

SUICIDALITY IN PERSONS WITH POST-TRAUMATIC STRESS DISORDER: WHAT ARE THE RISK FACTORS?

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SUMMARY

Background: The results of the previous research imply that persons with post-traumatic stress disorder (PTSD) are at an increased suicide risk. Suicidality is more probable when PTSD occurs in comorbidity with other psychological disorders. The studying of potential differences and the fundamental social and physiological characteristics of suicidal and non-suicidal persons with PTSD has so far failed to produce consistent results. The objective of this article is to examine whether suicidal and non-suicidal persons with PTSD differ by demographic characteristics, the presence and the type of comorbidity with other psychological disorders and the type of traumatic experience.

Subjects and methods: The study included 147 participants from Bosnia and Herzegovina, 91 men and 56 women, who have been diagnosed with PTSD under the 10th revision of the International Classification of Diseases (ICD-10). Based on the suicidality status (suicidal/non-suicidal), the sample was divided into two sub-samples. For the purpose of data collection, a clinical interview and a socio-demographic questionnaire was applied during psychological clinical assessment at a psychiatric ward.

Results: It has been established that suicidal and non-suicidal persons with PTSD differ by demographic characteristics, such as the educational and employment status, the presence of a history of suicide in the family, the presence and type of comorbidity with other psychiatric disorders, and the type of traumatic experience. In terms of age, gender, marital status and psychiatric heredity, no significant differences have been found relative to the suicidality status.

Conclusions: Suicidal persons with PTSD more frequently have low education, they are unemployed and have a history of suicide in the family, and they are diagnosed with comorbid psychiatric disorders, dominated by mood disorders and personality disorders, with multiple comorbid disorders combined, and with war, civilian and mixed trauma being equally present in these persons. Based on the established demographic and clinical characteristics of suicidal patients with PTSD, it is possible to improve the psychological and psychiatric assessment of suicidality in persons with PTSD, which enables adequate and timely identification of the suicide risk in this population.

Key words: suicidality - PTSD - trauma - Bosnia and Herzegovina

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INTRODUCTION

The concept of suicidality entails various behaviours, whose common characteristic is endangering one's own life with the ultimate objective of committing suicide (Begić 2011, Dumenčić et al. 2019). According to the data of the World Health Organisation (WHO), almost a million people take their own lives every year, with men outnumbering women significantly in most parts of the world (WHO 2017). The cause for differences in suicide rates among countries is mostly interpreted as a difference in the socio-economic circumstances, such as an increase in unemployment, imbalance between income and expenses and incidence of divorce (Gunnell et al. 2003). However, it has not been fully clarified yet in what way the social community system within a specific country contributes to the suicidality of an individual. While the previous research implies that suicidality does not increase during war, which had been the popular belief in the past (Henderson et al. 2006, Kozarić-Kovačić 2002), the number of studies about the connection between suicidality and post-traumatic stress disorder (PTSD) in war veterans (Law et al. 2019,

Cunningham et al. 2019, Locci & Pinna 2019, Stanley et al. 2019) is also increasing. A study which covered 3,313 participants from the territory of former Yugoslavia (Bosnia and Herzegovina, Croatia, Serbia, Macedonia, Kosovo) who have experienced war trauma shows that extensive war experience, and in particular experience of a prisoner of war, increase the suicide risk (Janković et al. 2012, Hasanović & Hasanović 2020).

The occurrence of suicidality in persons with PTSD caused by war trauma is explained by means of interpersonal theory. A person with PTSD feels that he or she is useless and a "burden" to others, which is accompanied by the feelings of hopelessness, lack of purpose, helplessness, self-blame, anxiety, shame and a distorted picture of oneself. Research conducted on war veterans in the United States of America (USA) confirms the hypotheses that this experience, in interaction with the absence of fear of death is associated with increased suicidality (Bryan et al. 2012). The failure to fulfill the fundamental human need of belongingness and a lack of social cohesion in these persons intensifies the desire for death, with this state being labeled in suicidology also as passive suicidal ideation. The level of suicide risk in

war veterans is further increased by them being accustomed to fear and physical pain, which makes them more mentally prepared for a terrifying outcome (Gaudet et al. 2015, Joiner 2005). It has been confirmed that war veterans who have been wounded more than once, who have had brain injuries and/or who have amputated limbs are at a much higher risk of suicide. Their ability to overcome fear and pain related to suicide is the key factor in the understanding of suicidality in the military population. Such tolerance may be gained with combat experience from war zones or with training in which soldiers are trained to kill the enemy, sustain pressure and overcome all difficulties awaiting them on this path (Crocker et al. 2019, Dillon et al. 2018, Van Orden et al. 2010).

There are numerous risk factors which mediate in the correlation between suicidality and PTSD. Standing out among the socio-demographic factors, as key determinants of suicidality, are gender and marital status (Mäki & Martikainen 2007). The results of the previous research are consistent in the conclusions that men commit suicide more frequently, while women are more prone to attempting suicide. Based on the findings from the gender perspective, it may be concluded that suicidal men on average select more lethal methods to end their own lives (hanging, firearms) compared to women, who more frequently apply methods with a lesser probability of a lethal outcome (medications) (Taktak et al. 2012, Varnik 2008). Standing out among the social risk factors for suicidality are unemployment and economic instability (Barth et al. 2011, Lundin et al. 2012, Pitman et al. 2012). At the personality level, it has been shown that a lower level of extraversion and a higher level of neuroticism, psychoticism, hostility, depression, aggressiveness, self-criticism, tendencies for rumination and anxiety sensitivity are connected with a higher suicide risk (Capron et al. 2012, Morrison & O'Connor 2008, O'Connor & Noyce 2008, Sarchiapone et al. 2009). The most dominant psychiatric risk factor is a suicide attempt, followed by other suicidal behaviors, such as a tendency for self-harm (Cunningham et al. 2019). It is significant to mention the results of research which has concluded that persons with suicidal ideation does not differ from persons who have attempted suicide by the "ability/tendency for suicide" in the context of the absence of fear of death, subjective pain tolerance and presence of objective pain (Paashaus et al. 2019). The results of a recent study conducted in the USA show that there is a significant correlation between suicidality and the functional and structural integrities in the brain which affect the ability of persons with PTSD to make decisions. It has been explained that the findings about biomarkers of suicidality in the brain networks responsible for decision-making in persons with depression could be generalized also to persons with PTSD (Barredo et al. 2019).

Suicidality is more frequent when PTSD occurs in comorbidity with other psychological disorders (Lento et al. 2019). The highest suicide risk occurs when PTSD

is combined with mood disorders, disorders related to psychoactive substance abuse, psychotic disorders and personality disorders (Arenson et al. 2018, Bing-Canar et al. 2019, Monnin et al. 2012, Nelson et al. 2011). Also playing a significant role in the occurrence of suicidality is a specific configuration of symptoms within an individual cluster characteristic of PTSD (Brake et al. 2019, Watkins et al. 2017). The most consistent conclusions speak in favor of symptoms of hyperarousal culminating more frequently in suicidality in comparison to other symptom clusters. This in particular relates to long periods of insomnia in persons suffering from PTSD (Britton et al. 2019). In the review article, which covered a total of 36 studies, it is shown that the greatest suicide risk occurs in combination with comorbid depressive mood disorder, borderline personality disorder, schizophrenia and addictive disorders (Aziraj-Smajić 2013).

Based on a review of the available literature in the field of suicidality in persons with PTSD, it may be concluded that the results are inconsistent, which is mainly a consequence of the difficulty to compare studies which examines suicidality at different levels. Beautrais (2001) notes that suicidal ideation and suicide attempts, on the one hand, and committed suicides on the other, are actually two completely different phenomena. The main methodological problem when it comes to committed suicides is the fact that the suicide is unavailable, and that it is questionable whether the information obtained from persons who report the presence of suicidal ideation and suicide attempts can reliably foresee the etiological determinants of persons who indeed commit suicide. Currently dominating are studies which cover samples of persons who have attempted suicide, as many authors believe that attempted suicide is the most predicting risk factor for suicide (Borges et al. 2006, Gieling et al. 2009, Sareen et al. 2005). However, also existing are studies restricted only to suicidal ideation and, possibly, suicidal plans (Blais & Geiser 2019, Elbogen et al. 2020, Raines et al. 2017). One of the limitations is that the largest number of studies covers exclusively samples from the American population, with the participants being men (Bing-Canar et al. 2019, Cunningham et al. 2019, Lento et al. 2019, Wilks et al. 2019). A majority of studies are cross-sectional and do not enable conclusions about a causal link between the examined variables, they do not clearly define the type of traumatic experience, apply different methodological procedures and assessment instruments and do not control the effects of potential comorbid psychological disorders (Brown et al. 2018, Jing et al. 2018). The number of studies which examine suicidality in persons with PTSD caused by civilian and mixed traumatic experience is small (Brown et al. 2019).

It is known that a war broke out in Bosnia and Herzegovina (1992-1995) as a consequence of the breakup of the Socialist Federative Republic of Yugoslavia. The presence of a large number of military and civilian

victims prompted numerous studies about the correlation between the war experience and PTSD (Hasanović & Pajević 2010, 2013, 2015). Not negligible for the social dynamic and global mental health of people in these countries is the impact of unprocessed cumulative war trauma, which is deeply integrated in the collective consciousness of the population, which is passed from one generation to another (it has a trans-generational effect) and whose consequences are recorded even today in many aspects of everyday life (Delić et al. 2014, Hasanović et al. 2005). However, in the period between the end of the war and today (24 years since the end of the war), a rare number of studies examined suicidality in persons with PTSD in Bosnia and Herzegovina (Avdibegović et al. 2007, Aziraj-Smajić 2014, Janković et al. 2012). Better understanding of determinants which mediate between PTSD and suicidality in this population may encourage the development of more effective mechanisms for the prevention of this phenomenon and for more adequate identification of critical points which may lead a person in the process from trauma to suicide.

The objective of this study was to examine whether suicidal and non-suicidal persons with PTSD differ by demographical characteristics, the presence and type of comorbidity with other psychological disorders and the type of traumatic experience.

SUBJECTS AND METHODS

Participants

The sample covers a total of 147 participants - 91 men (61.9%) and 56 women (38.1%) who have been diagnosed with PTSD under the criteria of the 10th revision of the International Classification of Diseases (ICD-10). The criteria for the selection of participants were the presence of PTSD caused by war, civilian or mixed traumatic experience, the absence of psychological disturbances caused by organic etiology, and the ability to provide written answers. Data collection was conducted individually as part of the hospital treatment of patients between 2010 and 2012. The average age at the level of the total sample was 44.82 (SD=10.3, range: 44-61 years). A majority of the respondents have finished secondary school (53.7%), while 43.6% of them have not finished primary school. 39.7% of the respondents have finished primary school, while those with higher education represented the smallest share (8.2%). Out of the total number, 121 (82.3%) were unemployed, and 26 (17.7%) were employed. When it comes to marital status, 96 (65.3%) of the respondents were married, 26 (17.7%) divorced, 11 (7.5%) were widowed, and 16 (10.9%) were not married. With respect to the type of traumatic experience, 79 of the 147 participants (53.7%) reported war trauma, 40 (27.2%) civilian trauma and 28 (19.1%) mixed trauma. In terms of suicidality, 51 (34.7%) participants was recorded as non-suicidal, 43 (29.3%) participants were hospitalized for actually

attempting suicide, and 53 (36.1%) had a history of attempted suicide. Patients with acute suicidality who had attempted suicide were grouped into one category - „suicidal” ($n=96$). In 105 (71.4%) participants, one or more comorbid psychological disorders were present in addition to the diagnosed PTSD, while no comorbidity was recorded in 42 (28.6%) participants.

Measures/Instruments

In accordance with ICD-10 (WHO 1992), they were diagnosed with PTSD with a psychiatric interview, which was recorded in their medical history. A history of attempted suicides was determined based on medical history and on the question of whether they have attempted suicide, with their answers categorised as „without a history of attempted suicide” and „with a history of attempted suicide”. Disorders which were recorded in comorbidity were mood disorders (Bipolar disorder F31, Major depressive disorder F32, Recurrent depressive disorder F33), personality disorders (Paranoid personality disorder F60.0, Borderline personality disorder F60.3, Personality disorder, unspecified F60.9, Mixed and other personality disorders F61), psychotic disorders (Chronic psychotic disorders/Schizophrenia F20, Persistent delusional disorders F22, Acute and transient psychotic disorders F23, Acute polymorphic psychotic disorder without symptoms of schizophrenia F23.0, Acute polymorphic psychotic disorder with symptoms of schizophrenia, Schizoaffective disorder F25) and disorders related to psychoactive substance use (alcohol use F10, opioid abuse F11). For the purpose of research, they were grouped into basic categories such as mood disorders, personality disorders, psychotic disorders and disorders related to psychoactive substance use. Traumatic experiences were divided into war, civilian and mixed traumatic experiences. War traumas covered traumas caused by the exposure to fighting, experience of war-related rape, detention in camps for prisoners of war and being wounded. Civilian traumas covered traumas caused by physical, emotional and sexual violence by an intimate partner, domestic violence, physical and/or sexual assault by an unknown perpetrator, as well as traffic accidents, witnessing the killing of a family member, and loss/death of a child. The data was collected by means of insight into medical history, a structured clinical interview and application of a socio-demographic questionnaire.

Procedure

The participants were hospitalised at the Neuro-psychiatric Ward or/and at the Internal Medicine Ward of Dr. Irfan Ljubijankić Cantonal Hospital in Bihać, and the study was implemented during psychological differential diagnosis evaluation in hospital conditions. The study was approved by the ethics committee of the institution and the ward in which it was implemented, and informed consent from each participant was obtained.

Statistical Analyses

The data in this research was described using descriptive statistical methods (means, percentages, and standard deviation). A Chi-square test and a Student's T-test were used for assessing the differences between socio-demographic characteristics in both sample groups. The level of significance was set at P of 0.05 and P of 0.01. All the statistical analyses were performed using the SPSS version 15.0 and GraphPad Software (2010).

RESULTS

The studied sample covered a total of 96 (65.3%) suicidal patients with the average age of 44.84 ($\pm 10.9\%$) and 51 (34.69%) non-suicidal persons with PTSD with the average age of 44.78 ($\pm 9.2\%$). The results show that there are no differences in the prevalence of suicidality in persons with PTSD between men and women ($\chi^2(1)=1.09$, $p=0.2960$) (Table 1). Suicidal persons significantly more frequently have low education ($\chi^2(3)=15.42$, $p=0.0015$) and are significantly more frequently unemployed ($\chi^2(1)=32.12$, $p<0.0001$). What

is more, suicidal and non-suicidal persons differ in terms of the type of trauma, with war trauma being predominant in non-suicidal persons (84.3%), while war, civilian and mixed trauma are equally present in suicidal persons ($\chi^2(1)=29.81$, $p<0.0001$). However, there are no differences between suicidal and non-suicidal persons with PTSD when it comes to age ($t(145)=0.03$, $p=0.9733$) or marital status ($\chi^2(3)=2.53$, $p=0.4706$). While the prevalence of psychiatric heredity is equal in suicidal and non-suicidal persons ($\chi^2(1)=1.37$, $p=0.2423$), attempted suicide in the family is more frequently present in suicidal persons ($\chi^2(1)=5.03$, $p=0.0249$).

When these differences are observed separately for men and women (Table 2), it is noticeable that differences related to education are present only in men, and not in women, with suicidal men having significantly lower education than non-suicidal men ($\chi^2(2)=18.69$, $p<0.0001$). The previously established differences with regard to employment, with suicidal persons being more frequently unemployed than non-suicidal persons, are equally present in men ($\chi^2(1)=19.22$, $p<0.0001$) and in women ($\chi^2(1)=14.12$, $p=0.0002$).

Table 1. Differences in demographic characteristics of suicidal ($n=96$) and non-suicidal persons ($n=51$) with PTSD

	Suicidal ($n=96$) M (SD)	Non-suicidal ($n=51$) M (SD)	
Age	44.84 (10.9)	44.78 (9.2)	$t(145)=0.03$; $p=0.9733$
	n (%)	n (%)	
Gender			$\chi^2(1)=1.09$; $p=0.2960$
male	56 (58.3)	35 (68.6)	
female	40 (41.7)	16 (31.4)	
Marital status			$\chi^2(3)=2.53$; $p=0.4706$
not married	12 (12.5)	4 (7.8)	
married	58 (60.4)	36 (70.6)	
divorced	17 (17.7)	9 (17.7)	
widowed	9 (9.4)	2 (3.9)	
Education			$\chi^2(3)=15.42$; $p=0.0015$
no primary education	23 (24.0)	6 (11.8)	
primary education	24 (25.0)	3 (5.9)	
secondary education	41 (42.7)	38 (74.5)	
higher education	8 (8.3)	4 (7.8)	
Employment status			$\chi^2(1)=32.12$; $p<0.0001$
unemployed	92 (95.8)	29 (56.9)	
employed	4 (4.2)	22 (43.1)	
Type of trauma			$\chi^2(2)=29.81$; $p<0.0001$
war trauma	36 (37.5)	43 (84.3)	
civilian trauma	34 (35.4)	6 (11.8)	
mixed trauma	26 (27.1)	2 (3.9)	
Psychiatric heredity			$\chi^2(1)=1.37$; $p=0.2423$
present	43 (44.8)	17 (33.3)	
not present	53 (55.2)	34 (66.7)	
History of suicide in the family			$\chi^2(1)=5.03$; $p=0.0249$
present	18 (17.7)	2 (3.9)	
not present	78 (81.3)	49 (96.1)	

Table 2. Differences in demographic characteristics of suicidal and non-suicidal persons with PTSD by gender

	Men		Women	
	Suicidal (n=56)	Non-suicidal (n=35)	Suicidal (n=40)	Non-suicidal (n=16)
Marital status				
not married	7 (12.5)	1 (2.9)	5 (12.5)	3 (18.8)
married	43 (76.8)	31 (88.6)	15 (37.5)	5 (31.2)
divorced	6 (10.7)	3 (8.6)	11 (27.5)	6 (37.5)
widowed	0 (0)	0 (0)	9 (22.5)	2 (12.5)
	$\chi^2(2)=2.75; p=0.2533$		$\chi^2(3)=1.40; p=0.7065$	
Education				
no primary education	18 (32.1)	6 (17.1)	5 (12.5)	0 (0)
primary education	18 (32.1)	1 (2.9)	6 (15.0)	2 (12.5)
secondary education	20 (35.8)	27 (77.1)	21 (52.5)	11 (68.7)
higher education	0 (0)	1 (2.9)	8 (20.0)	3 (18.8)
	$\chi^2(2)=18.69; p<0.0001$		$\chi^2(2)=1.65; p=0.4394$	
Employment status				
unemployed	56 (100)	23 (65.7)	36 (90.0)	6 (37.5)
employed	0 (0)	12 (34.3)	4 (10.0)	10 (62.5)
	$\chi^2(1)=19.22; p<0.0001$		$\chi^2(1)=14.12; p=0.0002$	
Type of trauma				
war trauma	26 (46.4)	33 (94.3)	10 (25.0)	10 (62.5)
civilian trauma	15 (26.8)	0	19 (47.5)	6 (37.5)
mixed trauma	15 (26.8)	2 (5.7)	11 (27.5)	0
	$\chi^2(2)=22.10; p<0.0001$		$\chi^2(2)=9.16; p=0.0103$	
Psychiatric heredity				
present	24 (42.9)	10 (28.6)	19 (47.5)	7 (56.2)
not present	32 (57.1)	25 (71.4)	21 (52.5)	9 (43.8)
	$\chi^2(1)=1.32; p=0.2511$		$\chi^2(1)=0.07; p=0.7993$	
History of suicide in the family				
present	6 (10.7)	1 (2.9)	12 (30.0)	1 (6.3)
not present	50 (89.3)	34 (97.1)	28 (70.0)	15 (93.7)
	$\chi^2(1)=0.93; p=0.3350$		$\chi^2(1)=2.41; p=0.1208$	

Table 3. Differences in the presence and type of comorbidity in suicidal (n=96) and non-suicidal persons (n=51) with PTSD

	Suicidal (n=96) n (%)	Non-suicidal (n=51) n (%)	χ^2 test
Comorbidity			$\chi^2(1)=58.43; p<0.0001$
present	89 (92.7)	16 (31.4)	
not present	7 (7.3)	35 (68.6)	
Type of comorbidity			
substance abuse	1 (1.0)	0 (0)	$\chi^2(1)=0.54; p<0.4646$
mood disorder	55 (57.3)	16 (31.4)	$\chi^2(1)=7.95; p=0.0048$
psychotic disorder	2 (2.1)	0 (0)	$\chi^2(1)=0.08; p=0.7718$
mood disorder	17 (17.7)	0 (0)	$\chi^2(1)=8.55; p=0.0034$
other psychiatric disorders	3 (3.1)	0 (0)	$\chi^2(1)=0.44; p=0.5075$
multiple comorbid disorders	11 (11.5)	0 (0)	$\chi^2(1)=4.77; p=0.0290$

When it comes to the type of trauma in men, war trauma is significantly more frequently present in non-suicidal (94.3%) than suicidal men (46.4%; $\chi^2(2)=22.10, p<0.0001$). In women, war trauma is also more frequently present in non-suicidal than suicidal ($\chi^2(2)=9.16, p=0.0103$) women. When the gender differences in the type of trauma are observed separately for suicidal and non-suicidal persons, it is established that there is no difference in the type of trauma between suicidal men and women ($\chi^2(2)=5.69, p=0.0581$). However, there are

gender differences in non-suicidal persons ($\chi^2(1)=6.16, p=0.0131$), with war trauma dominating in non-suicidal men (94.3%), while war trauma is present in two-thirds of non-suicidal women (62.5%) and civilian trauma in the remaining third (37.5%).

When it comes to the presence of comorbidity, it has been concluded that suicidal persons with the PTSD diagnosis more frequently have an additional comorbid disorder ($\chi^2(1)=58.43, p<0.0001$) (Table 3). Moreover, suicidal and non-suicidal persons differ in terms of the

Table 4. Differences in the presence and type of comorbidity in suicidal ($n=96$) and non-suicidal persons ($n=51$) with PTSD by gender

	Men		Women	
	Suicidal ($n=56$)	Non-suicidal ($n=35$)	Suicidal ($n=40$)	Non-suicidal ($n=16$)
Comorbidity				
present	54 (96.4)	14 (40.0)	35 (87.5)	2 (12.5)
not present	2 (3.6)	21 (60.0)	5 (12.5)	14 (87.5)
	$\chi^2(1)=33.39; p<0.0001$		$\chi^2(1)= 25.43; p<0.0001$	
Type of comorbidity				
substance abuse	0	0	1 (2.5)	0
	$\chi^2(1)=0; p=1.00$		$\chi^2(1)=3.82; p=0.5366$	
mood disorder	34 (60.7)	14 (40.0)	21 (52.5)	2 (12.5)
	$\chi^2(1)=2.92; p=0.0873$		$\chi^2(1)=5.99; p=0.0144$	
psychotic disorder	2 (3.6)	0	0	0
	$\chi^2(1)=0.16; p=0.6923$		$\chi^2(1)=0; p=1.00$	
mood disorder	8 (14.3)	0	9 (22.5)	0
	$\chi^2(1)=3.85; p=0.0499$		$\chi^2(1)=2.78; p=0.0952$	
other psychiatric disorders	3 (5.4)	0	0	0
	$\chi^2(1)=0.62; p =0.4301$		$\chi^2(1)=0; p=1.00$	
multiple comorbid disorders	7 (12.5)	0	4 (10.0)	0
	$\chi^2(1)=3.14; p=0.0763$		$\chi^2(1)=0.55; p=0.4603$	

type of comorbid disorder, with suicidal persons significantly more frequently having a mood disorder ($\chi^2(1)=7.95, p=0.0048$), personality disorder ($\chi^2(1)=8.55, p=0.0034$) or more comorbid disorders combined ($\chi^2(1)=4.77, p=0.0290$).

When the differences in the presence of comorbidity in suicidal and non-suicidal persons are observed separately for men and women, it is noticeable that suicidal women have a mood disorder more frequently than non-suicidal women ($\chi^2(1)=5.99, p=0.0144$) (Table 4), while suicidal men have a personality disorder significantly more frequently than non-suicidal men ($\chi^2(1)=3.85, p=0.0499$).

DISCUSSION

In accordance with the expectations, the results of this study show that suicidal and non-suicidal persons with PTSD differ by certain demographic characteristics (Hasanović & Hasanović 2020). It has been established that suicidal persons with PTSD significantly more frequently have low education, which is consistent with some previous research (Lorant et al. 2005). Speaking in favour of this are the results of a study conducted in Finland, where a good performance in school among individuals from the general population has shown to be a good protective factor against suicide. On the other hand, in persons with psychotic disorders observed among individuals from the clinical population, a high educational achievement, as well as a high level of premorbid functioning has shown to be a significant risk factors for suicide (Alaraisanen et al. 2006). It has been shown that persons with a higher level of education may be more prone to committing suicide when faced with failure, public shaming and similar problematic situa-

tions (Pompili et al. 2012). What is specific for this sample is that observing it from the gender perspective implies that suicidal men are more frequently persons with low education, while for women there are no significant differences in this respect. These are exactly the results which provide us with specific guidelines for clinical evaluation of suicide risk in the male population, and which point to the need for further research in this field. On the other hand despite the fact that suicidality is caused by numerous factors, Dumenčić et al. (2019) confirmed that a sudden change of weather in the days preceding the suicide can be a trigger to suicidal behavior. Their study also suggests that in the matter of suicidal behavior, the female population is more susceptible to sudden weather changes.

Furthermore, the results of our study show that persons with PTSD, with respect to the suicidality status, differ in terms of the employment status, which is consistent with the results of earlier studies which point to a strong correlation between unemployment and suicidality (Gerdtham & Johannesson 2003, Kposowa 2001, Qin et al. 2003). A study conducted in Sweden, which covered 771,068 men and women (who were monitored over a two-year period) has shown that unemployment which lasted up to 90 days was related to suicides committed by men, while unemployment which lasted for more than 90 days was related to suicides committed by women (Lundin et al. 2012). What is tied in such cases to increased suicidality is the reaction of men to depression and them resisting to seeking help in such situations. Depression is usually unfairly characterised as a *women's disorder*, which is the basis for the notion that it is unmasculine for men to seek help when they found themselves in such a situation, which is why they get withdrawn, which in turn significantly contributes to

the suicidal process. Branney and White (2008) suggest that unemployment significantly contributes to increase in depression in men because for them, this may not only mean a disruption and/or collapse of their professional career, but also an attack of sorts on their identity as a family provider. By means of psychological autopsy conducted in 163 cases of suicide and individual interviews conducted with 396 living persons from the control group, it has been concluded that factors such as unemployment (in particular longer than six months), and early/premature retirement has a significant correlation to increased suicidality, which is independent from the categorised psychiatric diagnosis (Fekete et al. 2005, Schneider et al. 2011). When it comes to suicidality from the gender perspective, androgen hormones playing a significant role in connection with committed suicides are being increasingly discussed. In this context, it is suggested that these hormones are related to the risk factors for suicide, such as male gender, impulsiveness and aggressiveness (Lenz et al. 2019). It is interesting to also mention the results of a cross-sectional study which covered a sample of 298 transgender veterans, which showed that their discrimination had a significant correlation to a higher risk of suicidal ideation (Carter et al. 2019). Fekete et al. (2005) point to the data that housewives without independent employment outside their homes have a higher suicidality risk. In general terms, a correlation has been established between unemployment and negative health consequences (Kasli & Jones 2002). Persons in full-time employment have a lower level of stress and depression, they consume healthier food and have more physical activity, and they consume less tobacco and alcohol in comparison to unemployed persons or persons in part-time employment. More negative health consequences have been identified in persons with part-time employment or persons who perform precarious work in comparison with persons who are employed full-time (Rosenthal et al. 2012). For all the listed reasons, it is very important to understand the health and social consequences of unemployment in the risk group, which is also the target group of our study. When it comes to examining how pathognomonic is the occurrence of unemployment of persons with PTSD, it must be noted that it is hard to compare the obtained data with the unemployment rate and the general social context at the time of the study because the sample was heterogeneous and because we do not possess the data on the duration of unemployment.

In our study, no differences have been found between suicidal and non-suicidal persons with PTSD when it comes to marital status. This is not consistent with the results of the previous research, in which it is emphasised that different types of marital status affect the occurrence of suicidality differently (Cantor & Neulinger 2000, Lloyd & Yip 2001, Roskar et al. 2010). While marriage has shown to be a protective factor for men, a lower suicidal risk has not been recorded in married women. It has been concluded that the factor of

change of marital status is in itself a significant risk factor in suicidality, with the first year following a change in marital status being particularly critical. Contrary to expectations, also showing to be as significant are reportedly positive changes, which includes the period after the conclusion of marriage (Roskar et al. 2010). Some research imply that the internalised *feeling of shame* which occurs due to the break-up of marriage, although not being direct, is actually one of the significant mediating factors of suicidality both in men and women, with divorced men being more vulnerable in this context (Kölves et al. 2011). *Being separated from the spouse* (which should be differentiated from divorce) has shown as a four times greater risk for suicide both for men and women in comparison to any other marital status, with the greatest risk being present in young men (Wyder et al. 2009). Research on the fluctuation of suicidality as a consequence of separation from the spouse implies reduced suicidality, which has resulted in the conclusion that individuals from the general population manage to get adjusted to new circumstances of life (Kölves et al. 2003). Some studies show that divorce significantly contributes to increased suicidality in men, but not also in women, and the same situation is also found in widowhood, especially in very young and in older persons (Agerbo et al. 2006, Roskar et al. 2010). What is specific for women war veterans is that the overlap of war and civilian traumatic experience is frequent, given that it has been shown that they are more frequently than men exposed at the same time to abuse by an intimate partner, which makes them particularly vulnerable to developing suicidality (Lovine-Wong et al. 2019). What is more, it has been shown that men who have experienced sexual trauma in war more frequently report suicidal ideation compared to women with the same experience, or to war veterans without such an experience (Monteith et al. 2016).

It has been shown in our sample that suicidality is equally present in men and women with PTSD, which is not consistent with the results of the previous research. In other research, it has been shown that men commit suicide more frequently compared to women (Varnik et al. 2008, Cibis et al. 2012). However, when it comes to the presence of suicidal ideation and suicidal behaviour, it has been shown that they are more frequent in men than in women (Beautrais 2002). Moreover, it has been shown that differences in suicidality between men and women vary in terms of the cultural milieu they live in. In the Western European countries, suicide rate for men is two to four times higher than that for women (Ahn et al. 2012, Lloyd & Yip 2001). In Asian countries, approximately the same suicide rates have been recorded for both genders (Vijayakumar et al. 2005). Furthermore, it has been shown that the suicidal process, which begins with suicidal ideation and ends with suicide, is shorter for men than for women (Ahn et al. 2012). What is also indicated is a significant role of the testosterone level in the occurrence and increase of suicidality. It has

been concluded by using a sample of men and women diagnosed with bipolar mood disorder that the testosterone level is positively related both to the number of manic episodes and the number of suicide attempts, but it has also been shown that the testosterone level was higher in men (Sher et al. 2012). However, when it comes to men with PTSD, somewhat older research showed that the testosterone level was not connected with suicide attempts by men (Butterfield et al. 2005). The results of a study conducted on a sample of South African police officers, of which 165 were men and 56 women, have shown that the gender specificity of the configuration of symptoms of the PTSD profile is a significant predictor of suicidal ideation. While the symptoms of hyperarousal (dominated by insomnia) in men had a significant correlation to suicidal ideation, what was connected with suicidality in women were the symptoms of reliving of a traumatic experience (dominated by intrusive thoughts) (Britton et al. 2019, Steyn 2012).

In terms of the differences in suicidality relevant to age, the results obtained are not consistent with the results of the previous research, which shows that persons older than 60 are at the highest risk of suicide. Their suicidality is connected with the deteriorating physical health, chronic and debilitating illnesses, abrupt cognitive deterioration, the feeling of void related to the loss of the ability to work, financial difficulties or death of the spouse (Lloyd & Yip 2001, Marčinko 2011, Paraschakis et al. 2012). In comparison, in young adulthood suicidality is most frequently connected with the problems of psychoactive substance abuse, which frequently provoke the symptoms of depression and hopelessness, and lead towards suicidality (Buckner et al. 2012, Pedersen 2008). With the objective of self-soothing and self-medicating the feeling of anxiousness and depression, individuals frequently resort to these substances, with which the mechanism for the development of comorbidity of the listed disorders is explained. Self-medication becomes a way to face the overwhelming psychopathological symptoms, which does not lead to their withdrawal, but on the contrary, may lead to their escalation and, consequently, increase the risk of addiction to alcohol and other psychoactive substances (Turner et al. 2018). In accordance with expectations, it has been confirmed with the conducted study that suicidal persons with PTSD are more frequently diagnosed with comorbid disorders. In suicidal persons, a significantly larger range of psychological disorders in comorbidity with PTSD has been shown in comparison with non-suicidal persons, who mostly have mood disorders. The largest number of suicidal persons had comorbid mood disorders, psychotic disorders and personality disorders combined with PTSD, which is consistent with the previous research (Cacciola et al. 2009, Sher et al. 2012, TARRIER & Picken 2011). It has also been shown that persons with dramatic personality disorders (Cluster B) are more prone to repeating suicide attempts (Irygoyen et al. 2019). Based on studies on

persons who have attempted suicide, Vishnuvardhan & Saddichha (2012) conclude that the presence of any psychiatric comorbidity correlates with increased suicidality. In a study which examined the risk factors for the occurrence of suicidal ideation in American veterans upon their return from Iraq and Afghanistan, it has been established that the comorbidity of PTSD and depression increases the suicide rate in comparison to the presence of one of these disorders separately (Lemaire & Graham, 2011). In relation with this, the results of our study, which imply that suicidal women more frequently have mood disorder, while personality disorder is present in suicidal men, provide valuable indicators for assessing the suicidality factors for persons with PTSD from the gender perspective.

Our study has shown that suicidal and non-suicidal persons with PTSD report the presence of psychiatric heredity with equal frequency. These results are not consistent with the results of the previous research (Bryan et al. 2008, Forman 2004, Lipschitz et al. 2012). It has been shown that even adopted persons are at a higher suicide risk if their biological parents or adopters have psychiatric disorders (Wulcox et al. 2012).

Our expectations that suicidal persons with PTSD will report a history of suicide in the family more frequently have been confirmed, which is consistent with the results of the previous research in the field of suicidality (Diaconu & Turecki 2009, Lopez-Castroman et al. 2012, Roy 2011, Rodante et al. 2016). It has been shown that early traumatic experience such as abuse in childhood, in addition to a history of suicide in the family, plays a significant role in the development of suicidality at the level of suicide attempts (Rajalin et al. 2013). It has been confirmed that persons with a history of suicide in the family are more frequently diagnosed with personality disorder, which interferes with their ability to create and maintain stable and lasting relationships, and in general express difficulties in interpersonal relations and attempt suicides more frequently (Rajlin et al. 2017).

In terms of the type of traumatic experience, an unexpected piece of data implies that war trauma was more frequently present in non-suicidal persons, while all three types of traumatic experience were present in suicidal persons. This means that it is important to equally rank all traumatic experiences in clinical practice. It may be assumed that such results are partly based on the fact that, due to the recent war, war trauma in Bosnia-Herzegovina is expected, and socially "more acceptable", and is becoming less and less stigmatised, which makes it easier to identify it and provide adequate psychiatric and psychological treatment to such persons. On the other hand, it is justifiable to assume that civilian trauma (for example, caused by abuse by an intimate partner or domestic violence) and, consequently, mixed trauma is harder to detect, which makes such persons deprived of adequate treatment. No similar research has been found in the recent literature. In the context of

suicidality and PTSD, the results of the previous research mainly deal with only one type of traumatic experience, or compare men and women war veterans with the civilian population in whom traumatic experience has not been identified, or deal with comparisons between different types of trauma within a single category, mainly within war trauma (Blais & Gleiser 2019, Khan et al. 2019). In addition to the small sample, a factor that might have affected the results obtained is the heterogeneousness of the period in which the trauma developed, with war and civilian trauma being significantly different in this respect. In this context, it may be assumed that 15-20 years since the development of trauma is a significant period in which protective factors might have been strengthened, and risk factors for attempted suicide reduced, given that persons with war trauma are mostly long-term psychiatric patients.

Limitations

Regardless of certain limitations of this study, such as a relatively small sample and the heterogeneousness of the type of traumatic experiences and the period of their development, it is expected that these results will help expand our understanding of suicidal risk in persons with PTSD. In addition to the above mentioned, what is missing is data about the length of psychiatric treatment, as well as about the perceived social support and other potentially protective factors, such as the religiousness factor (Hasanović & Pajević 2010), which could have significantly affected the suicidal process in persons with PTSD. Furthermore, it would be important to examine and control the personality traits of suicidal and non-suicidal persons with PTSD, given that in this context they may function both as protective and vulnerable factors (Jakšić et al. 2012). It is recommended that future research should focus on the still insufficiently clarified mechanisms of interactive functioning of PTSD and comorbid psychological disorders which contribute to the occurrence and culmination of the suicidal process, as well as the impact of cultural factors, personality traits and gender specificities with regard to the type of traumatic experience and perceived social support. Considering that it is known that the level of hopelessness significantly mediates in the relation between PTSD and suicidality (Boffa et al. 2018), while the potential phenotypic functioning of the feeling of hopelessness which mediated between tryptophan hydroxylase (TPH2) genes, depression and suicidality (Lazary et al. 2012) is being increasingly talked about, it is recommended that this variable is also controlled in future research, in addition to the feelings of shame and blame. What is more, we must not disregard the fact that in this context we speak about suicidality at the level of suicide attempts and, with regard to the specificity and dynamic of suicidal processes of individuals with PTSD, these results cannot be generalised also to other levels of suicidality,

such as suicidal ideation and, eventually, committed suicide. Also recommended to be researched further is the application of standardised scales for the assessment of the presence and prevalence of suicidal ideation, in order to include this level of suicidality as well. In order to come to comprehensive and more reliable conclusions, also recommended is the application of measuring instruments for the assessment of the configuration of PTSD profile with regard to the dominance of certain symptom clusters and examining their correlation with suicidal ideation and suicide attempts. One of the limitations is also reflected in comorbid diagnostic categories being rough, which is a result of the limited data from the available medical documentation, which is why the application of a combination of a structured psychiatric interview and standardised scales is recommended to be researched further in order to examine the impact of a potential interaction between PTSD and a concrete comorbid disorder from a specific type of psychiatric disorders on the occurrence and maintenance of suicidality. Though, about war veteran's suicidality should be talked constantly, because there is a lack of care for war veterans, and their attitudes. A war veteran alone cannot help him/herself with suicidal ideations. It is a very complex trauma, and due to this, war veterans haven't often come to our clinics looking for help; most of them have left the country and most do not even want to be psychiatric patients. It is certain that the public health system of Bosnia-Herzegovina never expected, before the war, to have to deal with such a large number of consequences of the war, on such a vast scale. The increasing shortage of resources and the lack of a multi-sectorial integrative approach, contribute to the "conspiracy of silence" even 25 years later, and need to be scientifically and politically discussed (Hasanović & Hasanović 2020). In order to overcome the limitations of such transversal studies, it is recommended to plan and implement longitudinal studies on larger and more homogeneous samples which would enable an analysis of causal relations.

CONCLUSIONS

Suicidal persons with PTSD more frequently have lower education, are unemployed, and have a history of suicide in the family. They more frequently have comorbid psychiatric disorders, dominated by disorders from the groups of mood disorders and personality disorders, and it has been shown that in addition to PTSD, they have more comorbid disorders combined. In this sample, war, civilian and mixed trauma is equally present in such persons. These results confirm the preventive importance of a detailed psychiatric and psychological assessment of vulnerability of persons with PTSD to suicidality, regardless of the type of traumatic experience. Putting an emphasis on the fact that the mentioned assessment cannot be understood as

a one-off but a process activity, the clinical article enables the monitoring of the balance between the protective and risk factors of suicide. In doing so, experts in mental health are able to make a timely and directive treatment impact and encourage an individual to continue to live.

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Vildana Aziraj Smajić: collecting data, design of the article, drafting the article, review of literature, revising it critically for important intellectual content.

Mevludin Hasanović: design of the article, drafting the final version of article and revising it critically for important, intellectual content, review of literature.

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