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Longitudinal study of PTSD and depression in a war-exposed sample – comorbidity increases distress and suicide risk

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Abstract

Background: Major depressive disorder (MDD) and post-traumatic stress disorder (PTSD) are the most common mental disorders following traumatic experiences. The aim of this study was to investigate the extent to which PTSD and depression co-occurred in Serbian general population at baseline and 1 year after the follow-up, as well as how this co-occurrence was associated with sociodemographic factors, personal distress, suicidality and quality of life.

Subjects and methods: The sample consisted of 159 subjects, who fulfilled the IES criteria for PTSD, and were taken from a larger sample of 640 participants, which was chosen by a random walk technique in five regions of the country affected by major trauma. The assessment was carried out by the following instruments: Mini International Neuropsychiatric Interview 5 (MINI 5), Life Stressor Checklist-Revised (BSC-R), Brief Symptom Inventory (BSI), Impact of Event Scale-Revised (IES-R) and Manchester Short Assessment of Quality of Life Scale (MANSA). The follow-up study was carried out 1 year after the baseline.

Results: In the initial phase, PTSD was found in 100 out of 159 participants (62.9%), while 81 (51%) fulfilled the diagnostic criteria for MDD. Comorbidity of PTSD and depression was identified in 65 (40.9%) subjects of the sample. After 1 year, PTSD was found in 56 (35.2%) and MDD in 73 (45.9%) participants. Comorbidity of PTSD and depression in the follow-up phase was identified in 41 (25.8%) subjects of the sample. The subjects with comorbidity had significantly higher level of post-traumatic stress symptoms, general psychological distress as well as suicide risk and lower level of quality of life than participants with either condition alone.

Conclusion: PTSD–depression comorbidity is a common post-traumatic condition. Complex psychopathology, severity of symptoms and their consequences, both at individual and community levels, require attention to be paid to early diagnostics and treatment of affected persons.

Keywords

depression, post-traumatic stress disorder, comorbidity, trauma, longitudinal study

INTRODUCTION

Traumatic experiences are frequent and widely spread in contemporary world, causing acute and chronic stress that might produce significant psychological sequelae and social consequences, especially to vulnerable people (Lecic-Tosevski et al., 2016, 2018).

Post-traumatic stress disorder (PTSD) and major depressive disorder (MDD) are among the two most common psychiatric sequelae of trauma that might develop independently. However, their co-occurrence could be considered a norm rather than an exception (O'Donnell et al., 2014). The comorbidity of PTSD and MDD was found in as many as 50% of cases following trauma (Charlson et al., 2012; Richardson et al., 2017) and it was also high across diverse epidemiological samples (Caramanica et al., 2014; Rytwinski et al., 2013). The co-occurrence of these two disorders is associated with greater symptom severity and psychological distress as well as higher levels of functional impairment and reduced life satisfaction and quality of life, compared to those in individuals with PTSD or MDD alone (Byllesby et al., 2017; Contractor et al., 2018; Goenjian et al., 2011; Post et al., 2011). This pattern of findings was previously reported in refugees (Momartin et al., 2004), various patient groups (Holtzheimer et al., 2005; Shalev et al., 1998) as well as in the studies of war veterans (Bowler et al., 2016; Ikin et al., 2010;

Raab et al., 2015).

Individuals with comorbid PTSD and depression have more severe depressive symptoms, higher impulsivity and hostility and are more likely to make suicide attempt, compared to subjects with depression alone (Kimbrel et al., 2016; Sher, 2005). It was found that presence of both disorders was associated with prevalence rates of suicidal ideation nearly twice as high as having only one of these disorders (Cougle et al., 2009). The findings from a recent longitudinal study on Iraq and Afghanistan veterans suggested that comorbid PTSD–depression may be a significant risk factor for future suicidal behaviour (Kimbrel et al., 2016). Tural et al. (2012) found that comorbid PTSD and MDD patients had significantly lower rates of recovery from PTSD in comparison to those with PTSD but without MDD.

There is evidence that pre-existing major depression may render an individual more vulnerable to PTSD in the aftermath of trauma (Breslau et al., 2000) and vice versa (Horesh et al., 2017; Kessler et al., 1995). Furthermore, participants with a higher number of traumatic events were more likely to receive a PTSD–depression comorbid diagnosis (Kaltman et al., 2010).

The aim of our study was to investigate the extent to which PTSD and depression co-occurred in Serbian general population after a major trauma at baseline and 1 year after the follow-up, as well as how the co-occurrence of MDD and PTSD was associated with sociodemographic factors, personal distress, suicidality and quality of life.

SUBJECTS AND METHODS

Sampling techniques and participants

This longitudinal study was carried out in two phases. At the initial stage, a random sample of inhabitants was selected from five areas of the country directly exposed to 78 days of NATO bombing of Serbia in 1999. The sample consisted of 640 participants aged 39.8±12.05 years, ranging from 18 to 65 years. All interviews were conducted between 15 January 2005 and 20 November 2006. The study was a part of the international multicentre study, "Components, Organization, Costs, and Outcomes of Health Care and Community Based Interventions for People with Posttraumatic Stress Following War and Conflict in the Balkans – CONNECT" (Priebe et al., 2004), supported by the Sixth Framework Programme of the European Union. Every fourth household was selected in randomly identified streets in each locality, until a maximum of 15 interviews per street were carried out. If there were several households in the same building, they were chosen randomly, but no more than six participants were interviewed per building. The interviews were conducted with the eligible adult member of the household whose birthday was closest to the date of interviewing and who fulfilled the following inclusion criteria: born within the territory of former Yugoslavia with residence in the Republic of Serbia; aged between 18 and 65; having experienced at least one war-related traumatic event at the age of 16 or older; no severe learning difficulty, no mental impairment due to a brain injury or other organic cause.

The follow-up was done 1 year later on 159 participants who fulfilled the criteria for PTSD based at least on one of the two diagnostic criteria, Mini International Neuropsychiatric Interview (MINI) or Impact of Event Scale (IES with scores above 22), and they were examined by a face-to-face interview again. All interviews were conducted between 15 January 2005 and 20 November 2006. The findings obtained on the whole sample are shown elsewhere (Lecic-Tosevski et al., 2013).

PROCEDURES AND MEASURE

Data on the participants' age, gender, education level, income, employment and marital status were obtained through a brief structured sociodemographic questionnaire.

The history of potential traumatic experience was assessed using a specifically amended version of the Life Stressor Checklist-Revised (LSC-R) (Wolfe and Kimerling, 1997). The presence of PTSD, depression and suicidality was assessed by the MINI-5 (Sheehan et al., 1998), a structured diagnostic interview assessing the symptom criteria used in the Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV. Inter-rater reliability was assessed in two mock interviews. Agreement on an item was reached when the interviewers gave the same answer for it. The Brief Symptom Inventory (BSI) (Derogatis and Melisaratos, 1983) was used as a measure of general psychological symptoms. The IES-Revised (IES-R) (Weiss and Marmar, 1997) was applied for the assessment of post-traumatic stress reactions, and the Manchester Short Assessment of Quality of Life (MANSA) (Priebe et al., 1999) for the assessment of quality of life. The interviews were conducted face-to-face by trained psychiatrists and psychologists.

The study was approved by the Ethics Committee of the Belgrade University School of Medicine. All participants provided written informed consent after being fully informed about the study content and procedures.

Data analyses

In addition to descriptive statistics, for testing significant differences between various groups of participants (no disorder, PTSD only, MDD only and PTSD+MDD), we used univariate analysis of variance.

RESULTS

Although the starting sample consisted of 640 participants, in order for the findings from two phases (at baseline and follow-up) to be comparable, we included only 159 subjects who participated in both the phases in this analysis. The average age of this subsample was 43.61 (SD=10.74), ranging from 22 to 65 years. Females formed 67.9% of the sample. Also, 63.5% of the sample were married, 11.9% single, 13.8% divorced, 10.1% widowed and 0.6% were cohabitating. The minimum years of education was 4 and the maximum was 22, with a mean of 12.14 (SD=3.04). As for the employment status, 43.4% of the sample were currently employed, 32.7% unemployed and 17% were retired, while 5.7% of the participants were students. Also, 13.2% participants had previously participated in combat.

Prevalence rates of MDD, PTSD and MDD+PTSD in the initial phase

Although all the participants (159) fulfilled the criteria for PTSD according to the IES (score above 22), further on, we will use MINI data for the prevalence and comorbidity rates, since it is a standard diagnostic instrument and contains the criteria for different pathologies, while IES is relevant only to PTSD. Based on the MINI, current PTSD was found in 100 participants in the initial phase (62.9%), while 81 (51%) subjects fulfilled the diagnostic criteria for MDD. In 65 participants, we identified PTSD–depression comorbidity (40.9%). PTSD without MDD was found in 35 participants (22%), while MDD without PTSD was found in 16 participants (10.1%).

Factors associated with MDD+PTSD in the initial phase/ general psychological symptoms, post-traumatic stress symptoms, suicide risk and quality of life

In order to determine the possible correlates of PTSD+MDD comorbidity, we formed four groups of participants: no disorder, PTSD only, MDD only and PTSD+MDD. Univariate analysis revealed significant differences in several variables: IES score ($F_{3;155}$=7.66, p<0.01), quality of life – MANSA ($F_{3;155}$=9.15, p<0.01), suicidality ($F_{3;155}$=4.87, p<0.01) and BSI score ($F_{3;155}$=26.18, p<0.01) (Table 1). Thus, participants with PTSD+MDD comorbidity reported the highest scores on IES, BSI, severity of suicidality and the lowest scores on MANSA, while participants without any disorder showed exactly the opposite results. While the existence of only one disorder (PTSD or MDD) is related to increased distress, severity of suicidality and lower quality of life, participants with PTSD+MDD comorbidity reported additionally higher scores of post-traumatic stress symptoms and higher scores of general psychological distress, were more likely to report current suicide risk and had lower levels of quality of life than the comparison groups.

Prevalence rates of MDD, PTSD, and MDD+PTSD in the follow-up phase

Follow-up was conducted 1 year after the baseline on 159 participants, out of which, as already mentioned, 100 had current PTSD in the initial phase, based on the MINI criteria. According to the same criteria, PTSD was found in 56 participants (35.2%) and MDD in 73 participants (45.9%). PTSD–depression comorbidity was identified in 41 participants (25.8%), PTSD only (with absence of depression) in 15 participants (9.4%) and MDD only (with absence of PTSD) in 32 participants (20.1%).

It is noticeable that prevalence of any of the disorders, including the comorbidity, reduced in the participants. PTSD prevalence reduced from 62.9% to 35.2%, MDD prevalence from 51% to 45.9%, and PTSD+MDD comorbidity prevalence from 40.9% to 25.8%.

Factors associated with MDD+PTSD comorbidity/ general psychological symptoms, post-traumatic stress symptoms, suicide risk and quality of life

The analysis showed similar findings as at the baseline, with significant differences on the following: IES score ($F_{3;155}$=21.05, p<0.01), number of stressors ($F_{3;155}$=5.86, p<0.01), quality of life – MANSA ($F_{3;155}$=16.55, p<0.01), years of education ($F_{3;155}$=4.51, p<0.01), suicidality ($F_{3;155}$=7.92, p<0.01) and BSI score ($F_{3;155}$=34.05, p<0.01). Thus, our findings have shown that participants with PTSD+MDD comorbidity reported higher scores than the comparison groups on IES, number of stressors, BSI, severity of suicidality and lower education and quality of life, while the subjects without any disorders showed exactly the opposite results (Table 2).

Table 1. Factors associated with MDD+PTSD in the initial phase

	No disorder		PTSD		MDD		PTSD+MDD		F	df	Sig.
	Mean	SD	Mean	SD	Mean	SD	Mean	SD			
IES	43.95	13.79	53.26	15.70	51.25	13.77	57.83	15.17	7.66	3; 155	.000
Number of stressors	9.02	11.61	10.37	8.35	9.69	6.36	21.66	41.68	2.41	3; 156	.069
Quality of life	4.65	0.88	4.47	0.74	4.18	0.93	3.83	0.88	9.15	3; 157	.000
Gender (male)	0.33	0.47	0.29	0.46	0.19	0.40	0.37	0.49	0.73	3; 158	.537
Age	46.40	10.31	41.63	11.87	41.38	11.44	43.38	10.04	1.62	3; 159	.187
Employed	0.60	0.49	0.53	0.51	0.44	0.51	0.42	0.50	1.27	3; 160	.288
Married	0.72	0.45	0.63	0.49	0.63	0.50	0.58	0.50	0.69	3; 161	.559
Years of education	12.93	2.92	11.94	2.48	11.50	3.08	11.88	3.34	1.42	3; 162	.238
Active participation in war	0.07	0.26	0.09	0.28	0.13	0.34	0.20	0.40	1.59	3; 163	.195
Severity of suicidality	0.16	0.43	0.29	0.67	0.38	0.81	0.72	1.02	4.88	3; 164	.003
BSI_total	0.79	0.53	1.30	0.61	1.42	0.74	1.95	0.77	26.18	3; 165	.000

Key: BSI, Brief Symptom Inventory; df, degree of freedom; IES, Impact of Event Scale; MDD, major depressive disorder; PTSD, post-traumatic stress disorder.

Table 2. Factors associated with MDD+PTSD in the follow-up phase

	No disorder		PTSD		MDD		PTSD+MDD		F	df	Sig.
	Mean	SD	Mean	SD	Mean	SD	Mean	SD			
IES	21.59	11.61	34.27	8.23	30.03	11.73	37.56	9.12	21.06	3; 155	.000
Number of stressors	7.66	7.94	10.67	10.53	10.16	11.23	29.00	50.58	5.86	3; 155	.001
Quality of life	4.70	0.76	4.23	0.88	3.95	0.87	3.62	0.85	16.55	3; 155	.000
Gender (male)	0.37	0.49	0.33	0.49	0.31	0.47	0.24	0.43	0.59	3; 155	.620
Age	44.65	11.20	40.67	12.19	44.94	10.38	41.85	9.53	1.13	3; 155	.340
Employed	0.51	0.50	0.53	0.52	0.34	0.48	0.32	0.47	1.84	3; 155	.141
Married	0.69	0.47	0.73	0.46	0.56	0.50	0.49	0.51	1.94	3; 155	.125
Years of education	12.96	2.92	11.87	2.29	11.00	3.15	11.34	2.91	4.51	3; 155	.005
Active participation in war	0.10	0.30	0.13	0.35	0.13	0.34	0.20	0.40	0.70	3; 155	.552
Severity of suicidality	0.07	0.26	0.07	0.26	0.25	0.62	0.66	1.06	7.92	3; 155	.000
BSI_total	0.80	0.55	1.27	0.65	1.53	0.79	2.06	0.69	34.05	3; 155	.000

Key: BSI, Brief Symptom Inventory; df, degree of freedom; IES, Impact of Event Scale; MDD, major depressive disorder; PTSD, post-traumatic stress disorder.

DISCUSSION

In spite of an increasing interest shown on post-traumatic conditions in war-affected populations, a comprehensive epidemiological profile of PTSD–depression comorbidity is lacking. Particularly scarce are studies with a longitudinal approach. Our study has shown that PTSD and depression were common in general Serbian population after major trauma, as well as their co-occurrence. The finding of a high overlap between PTSD and depression is partly consistent with some studies. The US National Comorbidity Survey reported the lifetime comorbidity between PTSD and depressive disorders to be higher than 50% in the general population (Kessler et al., 1995). Similar comorbidity results were found in several studies with war veterans – 50% (Bleich et al., 1997), 51% (Constans et al., 1997) and 52% (Ikin et al., 2010). A recent study conducted among Canadian veterans as well as currently serving Forces members has shown 61.5% of PTSD+MDD comorbidity in the sample (Richardson et al. 2017).

The rate of PTSD and depression varies highly in different post-conflict populations (Johnson and Thompson, 2008). A cross-sectional community study in South Sudan has shown the rate of PTSD to be 37.6% and MDD to be 15.9% in the sample, while their comorbidity was identified in 9.5% of the total sample (Ayazi et al., 2012), which are significantly lower than our findings. A recent study in South Lebanese civilian sample has shown PTSD+MDD comorbidity to be present in 23.4% of the sample (Farhood et al., 2016), which is also lower than the findings of our study.

The strong association between PTSD–depression comorbidity and high psychological distress, found in our study, is in accordance with other studies. A study on South Sudan war-affected population has shown a higher level of psychological distress in participants with PTSD–depression comorbidity than in participants with either condition alone (Ayazi et al., 2012). A recent study on combat veterans from the Ohio National Guards has shown that PTSD+MDD comorbidity is more related to underlying general distress or negative affectivity than the symptom categories of the PTSD diagnostic criteria (Byllesby et al., 2017). Furthermore, our findings provide support to a previous research indicating that PTSD and depression symptoms are negatively correlated with quality of life (Ikin et al., 2010; Pittman et al., 2012). Raab et al. (2015) found that combat veterans with comorbid PTSD+MDD reported significantly worse satisfaction-related quality of life than those with PTSD alone. A study on victims of civilian violence has shown that the presence of comorbid mental disorders as well as the severity of post-traumatic symptoms remained the strongest predictor for impaired health-related quality of life in PTSD outpatients (Pagotto et al., 2015).

In our study, individuals with PTSD+MDD comorbidity were more likely to report current suicide risk, which was also reported in other studies of post-traumatic conditions. The findings of a prospective study of Iraq/Afghanistan veterans suggested that PTSD+MDD comorbidity may be a significant risk factor for future suicidal behaviour (Kimbrel et al., 2016). Our findings have shown that presence of only one disorder (PTSD or MDD) was related to increased suicidality, in accordance with the study of Arenson et al. (2018) who found that 49% of war veterans with PTSD and depression comorbidity had suicidal ideations, unlike 11% of subjects with PTSD alone or 34% with MDD alone. Another cross-sectional and prospective analysis of a national probability sample of women confirmed a strong association between suicidality and PTSD/depression comorbidity (Cougle et al., 2009; Oquendo et al., 2003).

In the follow-up phase, we found a significant association between number of traumatic events and years of education with PTSD–depression comorbidity. This is in line with previous studies showing that participants with a higher number of traumatic events were more likely to develop PTSD–depression comorbidity (Ayazi et al., 2012; Shalev et al., 1998). In contrast with most previous studies (Ayazi et al., 2012; Roberts et al., 2009), but consistent with that of Tracy et al. (2011), our study did not show significant association between sociodemographic factors and PTSD+MDD comorbidity, with the educational level being an exception. This is in accordance with recent findings showing that the educational status significantly predicts co-occurrence of PTSD+MDD (Farhood et al., 2016). A possible explanation could be that persons with lower education may have lower cognitive capacity to cope with traumatic events (Priebe et al., 2009) and lower ability to use healthy coping strategies.

The limitation of our study might be related to the accuracy of data, since they are based on respondent's memory. Exposure to traumatic events was assessed retrospectively and might have been influenced by a recall bias. This, however, is the problem of most studies (Mollica et al., 2007). Also, only part of the participants took part in both phases, since we deliberately selected participants who fulfilled the criteria for PTSD; hence, the sample shown in this paper might be biased and does not provide representative rates for the population. The major strengths of our study are its longitudinal design, the sample being representative of the general population as well as the sample size.

CONCLUSIONS

High prevalence of PTSD/MDD comorbidity has increased our focus on post-traumatic conditions, particularly in war-affected populations, during the last decade. Co-occurrence of these two disorders following traumatic experiences is associated with functional impairment, disability and prolonged suffering. Our findings may have implications for understanding complex psychopathology following trauma. Symptom severity, high personal distress and high suicidal risk are important both for individual and public mental health. Therefore, particular attention should be paid to screening both for PTSD and depression in traumatised populations. Comorbidity of PTSD and depression is important in terms of treatment efficacy. The consensus guidelines have suggested that the presence of MDD should change the treatment practice of PTSD (Flory and Yehuda, 2015; Zoellnar et al., 2014).

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CONFLICT OF INTEREST

The authors report no conflict of interest.

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ETHICAL APPROVAL

The study was approved by the Ethics Committee of the Belgrade University School of Medicine.

INFORMED CONSENT

All participants provided written informed consent after being fully informed about the study content and procedures.

REFERENCES

Arenson, MB, Whooley, MA, Neylan, TC, Maguen, Metzler, TJ, Cohen, BE 2018, 'Posttraumatic stress disorder, depression, and suicidal ideation in veterans: Results from the mind your heart study', *Psychiatry Research,* vol. 265, pp. 224-230.

Ayazi, T, Lien, L, Eide, AH, Ruom, MM, Hauff, E 2012, 'What are the risk factors for the comorbidity of posttraumatic stress disorder and depression in a war-affected population? a cross- sectional community study in South Sudan', *BMC Psychiatry*, vol. 12, 175.

Bowler, RM, Kornblith, ES; Li, J, Adams, SW, Gocheva, VV, Schwarzer, R, Cone, JE 2016, 'Police officers who responded to 9/11: Comorbidity of PTSD, depression, and anxiety 10-11 years later', *American Journal of Industrial Medicine,* vol. 59, no. 6, pp. 425-436.

Breslau, N, Davis, GC, Peterson, EL, Schultz, LR 2000, 'A second look at comorbidity in victims of trauma: The posttraumatic stress disorder-major depression connection', *Biological Psychiatry*, vol. 48, no. 9, pp. 902-909.

Byllesby, BM, Elhai, JD, Tamburrino, M, Fine, TH, Cohen, G, Sampson, L, Shirley, E, Chan, PK, Liberzon, I, Galea, S, Calabrese, JR 2017, `General distress is more important than PTSD's cognition and mood alterations factor in accounting for PTSD and depression's comorbidity`, *Journal of Affective Disorders*, vol. 211, pp. 118-123.

Caramanica K, Brackbill, RM, Liao, T, Stellman, SD 2014,`Comorbidity of 9/11-Related PTSD and Depression in theWorld Trade Center Health Registry 10-11 Years Postdisaster`, *Journal of Traumatic Stress*, vol. 27, pp. 680-688.

Charlson, FJ, Steel, Z, Degenhardt, L, Chey, T, Silove, D, Marnane, C, Whiteford, HA 2012, 'Predicting the impact of the 2011 conflict in Libya on population mental health: PTSD and depression prevalence and mental health service requirements', *PloS One*, vol. 7, no. 7, e40593.

Constans, JI, Lenhoff, K, McCarthy, M 1997, 'Depression subtyping in PTSD patients'. *Annals of Clinical Psychiatry*, vol. 9, no. 4, pp. 235-240.

Contractor, AA, Greene, T, Dolan, M, Elhai, JD 2018, 'Relations between PTSD and depression symptom clusters in samples differentiated by PTSD diagnostic status', *Journal Of Anxiety Disorders*, vol. 59, pp. 17-26.

Cougle, J, Resnick, H, Kilpatrick, D 2009, 'PTSD, depression, and their comorbidity in relation to suicidality: cross-sectional and prospective analyses of a national probability sample of women', *Depression and Anxiety*, vol. 26, no. 12, pp. 1151-1157.

Derogatis, LR, Melisaratos, N 1983, `Brief Symptom Inventory: an introductory report`, *Psychological Medicine*, vol. 13, no. 3, pp. 595-605.

Farhood, LF, Fares, S, Sabbagh, R, Hamady, C 2016, PTSD and depression construct: prevalence and predictors of co-occurrence in a South Lebanese civilian sample, *European Journal of Psychotraumatology*, 7: 10.3402/ejpt.v7.31509.

Goenjian, AK, Roussos, A, Steinberg, AM, Sotiropoulou, C, Walling, D, Kakaki, M, Karagianni, S 2011, 'Longitudinal study of PTSD, depression, and quality of life among adolescents after the Parnitha earthquake', *Journal of Affective Disorders*, vol. 133, no. 3, pp. 509-515.

Holtzheimer, PE, Tusso, J, Zatzick, DF, Bundy, C, Roy-Byrne, PP 2005, 'The impact of comorbid posttraumatic stress disorder on short-term clinical outcome in hospitalized patients with depression', *American Journal of Psychiatry*, vol. 162, no. 5, pp. 970-976.

Horesh, D, Lowe, SR, Galea, S, Aiello, AE, Uddin, M, Koenen, KC 2017, `An in-depth look into PTSD-depression comorbidity: A longitudinal study of chronically-exposed Detroit residents`, *Journal of Affective Disorders*, vol. 208, pp. 653-661.

Ikin, JF, Creamer, MC, Sim, MR, McKenzie, DP 2010, 'Comorbidity of PTSP and depression in Korean War veterans: prevalence, predictors, and impairment', *Journal of Affective Disorders*, vol. 125, no. 1-3, pp. 279-286.

Johnson, H, Thompson, A 2008, 'The development and maintenance of post-traumatic stress disorder (PTSD) in civilian adult survivors of war trauma and torture: a review', *Clinical Psychology Review*, vol. 28, no. 1, pp. 36-47.

Kaltman, S, Green, BL, Mete, M, Shara, N, Miranda, J 2010, 'Trauma, depression, and comorbid PTSD/depression in a community sample of Latina immigrants', *Psychological Trauma*, vol. 2, no. 1, pp. 31-39.

Kessler, RC, Sonnega, A, Bromet, E, Hghes, M, Nelson, CB 1995, 'Posttraumatic-stress-disorder in the national comorbidity survey', *Archive of General Psychiatry*, vol. 52, no. 12, pp. 1048-1060.

Kimbrel, NA, Meyer, EC, DeBeer, BB,Gulliver, SB, Morissette, SB 2016, 'A 12-month prospective study of the effects of PTSD-depression comorbidity on suicidal behavior in Iraq/Afghanistan-era veterans, *Psychiatry Research*, vol. 243, pp. 97-99.

Lecic-Tosevski, D, Vukovic, O, Pejuskovic, B, Maric, N 2018, 'Stress and its multiple faces' in V Zeigler-Hill & TK Shackelford (eds), The SAGE *Handbook of Personality and Individual Differences*, pp. 90-114. SAGE Publishing.

Lecic-Tosevski, D, Pejušković, B**,** Vukovic, O 2016, 'The spiral of trauma and its consequences' in GN Christodoulou, J Mezzich, NG Christodoulou, D Lecic-Tosevski (eds), *Disasters – Mental Health Context and Consequences*, pp.237-248. Cambridge Scholars Publishing.

Lecic-Tosevski D, Pejuskovic B, Miladinovic T, Toskovic O, Priebe S 2013, PTSD in Serbian community – seven years after trauma exposure. *Journal of Nervous and Mental Disease*, vol. 201, no. 12, pp. 1040-1044.

Mollica, R, Caridad, K, Massagli, M 2007, 'Longitudinal study of posttraumatic stress disorder, depression, and changes in traumatic memories over time in bosnian refugees', *The Journal of Nervous and Mental Disease*, vol. 195, no. 7, pp. 572-579.

Momartin, S, Silove, D, Manicavasagar, V, Steel, Z 2004, 'Comorbidity of PTSD and depression: associations with trauma exposure, symptom severity and functional impairment in Bosnian refugees resettled in Australia', *Journal of Affective Disorders*, vol. 80, no. 2-3, pp. 231-238.

O'Donnell, ML, Creamer, M, Pattison, P 2004, 'Posttraumatic stress disorder and depression following trauma: understanding comorbidity', *American Journal of Psychiatry*, vol. 161, no. 8, pp. 1390-1396.

Oquendo, M, Friend, J, Halberstam, B, Brodsky, BS, Burke, AK, Grunebaum, MF, Malone, KM, Mann, JJ 2003, 'Association of comorbid posttraumatic stress disorder and major depression with greater risk for suicidal behavior', *American Journal of Psychiatry*, vol. 160, no. 3, pp. 580-582.

Pagotto, LF, Mendlowicz, MV, Coutinho, ES, Figueira, I, Luz, MP, Araujo, AX, Berger, W 2015, 'The impact of posttraumatic symptoms and comorbid mental disorders on the health-related quality of life in treatment-seeking PTSD patients', *Comprehensive Psychiatry*, vol. 58, pp. 68-73.

Pittman, JOE, Goldsmith, AA, Lemmer, JA, Kilmer, MT, Baker, DG 2012, 'Post-traumatic stress disorder, depression, and health-related quality of life in OEF/OIF veterans', *Quality of Life Research*, vol. 21, no. 1, pp. 99-103.

Post, L, Zoellner, L, Youngstrom, E, Feeny, N 2011, 'Understanding the relationship between co- occuring PTSD and MDD: symptom severity and affect', *Journal of Anxiety Disorders*, vol. 25, no. 8. pp. 1123-1130.

Priebe, S, Grappasonni, I, Mari, M, Dewey, M, Peterelli, F, Costa, A 2009, Posttraumatic stress disorder six months after an earthquake, *Social Psychiatry and Psychiatric Epidemiology*, vol. 44, no. 5, pp. 393-397.

Priebe, S, Gavrilovic-Jankovic, J, Schuetzwohl, M, Galeazzi, GM, Lecic-Tosevski, D, Ajdukovic, D, Franciskovic, T, Kucukalic, A, Popovski, M 2004, 'A study of long-term clinical and social outcomes after war experiences in ex-Yugoslavia – methods of the 'CONNECT' project' [in Serbian], *Psihijatrija danas*, vol. 36, pp. 101-122.

Raab, PA, Mackintosh, MA, Gros, DF, Morland, LA 2015, 'Impact of comorbid depression on quality of life in male combat Veterans with posttraumatic stress disorder', *Journal of Rehabilitation Research & Development*, vol. 52, no. 5, pp. 563-576.

Richardson, JD, Ketchesona, F, Kinga, L, Shnaiderd, P, Marlborougha, M, Thompsone, A, Elhaif JD 2017, Psychiatric comorbidity pattern in treatment-seeking veterans, *Psychiatry Research*, vol. 258, pp. 488-493.

Roberts, B, Damundu, EY, Lomoro, O, Sondorp, E 2009, 'Post-conflict mental health needs: a cross-sectional survey of trauma, depression and associated factors in Juba, Southern Sudan', *BMC Psychiatry*, vol. 9, pp. 7.

Rytwinski, NK, Scur, MD, Feeny, NC, Youngstrom, EA 2013, 'The co-occurrence of major depressive disorder among individuals with posttraumatic stress disorder: a meta-analysis', *Journal of Traumatic Stress*, vol. 26, no. 3, pp. 299-309.

Shalev, AY, Freedman, S, Peri, T, Brandes, D, Sahar, T, Orr, SP, Pitman, RK 1998, 'Prospective study of Posttraumatic stress disorder and Depression following trauma', *American Journal of Psychiatry*, vol. 155, no. 5, pp. 630-637.

Sheehan, DV, Lecrubier, Y, Sheehan, KH, Amorim, P, Janavs, J, Weiller, E, Hergueta, T, Baker, R, Dunbar, GC 1998, 'Mini – International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD- 10', *Journal of Clinical Psychiatry*, vol. 59, suppl. 20, pp. 22-33.

Sher L 2005, 'The concept of post-traumatic mood disorder', *Medical Hypotheses*, vol. 65, no. 2, pp. 205-210.

Tracy, M, Norris, FH, Galea, S 2011, 'Differences in the determinants of posttraumatic stress disorder and depression after a mass traumatic event', *Depression and Anxiety*, vol. 28, no. 8, pp. 666-675.

Tural, U, Onder E, Aker, T 2012, 'Effect of depression on recovery from PTSD', *Community Mental Health Journal*, vol. 48, pp. 161-166.

Weiss, DS, Marmar, CR 1997, 'The Impact of Event Scale Revised' in JP Wilson & TM Keane (eds), *Assessing Psychological Trauma and PTSD – A Practitioners Handbook*, Guilford Press, New York.

Wolfe, J, Kimerling, R 1997, 'Gender issues in the assessment of Posttraumatic Stress Disorder' in J Wilson &TM Keane (eds.), *Assessing Psychological Trauma and PTSD*, pp. 192-238. Guilford, New York.