9 (1.7)	14.4 (1.4)	18.8 (1.5)
≥2 Mental disorders	3313	25.2 (1.7)	21.6 (1.5)	35.3 (1.9)	7.1 (1.0)	35.2 (1.9)

Abbreviation: MDE, major depressive disorder.
[a] Data are given as the percentage of participants (standard error) unless otherwise indicated.

FACTORS ASSOCIATED WITH PREVALENCE RATES

When testing for the multicollinearity of the potential correlates, the length of time since the potentially most traumatic war-related experience showed high collinearity with the country. This reflects the history of events with the war happening in different countries at different times. The variable on experienced distress at the time of the potentially most traumatic event during the war showed a very low variance in all countries, with up to 99.5% of participants (Bosnia and Herzegovina) rating the highest option. These 2 variables were therefore excluded from logistic regression analyses.

The results of the multivariable logistic regression analyses with randomly selected two-thirds of the total sample are shown in **Table 5**.

When all selected variables were considered, higher rates of anxiety disorders were associated with older age, female sex, more potentially traumatic experiences during and after the war, and being unemployed. The same factors were associated with PTSD. Higher rates of mood disorders were significantly associated with older age; female sex; lower educational level; more potentially traumatic experiences before, during, and after the war; and being unemployed. Men and people without a partner had higher probability of having substance use disorders. In each of these analyses, significant differences remained between countries.

The ROC curves indicated that the discriminating ability of the 4 models to predict anxiety disorders, mood disorders, substance use disorders, and PTSD was satisfactory, with an AUC of 0.72 for anxiety disorders, 0.74 for mood disorders, 0.82 for substance use disorders, and 0.76 for PTSD.

FIT OF THE LOGISTIC MODEL

The AUCs for ROC curves calculated using the risk score derived from the estimated coefficients from the two-thirds sample and the data from the remaining one-third sample by country are plotted in the **Figure**. The AUCs had a value around 0.70 for the 4 study outcomes (anxiety disorders, mood disorders, substance use disorders, and PTSD) in all countries, suggesting that the estimated models based on a two-third sample had similarly moderate predictive ability across the 5 countries. The comparison of AUCs between countries showed no statistically significant difference.

The ROC curves for substance use disorders were more variable across countries and unstable. This may be a consequence of sampling errors, the relatively lower prevalence of these disorders, and the inclusion of only 2 strong binary predictors.

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Table 5. Association Between Prewar, War, and Postwar Factors and Indices of Any Disorder Among the War-Affected Population[a]

	Any Anxiety Disorder		Posttraumatic Stress Disorder		Any Mood Disorder		Any Substance Use Disorder	
	Coefficient (95% CI)	P Value	Coefficient (95% CI)	P Value	Coefficient (95% CI)	P Value	Coefficient (95% CI)	P Value
Country								
Serbia	1 [Reference]	. . .	1 [Reference]	. . .	1 [Reference]	. . .	1 [Reference]	. . .
Croatia	−0.99 (−1.31 to −0.67)	<.001	−0.82 (−1.21 to −0.42)	<.001	−1.04 (−1.39 to −0.69)	<.001	−0.16 (−0.76 to 0.43)	.59
Kosovo	−0.40 (−0.75 to −0.05)	.03	−0.68 (−1.13 to −0.24)	<.01	0.14 (−0.21 to 0.50)	.43	−0.63 (−1.38 to 0.11)	.10
Bosnia and Herzegovina	−0.91 (−1.29 to −0.53)	<.001	−0.37 (−0.81 to 0.06)	.09	−1.47 (−1.88 to −1.05)	<.001	−0.30 (−1.02 to 0.41)	.41
Republic of Macedonia	−1.21 (−1.58 to −0.84)	<.001	−0.41 (−0.87 to 0.04)	.07	−1.25 (−1.65 to −0.85)	<.001	−2.53 (−3.76 to −1.30)	<.001
Prewar context								
Age, y	0.01 (0.00 to 0.02)	.02	0.02 (0.01 to 0.03)	<.01	0.02 (0.01 to 0.03)	<.01	0.01 (−0.01 to 0.03)	.41
Female sex	0.56 (0.33 to 0.79)	<.001	0.39 (0.11 to 0.67)	<.01	0.34 (0.10 to 0.59)	<.01	−2.12 (−2.68 to −1.55)	<.001
Educational level								
Primary or none	1 [Reference]	. . .	1 [Reference]	. . .	1 [Reference]	. . .	1 [Reference]	. . .
Secondary or higher	−0.15 (−0.39 to 0.09)	.23	−0.09 (−0.37 to 0.19)	.53	−0.26 (−0.51 to −0.00)	.05	−0.14 (−0.68 to 0.39)	.60
No. of potentially traumatic prewar events	0.05 (−0.05 to 0.14)	.36	0.08 (−0.03 to 0.18)	.17	0.14 (0.04 to 0.24)	<.01	0.05 (−0.11 to 0.22)	.54
War context								
No. of potentially traumatic war events	0.21 (0.16 to 0.26)	<.001	0.29 (0.23 to 0.34)	<.001	0.18 (0.13 to 0.23)	<.001	0.01 (−0.08 to 0.10)	.84
Combat involvement								
No	1 [Reference]	. . .	1 [Reference]	. . .	1 [Reference]	. . .	1 [Reference]	. . .
Yes	0.16 (−0.16 to 0.48)	.34	0.30 (−0.06 to 0.66)	.10	−0.06 (−0.40 to 0.29)	.75	−0.06 (−0.62 to 0.49)	.82
Postwar context								
No. of potentially traumatic postwar events	0.24 (0.11 to 0.36)	<.001	0.20 (0.05 to 0.34)	<.01	0.32 (0.19 to 0.45)	<.001	0.20 (−0.01 to 0.41)	.07
Employment status								
Employed	1 [Reference]	. . .	1 [Reference]	. . .	1 [Reference]	. . .	1 [Reference]	. . .
Unemployed	0.53 (0.31 to 0.75)	<.001	0.55 (0.29 to 0.82)	<.001	0.46 (0.23 to 0.70)	<.001	0.39 (−0.06 to 0.83)	.09
Living with partner								
Yes	1 [Reference]	. . .	1 [Reference]	. . .	1 [Reference]	. . .	1 [Reference]	. . .
No	−0.13 (−0.23 to 0.21)	.91	0.02 (−0.24 to 0.28)	.88	0.16 (−0.07 to 0.40)	.17	0.93 (0.47 to 1.39)	<.001

Abbreviations: CI, confidence interval; ellipses, not applicable.
[a]The results presented are from multivariable logistic regression analyses.

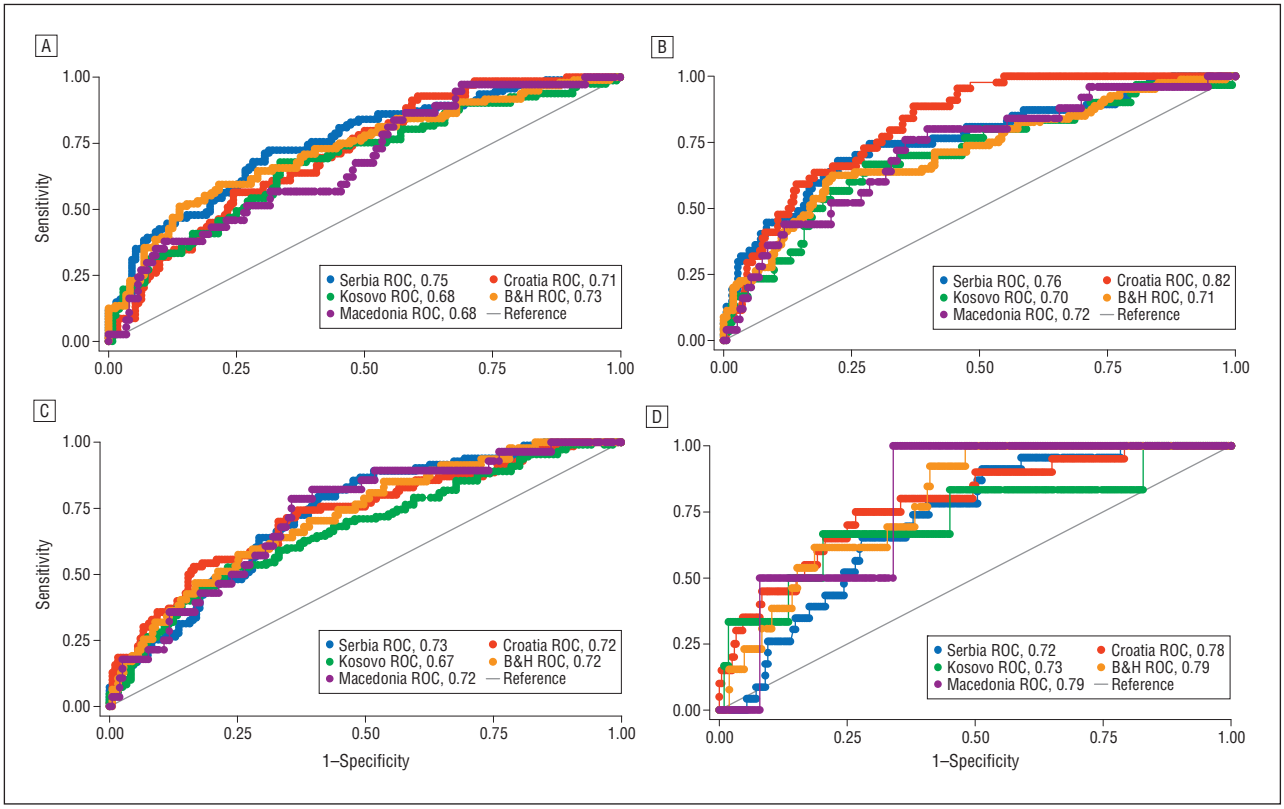

Figure. Receiver operating characteristic (ROC) curves. The curves are presented for any anxiety disorder (A), posttraumatic stress disorder (PTSD) (B), mood disorder (C), and substance use disorder (D) for one-third of the samples in each country. B&H indicates Bosnia and Herzegovina.

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Table 6. Unadjusted and Adjusted Prevalence Rates of Any Anxiety Disorder and Posttraumatic Stress Disorder Among War-Affected Populations[a]

	Bosnia and Herzegovina		Croatia		Kosovo		Republic of Macedonia		Serbia	
	Observed	Adjusted	Observed	Adjusted	Observed	Adjusted	Observed	Adjusted	Observed	Adjusted
Any Anxiety Disorder										
Sex										
Male	40.3 (2.9)	40.1 (1.0)	30.6 (2.5)	30.2 (0.9)	33.5 (2.8)	33.8 (1.0)	12.9 (1.8)	11.9 (0.3)	33.2 (2.9)	34.9 (1.0)
Female	42.4 (2.7)	42.6 (0.9)	29.6 (2.3)	30.0 (0.7)	48.1 (2.6)	47.9 (0.8)	18.5 (2.2)	19.7 (0.3)	44.7 (2.6)	43.4 (0.8)
Age, y										
20-40	33.0 (3.3)	33.3 (1.1)	22.9 (2.7)	23.7 (0.8)	39.4 (2.6)	38.5 (0.9)	11.9 (1.8)	13.8 (0.4)	36.0 (2.6)	34.9 (0.8)
41-65	45.4 (2.4)	45.4 (0.8)	33.8 (2.2)	33.4 (0.7)	44.8 (2.9)	46.0 (1.1)	19.3 (2.2)	17.4 (0.4)	43.9 (2.9)	45.1 (0.9)
No. of potentially traumatic war events										
1-3	13.0 (7.2)	19.7 (1.7)	22.6 (2.5)	20.7 (0.5)	32.3 (3.3)	27.4 (0.7)	14.7 (1.4)	15.0 (0.3)	35.3 (2.1)	35.5 (0.6)
≥4	42.5 (2.0)	42.3 (0.7)	34.6 (2.2)	35.8 (0.7)	46.0 (2.4)	48.2 (0.8)	25.9 (6.0)	22.1 (1.3)	60.2 (4.6)	59.6 (1.5)
No. of potentially traumatic postwar events										
0	39.6 (2.5)	38.2 (0.9)	26.3 (2.3)	25.9 (0.7)	39.8 (2.3)	39.1 (0.8)	13.0 (1.5)	14.8 (0.3)	33.2 (2.8)	34.2 (0.8)
≥1	44.0 (3.0)	46.0 (1.0)	33.8 (2.5)	34.3 (0.8)	46.6 (3.6)	48.1 (1.4)	23.5 (3.3)	18.0 (0.7)	44.9 (2.6)	44.1 (0.9)
Employment										
Employed	30.4 (1.8)	29.2 (0.8)	16.7 (2.1)	20.2 (0.6)	32.1 (3.4)	28.6 (1.0)	7.9 (2.9)	8.6 (0.2)	32.1 (2.4)	31.6 (0.6)
Unemployed	48.5 (1.9)	49.2 (0.7)	38.9 (2.3)	36.6 (0.6)	45.9 (2.3)	47.3 (0.7)	19.6 (2.5)	19.2 (0.3)	50.8 (3.1)	51.6 (0.9)
Posttraumatic Stress Disorder										
Sex										
Male	35.9 (2.8)	38.2 (1.2)	23.1 (2.3)	21.4 (0.9)	17.3 (2.3)	15.9 (0.8)	10.1 (1.6)	9.1 (0.3)	16.1 (2.2)	18.5 (1.0)
Female	34.9 (2.6)	33.0 (0.9)	13.7 (1.7)	15.2 (0.5)	18.9 (2.0)	20.0 (0.7)	11.2 (1.8)	12.3 (0.3)	20.9 (2.1)	19.1 (0.7)
Age, y										
20-40	26.3 (3.1)	27.3 (1.2)	12.0 (2.1)	13.0 (0.7)	16.9 (2.0)	15.3 (0.6)	6.9 (1.4)	9.0 (0.3)	17.4 (2.1)	15.2 (0.7)
41-65	39.6 (2.4)	39.2 (0.9)	20.7 (1.9)	21.0 (0.6)	19.8 (2.4)	21.8 (0.9)	14.4 (1.9)	12.2 (0.3)	20.5 (2.3)	22.8 (0.9)
No. of potentially traumatic war events										
1-3	8.7 (6.0)	11.4 (1.1)	4.7 (1.3)	8.9 (0.3)	9.1 (2.0)	7.2 (0.2)	9.9 (1.2)	9.9 (0.2)	14.3 (1.5)	14.2 (0.3)
≥4	36.4 (1.9)	36.3 (0.7)	26.1 (2.1)	23.6 (0.7)	22.2 (2.0)	23.0 (0.7)	18.5 (5.3)	18.7 (1.2)	39.8 (4.6)	40.2 (1.7)
No. of potentially traumatic postwar events										
0	35.3 (2.5)	32.6 (0.9)	16.3 (1.9)	15.2 (0.6)	16.5 (1.7)	16.4 (0.6)	9.4 (1.3)	10.0 (0.2)	12.3 (2.0)	15.3 (0.7)
≥1	35.4 (2.9)	39.2 (1.1)	19.8 (2.1)	20.9 (0.8)	22.3 (3.0)	22.5 (1.2)	14.2 (2.8)	12.3 (0.5)	23.9 (2.3)	21.6 (0.8)
Employment										
Employed	25.1 (2.8)	23.6 (0.9)	8.0 (1.6)	11.4 (0.6)	12.6 (2.4)	11.6 (0.7)	5.3 (1.5)	6.0 (0.2)	14.6 (1.8)	13.1 (0.5)
Unemployed	41.8 (2.5)	42.8 (0.9)	24.7 (2.1)	22.4 (0.7)	20.5 (1.9)	21.0 (0.7)	13.4 (1.6)	13.0 (0.3)	25.0 (2.7)	27.2 (1.0)

[a] Data are given as percentage of participants (standard error).

ASSOCIATION OF INFLUENTIAL FACTORS WITH OBSERVED AND ADJUSTED PREVALENCE RATES

The differences in observed and adjusted prevalence rates associated with each of the factors identified as influential are shown in **Table 6** and **Table 7**.

Observed and adjusted prevalence rates were similar in most cases. The number of war-related potentially traumatic events was associated with the largest differences of adjusted rates of anxiety disorders (≥4 potentially traumatic experiences were linked with between 6.9% and 24.1% higher rates) and PTSD (9.8%-26.0%). These differences were smaller for the adjusted rates of mood disorders (3.9%-19.8%). The factor associated with the highest difference in prevalence rates of substance use disorders was sex.

Of the 19 tested potential interaction effects, 3 were statistically significant at $P<.05$. Country interacted with sex in predicting mood disorders ($P<.001$), with the number of war-related potentially traumatic experiences for anxiety disorders ($P=.02$), and with postwar potentially traumatic experiences for PTSD ($P=.01$). In all countries, the differences of the adjusted rates of the given disorder explained by these factors went in the same direction, although they varied in size (Tables 6 and 7).

COMMENT

MAIN FINDINGS

More than 5 years after the war, the prevalence rates of mental disorders in war-affected people varied across Balkan countries. Overall, they were substantially higher than those reported for non–war-affected populations in Western countries.[19-22] The substantial differences between countries held true when other factors were considered in multivariable analyses. However, the multivariable models developed for predicting disorders in all countries had similarly moderate predictive power in each country. In these models, older age, female sex, more potentially traumatic experiences during and after the war, and unemployment were associated with higher rates of mood and anxiety disorders. In addition, mood disorders were correlated with lower educational level and more potentially traumatic experiences before the war. Male sex and not living with a partner were the only factors

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Table 7. Unadjusted and Adjusted Prevalence Rates of Any Mood and Substance Use Disorders Among War-Affected Populations[a]

	Bosnia and Herzegovina		Croatia		Kosovo		Republic of Macedonia		Serbia	
	Observed	Adjusted	Observed	Adjusted	Observed	Adjusted	Observed	Adjusted	Observed	Adjusted
Any Mood Disorder										
Sex										
Male	18.3 (2.3)	20.6 (0.7)	23.8 (2.4)	25.4 (0.8)	48.4 (3.0)	40.8 (1.0)	10.3 (1.6)	9.7 (0.3)	27.9 (2.7)	31.9 (1.0)
Female	26.5 (2.4)	24.5 (0.7)	27.8 (2.3)	26.4 (0.6)	47.0 (2.6)	52.7 (0.8)	14.1 (2.0)	14.8 (0.3)	42.2 (2.7)	39.1 (0.8)
Age, y										
20-40	14.1 (2.4)	16.3 (0.7)	20.7 (2.6)	20.0 (0.7)	44.1 (2.6)	43.5 (0.8)	7.8 (1.5)	10.2 (0.3)	33.0 (2.6)	31.0 (0.8)
41-65	26.7 (2.1)	25.7 (0.6)	28.7 (2.1)	29.2 (0.6)	51.9 (3.0)	52.8 (1.0)	16.6 (2.1)	14.1 (0.3)	39.2 (2.9)	42.0 (0.9)
Educational level										
Primary or none	31.3 (3.2)	30.3 (0.9)	32.7 (3.7)	35.5 (1.0)	52.8 (3.0)	56.6 (0.9)	18.0 (2.2)	15.2 (0.3)	57.1 (6.7)	49.3 (2.5)
Secondary or higher	18.6 (1.9)	19.0 (0.5)	24.0 (1.8)	23.1 (0.5)	43.9 (2.6)	41.0 (0.8)	7.0 (1.4)	9.4 (0.2)	33.8 (2.0)	34.7 (0.7)
No. of potentially traumatic prewar events										
0	18.6 (1.9)	19.8 (0.5)	20.3 (2.2)	21.0 (0.6)	44.0 (2.3)	43.3 (0.7)	10.8 (1.5)	11.4 (0.3)	29.4 (3.1)	28.0 (0.9)
≥1	30.7 (3.2)	28.4 (0.9)	31.2 (2.4)	30.5 (0.7)	55.9 (3.6)	57.4 (1.2)	14.9 (2.5)	13.7 (0.4)	39.4 (2.4)	40.1 (0.8)
No. of potentially traumatic war events										
1-3	13.0 (7.2)	10.8 (1.2)	18.1 (2.3)	19.2 (0.6)	36.7 (3.5)	34.1 (0.8)	12.2 (1.3)	11.8 (0.2)	32.5 (2.1)	32.5 (0.6)
≥4	23.1 (1.7)	23.1 (0.5)	30.7 (2.2)	30.0 (0.6)	52.3 (2.4)	53.5 (0.8)	11.1 (4.3)	15.7 (1.1)	51.4 (4.8)	52.3 (1.6)
No. of potentially traumatic postwar events										
0	20.4 (2.1)	19.3 (0.6)	20.3 (2.1)	20.5 (0.5)	45.1 (2.3)	43.8 (0.7)	9.2 (1.3)	11.1 (0.2)	27.7 (2.7)	28.1 (0.7)
≥1	25.8 (2.7)	27.5 (0.8)	31.4 (2.4)	31.3 (0.7)	53.4 (3.6)	56.4 (1.3)	21.0 (3.2)	15.1 (0.5)	42.5 (2.7)	42.2 (0.9)
Employment										
Employed	13.0 (2.1)	15.1 (0.5)	16.9 (2.2)	17.5 (0.5)	40.7 (3.6)	36.1 (1.1)	6.2 (1.6)	7.3 (0.2)	29.6 (2.4)	29.2 (0.6)
Unemployed	28.8 (2.3)	27.5 (0.6)	31.9 (2.2)	31.4 (0.6)	50.4 (2.3)	52.4 (0.7)	15.2 (1.7)	14.6 (0.3)	45.3 (3.2)	45.8 (1.0)
Any Substance Use Disorder										
Sex										
Male	10.5 (1.8)	9.8 (0.2)	11.7 (1.8)	11.9 (0.3)	5.5 (1.4)	5.3 (0.1)	1.1 (0.6)	1.0 (0.0)	16.5 (2.3)	17.3 (0.4)
Female	1.2 (0.6)	1.8 (0.1)	2.0 (0.7)	1.9 (0.1)	0.8 (0.5)	0.9 (0.0)	0.0	0.2 (0.0)	3.3 (0.9)	2.7 (0.1)
Living with a partner										
Yes	4.0 (1.0)	4.6 (0.2)	5.1 (1.0)	5.3 (0.2)	2.9 (0.8)	2.6 (0.1)	0.2 (0.2)	0.5 (0.0)	7.1 (1.3)	6.2 (0.3)
No	8.3 (1.9)	7.1 (0.4)	9.6 (2.1)	9.6 (0.6)	2.5 (1.3)	3.4 (0.3)	1.9 (1.1)	0.9 (0.1)	11.7 (2.0)	13.1 (0.6)

[a] Data are given as percentage of participants (standard error).

associated with higher rates of substance use disorders. Most of these associations did not significantly differ between countries.

STRENGTHS AND LIMITATIONS

To our knowledge, this is the largest community-based study assessing mental disorders in people directly exposed to war that has been conducted several years after the war and used consistent methods with random sampling across 5 countries. A multistage probabilistic sampling method and random-walk technique were applied in all countries. The findings may therefore be seen as representative for large populations of people who were directly affected by the war in the former Yugoslavia and who still live in the area of conflict. The study included civilians and people with active combat experience. Further strengths are that all interviewers were well-trained researchers with a relevant professional background who were familiar with the local context. The study was conducted in a cultural context in which concepts of Western psychiatry may be seen as valid. Studies using methods that were developed in Western medicine to assess distress in war-affected non-Western societies have often been criticized as culturally inappropriate.[43] Another strength was that the influence of participants' sociodemographic characteristics and postwar social situation was considered in a multivariable analysis. Indeed both patients' prewar characteristics and aspects of their social situation after the war showed significant associations with prevalence rates but did not explain the variance in rates of anxiety and mood disorders associated with the level of war experiences. Finally, it is a strength of the analysis that the logistic regression model was developed in a randomly selected subsample and then tested in independent subsamples in each country.

The study also has several limitations. We only assessed point prevalence rates and have no information about the onset of the disorders. Because there are no comparable data on the prewar prevalence rates of mental disorders in the populations of the former Yugoslavia, it is not possible to determine whether the high rates of mental disorders are a direct consequence of the war and the postwar situation in these countries or whether they are influenced by other factors. The reporting of past experiences may have been influenced by recall bias. Substantial, although inconsistent, evidence suggests that people with current symptoms tend to report more potentially traumatic experiences.[44,45] This bias may exaggerate associations between disorders and reported experiences.

Although a consistent sampling method was applied, the response rates varied across countries. In Bosnia-Herzegovina, the Republic of Macedonia, and Kosovo, the rates were 78% and higher, but in Serbia, we achieved a response rate of only 46.7%. This lower response rate

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may impair comparisons across countries. Some findings suggest that a lower response rate might be associated with underrepresentation of mental disorders, particularly anxiety disorders,[46] whereas a less rigorous sampling has also been linked with higher rates of disorders.[47] We used different interviewers across the 5 countries, and although they underwent extensive training and achieved an acceptable level of agreement, some of the differences between countries may be owing to differences in interviewing methods. There may also have been underreporting of mental disorders, in particular with respect to substance use disorders, which may be seen as unacceptable in the cultural context of the studied populations. Conclusions on causal relationships between the existence of current mental disorders and the social situation of interviewees cannot be drawn. For instance, unemployment may be the result of depression, contribute to its occurrence, or both. Finally, only a limited number of potential predictor variables were assessed, and the differences and associations found in this study may still be subject to unobserved confounding factors.

Studying mental disorders following war experiences, we selected only interviewees who had been directly exposed to war activities. The findings are therefore neither representative for the included countries as a whole nor for all people who had experienced war. The samples represent people who had been directly exposed to war and still live in the affected areas. Within the selected communities, less than 5% of potential interviewees were excluded because they had not experienced any war events, usually because they had been elsewhere during that time.

COMPARISONS WITH THE LITERATURE

The results are consistent with other studies suggesting that war experience may be associated with negative, long-term consequences for mental health.[5-15,17,23,26,27] Previous studies in countries in the former Yugoslavia found prevalence rates of PTSD between 16% and 34%, major depressive episodes between 9% and 32%, and substance use disorders between 7% and 16% among war-affected community samples in Bosnia and Herzegovina, Croatia, Kosovo, and Serbia,[26-28] which are similar to the rates in this study. Major depression and PTSD were the most prevalent disorders in the present study. Except for the Republic of Macedonia, PTSD occurred in at least 1 of every 5 survivors living in the community. Also, the substantial levels of comorbidity between mood, anxiety, and substance use disorders observed here are consistent with findings from previous research in other war-affected populations.[5,15,27,28,48] Exposure to potentially traumatic experiences during the war showed a strong positive association with mood and particularly anxiety disorders, a finding reported in other studies assessing long-term outcomes of war.[5,7-15,17,23,26,27,41] A survey of war-affected civilians in Algeria, Cambodia, Ethiopia, and Gaza identified war-related experiences after the age of 12 years as the only factor consistently associated with PTSD across all 4 samples.[14] In Bosnia and Herzegovina, Croatia, and Serbia, Başoglu et al[27] found higher rates of major depression and PTSD in a nonrandom community-based sample of people with direct war exposure compared with matched interviewees without such experience. In a study in Herzegovina, women in war-exposed areas had higher rates of PTSD than women in other areas.[26]

The lack of a significant association between war trauma and substance use disorders found in this study is inconsistent with some, but not all, previous research.[5,49-51] A study of Cambodian refuges 2 decades after resettlement in the United States also failed to find an association between war trauma exposure and later alcohol use disorder.[5]

Furthermore, we identified individual risk factors for ongoing mental disorders after war, ie, older age, female sex, and lower educational level, that are in line with findings in other settings and historical contexts.[5,8,10-13,16,17,27] Also consistent with previous research is the association of socioeconomic adversities after war, in particular unemployment[6,11,12] and being separated or divorced[6,13] as well as postwar potentially traumatic experiences,[5,41] with unfavorable long-term outcomes. Factors associated with anxiety and mood disorders are similar, whereas other factors, in particular male sex and living alone, are linked with substance use disorders.

DIFFERENCES AND SIMILARITIES AMONG COUNTRIES

We found significant differences of prevalence rates of mental disorders among the 5 countries. Substantial differences of prevalence rates of mental disorders between countries after war have also been reported previously.[15] However, the differences may be of particular interest in this study because all 5 countries had until 1990 been part of the same country (ie, Yugoslavia) and share much of their history, culture, and traditions.

There are several factors that may account for the identified differences between countries. The exact features of the warfare and the related experiences of the affected people varied across the countries. Most war experiences in Serbia and the Republic of Macedonia related to shelling or bombardment. Participants in other countries reported a range of other war experiences, including a loss of family or friends, witnessing murder, being under siege, and being in a concentration camp/prison. It is unknown whether the different quality of such experiences may have a specific influence on mental disorders.

Ongoing societal instability and political uncertainty may have been factors increasing rates of all mental disorders in Serbia. The increased levels of mood disorders among the war-affected Kosovan population may reflect a cumulative effect of particular socioeconomic hardship and ethnic tensions experienced by this population over several decades, including long periods before the beginning of the war.[24] Differences of prevalence rates may also have been influenced by the overall level of health and social care provision in each country or specific aspects of the national health and social care systems.

The considered prewar characteristics, war experiences, and postwar factors did not explain the marked differences between countries. However, the associa-

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tions of these factors with adjusted outcomes pointed in the same direction in all countries, even when interaction effects were taken into account and the predictive value of the developed multivariable models for adjusted mental disorders did not differ significantly between countries. The findings suggest that the influence of the factors was generally not dependent on the country. The consistency of associations may reflect the cultural similarity of the 5 countries and the consistent methodological approach of the study across countries.

IMPLICATIONS AND CONCLUSIONS

Studies predicting or identifying the mental health needs of war-affected populations need to be country specific. The large differences of prevalence rates between countries found in this study in the same region, in a similar historical context and using the same methods, underline the limits of generalizing findings from one war-affected area to another. At the same time, once differences in prevalence rates among countries in the same region are taken into account, similar multivariable models might be used to estimate the risks for mental disorders and the level of potentially traumatic experiences in the war may be expected to explain a substantial difference in prevalence rates of mood, and particularly, anxiety disorders. Once other factors were considered, combat involvement was not significantly associated with any of the outcomes. This may indicate that research findings in people with combat experience may to some extent be generalized to civilians and vice versa.

Wars are still happening in different parts of the world and affect millions of civilians every day. Long-term policies are required to meet the mental health needs of war-affected populations and should go beyond the international aid programs that had been organized in various war-affected regions in the studied countries. Such policies should consider country-specific aspects. Across countries they should target groups with higher risks, such as older people, women, those with lower educational levels, those having experienced more war-related potentially traumatic events, and those without employment. Strategies should include evidence-based health care interventions, which exist for the most frequent disorders found in this study, and social reconstruction facilitating and providing employment. The impact of war experience on mood and anxiety disorders but not on substance use disorders may be relevant for compensation legislation.

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