

- 6 Akdağ R. *Health transformation program in Turkey progress report*. Ministry of Health Ankara, Turkey, 2009.
- 7 Ersoy K, Kavuncubasi S, Ozcan YA, Harris JM. Technical efficiencies of Turkish hospitals: DEA approach. *J Med Sys* 1997;21:67–74.
- 8 Sahin I, Ozcan YA. Public sector hospital efficiency for provincial markets in Turkey. *J Med Sys* 2000;24:307–320.
- 9 Sahin I, Ozcan YA, Ozgen H. Assessment of hospital efficiency under health transformation program in Turkey. *Central European Journal of Operations Research* 2009. <http://www.springerlink.com/content/mq87542401733n7m/>.
- 10 Charnes A, Cooper WW, Rhodes E. Measuring the efficiency of decision making units. *Eur J Oper Res* 1978;2:429–444.
- 11 Banker RD, Charnes RF, Cooper WW. Some models for estimating technical and scale inefficiencies in data envelopment analysis. *Manag Sci* 1984;30:1078–1092.
- 12 Färe R, Grosskopf S, Norris M, Zhang Z. Productivity growth, technical progress and efficiency changes in industrialized countries. *Am Eco Rev* 1994;84:66–83.
- 13 Seiford LM, Thrall RM. Recent developments in DEA: the mathematical programming approach to frontier analysis. *J Eco* 1990;46:7–38.
- 14 Coelli TJ. A guide to DEA version 2.1: A data envelopment analysis (computer) program. The University of New England, Department of Econometrics, Center for Efficiency and Productivity Analysis (CEPA) Working Paper No: 8/96, 1996.
- 15 Cooper WW, Seiford LM, Tone K. *Data Envelopment Analysis: A Comprehensive Text with Models, Applications, References and Dea-Solver Software*. Boston: Kluwer, 2000.
- 16 Färe RS, Grosskopf S, Lovell CAK. *Production Frontiers*. Cambridge: Cambridge University Press, 1994.
- 17 Wilcoxon F. Individual comparisons by ranking methods. *Biometrics Bulletin* 1945;1:80–83.
- 18 Ministry of Health. *The Statistical Year Book of Inpatient Health Care Organizations of Turkey*. Ministry of Health, Directorate General of Curative Services, Ankara, Turkey, 2001.
- 19 Ministry of Health. *The Statistical Year Book of Inpatient Health Care Organizations of Turkey*. Ministry of Health, Directorate General of Curative Services, Ankara, Turkey, 2006.
- 20 Aletras V, Kontodimopoulos N, Zagouldoudis A, Niakas D. 2007. The short-term effect on technical and scale efficiency of establishing regional health systems and general management in Greek NHS hospitals. *Health Policy* 2007;83:236–245.
- 21 Roemer MI, Moustafa AT, Hopkins CE. A proposed hospital quality index: hospital death rates adjusted for case severity. *Health Serv Res* 1968;3:96–118.
- 22 Evans RG, Walker HD. Information theory and the analysis of hospital cost structure. *Can J Eco* 1972;5:398–418.
- 23 Jensen GA, Morrisey MA. Medical staff specialty mix and hospital production. *Health Econ* 1986;5:253–76.
- 24 Grosskopf S, Valdmanis V. Evaluating hospital performance with case-mix-adjusted outputs. *Med Care* 1993;31:525–32.
- 25 State Planning Organization. *Research of the Socio-Economic Development of Provinces*. Ankara, Turkey: State Planning Organization Press, 1996.
- 26 Vujicic M, Sparkes S, Mollahaliloglu S. *Health Workforce Policy in Turkey: Recent Reforms and Issues for the Future*. Washington DC, USA: The International Bank for Reconstruction and Development/The World Bank, 2009.
- 27 Özmen, Mustafa N. Türkiye’de geri ödeme sistemi ve tanı ilişkili gruplar (DRG) (Reimbursement System in Turkey and the diagnosis related groups (DRG)). *Makro Bakış Sağlık Politikası Gündemi* 2009;9:2–5.

.....  
 European Journal of Public Health, Vol. 22, No. 5, 638–643

© The Author 2011. Published by Oxford University Press on behalf of the European Public Health Association. All rights reserved.  
 doi:10.1093/eupub/ckr096 Advance Access published on 11 July 2011

## Use of healthcare services 8 years after the war in Kosovo: role of post-traumatic stress disorder and depression

Ariel Eytan, Marianne Gex-Fabry

Department of Mental Health and Psychiatry, University Hospitals of Geneva, Switzerland

**Correspondence:** Ariel Eytan, MD, University Hospitals of Geneva, Department of Mental Health and Psychiatry, 2 Chemin du Petit-Bel-Air, CH-1225 Geneva, Switzerland, tel: +41 22 305 47 55, fax: +41 22 305 50 40, e-mail: ariel.eytan@hcuge.ch

**Background:** The aim of the present study was to examine the use of health-care services and medication, as well as health risk behaviours such as smoking, in relation with post-traumatic stress disorder (PTSD) and major depressive episode (MDE) in post-war Kosovo. **Methods:** A sample of 864 adults was interviewed in 2007 of which 551 took part in a 2001 survey. They were assessed using the PTSD and MDE sections of the Mini International Neuropsychiatric Interview (MINI) and the Medical Outcomes Study 36-item Short Form Health Survey (SF-36). Use of health-care services, alcohol and tobacco were also recorded. **Results:** Respondents were predominantly female (56.6%) with a median age of 36 years and a primary educational level (44.6%). While 11.9% of participants met diagnostic criteria for PTSD, MDE prevalence was 30.6%. Both PTSD and MDE were significantly associated with lower scores on the SF-36 physical component summary. After adjustment for sex, age, education, unemployment, municipality and SF-36 perceived physical health, no significant association was observed between PTSD and medical visits in the past 12 months, hospitalizations in the past 12 months and use of medication in the past 7 days. Results were similar for MDE, except for a significantly higher frequency of medication use that included psychotropic and other drug classes. **Conclusion:** Eight years after the war in Kosovo, poor perceived physical health displayed a long-lasting association with PTSD and MDE and was a major determinant of increased use of health-care services without additional contribution of PTSD *per se*.

### Introduction

Consequences of collective trauma on the mental health of civilian populations have been studied in various settings. A systematic review and meta-analysis of the prevalence rates of post-traumatic stress disorder (PTSD) and depression in the refugee and post-conflict mental health field included 161 articles.<sup>1</sup> Noteworthy, only a third addressed long-term outcome (6 years or more after the conflict) and,

among these, most were conducted in countries of asylum rather than in post-war countries. The scarcity of long-term follow-up studies probably reflects the time-frame of humanitarian and crisis intervention programmes, which are too often designed on a short-term basis.

PTSD, which can be understood as the inability to recover from a stress reaction to a traumatic event, is often long-lasting in civilian adult survivors of war<sup>2</sup> and can display a delayed onset.<sup>3</sup> Research conducted with Holocaust and World War II survivors<sup>4</sup> suggested that suffering

continues for decades after the crisis has ended. It is currently accepted that in low-income post-conflict settings, PTSD is the most frequently reported mental disorder, affecting as much as 37% of populations exposed to armed conflicts.<sup>5</sup> Civilians exposed to war-related traumatic events are also at higher risk for major depressive episodes (MDE).<sup>6</sup> Co-morbidity of PTSD and depression are frequent among traumatized civilians with rates between 20% and 50%.<sup>7</sup>

In high-income countries, post-traumatic stress symptoms are positively correlated with increased use of general health services<sup>8</sup> and PTSD is associated with higher rates of general medical complaints.<sup>9</sup> Worldwide care for depression is mostly delivered by general practitioners<sup>10</sup> and patients with depressive disorders often present with somatic complaints, especially in non-Western cultures.<sup>11</sup> Associations between health risk behaviors and mental disorders are well documented, with both PTSD and depressive disorders associated with increased rates of smoking and alcohol misuse.<sup>12–14</sup>

For the Balkans area, data indicate that prevalence of PTSD and mood disorders are generally high several years after the end of the war, in particular, among subjects who never received psychiatric or psychological treatment.<sup>15,16</sup> In Kosovo, during the years following the war, specific treatments for MDE and PTSD were seldom available and primary health care was the cornerstone of health policy reforms.<sup>17</sup> According to our 2001 survey, PTSD was associated with an increased use of most health-care services 2 years after the end of the conflict, despite significant barriers to access to care. Use of services was positively correlated with the number of traumatic events people had been exposed to.<sup>18</sup> The present study is based on a follow-up survey conducted in 2007.<sup>19</sup> It aims at re-examining the use of health-care services and its relationship with PTSD and depression 8 years after the end of the conflict, with additional focus on the use of medication, alcohol and nicotine.

## Method

### Study setting, design and sample selection

At the end of the 1990s, an estimated 45.7% of the Kosovar Albanian population fled the area because of the war. Over 1.5 million subsequently returned to their home country. The population is now ~2.2 million, made up of ~90% ethnic Albanians and 50% under the age of 25 years.<sup>19</sup>

Study design proceeded in two stages. A first survey of 996 adults of Kosovar Albanian ethnicity was conducted in 2001, 2 years after the end of the conflict.<sup>20</sup> Households from eight municipalities were randomly selected from a list of families that included at least one person who had sought asylum in Switzerland and returned to Kosovo by April 2001, with the aid of the Swiss Development Agency and the International Organization for Migration (IOM). A follow-up survey was conducted in 2007 that retrieved and re-interviewed 551 people from the 2001 sample.<sup>19</sup>

The present study focuses on data collected in 2007 in an extended sample of 864 respondents, of whom 313 only participated in the 2007 survey. This subsample included people <16 years at the time of the first survey ( $n=121$ ), subjects who were either absent from household ( $n=76$ ) or not identified as household members ( $n=78$ ) in 2001, and respondents excluded from the first survey for incomplete data ( $n=38$ ). Interviewers were recruited among local psychosocial counsellors. They were specifically trained by the authors.

### Ethics

The study was approved by the Ethics Committee of the Geneva University Hospitals. Financial compensation of €30 per household was provided. It did not depend on the number of participants in each household in order to avoid financial pressures to be exerted upon family members by the head of household. The study only included people aged  $\geq 16$  years and without any obvious impairment of their capacity to consent. Interviewers were aware that in the presence of acute mental distress, they would have to refer participants to local primary health-care centres.

### Instruments and study variables

PTSD and MDE were assessed with the appropriate sections of the Albanian version of the Mini International Neuropsychiatric Interview (MINI).<sup>21,22</sup> Self-perceived physical and mental health were assessed using the Albanian translation of the Medical Outcomes Study 36-Item Short Form Health Survey (SF-36).<sup>23</sup> Physical Component Summary (PCS) and Mental Component Summary (MCS) scores were computed according to a three-step procedure allowing for comparison with US reference values (norm-based scores).<sup>24</sup> Because of a high percentage of illiteracy, especially in rural areas, questionnaires were always read aloud.

Questions related to the use of health-care services were adapted from our experience with the 2001 survey.<sup>18</sup> Alcohol use was measured with the first three questions of the Alcohol Use Disorders Identification Test (AUDIT).<sup>25</sup> Tobacco use was addressed through the following two questions 'Do you smoke cigarettes (at least one cigarette/day)? (yes or no)' and 'In the past, have you ever smoked cigarettes regularly (at least one cigarette/day for at least 6 months)? (yes or no)'. Participants who answered positively to both questions were considered as current smokers, in agreement with the Center for Disease Control (CDC) definition.

### Statistical analysis

Associations between use of health-care services and participants' socio-demographic and perceived health characteristics were first investigated in univariate analyses, using cross-tabulations and chi-square tests for proportions. They were then analysed using multivariable logistic regression models that considered the following predictors together: sex, age (three groups), education, unemployment, municipality, SF-36 PCS (three groups, defined *a priori*), PTSD and MDE diagnoses. Because worse subjective mental health was hypothesized to be secondary to PTSD and MDE, SF-36 MCS was not included among adjustment variables. Adjusted odds ratios (ORs) and 95% confidence intervals (95% CIs) were estimated for each predictor. Factors associated with use of medication and cigarettes were investigated with similar approaches. SF-36 components were analyzed using analysis of variance models (ANOVA), with sex, age group (10-year intervals), PTSD and MDE entered as factors.

## Results

### Sample description

Table 1 provides socio-demographic characteristics of the 864 participants in the 2007 survey, who were part of 264 households. Median number of respondents per household was three (range 1–13). Respondents were predominantly female (56.6%), with a median age of 36 years and a primary educational level (44.6%). Unemployment rate was 24.7%. While 11.9% of participants met diagnostic criteria for PTSD, MDE prevalence was 30.6%. Comorbid MDE was diagnosed in 79.6% of respondents with PTSD. Sex- and age-adjusted SF-36 PCS and MCS were below 1998 norms for the US general population. PTSD and MDE were both associated with significantly worse perceived physical health (mean difference  $-4.0$  points,  $P < 0.001$  for PTSD; mean difference  $-6.0$  points,  $P < 0.001$  for MDE) and mental health (mean difference  $-5.8$  points,  $P < 0.001$  for PTSD; mean difference  $-11.8$  points,  $P < 0.001$  for MDE), when considered together in additive sex- and age-adjusted ANOVA models.

### Use of healthcare services

Overall, 620 subjects (71.8%) reported a medical visit in the past 12 months. A majority of participants (63.2%) attended a family health-care centre at least once, 46.4% consulted a physician in the private sector and 33.7% consulted a physician in the public sector. Only 20 participants (2.3%) attended community mental health-care centres. Hospitalization rate in the past 12 months was 12.6%.

As indicated in table 2, female sex, older age, lower level of education, being employed and lower subjective physical health were significantly

**Table 1** Characteristics of participants (*n* = 864)

Gender, <i>n</i> (%)	
Female	489 (56.6)
Male	375 (43.4)
Age, median (range)	36 (16–89)
Education, <i>n</i> (%) <sup>a</sup>	
Less than primary	157 (18.3)
Primary	382 (44.6)
Higher than primary	318 (37.1)
Unemployed, <i>n</i> (%) <sup>b</sup>	
Yes	213 (24.7)
No	648 (75.3)
Municipality, <i>n</i> (%) <sup>c</sup>	
Deçan/Decani	153 (17.7)
Gjakovë/Djakovica	140 (16.2)
Gjilan/Gnjilane	38 (4.4)
Rahovec/Orahovac	109 (12.6)
Pejë/Pec	89 (10.3)
Prishtinë/Pristina	103 (11.9)
Prizren/Prizren	138 (16.0)
Ferizaj/Urosevac	94 (10.9)
SF-36 PCS, adjusted for age and sex, mean (95% CI) <sup>d</sup>	44.1 (43.5–44.8)
SF-36 MCS, adjusted for age and sex, mean (95% CI) <sup>d</sup>	42.8 (42.0–43.5)
PTSD, <i>n</i> (%)	103 (11.9)
MDE, <i>n</i> (%)	264 (30.6)

a: Missing values (*n* = 7)b: Missing values (*n* = 3)

c: Names of municipalities in Albanian and Serbian (A/S)

d: Missing values (*n* = 15)

associated with an increased frequency of medical visits in the past 12 months, while significant disparities were observed across municipalities. Diagnoses of PTSD and MDE were also associated with more frequent medical visits in unadjusted analyses. However, after adjustment for sex, age, education, unemployment, municipality and SF-36 PCS, neither PTSD nor MDE remained significant predictors of medical visits. Results were very similar for hospitalization in the past 12 months, with a significant association with PTSD and MDE in unadjusted models, but no significant association left after adjustment for socio-demographic variables and SF-36 PCS (data not shown).

### Use of medication

Overall, 56.8% of the participants took some medication during the last 7 days. In keeping with increased frequency of medical visits, increased use of medication was associated with female sex, older age, lower education, not being unemployed and lower subjective physical health. Medication use was also significantly higher in the presence of PTSD and MDE (table 2) in unadjusted analyses. After adjustment for socio-demographic variables and SF-36 PCS, MDE remained significantly associated with increased use of medication (OR = 3.0, 95% CI 1.9–4.8), unlike PTSD.

The use of specific drug classes is documented in table 3. The most frequently used drugs were analgesics (labelled ‘pain killers’, 53.0%), medication for hypertension (18.6%), vitamins and nutritional supplements (labelled ‘fortifying medication’, 17.9%) and tranquilizers (15.4%). In models adjusted for socio-demographic variables and SF-36 PCS, MDE was not only significantly associated with increased use of tranquilizers (OR = 3.9, 95% CI 2.3–6.5), anti-depressants (OR = 3.6, 95% CI 1.7–7.3) and hypnotics (labelled ‘sleeping pills’, OR = 2.9, 95% CI 1.6–5.3), but also with more frequent use of most other drug categories, including medication for pain, lung disease, hypertension, high cholesterol and arthritis. PTSD was significantly associated with increased use of lipid-lowering medication (labelled ‘medication for high cholesterol’, OR = 3.1, 95% CI 1.4–6.7) and hypnotics (OR = 2.6, 95% CI 1.4–4.8).

### Alcohol and smoking

To the question ‘How often did you have a drink containing alcohol in the last year?’ 762 participants answered ‘never’ (89.2% of 854 valid answers) and only 16 (1.9%) reported drinking alcohol at least twice a

week. Thus, factors associated with alcohol consumption were not investigated further.

Prevalence of smoking was 34.7% in men and 11.0% in women. Associations between smoking and socio-demographic and health characteristics are summarized in table 2. In univariate analyses, male sex, age between 30 and 50 years, higher education and unemployment were significantly associated with smoking, while significant differences across municipalities were observed. MDE was significantly associated with smoking in unadjusted analyses but no association remained after adjustment for socio-demographic variables and SF-36 PCS. PTSD displayed no association with smoking, whether in unadjusted or adjusted models.

## Discussion

The present survey investigates several dimensions of health that are rarely described together, such as PTSD and MDE, perceived physical and mental health, use of medical services, medication, alcohol and tobacco. It has been emphasized that few studies in war survivors have taken into account psychological disorders other than PTSD.<sup>26</sup> Furthermore, PTSD has been documented as a major determinant of poor physical health, particularly with respect to cardiovascular and pulmonary diseases.<sup>27</sup>

Prevalence of PTSD (11.9%) and MDE (30.6%) in the present study were lower than those reported in another large survey conducted in 2005–06 with the same instrument (MINI). In a sample of 648 Albanian Kosovars recruited in the Pristina and Mitrovica districts, prevalence of PTSD and MDE were 18.2 and 37.3%, respectively.<sup>16</sup> The difference might partly be attributed to inclusion criteria. Unlike our study, the study by Priebe *et al.* only included subjects who had experienced at least one war-related traumatic event and excluded people who had left Kosovo during wartime. PTSD prevalence was estimated at 17.1% in 1999, shortly after the war,<sup>28</sup> and at 23.5% according to our 2001 survey.<sup>20</sup> Follow-up data indicated that traumatic and stressful life events in the post-war period were associated with both persistence and incidence of PTSD in the 2001–07 time interval.<sup>19</sup> Geographical disparities with respect to economic conditions, reconstruction programs and unresolved ethnic conflicts might also have contributed to different prevalence rates in different regions of Kosovo.

Although PTSD and MDE in 2007 were significantly associated with increased use of medical services (visits to medical doctors and hospitalizations) in unadjusted analyses, no association remained after adjustment for socio-demographic variables and perceived physical health. These results contrast with the ones of our 2001 survey, which showed a significant association between PTSD and use of health-care services, in both unadjusted and adjusted models.<sup>18</sup> Several explanations can be invoked. First, PTSD prevalence had significantly decreased in the 6-year interval.<sup>19</sup> When persistent, its clinical presentation was possibly different or less severe in 2007 than in 2001, a change that a diagnostic instrument like the MINI might have missed. Lack of an association between health-care utilization and PTSD in 2007 was nevertheless worrisome. Second, unmet needs for care and treatment might have played a role. Indeed, ill health without access to medical care was the most frequent stressor in the 2001–07 period, endorsed by 31.2% of all participants in the follow-up study<sup>19</sup> and 72.5% of those with PTSD. Indeed, despite the recognized importance of proposing adapted psychotherapeutic treatments in post-conflict settings,<sup>29</sup> specialized mental health resources were still scarce at the time the second survey was conducted. Third, personal beliefs and societal values might have played a role, e.g. reluctance and fear of bringing up painful memories, stigmatization of seeking care for psychiatric disorders and reliance on family support when facing mental suffering.<sup>30,31</sup> Fourth, the relationship between PTSD and MDE and increased use of medical services might have been mediated through their long-lasting association with poor perceived physical health. Indeed, PTSD and MDE participants displayed worse self-rated physical condition 8 years after the end of the conflict in Kosovo. Furthermore, the SF-36 physical component had remained largely unchanged from 2001 to

**Table 2** Associations between medical visits, medication use, smoking status and socio-demographic and health characteristics in Kosovo ( $n = 864$ , 2007)

	<i>n</i>	Visit to medical doctor in the past 12 months ( $n = 620$ )			Any medication in the past 7 days ( $n = 491$ )			Current smoker ( $n = 184$ )		
		%	<i>P</i> -value <sup>d</sup>	Adj. OR (95% CI) <sup>e</sup>	%	<i>P</i> -value <sup>d</sup>	Adj. OR (95% CI) <sup>e</sup>	%	<i>P</i> -value <sup>d</sup>	Adj. OR (95% CI) <sup>e</sup>
Gender			<0.001			0.004			<0.001	
Female	489	76.7		1.9 (1.3–2.8)	61.1		1.4 (1.0–2.1)	11.0		0.2 (0.1–0.3)
Male	375	65.3		1.0	51.2		1.0	34.7		1.0
Age (years)			<0.001			<0.001			0.001	
16–29	273	57.1		1.0	31.1		1.0	15.4		1.0
30–49	357	73.4		1.2 (0.8–1.8)	59.7		1.9 (1.3–2.9)	27.5		2.1 (1.3–3.4)
≥50	234	86.3		1.7 (0.9–3.2)	82.5		3.8 (2.1–7.1)	18.8		1.0 (0.5–1.9)
Education <sup>a</sup>			0.001			<0.001			<0.001	
Less than primary	157	82.8		0.5 (0.3–1.0)	73.9		0.7 (0.4–1.3)	16.6		1.0 (0.5–1.9)
Primary	382	71.2		0.7 (0.4–1.0)	59.9		1.2 (0.8–1.8)	16.0		0.7 (0.4–1.0)
Higher than primary	318	66.4		1.0	43.7		1.0	30.2		1.0
Unemployed <sup>b</sup>			0.021			0.008			<0.001	
Yes	213	65.3		0.9 (0.6–1.4)	48.8		0.9 (0.6–1.3)	30.5		1.1 (0.7–1.7)
No	648	73.8		1.0	59.6		1.0	18.4		1.0
Municipality (A/S)			0.012			<0.001			0.007	
Deçan/Decani	153	73.2		1.0	59.5		1.0	18.3		1.0
Gjakovë/Djakovica	140	78.6		1.4 (0.8–2.6)	75.7		2.7 (1.5–4.9)	20.0		1.1 (0.6–2.0)
Gjilan/Gnjilane	38	86.8		1.8 (0.6–5.3)	65.8		0.6 (0.2–1.5)	42.1		3.2 (1.3–7.6)
Rahovec/Orahovac	109	75.2		1.4 (0.8–2.6)	56.9		0.9 (0.5–1.7)	14.7		0.8 (0.4–1.6)
Pejë/Pec	89	70.8		0.9 (0.5–1.7)	53.9		0.7 (0.4–1.4)	16.9		0.9 (0.4–1.8)
Prishtinë/Pristina	103	69.9		0.9 (0.5–1.8)	46.6		0.6 (0.3–1.2)	27.2		1.8 (0.9–3.6)
Prizren/Prizren	138	60.1		0.7 (0.4–1.2)	47.1		0.6 (0.4–1.1)	19.6		1.2 (0.6–2.3)
Ferizaj/Uroševac	94	69.1		0.7 (0.4–1.4)	48.9		0.4 (0.2–0.8)	27.7		2.0 (1.0–3.8)
SF-36 PCS <sup>c</sup>			<0.001			<0.001			0.51	
<45	343	89.8		6.2 (3.6–10.6)	84.8		6.7 (4.1–11.1)	23.0		1.4 (0.8–2.3)
45–55	206	71.8		2.2 (1.5–3.3)	51.0		1.9 (1.3–2.9)	22.3		1.1 (0.7–1.8)
>55	300	52.0		1.0	28.7		1.0	19.3		1.0
PTSD			<0.001			<0.001			0.36	
Present (MINI)	103	90.3		1.5 (0.7–3.1)	83.5		0.9 (0.5–1.9)	25.2		1.2 (0.7–2.2)
Absent (MINI)	761	69.3		1.0	53.2		1.0	20.8		1.0
MDE			<0.001			<0.001			0.017	
Present (MINI)	264	85.2		1.2 (0.8–2.0)	83.3		3.0 (1.9–4.8)	26.5		1.5 (0.9–2.3)
Absent (MINI)	600	65.8		1.0	45.2		1.0	19.0		1.0

a: Missing values ( $n = 7$ )b: Missing values ( $n = 3$ )c: Missing values ( $n = 15$ )

d: Chi-square test for proportions

e: Adjusted odds ratios according to multivariable logistic regression models including gender, age, education, unemployment, municipality, SF-36 PCS, PTSD and MDE ( $n = 839$ )**Table 3** Use of specific types of medication and association with PTSD and MDE diagnoses

	Total sample ( $n = 864$ )	PTSD present ( $n = 100$ ) vs. absent ( $n = 739$ )	MDE present ( $n = 253$ ) vs. absent ( $n = 586$ )
	<i>n</i> (%)	Adj. OR <sup>a</sup> (95% CI)	Adj. OR <sup>a</sup> (95% CI)
During the past 7 days, have you taken ...			
...any pain killer?	458 (53.0)	1.1 (0.6–2.2)	2.2 (1.4–3.4)
...any medication for lung disease?	36 (4.2)	1.7 (0.7–3.8)	3.2 (1.3–7.7)
...any fortifying medication?	155 (17.9)	1.7 (1.0–2.8)	2.4 (1.5–3.8)
...any medication for hypertension?	161 (18.6)	1.5 (0.8–2.6)	2.2 (1.3–3.7)
...any medication for your heart	96 (11.1)	1.7 (0.9–3.2)	1.6 (0.9–2.8)
...any medication for diabetes?	30 (3.5)	1.9 (0.8–5.0)	1.2 (0.5–2.8)
...any medication for cholesterol?	44 (5.1)	3.1 (1.4–6.7)	2.7 (1.2–6.1)
...any medication for arthritis?	130 (15.0)	1.5 (0.8–2.7)	2.1 (1.3–3.5)
...any medication for depression?	59 (6.8)	1.7 (0.8–3.3)	3.6 (1.7–7.3)
...any sleeping pills?	92 (10.6)	2.6 (1.4–4.8)	2.9 (1.6–5.3)
...any tranquilizers?	133 (15.4)	1.6 (0.9–2.8)	3.9 (2.3–6.5)

a: Adjusted odds ratios according to multivariable logistic regression models including gender, age, education, unemployment, municipality, SF-36 PCS, PTSD and MDE ( $n = 839$ )

2007, while mental health had significantly improved.<sup>19</sup> As mentioned above, somatic diseases are frequently associated with PTSD in persons exposed to multiple war-related traumatic events, notably in the Balkans region.<sup>32</sup> Several studies have demonstrated a significant and positive association between PTSD and self-reported physical health problems<sup>33</sup> or

somatic distress, defined as a clinical syndrome of medically unexplained symptoms.<sup>22</sup> It should be emphasized that use of health-care services might not only depend on need for care, but also on the complex interplay between pre-disposing characteristics (e.g. social structure, health beliefs), enabling resources (e.g. income, insurance) and external

environment (e.g. available health-care system), as proposed in different behavioural models.<sup>34</sup>

A majority of participants to the 2007 Kosovo survey reported taking some medication in the last 7 days, the most frequent class of drugs being analgesics (53.0%). This figure is consistent with a recent study of victims of mass violence in Northern Kosovo, of whom 70% experienced moderate or severe pain within the previous 2 weeks.<sup>35</sup> Frequencies for tranquilizers (15.4%) and anti-depressants (6.8%) in the last 7 days exceeded the 12-month estimates (9.8 and 3.7%) in the general population of six European countries.<sup>36</sup> While increased use of hypnotics among respondents with PTSD was not unexpected, the reason for increased use of lipid-lowering medication was less straightforward. Higher prevalence of overweight and obesity might be invoked, in agreement with the observation that over two-thirds of the victims of massive violence in Northern Kosovo (Mitrovica district) had a body mass index above 25.<sup>35</sup>

The low rate of alcohol use in our sample was largely attributable to cultural and religious factors. Islam, which proscribes the use of alcohol, is the predominant religion in Kosovo. According to a recent publication, prevalence of alcohol dependence and alcohol abuse in Kosovo were estimated at 0.5 and 0.2%, respectively.<sup>16</sup>

While smoking patterns have been described in other areas of the Balkans, such as Croatia<sup>37</sup> and Bosnia,<sup>38</sup> we did not find population data for Kosovo. In the adult Croatian population, smoking prevalence in 2003 was 24–33% in men and 10–21% in women, depending on the region.<sup>39</sup> Smoking frequency was 48% in Bosnia and Herzegovina in 2002 and 59% among Bosnian refugees resettled in the USA and seeking primary care treatment.<sup>38</sup> In Kosovo, 37% of schoolchildren aged 13–14 years reported having smoked cigarettes.<sup>40</sup> In the present study, the proportion of female smokers (11.0%) was relatively low, whereas prevalence among men (34.7%) was in the range of values reported in Western European countries. The present survey did not support a significant association between smoking and either PTSD or MDE after taking socio-demographic variables into account, in contrast, with our hypothesis. Because our 2001 survey did not provide data about tobacco use and our 2007 survey was restricted to current smoking, the temporal relationship between exposure to traumatic events, PTSD, MDE and possible changes in smoking habits was not investigated.

The main limitation of the present study pertains to the representativeness of the sample. Sampling took place in two steps with a first group followed from 2001 to 2007<sup>19</sup> and an additional group interviewed in 2007 only. Since participants originated from eight municipalities, the sample was not representative of the population in Kosovo. Inhabitants of Pristina, the capital city, were underrepresented (12% of the sample vs. ~25% of the Kosovo population) and the Northern region of Mitrovica, which differs with respect to ethnic composition and exposure to ethnic conflicts, was excluded.<sup>35</sup> Compared with usual estimates of 25–50% during the survey period, unemployment rate was relatively low (24.7%). An explanation might be that females were over-represented in the survey and tended to engage in doing unpaid work such as 'housewife', thus not describing themselves as unemployed. Another limitation is related to PTSD and depression being investigated as diagnostic categories rather than in a dimensional perspective. Valuable information might have been provided by examining possible changes in the severity and clinical presentation of PTSD during the 6-year period separating both surveys.

In conclusion, our 2007 Kosovo survey conducted 8 years after the war indicated that poor perceived physical health displayed a long-lasting association with PTSD and MDE, and was a major determinant of increased use of health-care services and medication. It did not provide support for an additional effect of PTSD *per se*, while MDE further contributed to medication use, whether for psychiatric or somatic symptoms.

## Acknowledgements

The authors thank all Kosovar Albanian participants who agreed to be interviewed; Shyhrete Baraliu, Naim Hoxha, Arta Kelmendi, Arben Muhaxhiri, Visare Shala, Amira Bajramovic, Besir Kubati, Zoja Gojani, Edina Bajramovic, Edona Isufi, Eroll Shporta, Arieta Kurtolli-Aliu, Aferdita Ferri, Indira Kelmendi and Fisnik Vejsa, the psychosocial

counsellors who conducted the interviews; Gazmend Ahmeti, MSc for database management and preliminary analysis; Ruhje Hodza Beganovic, MD; Patrick A. Bovier, MD, MPH; Sophie Durieux-Paillard, MD, MPH; Louis Loutan, MD, MPH and Ann Guthmiller, MA for their help and methodological support.

## Funding

The humanitarian fund of the University Hospitals of Geneva and the Geneva Foundation to protect health in war. Local support in Kosovo was assured by IOM.

*Conflicts of interest:* None declared.

## Key points

- Most participants reported attending medical services in the past 12 months (72%) and taking some medication in the last 7 days (57%), mostly analgesics (53%).
- In contrast with results from our 2001 survey, PTSD and MDE were not associated with increased use of health-care services in 2007, after adjustment for socio-demographic variables and perceived physical health.
- Poor perceived physical health displayed a long-lasting association with PTSD and MDE, and was a major determinant of increased use of health-care services and medication.

## References

- 1 Steel Z, Chey T, Silove D, et al. Association of torture and other potentially traumatic events with mental health outcomes among populations exposed to mass conflict and displacement: a systematic review and meta-analysis. *JAMA* 2009;302:537–49.
- 2 Johnson H, Thompson A. The development and maintenance of post-traumatic stress disorder (PTSD) in civilian adult survivors of war trauma and torture: a review. *Clin Psychol Rev* 2008;28:36–47.
- 3 Andrews B, Brewin CR, Philpott R, Stewart L. Delayed-onset posttraumatic stress disorder: a systematic review of the evidence. *Am J Psychiatry* 2007;164:1319–26.
- 4 Bramsen I, van der Ploeg HM. Fifty years later: the long-term psychological adjustment of ageing World War II survivors. *Acta Psychiatr Scand* 1999;100:350–8.
- 5 de Jong JT, Komproe IH, Van Ommeren M. Common mental disorders in postconflict settings. *Lancet* 2003;361:2128–30.
- 6 Basoglu M, Livanou M, Crnobaric C, et al. Psychiatric and cognitive effects of war in former Yugoslavia: association of lack of redress for trauma and posttraumatic stress reactions. *JAMA* 2005;294:580–90.
- 7 Eytan A, Durieux-Paillard S, Whitaker-Clinch B, et al. Transcultural validity of a structured diagnostic interview to screen for major depression and posttraumatic stress disorder among refugees. *J Nerv Ment Dis* 2007;195:723–8.
- 8 Kartha A, Brower V, Saitz R, et al. The impact of trauma exposure and post-traumatic stress disorder on healthcare utilization among primary care patients. *Med Care* 2008;46:388–93.
- 9 Weisberg RB, Bruce SE, Machan JT, et al. Nonpsychiatric illness among primary care patients with trauma histories and posttraumatic stress disorder. *Psychiatr Serv* 2002;53:848–54.
- 10 Mitchell AJ, Vaze A, Rao S. Clinical diagnosis of depression in primary care: a meta-analysis. *Lancet* 2009;374:609–19.
- 11 Kleinman A. Culture and depression. *N Engl J Med* 2004;351:951–3.
- 12 Fu SS, McFall M, Saxon AJ, et al. Post-traumatic stress disorder and smoking: a systematic review. *Nicotine Tob Res* 2007;9:1071–84.
- 13 Stewart SH. Alcohol abuse in individuals exposed to trauma: a critical review. *Psychol Bull* 1996;120:83–112.
- 14 Jane-Llopis E, Matytsina I. Mental health and alcohol, drugs and tobacco: a review of the comorbidity between mental disorders and the use of alcohol, tobacco and illicit drugs. *Drug Alcohol Rev* 2006;25:515–36.
- 15 Priebe S, Matanov A, Jankovic Gavriloic J, et al. Consequences of untreated posttraumatic stress disorder following war in former Yugoslavia: morbidity, subjective quality of life, and care costs. *Croat Med J* 2009;50:465–75.
- 16 Priebe S, Bogic M, Ajdukovic D, et al. Mental disorders following war in the Balkans: a study in 5 countries. *Arch Gen Psychiatry* 2010;67:518–28.

- 17 Buwa D, Vuori H. Rebuilding a health care system: war, reconstruction and health care reforms in Kosovo. *Eur J Public Health* 2007;17:226–30.
- 18 Eytan A, Toscani L, Loutan L, Bovier PA. Posttraumatic stress disorder and the use of general health services in postwar Kosovo. *J Trauma Stress* 2006;19:57–67.
- 19 Eytan A, Guthmiller A, Durieux-Paillard S, et al. Mental and physical health of Kosovar Albanians in their place of origin: a post-war 6-year follow-up study. *Soc Psychiatry Psychiatr Epidemiol* 2010. (15 July 2010, Epub ahead of print).
- 20 Eytan A, Gex-Fabry M, Toscani L, et al. Determinants of postconflict symptoms in Albanian Kosovars. *J Nerv Ment Dis* 2004;192:664–71.
- 21 Sheehan DV, Lecrubier Y, Sheehan KH, et al. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *J Clin Psychiatry* 1998;59(Suppl. 20):22–33. quiz 34–57.
- 22 Morina N, Ford JD. Complex sequelae of psychological trauma among Kosovar civilian war victims. *Int J Soc Psychiatry* 2008;54:425–36.
- 23 Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Med Care* 1992;30:473–83.
- 24 Leplège A. *Le questionnaire MOS SF-36, manuel de l'utilisateur et guide d'interprétation des scores*. Paris: ESTEM éditions, 2001.
- 25 Reinert DF, Allen JP. The alcohol use disorders identification test: an update of research findings. *Alcohol Clin Exp Res* 2007;31:185–99.
- 26 Kashdan TB, Morina N, Priebe S. Post-traumatic stress disorder, social anxiety disorder, and depression in survivors of the Kosovo War: experiential avoidance as a contributor to distress and quality of life. *J Anxiety Disord* 2009;23:185–96.
- 27 Spitzer C, Barnow S, Volzke H, et al. Trauma, posttraumatic stress disorder, and physical illness: findings from the general population. *Psychosom Med* 2009;71:1012–7.
- 28 Lopes Cardozo B, Vergara A, Agani F, Gotway CA. Mental health, social functioning, and attitudes of Kosovar Albanians following the war in Kosovo. *JAMA* 2000;284:569–77.
- 29 Cloitre M. Effective psychotherapies for posttraumatic stress disorder: a review and critique. *CNS Spectr* 2009;14(Suppl. 1):32–43.
- 30 Eytan A, Shehu-Brovina S. [From Kosovo to Switzerland: mental health perceptions and practical implications for health professionals]. *Rev Med Suisse* 2005;1:2167–8, 2170, 2172.
- 31 De Vries AK, Klazinga NS. Mental health reform in post-conflict areas: a policy analysis based on experiences in Bosnia Herzegovina and Kosovo. *Eur J Public Health* 2006;16:247–52.
- 32 Avdibegovic E, Delic A, Hadzibeganovic K, Selimbasic Z. Somatic diseases in patients with posttraumatic stress disorder. *Med Arh* 2010;64:154–7.
- 33 Dirkzwager AJ, van der Velden PG, Grievink L, Yzermans CJ. Disaster-related posttraumatic stress disorder and physical health. *Psychosom Med* 2007;69:435–40.
- 34 Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? *J Health Soc Behav* 1995;36:1–10.
- 35 Wang SJ, Pacolli S, Rushiti F, et al. Survivors of war in the Northern Kosovo (II): baseline clinical and functional assessment and lasting effects on the health of a vulnerable population. *Confl Health* 2010;4:16.
- 36 Alonso J, Angermeyer MC, Bernert S, et al. Prevalence of mental disorders in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project. *Acta Psychiatr Scand Suppl* 2004;109(Suppl. s420):21–7.
- 37 Goel RK, Budak J. Smoking patterns in Croatia and comparisons with European nations. *Cent Eur J Public Health* 2007;15:110–5.
- 38 Weaver TL, Cajdric A, Jackson ER. Smoking patterns within a primary care sample of resettled Bosnian refugees. *J Immigr Minor Health* 2008;10:407–14.
- 39 Samardzic S, Marvinac GV, Prlc A. Regional pattern of smoking in Croatia. *Coll Antropol* 2009;33(Suppl. 1):43–6.
- 40 Ramadani N, Berisha M, Thaci A, et al. Tobacco use among Kosovar schoolchildren: a cross-sectional study. *Med Arh* 2009;63:44–7.

.....  
 European Journal of Public Health, Vol. 22, No. 5, 643–647

© The Author 2011. Published by Oxford University Press on behalf of the European Public Health Association. All rights reserved.

doi:10.1093/eurpub/ckr103 Advance Access published on 11 August 2011  
 .....

## Usefulness of a single-item measure of depression to predict mortality: the GAZEL prospective cohort study

Thomas Lefèvre<sup>1,2,3,4</sup>, Archana Singh-Manoux<sup>1,2,5,6</sup>, Silvia Stringhini<sup>1,2</sup>, Aline Dugravot<sup>1,2</sup>, Cédric Lemogne<sup>7,8,9</sup>, Silla M. Consoli<sup>7,8</sup>, Marcel Goldberg<sup>1,2</sup>, Marie Zins<sup>1,2</sup>, Hermann Nabi<sup>1,2</sup>

1 INSERM, U1018, Centre for research in Epidemiology and Population Health, Epidemiology of occupational and social determinants of health, F-94807, Villejuif, France

2 University of Versailles St-Quentin, UMRS 1018, F-94807, Villejuif, France

3 LaTIM, Laboratory of Medical Information Processing/INSERM U650/IFR 148, Brest, France

4 Faculty of Medicine Paris 12, AP-HP, France

5 Department of Epidemiology and Public Health, University College London, UK

6 Hôpital Ste Péline, AP-HP, Centre de Gérontologie, Paris, F-75781, France

7 AP-HP, Department of C-L Psychiatry, European Georges Pompidou Hospital, F-75908, Paris, France

8 Université Paris Descartes, Sorbonne Paris Cité, Faculté de Médecine, Paris, France

9 INSERM UMR 894, Centre Psychiatrie et Neurosciences, Paris, France

**Correspondence:** Hermann Nabi, INSERM, U1018, Centre for research in Epidemiology and Population Health, Hôpital Paul Brousse, Bâtiment 15/16, 16 avenue Paul Vaillant Couturier, 94807 Villejuif Cedex, France, tel: +33 1 77 74 74 21, fax: +33 1 77 74 74 03, e-mail: Hermann.Nabi@inserm.fr

**Background:** It remains unknown whether short measures of depression perform as well as long measures in predicting adverse outcomes such as mortality. The present study aims to examine the predictive value of a single-item measure of depression for mortality. **Methods:** A total of 14 185 participants of the GAZEL cohort completed the 20-item Center-for-Epidemiologic-Studies-Depression (CES-D) scale in 1996. One of these items (I felt depressed) was used as a single-item measure of depression. All-cause mortality data were available until 30 September 2009, a mean follow-up period of 12.7 years with a total of 650 deaths. **Results:** In Cox regression model adjusted for baseline socio-demographic characteristics, a one-unit increase in the single-item score (range 0–3) was associated with a 25% higher risk of all-cause mortality (95% CI: 13–37%,  $P < 0.001$ ). Further adjustment for health-related behaviours and physical chronic diseases reduced this risk by 36% and 8%, respectively. After adjustment for all these variables, every one-unit increase in the single-item score predicted a 15% increased risk of death (95% CI: 5–27%,  $P < 0.01$ ). There is also an evidence of a dose–response relationship between response scores on the single-item measure of depression and mortality. **Conclusion:** This study shows that a single-item measure of depression is associated with an increased risk of death. Given its simplicity and ease of administration, a very simple single-item measure of depression might be useful for identifying middle-aged adults at risk for elevated depressive symptoms in large epidemiological studies and clinical settings.

.....