First World War and Mental Health: a retrospective comparative study of veterans admitted to a psychiatric hospital between 1915 and 1918

Prima Guerra Mondiale e salute mentale: uno studio retrospettivo su veterani ricoverati in un ospedale psichiatrico tra il 1915 e il 1918

PAOLO LAGONIA[1], MATTEO ALOI[2], FABIO MAGLIOCCO[2], GREGORIO CERMINARA[2], CRISTINA SEGURA-GARCIA[2], VALERIA DEL VECCHIO[3], MARIO LUCIANO[3], ANDREA FIORILLO[3], PASQUALE DE FAZIO[2*]

*E-mail: defazio@unicz.it

[1]Institute of Bioimaging and Molecular Physiology, National Research Council, Catanzaro, Italy [2]Department of Health Sciences, Psychiatry Unit, "Magna Graecia" University, Catanzaro, Italy [c]Department of Psychiatry, University of Naples SUN, Naples, Italy

SUMMARY. Aim. The association between mental illness and war has been repeatedly investigated. Higher levels of depressive symptoms and an increased suicidal risk have been found in veterans. In this study we investigated the mental health conditions among Italian soldiers during the "Great War", who were hospitalized in a mental health hospital in Italy. **Methods.** The study sample consists of 498 soldiers who were admitted during the World War I between 1915 and 1918, and 498 civilian patients admitted in two different periods (1898-1914, 1919-1932). Psychiatric diagnoses have been recorded retrospectively by a detailed examination of clinical records. Socio-demographic informations, diagnosis at first admission, number of admissions, and deployment in war zones were collected. A logistic regression analysis was performed, the diagnosis of depression was considered as dependent variable while clinical and demographic variables as independent predictors. **Results.** Soldiers deployed in war zones were more likely to have a diagnosis of depression compared to those not serving on the frontline. The logistic regression analysis showed that the diagnosis of depression is predicted by being a soldier and being deployed in a war area. **Discussion and conclusions.** Our data confirm that soldiers engaged in war are at higher risk of developing depression compared to non-deployed soldiers.

KEY WORDS: war, depression, soldiers, mental hospital.

RIASSUNTO. Scopo. L'associazione tra malattia mentale e guerra è stata più volte indagata. Nei reduci sono stati riscontrati alti livelli di sintomi depressivi e un aumento del rischio di suicidio. In questo studio abbiamo indagato le condizioni di salute mentale dei soldati italiani che hanno partecipato alla "Grande Guerra" che sono stati ricoverati in un Ospedale Psichiatrico in Italia. **Metodi.** Il campione è composto da 498 soldati ospedalizzati durante la prima guerra mondiale tra il 1915 e il 1918, e 498 pazienti civili ricoverati in due diversi periodi (1898-1914, 1919-1932). Le diagnosi psichiatriche sono state codificate retrospettivamente attraverso un esame dettagliato delle cartelle cliniche. Sono state raccolte le informazioni socio-demografiche, la diagnosi al primo ricovero, il numero di ricoveri e l'essere stato o meno nelle zone di guerra. È stata effettuata un'analisi di regressione logistica dove la diagnosi di depressione è stata considerata come variabile dipendente mentre le variabili cliniche e demografiche come predittori indipendenti. **Risultati.** I soldati dispiegati nelle zone di guerra avevano una maggiore probabilità di avere una diagnosi di depressione rispetto a quelli non impiegati al fronte. L'analisi di regressione logistica ha mostrato che avere una diagnosi di depressione è predetta dall'essere un soldato e dall'essere schierato in una zona di guerra. **Discussione e conclusioni.** I nostri dati confermano che i soldati impegnati in guerra sono a più alto rischio di sviluppare la depressione rispetto ai soldati non schierati.

PAROLE CHIAVE: guerra, depressione, soldati, ospedale psichiatrico.

INTRODUCTION

The relationship between war and mental disorders has been well established, dating back to ancient times. Descriptions associated with the symptoms of mental illness appeared already in legendary poems, such as the *Epic of Gilgamesh*, *The Odyssey* and *The Iliad* by Homer, and in Virgil's *Aeneid*. Herodotus reported in 440 BC the first case of chronic mental health symptoms in the *Battle of Marathon*. Details of frightening battle dreams were chronicled by Hippocrates (460-377 BC). A common theme that emerged in classical literature was that soldiers were awakened by

frightening dreams in which they re-experienced past battles, for instance, in Mercutio's Queen Mab in *Romeo and Juliet* by Shakespeare. In another of his plays, *Henry IV*, the King appears to meet many of the diagnostic criteria for post-traumatic stress disorder (PTSD).

Following the development of psychology, several authors have investigated these themes. For example, in 1892 Hermann Oppenheim coined the term "traumatic neurosis"[1], to define an anxiety disorder that appeared following a serious emotional shock.

Until the beginning of 20th century, veterans were stigmatized when they had mental health problems in war. Stigma of mental health professionals toward these patients was evident, as shown by diagnoses made by mental health professionals, such as compensation neurosis, lack of moral fiber and inadequate personality, which clearly referred to the idea that mental disorders were the consequence of moral weakness or vulnerability[2]. This can be explained as an attempt of psychiatrists to minimize the horrors of war, explaining mental illnesses in veterans as a consequence of personal vulnerability, rather than as a consequence to the exposure to a trauma[3]. Historically, diagnoses and psychopathological descriptions of symptoms referred by veterans varied greatly, according to mental health professionals' cultural beliefs regarding disabilities[4,5]. During the World War I (WWI), some physicians used the term "shell-shocked", which referred to the emotional and physical reactions to the intensity of the bombardment and fighting that produced a sense of helplessness resulting in panic, inability to reason, sleep, walk or talk[6]. In the World War II and thereafter, the diagnosis of "shell shock" was replaced by that of "combat stress reaction", a similar but not identical response to the trauma of warfare and bombardment.

Several studies have explored the incidence of psychiatric disorders in veterans withdrawn from WWI. The study by Linden & Jones[7] highlighted that, in the period 1914-1919, the prevalence of anxiety and depressive symptoms in the 462 veterans admitted to the "London National Hospital for the Paralysed and Epileptic" was 21.2%. Moreover, several studies found higher rates of anxiety disorders (including PTSD), mood disorders, alcohol abuse, and a reduced psychosocial functioning among soldiers who participated in recent conflicts[7-11]. In particular, Major Depressive Disorder (MDD) was investigated in some studies. In a study by Bleich et al.[12] on 60 veterans from the Israeli-Lebanese conflict, a MDD was diagnosed in 95% of soldiers with PTSD. Bonde et al.[13] through a systematic literature calculated risk of depressive disorder in soldiers returning from military deployment and found that this risk was one of a half times higher among military [odds ratio (OR) 1.60, 95% confidence interval (CI) 1.09-2.35]. Furthermore, in a recent systematic review and meta-analysis Gulf War veterans had over twice the odds of experiencing depression (OR 2.28, 95% CI 1.88-2.76) and dysthymia or chronic dysphoria (OR 2.39, 95% CI 2.0-2.86) compared to non-deployed military personnel[14]. Interestingly, a recent follow up study[15] demonstrated that Australian Gulf War veterans exhibited slightly more severe depressive symptoms than a military comparison group, and depression continued to be associated with war-related stressors. Recently, some studies demonstrated that when depressive symptoms are associated with PTSD the risk of suicide was statistically higher[16,17] and this risk could be reduced when post-deployment social support was high[18]. Finally, Lippa et al.[19] demonstrated that deployment-related depressive symptoms are related to higher functional disability in veterans.

Based on the above, the aim of the present study is to verify if war increased the risk of developing MDD in a group of Italian soldiers hospitalised at a mental health hospital in Girifalco (Catanzaro, Italy), during the First World War (1915-1918), compared to civilian patients who were admitted to the same hospital.

METHODS

Sample and data source

A retrospective, comparative study was conducted examining 996 clinical records of men admitted to a mental health hospital in Girifalco, in Southern Italy, between the years 1898-1932. The sample consisted of 498 military patients admitted between 1915 and 1918 and 498 civilian patients (admitted between 1898-1914 and between 1919-1932). Information on age, marital status, educational level, family history of psychiatric conditions, socio-economic status, diagnosis at first admission, number of hospitalizations, and being deployed in war zones were collected. Diagnoses were determined retrospectively and agreed upon collectively through careful discussion of medical records by two expert psychiatrists (PDF and GC), using a checklist based on DSM-5 criteria.

Statistical analyses

Data were analyzed using the Statistical Package for Social Sciences, Version 21 (SPSS, Chicago, Illinois, USA). Descriptive statistics included frequencies and means and standard deviations, as appropriate. Differences between groups were explored through chi-squared and T-tests, as appropriate. A logistic regression analysis was performed in order to identify the possible socio-demographic and clinical variables related to the diagnosis of depression among participants. Thus, the diagnosis of depression was considered as dependent variable, and clinical and demographic variables as independent predictors. The level of statistical significance was set at $p \leq 0.05$.

RESULTS

The socio-demographic characteristics of the two samples are reported in Table 1. Compared to civilian patients, soldiers were more frequently married ($\chi^2=27.925$; $p<.001$), with a lower socio-economic status ($\chi^2=38.839$; $p=<.001$) and a lower educational level (illiterate or primary school degree; $\chi^2=14.777$; $p=.002$). Many soldiers were previously employed (i.e., electrician, mechanic, miner, businessmen, etc.) ($\chi^2=17.127$; $p=.004$). On the other hand, civilian patients had a significantly higher number of hospitalizations ($t=6.229$; $p<.001$). About one third of soldiers (33.1%) had been deployed in a war zone. Most of the soldiers belonged to the infantry regiment. There were no significant differences as regards age and family history of psychiatric disorders.

Patients' diagnoses at first admission are reported in Table 2. The most frequent diagnoses among soldiers were

Table 1. Characteristics of the sample.

	Civil patients		Military		Comparison	p value
Civil staus[a]						
Single	352	(71.6)	269	(55.4)	χ^2=27.925	<.001
Married	134	(27.2)	210	(43.2)		
Widowed	6	(1.2)	7	(1.4)		
Education[a]						
Illiterate	150	(39.2)	216	(48.8)		
Primary school	189	(49.3)	204	(46.0)	χ^2=14.777	0.002
Secondary school	42	(11.0)	22	(5.0)		
Degree	2	(0.5)	1	(0.2)		
Socio-economic status[a]						
Low	260	(73.4)	391	(86.1)	χ^2=38.839	<.001
Middle	52	(14.6)	13	(2.9)		
High	42	(12.0)	50	(11.0)		
Job[a]						
Craftsman	83	(18.2)	73	(15.9)		
Farmer	186	(40.6)	161	(35)		
Worker	87	(19.0)	106	(23)	χ^2=17.127	0.004
Professional	13	(2.8)	3	(0.7)		
Employee	22	(4.8)	18	(3.9)		
Businessman	67	(14.6)	99	(21.5)		
Family history of psychiatric disorders[a]						
Positive	163	(49.2)	170	(44.4)	χ^2=1.684	0.194
Negative	168	(50.8)	213	(55.6)		
Presence in war zone[a]						
Positive	-	-	165	(33.1)	-	-
Negative	-	-	333	(66.9)		
Regiment[a]						
Infantry	-	-	376	(75.7)		
Artillery	-	-	31	(6.2)		
Military District	-	-	27	(5.4)		
Military Genius	-	-	9	(1.8)	-	-
Carabinieri	-	-	35	(7.0)		
Cavalry	-	-	2	(0.4)		
not reported	-	-	17	(3.4)		
Age[b]	26.79	3.72	27.34	6.23	t= -1.701	0.089
Number of hospitalizations[b]	1.66	1.45	1.20	0.79	t= 6.229	<0.001

[a]results are presented as frequencies (%); [b]results are presented as means (SD).

factitious disorder, depression, delirium, or "symptoms do not reach a level of clinical significance", as compared to civilian patients (χ^2=378.224; p<.001).

Table 3 lists the diagnoses at first admission of soldiers who were either deployed or not in war zones. Most of the soldiers who were based in combat areas had a diagnosis of depression or delirium, compared to those who did not actively participate in the war (χ^2=42.694; p<.001).

According to the logistic regression analysis (Table 4), the diagnosis of depression was associated with being a soldier (OR 3.013; 95% CI 1.611-5.635) and being deployed in a war zone (OR 2.900; 95% CI 1.756-4.788).

DISCUSSION

To our knowledge, this is the first study that explores the frequency of psychiatric disorders in a representative sample of soldiers admitted at a large state asylum in Italy during the WWI, and compared this sample with civilians admitted to the same asylum.

One hundred years after the WWI, the greatest conflict in history, we retrospectively investigated its possible effects on mental health in a sample of Italian soldiers who were involved in the conflict. As reported in other studies[9,20], our data confirm that civilians and military patients have different socio-demographic characteristics. For example, a lower socio-economic status is associated with the probability of joining the army[21-23] and a worse mental health[24]. Soldiers may be more vulnerable to develop mental disorders even in the absence of enlisting in military service. On the other hand, because military personnel undergo rigorous health screening prior to induction or commissioning, individuals who serve in the military should be in better physical and mental health than civilians. This supports the theory that the exposure to war may be a precipitating factor for mental disorders among soldiers.

Our findings confirm the association between deployment and depression in soldiers, as already reported[14]. In a meta-

Table 2. Diagnosis at first admission between civil patients and military.

	Civil patients		Military		Comparison	p value
Diagnosis at first admission						
Depression	20	(4.1)	91	(18.4)	χ^2=378.224	<0.001
Delirium	25	(5.2)	76	(15.4)		
Epilepsy	78	(16.1)	29	(5.9)		
Psychogenic crises in non-epileptic patients	8	(1.6)	21	(4.2)		
Neurosyphilis	27	(5.6)	16	(3.2)		
Schizophrenia	185	(38.1)	16	(3.2)		
Anxiety disorder	8	(1.6)	13	(2.6)		
Mental Retardation	43	(8.9)	12	(2.4)		
Substance-induced Disorder	15	(3.1)	5	(1.0)		
Bipolar Disorder	22	(4.5)	12	(2.4)		
Delusional Disorder	4	(0.8)	3	(0.6)		
Conversion Disorder	1	(0.2)	1	(0.2)		
Factitious Disorder	38	(7.8)	143	(28.9)		
"It does not reach the extremes"	6	(1.2)	57	(11.5)		
Psychopathic Personality	1	(0.2)	0	(0)		
Psychotic disorders due to general medical condition	4	(0.8)	0	(0)		

Results are presented as frequencies (%).

Table 3. Diagnosis at first admission between military.

	In war zone		No war zone		Comparison	p value
Diagnosis at first admission						
Depression	48	(29.1)	43	(13)	χ^2=42.694	<0.001
Delirium	32	(19.4)	44	(13.3)		
Epilepsy	4	(2.4)	25	(7.6)		
Psychogenic crises in non-epileptic patients	10	(6.1)	11	(3.3)		
Neurosyphilis	3	(1.8)	13	(3.9)		
Schizophrenia	2	(1.2)	14	(4.2)		
Anxiety Disorder	6	(3.6)	7	(2.1)		
Mental Retardation	2	(1.2)	10	(3.0)		
Substance-induced disorder	0	(0)	5	(1.5)		
Bipolar Disorder	4	(2.4)	8	(2.4)		
Delusional Disorder	0	(0)	3	(0.9)		
Conversion Disorder	1	(0.6)	0	(0)		
Factitious Disorder	36	(21.8)	107	(32.4)		
"It does not reach the extremes"	17	(10.3)	40	(12.1)		

Results are presented as frequencies (%).

Table 4. Results of logistic regression analysis on diagnosis of depression.

	Wald-statistics	Odds ratio	95% CI
Family history of psychiatric disorders	.339		
War zone	17.315**	2.900	1.756-4.788
Being soldier	11.920**	3.013	1.61-5.635
Civil status	.524		
Socioeconomicus status	2.164		

R^2=.127 (**= p<.01.).

analysis of 25 epidemiological studies on the prevalence of MDD amongst USA military personnel, Gadermann et al.[20] found a prevalence of MDD of 12% amongst currently deployed, 13.1% for previously deployed, and 5.7% in those never deployed in war zones.

Sareen et al.[25] showed a correlation between deployment-related events and mental disorders, with a dose-response relationship between the amount of combat exposure and depression. In this study, the sample of 8.441 soldiers was divided into deployed and non-deployed soldiers. Among the former, witnessing to atrocities, combat exposure, and experiences of peace-keeping operations were associated with the greatest, intermediate, and least likelihood of associations with mental disorders. On the other hand, Black et al.[26] found a comparable risk of depression for deployed and not deployed veterans, but the former had significantly higher lifetime rates of comorbid cognitive dysfunction (55% vs. 35%), anxiety disorders (59% vs. 33%), specific phobias (12% vs. 2%), and PTSD (33% vs. 10%).

Differently from the other available studies, in our sample the most frequent diagnosis amongst soldiers was MDD and

not PTSD. This difference can be due to the fact that psychiatric symptoms described in the medical records are often influenced by the prevalent nosology of the period, and PTSD was officially introduced in 1980 with the publication of the third edition of the DSM (American Psychiatric Association, 1980). On the other hand, it could be explained by the sociocultural characteristics of our sample. It is likely that southern soldiers developed a depressive reaction in response to eradication that forced them to fight away from home in northern Italy. In fact since the unification of Italy occurred only in 1861, the sense of national solidarity was not yet fully shared. Therefore, in addition to the cruelty of war, the soldiers did not quite understand the reasons for fighting in this war.

We must also add that among the 10 035 Italian soldiers convicted for the crime of self-harm[27] and the 101 665 deserters[28], many of them belonged to the regions of southern Italy. In other words, the military from southern Italy experienced the transfer to the war zones with a great sense of nostalgia and uncertainty which probably led them to develop a depressive disorder rather than a post-traumatic disorder.

Another possible explanation is that most of the soldiers in our sample belonged to the infantry (75.7%). This section is the one that had most experience of trench warfare. Everything was difficult inside a trench. During the war, the soldiers had to face some very hard moments in the forefront with the constant fear of eventually being killed by some sniper or from receiving the order to prepare for the assault. These experiences marked many military for life.

The military, in order to escape from these atrocious sufferings were ready for anything. There were those who mutilated or wounded voluntarily, others who obtained a short leave never returned to the front. In fact, it is not surprising that in our sample 28.9% of the military have a factitious disorder diagnosis.

Of course, the study has some important limitations. The main limitation is the retrospective design of the study. Data have been collected from clinical records written about a century ago, and it was not possible to retrieve important clinical, military and socio-demographic information. A second limitation is that diagnoses presented in this paper were made according to information available in dated medical records. However, the available psychopathological descriptions were very detailed and we could easily formulate diagnoses according to the DSM-5 criteria.

CONCLUSIONS

In recent years, there has been a growing awareness of the impact of war on mental health, in particular in relation to stress and trauma. Our study supports the findings that soldiers in war are at higher risk of developing psychiatric symptoms. However, contrary to data already available, in our sample depressive symptoms were more frequent than those due to stress or anxiety disorder. In order to reduce the impact and the incidence of the possible consequences of war, it is extremely important to develop and provide effective psychological supportive programs, not only before leaving for the frontline, but in particular after returning home.

Conflict of interest: the authors declare declare no conflict of interest.

REFERENCES

1. Oppenheim H. Die TraumatischenNeurosen. 2nd ed. Berlin, Germany: Hirschwald, 1892.
2. Jones E, Palmer I, Wessely S. War pensions (1900-1945): changing models of psychological understanding. Br J Psychiatry 2002; 180: 374-9.
3. McFarlane AC. The impact of war on mental health: lest we forget. World Psychiatry 2015; 14: 351-3.
4. Merskey H. Shell-shock. In: Berrios GE, Freeman H (eds). 150 years of British Psychiatry 1841-1991. London: Gaskell, 1991.
5. Young A. The harmony of illusions: Inventing Post-Traumatic stress disorder. Princeton, NJ: Princeton University Press, 1995.
6. Hochschild A. To End All Wars: a story of loyalty and rebellion, 1914-1918. Wilmington, MA: Mariner Books, 2012.
7. Linden SC, Jones E. "Shell shock" revisited: an examination of the case records of the National Hospital in London. Med Hist 2014; 58: 519-45.
8. Cesur R, Sabia JJ, Tekin E. The psychological costs of war: military combat and mental health. J Health Econ 2013; 32: 51-65.
9. Maguen S, Lucenko BA, Reger MA, et al. The impact of reported direct and indirect killing on mental health symptoms in Iraq war veterans. J Trauma Stress 2010; 23: 86-90.
10. Stecker T, Fortney J, Owen R, McGovern MP, Williams S. Co-occurring medical, psychiatric, and alcohol-related disorders among veterans returning from Iraq and Afghanistan. Psychosomatics 2010; 51: 503-7.
11. Wells TS, Miller SC, Adler AB, Engel CC, Smith TC, Fairbank JA. Mental health impact of the Iraq and Afghanistan conflicts: a review of US research, service provision, and programmatic responses. Int Rev Psychiatry 2011; 23: 144-52.
12. Bleich A, Koslowsky M, Dolev A, Lerer B. Post-traumatic stress disorder and depression. An analysis of comorbidity. Br J Psychiatry 1997; 170: 479-82.
13. Bonde JP, Utzon-Frank N, Bertelsen M, et al. Risk of depressive disorder following disasters and military deployment: systematic review with meta-analysis. Br J Psychiatry 2016; 208: 330-6.
14. Blore JD, Sim MR, Forbes AB, Creamer MC, Kelsall HL. Depression in Gulf War veterans: a systematic review and meta-analysis. Psychol Med 2015; 45: 1565-80.
15. Ikin JF, McKenzie DP, Gwini SM, et al. Major depression and depressive symptoms in Australian Gulf War veterans 20 years after the Gulf War. J Affect Disord 2016; 189: 77-84.
16. Pukay-Martin ND, Pontoski KE, Maxwell MA, et al. The influence of depressive symptoms on suicidal ideation among U.S. Vietnam-era and Afghanistan/Iraq-era veterans with posttraumatic stress disorder. J Trauma Stress 2012; 25: 578-82.
17. Ramsawh HJ, Fullerton CS, Mash HB, et al. Risk for suicidal behaviors associated with PTSD, depression, and their comorbidity in the U.S. Army. J Affect Disord 2014; 161: 116-22.
18. Debeer BB, Kimbrel NA, Meyer EC, Gulliver SB, Morissette SB. Combined PTSD and depressive symptoms interact with post-deployment social support to predict suicidal ideation in Operation Enduring Freedom and Operation Iraqi Freedom veterans. Psychiatry Res 2014; 216: 357-62.
19. Lippa SM, Fonda JR, Fortier CB, et al. Deployment-related psychiatric and behavioral conditions and their association with functional disability in OEF/OIF/OND veterans. J Trauma Stress 2015; 28: 25-33.
20. Gadermann AM, Engel CC, Naifeh JA, et al. Prevalence of DSM-IV major depression among U.S. military personnel: meta-analysis and simulation. Mil Med 2012; 177 (8 Suppl): 47-59.
21. Bachman JG, Segal DR, Freedman-Doan P, O'Malley PM. Who chooses Military Service? Correlates of propensity and enlistment in the U.S. Armed Forces. Military Psychology 2000; 12: 1-30.
22. Kleykamp MA. College, jobs, or the military? Enlistment during a time of war. Soc Sci Q 2006; 87: 272-90.
23. Segal DR, Burns TJ, Silver MP, Falk WW, Sharda BD. The All-Volunteer Force in the 1970s. Soc Sci Q 1998; 79: 390-411.

24. Miech RA, Caspi A, Moffitt TE, Entner BR, Silva PA. Low socioeconomic status and mental disorders: a longitudinal study of selection and causation during young adulthood. The Am J Sociol 1999; 104: 1096-131.
25. Sareen J, Cox BJ, Afifi TO, et al. Combat and peacekeeping operations in relation to prevalence of mental disorders and perceived need for mental health care: findings from a large representative sample of military personnel. Arch Gen Psychiatry 2007; 64: 843-52.
26. Black DW, Carney CP, Forman-Hoffman VL, et al. Depression in veterans of the first Gulf War and comparable military controls. Ann Clin Psychiatry 2004; 16: 53-61.
27. Mortara G. Dati sulla giustizia e disciplina militare. Parte seconda, dal 24/5/15 al 4/11/18. Roma, Provveditorato Generale dello Stato, 1927.
28. Bianchi B. La follia e la fuga. Nevrosi di guerra, diserzione e disobbedienza nell'esercito italiano (1915-1918). Roma: Bulzoni, 2001.