Mental Health Consequences of War Conflicts

17

Vsevolod Rozanov, Tanja Frančišković, Igor Marinić, Maria-Magdalena Macarenco, Marina Letica-Crepulja, Lana Mužinić, Ruwan Jayatunge, Merike Sisask, Jan Vevera, Brenda Wiederhold, Mark Wiederhold, Ian Miller, and Georgios Pagkalos

V. Rozanov (✉)
Odessa National Mechnikov University, Odessa, Ukraine

T. Frančišković • M. Letica-Crepulja
Department for Psychiatry and Psychological Medicine, University of Rijeka School of Medicine, Rijeka, Croatia

Regional Psychotrauma Centre Rijeka and Department of Psychiatry, Clinical Hospital Centre Rijeka, Rijeka, Croatia

I. Marinić • L. Mužinić
Department of Psychiatry, University Hospital Dubrava, Zagreb, Croatia

M.-M. Macarenco
Military and Clinical Psychologist, 348th Battalion, Constanta, Romania

R. Jayatunge
Mental Health Therapist, Brampton, ON, Canada

M. Sisask
School of Governance, Law and Society, Tallinn University, Tallinn, Estonia

Estonian-Swedish Mental Health and Suicidology Institute, Tallinn, Estonia

J. Vevera
The 7th Field Military Hospital, Prague, Czech Republic

Department of Psychiatry, Charles University, Faculty of Medicine in Pilsen, Pilsen, Czech Republic

B. Wiederhold
Virtual Reality Medical Center, San Diego, CA, USA

Virtual Reality Medical Institute, Brussels, Belgium

M. Wiederhold
Virtual Reality Medical Center, San Diego, CA, USA

I. Miller
Interactive Media Institute, San Diego, CA, USA

G. Pagkalos
424 Military Hospital of Thessaloniki, Thessaloniki, Greece

A. Javed, K.N. Fountoulakis (eds.), *Advances in Psychiatry*,
https://doi.org/10.1007/978-3-319-70554-5_17

Abstract

Modern war conflicts, evolutionizing from large-scale collisions of armed forces to local, low-intensity, surrogate, terroristic and information wars, are associated with less direct mortality but with growing and long-lasting mental health consequences. These consequences can be traced in not only combatants and other military contingents and veterans but even to greater extent in the civilian populations, given that many modern war conflicts have signs of civil wars or religious conflicts. While active duty military undergo preliminary selection and resilience training, civilians in the war zone or as refugees and asylum-seeking victims are even at higher risk with the greater probability of transgenerational transmission, which implies long-lasting (decades) effects. Both military and civilians suffer from a similar set of disorders and psychological consequences caused by extreme trauma, including PTSD, depression, anxiety, addictions, somatization with chronic pain, dissociation, psychosocial dysfunctions, suicidal behavior, etc. War conflicts, terroristic acts, and information wars, amplified by technologically developing mass media, the internet and social networks, seem to add to a general feeling of instability and promote more anxiety, covering even wider contingents worldwide. Military psychiatry has accumulated knowledge and practical experience that, though not always can be applied directly, are useful for identification, management, prevention, and treatment of mental health consequences of war in wider contingents. This knowledge is a one more relevant and strong reason for advocating lowering of international tension and reducing the probability of war conflicts worldwide for the sake of preserving mental health of the humanity. It also has a potential of lowering the burden of this type of diseases worldwide.

17.1 Introduction

The impact of warfare of mental health conditions of the military and on the general population started to attract attention only in the several recent decades. Negative consequences of war have been traditionally evaluated in terms of mortality. During WW I more than 70 million of military personnel were mobilized, and 9 million of combatants and 7 million of civilians have died, almost the same number were permanently disabled and twice more seriously wounded. During WW II, which involved 62 from 73 countries existing by the moment in the world, already 130 million of the military were mobilized, while 25 million of combatants and 47 million of civilians have died. These amazing figures give an impression how little human life was valued only a century ago. No surprise that those military who survived were considered lucky, and their psychological sufferings were not in the focus. Not much attention was paid to social trauma and mental health of the civilians either.

The title of this review embraces very wide circle of issues. One can include here mental health consequences of the warfare for combatants (those who are directly involved in collisions on the battlefield); for the military in more general terms,

including support troops, reservists, etc.; for veterans of different wars; for the civil population in the region of conflict; for refugees; for victims of genocide; and even for wider contingents, which are influenced by mass media reports of war. Each of these issues has been scrutinized by many authors. Psychological and psychiatric aspects of the acute combat exposure, early management of combat stress, and preliminary selection and resilience training are the subject of the military psychiatry with its own principles and methods [1–5], while mental health of veterans is taken care of either by specialized administration (like in the USA) or by civilian specialists like in the UK [6]. Many aspects of the civilian mass trauma are discussed in the recent influential publications of WPA and UNICEF [7, 8]. Some issues of the impact of mass media exposure and information war are covered within the evaluation of mental health consequences of terroristic acts and natural disasters [9, 10].

Nevertheless, all these issues are unfortunately rarely discussed in conjunction. We consider that such combined representation is quite relevant as far as all contingents involved—acting military, reservists, war veterans, the civil population in the region of conflict, refugees, and wider contingents—are adding to the general growth of psychopathologies, mental health problems, psychosocial dysfunctions, self-destruction, and other mental disturbances that constitute burden of disease on the society as a whole. The main causative of it is war conflicts, which are spreading around the globe in a progressive manner. All this cannot but disturb both representatives of the professional community and wide public.

There is also another motivation to address this topic today. In the most modern times, the nature of war conflict has changed significantly. Modern wars may be characterized as "local," "low-intensity," "asymmetric," or "surrogate" wars where the enemy is not exposed and is not clear and where a growing number of local but constant never-ending conflicts eventually grow into global instability and chaos, associated with terrorists' attacks. Modern war conflicts have high technological level, while their location is often linked to inhabited cities and regions. They often have signs of civil wars or religious conflicts, which are characterized by especially high level of violence, embitterment, atrocities, and irreconcilability with extremely high probability of psychological distress and trauma [11]. The mental health consequences of this evolution are not assessed yet, it is a question of future decades. Nevertheless, some studies already provide relevant information. All the abovementioned issues will be discussed here by the international team of authors with consideration of the culture-specific aspects of the problem.

17.2 Combat Operational Stress Reactions

War is particularly traumatic for soldiers who most often appear in the situation of close and severe violence, including killing in a direct combat, viewing the enemy before or after killing them, and watching comrades die. Actually, from the earliest ages of mankind, the psychological impact of war on soldiers has been recognized among the other negative consequences of war, though not conceptualized in modern terms. There have been strivings for hundreds of years to apply an appropriate

name to psychological problems of soldiers exposed to extreme stressful experiences on the field. From the "nostalgia" during Napoleonic wars [12], "Swiss disease" [13], "irritable heart" or "Da Costa's syndrome" [14], "shell shock" [15, 16], and "battle fatigue" [17], there was gradual shift to combat operational stress reaction (COSR) or battle stress reaction. It should be noted that this shift took much time due to substantial stigmatization of those soldiers who suffered psychiatric disorders during World War I. Often those who broke down were labeled as "lacking moral fiber," and instead of receiving a popular diagnosis of the "shell shock," some could have been regarded as cowards with all that it implies in the wartime [1].

Finally, a concept of combat operational stress reaction (COSR) has emerged. According to recent practical guidelines, COSR refers to a reaction to high-stress events and potentially traumatic event exposure [18]. It is not considered to be an abnormal response to exposure to combat stressors and is not considered a psychiatric disorder per se, though it may result in a disorder over time. COSR has been described as a "normal" reaction to an "abnormal" experience. Modern guidelines emphasize that COSRs are "the expected and predictable emotional, intellectual, physical, and/or behavioral reactions of service members who have been exposed to stressful events in combat or noncombat military operations" [19]. As to the symptomatology, the transient problems may begin within minutes during and after the exposure and disappear within hours or days. The service member may experience physical signs, i.e., fatigue and exhaustion, psychomotor agitation, sweating, increased heart rate, nausea and vomiting, and insomnia. Difficulties in concentration, memory loss, disorientation, nightmares, and flashbacks are common cognitive disturbances, which could be experienced. On the emotional level, anxiety, fear, helplessness and hopelessness, mood lability, and anger can appear. Changes in behavior may include misconduct, careless behavior, withdrawal, and impulsivity [20, 21].

Terms associated with COSR like acute stress reaction (ASR), combat stress, and some traditional ones like "combat fatigue" or "battle neurosis" are used inconsistently. Military is stressing that combat stress is normal, generally short-term and should not be confused with regular psychiatric diagnosis. However, in psychiatric texts battle stress is sometimes uses as a synonym or subgroup of ASR. COSR is largely the result of the main principle of combat—either you kill or you will be killed. There is a direct relation between the intensity and time limits of fighting and the number of psychiatric casualty rates. In general, there is one psychiatric casualty for four wounded in action, though in different conditions, this ratio may vary. Depending on the severity of combat, the level of training and the tempo and time limits of engagement in a collision the rate of psychiatric casualties may vary from 3% to 30% of all casualties. Among troops that are defeated, the percentage of COSR and other psychiatric and psychological consequences will be inevitably higher than in those who win the battle [1, 2, 22–24].

On the other hand, evolution of the nature of war is changing the situation with COSR. In low-intensity conflicts, psychiatric presentations within operations consist mainly of adjustment reactions rather than acute stress reaction [24, 25]. Recent operations, which have usually been of a relatively fixed duration, have led to the majority of casualties presenting after return from operations; the numbers of frank intra-conflict

mental health casualties have been low. Data on admission to Czech and French field hospitals placed in Afghanistan shows that less than 1% of service members were referred to mental health professional or suffered from ASR [26]. In UK armed forces, mental health referrals represented around 0.4% of the UK force deployed [25].

17.3 Early Intervention Programs in the Armed Forces

During WW I, it was learned that mental distress needs to be managed in line with military demands to return as many men as possible to the front line [27]. The group of psychiatrists developed the concept of what has come to be known "forward psychiatry" [28, 29]. It could be summarized in the principles of proximity, immediacy, expectancy, and simplicity (PIES) and was subsequently used by the British and Americans in both World Wars [27]. Proximity is based on the principle of providing services to the soldier within his or her own unit or as close to the unit as possible. Expectancy is important as it does not focus on the soldier as a patient but as someone that is having a normal reaction to an extreme circumstance or condition. Simplicity is based on assuring that the soldiers' first-order needs (sleep, rest, food, water, hygiene) are available and provided. These principles still apply in the armies all over the world. Recently, they have been reformulated as BICEPS in US Army, which stands for brevity (refers to an initial intervention in COSR that lasts no more than 1–3 days), immediacy, centrality or contact (refers to an emphasis on the involvement of the service member's unit leaders in his/her care, in part to remind the service member that he/she continues to be part of the unit), expectancy, proximity, and simplicity [30–32].

During the eighties and nineties of the twentieth century, psychological debriefing (intervention performed by mental health professionals as soon as possible after potentially traumatic events) has been enthusiastically performed with the intention to allow either individuals or group of people to talk about their experience. During this brief crisis intervention, sufferers were encouraged to talk about their feelings and reactions to the critical incident [33]. The debriefing facilitator aims "to reduce the incidence, duration, and severity of, or impairment from, traumatic stress" [34]. Unfortunately, research revealed limited efficacy of single-session [35, 36] and multiple-session "debriefing" [3]. This intervention does not decrease the development of symptoms and in some cases, exacerbates them. Consequently, head organizations and institutes concerned with health, mental health, guidelines, and algorithms for management and treatment of posttraumatic stress reactions (i.e., the US Institutes of Mental Health, World Health Organization, Britain's National Public Health Service, etc.) have strongly recommended against the use of psychological debriefing. Psychological debriefing should not be mixed with operational debriefing, which is routine team review of a major incident from a factual perspective and has been used effectively to enable discussion.

As to medication possibilities, anxiolytics (mostly benzodiazepines) historically were the primary agent in the treatment of posttraumatic reactions. Nevertheless, there is theoretical, animal, and human evidence to suggest that benzodiazepines

may actually interfere with the extinction of fear conditioning or potentiate the acquisition of fear responses and worsen recovery from trauma [37–39]. If a service member treated with a psychotropic medication for a COSR returns to active duty, the effect of the medication on his psychomotor functioning should be evaluated.

In 2007 Hobfoll and a team of international experts have synthesized available scientific evidence and have formulated five essential principles of psychosocial care for people confronted with mass disasters, personal tragedies, or severe loss. From their perspective, the surrounding caregivers should promote (1) a sense of safety, (2) calming, (3) self-efficacy and community efficacy, (4) social connectedness, and (5) hope [31]. In relation to COSR treatment, some of these principles have been developed into several practical recommendations cited here.

1. Don't pathologize—acute stress management should not be carried out by the medical or mental health professional and should be simple and done within the unit and according to member's prior role, not as a "patient."
2. Don't psychologize—do not facilitate emotional reaction via group therapy or psychological debriefing, reactions that emerge are not indicative of a mental disorder, and interventions can be envisioned as more a correlate of physical, then psychological first aid.
3. Don't pharmacologize—there is still no evidence that any prophylactic medication treatment may prevent the development of PTSD (though such studies are in progress).
4. Educate—provide education about the broad range of normal stress-related reactions and natural course of interventions for posttraumatic stress disorders, and clarify that symptoms may be exacerbated by reexposure to traumatic stimuli or perceptions of danger.
5. Normalize observed psychological reactions to the chain of command and provide expectancy of recovery.
6. Address the basic needs by providing a wide range of psychosocial interventions aimed to facilitate contact with the caregiver, provide safety and possible comfort, ensure calming and stabilization, identify immediate needs and concerns, provide practical assistance in establishing connections with social support resources (friends, comrades, family, etc.), as well as provide information regarding coping and future opportunities of support. The last recommendation in this row is watchful waiting for those at risk for developing negative outcomes following trauma that can facilitate prevention, referral, and treatment. Specific treatment should not be commenced before 2 weeks after the trauma.

17.4 Combat-Related Prolonged Mental Health Consequences and Suicide Risk

In a certain percentage of cases, even if all positive recommendations are fulfilled, acute combat-related stress reaction will develop into more serious and prolonged condition—combat-related PTSD. For instance, data from the 1973 Yom Kippur

War show that 37% of veterans diagnosed with COSR during combat were later diagnosed with PTSD, compared with 14% of control veterans [40]. On the other hand, 16% of veterans without COSR may also develop PTSD [24]. The prevalence of PTSD among combatants and veterans varies in different cultures and warfare situations: from 16–17% among American Vietnam and Iraq war veterans and very similar figures among Soviet Army-Afghanistan conflict veterans [41–43] to 6–7% among Eelam war veterans in Sri Lanka [44]. On the other hand, it refers only full-scale PTSD, while there are studies that testify that separate symptoms of PTSD can be traced practically in all combatants [23].

PTSD is a very polymorphic and highly comorbid condition, associated not only with symptoms and syndromes that are considered "typical" (emerging after extreme stress, avoidance of the circumstances of the stressful situation, memory dysfunction, and increased psychological sensitivity and arousal) but also emotional disturbances (depressive symptoms), cognitive impairment, changes in the personality, addictive behavior, and self-harm [45, 46]. There is still a discussion if combat-related PTSD has certain peculiarities. Besides more severe manifestations, some additional psychosocial factors like a specific feeling of guilt, low social support, and rejection of the specific group of veterans by the public opinion may have an impact [23]. Though cultural peculiarities of trauma do exist especially regarding traditional rehabilitation strategies, PTSD is a phenomenon that is shared by both East and West if it comes about combat exposure [47].

Some veterans with malignant form of anxiety and a wider than the typical range of clinical symptomatology with severe psychosocial impairments may fit into the diagnostic category of DESNOS (disorders of extreme stress not otherwise specified) or complex posttraumatic stress disorder (C-PTSD). According to Herman [48], complex PTSD is a psychological injury that results from protracted exposure to prolonged social and/or interpersonal trauma in the context of either captivity or entrapment that results in the lack or loss of control, helplessness, and deformations of identity and sense of self. C-PTSD is distinct from, but similar to, PTSD, somatization disorder, dissociative identity disorder, and borderline personality disorder.

The most important feature of PTSD is that it starts to develop over time and lasts for months or years, sometimes with a tendency to chronicity. The patients with PTSD may have long-term consequences that can be divided into several groups: (1) chronic form of PTSD and enduring personality change after catastrophic experience, (2) comorbid psychiatric disorders such as depression, abuse of alcohol, or psychoactive substances, and (3) somatic diseases associated with chronic PTSD [49–56]. All this may adversely affect the ability of these patients to function in family, social, and work environment as well as interfere with the treatment and hamper recovery.

As the development of PTSD itself is affected by a number of etiological factors, including biological, social, and psychological ones, mechanisms that lead to long-term sequelae are inevitably complex. Some authors suggest that PTSD should be viewed as a heterogeneous diagnostic construct and that biomarkers should be investigated for each of the individual groups of PTSD symptoms [57]. Furthermore, the biology of routine stress response and biology of trauma are different, with the

"usual" stress causing a number of biological and physiological changes that are returning to "normal" after the stress has passed or after the body has established a new homeostasis. In contrast to that, in PTSD, biological changes last after the stressor has passed, what some authors call trauma "fixation" [58]. In addition, exposure to events that overwhelm coping mechanisms may damage self-regulatory systems essential for restoring the body to its previous state, and some studies emphasize the importance of changes in the "input filtering" in the central nervous system that helps distinguish relevant from irrelevant stimuli [58]. That could lead to a condition in which traumatized person may have difficulty in distinguishing between safe and threatening situations [58]. Some studies point out that the existence of dissociation in the early stages of acute stress disorder is one of the possible predictive factors for developing chronic PTSD [59].

PTSD is a disorder with the presence of comorbid disorders up to 80–90% [52, 60]. The most common comorbid disorders are major depressive disorder, anxiety disorders, abuse of alcohol or psychoactive disorders, and psychotic disorders. Depression is one of the most common comorbid disorders; up to 52% of patients with PTSD also have a comorbid major depression [55]. This may be due to an overlap between symptoms of PTSD and depressive disorder according to the current classification, though one cannot exclude that occurrence of depression with PTSD as a distinct phenotype [51].

PTSD and abuse of alcohol or psychoactive substances can also be found in comorbidity [61, 62]. Although there are several hypotheses that seek to explain the etiology of the connection of these two disorders, the most frequent one is that the abuse of alcohol or psychoactive substances is efforts to reduce the symptoms of PTSD, particularly hyperarousal, in an attempt of self-medication, especially among males [62–65, 146].

Furthermore, research shows that veterans who develop PTSD have a higher risk of developing certain somatic diseases or worsening existing ones, including obesity and dyslipidemia; hypertension and cardiovascular and cerebrovascular diseases; metabolic syndrome, diabetes mellitus, and ulcer; increased susceptibility to infections; and autoimmune disorders, chronic musculoskeletal disorders, osteoarthritis, chronic pain, fibromyalgia, and chronic fatigue syndrome [49, 53, 54, 66–70]. These conditions with a strong psychosomatic component may have multiple underlying factors, including biological factors (dysregulation of the hypothalamic-pituitary-adrenal axis, autonomic nervous system dysfunction, and inflammation), behavioral risk factors (substance use, obesity, decreased physical activity, medication nonadherence, and sleep disturbance), and psychosocial risk factors (comorbid psychological disorders and impairments in social functioning) [69, 71, 72].

Besides all abovementioned polymorphic manifestations, PTSD-suffering veterans often have a wide range of cognitive impairment, psychosocial disturbances, and dysfunctional behaviors including loss of the pre-traumatic personality structure, altered self-perception and distorted social interactions, alterations in the own system of values and meanings, dissociative flashback-driven violence, sexualized behaviors, sense of foreshortened future, self-harm, and suicide. With concomitant family problems, drinking, gambling, and somatization, such traumatized veterans constitute a very complicated contingent for treatment and rehabilitation [23, 47].

Early recognition of PTSD symptoms, working through the trauma, psychotherapy, and/or psychopharmacological treatment can help reduce long-term consequences and the occurrence of comorbid psychiatric and somatic conditions. If they occur, an integrated approach is needed for the treatment of both mental and possibly existing somatic conditions. It is necessary to provide an individual approach to the patient and individually evaluate best psychotherapeutic and pharmacological treatment for the patient, including socio-therapy procedures and rehabilitation, with the aim of remission of symptoms, stabilization of the condition, and improvement of the quality of life.

All abovementioned psychosocial and mental health problems of war veterans, but mostly depression, PTSD, alcohol and other substance use disorders, pain, and traumatic brain injury, constitute factors of enhanced risk of suicide [73–78, 147]. War veterans in many countries are an important part of the society that attracts the attention of mass media, politicians, and a wide public; thus, suicides among them are often scrutinized, and prevention programs are evaluated [73, 79].

Suicide in veterans is a controversial issue. Veterans are a heterogeneous group that is not easy to reach, which impairs objective studies. Nevertheless, according to the data collected among 17 NATO and Partnership for Peace (PfP) nations, it is apparent that in many countries suicide ranks highly among the leading causes of death within the military personnel, often much higher than in the general population. Moreover, in several countries, the military suicide rate (per 100,000) is higher compared with the suicide rate in the general population [80]. An example is the USA, where suicide rate among army members has increased strikingly during the last decade and exceeds since 2008 the rate in the general population [75, 81], and the rate of suicide in veterans is higher than expected [74, 82].

The most significant protective factor against suicidality seems to be a social support that enhances resilience—from the partner, from family, from friends, and also from military leaders and buddy soldiers [74, 76, 83]. In addition, positive attitudes and appreciation by society for serving in the military and participating in deployments provide protection against suicidality [83, 84]. Besides, individual-level protective factors are post-deployment sense of purpose and control [74, 76], sense of coherence and meaningfulness [83], self-forgiveness (i.e., being kind and generous toward oneself) [85], and spiritual health and well-being [86].

Some specific risk factors related to the context of military service include having been in active duty during military service [78], involuntary repatriation from service [87], witnessing violence, perceiving powerlessness, and having pointless tasks during deployment [83, 84]. Within the military system, the availability of firearms, as well as knowledge and skills in using them, is a relevant factor [73–75]. Early life stress and dysfunctional family relations [84] as well as negative life events may be important precipitating factors [87]. Suicide risk is also elevated if the barriers to care exist: lack of psychological resources [74], longer time from the last deployment to screening for mental health problems, and geographical distance from care facilities [78].

Different stages in the military life cycle comprise some specific vulnerabilities. For example, during the post-deployment stage, the service members have to redefine their role both in the military system and in the family. They may encounter

false perceptions, inadequate expectations, societal disapproval of the mission, lack of social support, and other psychosocial difficulties. When combined with limited access to mental health services and the tendency to self-medicate with substances (alcohol, drugs), these vulnerabilities may increase the risk of suicide. The final stage of the military life cycle—end of military service—means psychosocial tension due to difficulties in finding one's position and identity as a civilian, mental (and physical) health impairment due to experiences during deployment or during the military service in general, etc. [80, 88].

Among different theories of suicide, the Joiner's interpersonal-psychological theory has been found as the most appropriate one to explain suicidal behaviors among military personnel [79, 80, 89, 90]. According to this theory, three variables should be present for a person who eventually die by suicide—sense of thwarted belongingness, perceived burdensomeness, and acquired capability for suicide. The first two variables generate the desire to die by suicide (psychosocial vulnerability), and the third variable enables to reach to the lethal suicidal act by acquired habituation of self-injury or witnessing/engaging in violence (e.g., exposure to a combat situation). The Joiner's theory has been tested in several studies within the military system with good confirming results [89, 91, 92].

17.5 Military as Occupation: Preliminary Selection and Psychological Resilience Training

To diminish the deteriorating effect of combat stress, two principal strategies may be involved—to implement selection procedures that may rule out vulnerable personalities and to develop and introduce approaches and methods of special training that may attenuate the possible impact of trauma, i.e., to build resilience of the military personnel. Nevertheless, although preventing the war pathology sounds attractive, it is, at the same time, very controversial, as it is disclaimed by some armies and sustained by others.

17.5.1 Preliminary Selection Principles

This type of activity has been one of the first systematic attempts of preventing and limiting the occurrence of traumatic stress reactions. The huge number of psychological victims during the WW I stimulated search of methods to create a combat force invulnerable to psychiatric injury, so as by the beginning of WW II, the American army considered that a successful fighter could be predicted and thus selected. However, the reality showed that the screening could not select "the best and the brightest who could make insuperable warriors" [93] and neither rejects those whose psychological profile could make them prone to developing psychological disorders. Quite the contrary, during the WW II, US psychiatric casualties were more than twice compared to those of the previous war. It appeared that prediction methods were not sufficiently precise and of those recommended for

rejection due to psychiatric reasons, only 18% were later discharged on this reason [94], so US Army gave up the screening program.

The fact that there is not enough evidence that screening using psychological questionnaires could have a predictive value was the reason for stopping mental health screening before deployment also in the Armies of Australia, Canada, Netherland, UK, and the USA. Other discussed reasons were that screening could have negative effects on the career and mental health and well-being of service personnel [95, 96] and that results of the screening for psychological disorders may have counterproductive effect on manpower, often rejecting those who would have made good soldiers [97]. Besides, "there are extensive selection processes in selection for combat corps and most frontline roles that are a form of screening itself" [5].

In other countries, such as Austria, Bulgaria, or Romania, as well as in the Armies of the countries of the former Soviet Union, psychologists are still using the psychological testing or screening before deployment in order to exclude soldiers who might put themselves or others in danger during combat or peacekeeping operations and soldiers who have a low stress tolerance and adaptation capabilities [23, 98, 99]. The focus in these selection activities is on cognitive abilities, personality structure and specific traits, trauma and suicidal behavior history, and psychopathological clinical symptoms. In these Armies, the reduced number of psychiatric casualties after participating in combat missions and exposure to war trauma is supposed to be due to this selection stage and psychological support programs before, during, and after deployment [98, 99].

It is already well established that unresolved childhood trauma (existential, attachment, or loss trauma), highly stressful life events, lack of internal locus of control, and low intelligence are factors that increase the risk of PTSD [100–104]. Thus, mental health professionals should consider assessing the military personnel for vulnerability, exploring before deployment prior exposure to traumatic events, current or past psychopathology, and familial susceptibility. Moreover, recent recommendations of the Group NATO RTO HFM-081 admit that the military personnel selection solely at the beginning of the career is not enough and therefore support psychological evaluation before deployment as a possible measure of prevention of posttraumatic war pathology.

17.5.2 Enhancing Resilience in Combatants

Resilience is the ability to maintain a stable equilibrium in the face of adversity [105], which means that the person preserves a relatively stable behavior, emotions, and cognition within the range of healthy levels of psychological and physical functioning or quickly returns to normal functioning after extreme stress. In order to enhance the resilience, the training should begin by developing the motor abilities, so that in combat, the soldier can perform with maximum safety and mental energy and the time necessary to perform an action is reduced. Combat often implies extreme reactions of the sympathetic nervous system within acute stress reactions so that the performance can be altered. Building resilience by training

before missions is supposed to allow militaries to perform in stressful situations, helping them to recognize their physiological and emotional reactions and control their stress level.

The most frequent and efficient practice used in many armies before combat missions is stress inoculation training (SIT). As described by its founder, Donald Meichenbaum, in the 1970s, stress inoculation therapy (SIT) targeted a diverse population of individuals. Meichenbaum argued that in order to defend, or "inoculate," against potential traumatizing stressors, trainees must be taught preemptive strategies on how best to deal with them [106, 107]. In 1988, the National Research Council verified this approach, finding that stress surrounding an event can be diminished by first giving an individual knowledge of what to expect [108]. Thus, while new tasks can induce stress responses, SIT presents these tasks, often via mental imagery, in controlled settings in order to enhance the trainee's self-efficacy and facilitate performance improvement. According to this approach conceptualized as "cognitive-behavioral modification" every aspect of the battlefield is repeated over and over again so that soldiers can perform in the extreme stress conditions of combat. Thus, SIT diminishes the risk of a potential negative reaction of the soldiers, and it is done by gradual, controlled, and repeated exposure to highly stressful situations, similar to those on the battlefield, in order to desensitize the respective situation, so that the flight or freeze response would not appear.

Technological advancements over the past 20 years have introduced novel approaches to SIT, such is virtual reality SIT (VR-SIT). In this method, a military personnel is introduced to stressors via virtual reality (VR) while their physiological responses are monitored. Soldiers are trained in virtual environments by means of scenarios that contain elements related to the war zones, so that these trainings could be transferred in real environments, with specially created tactical exercises**.** Ultimately, repeated exposure to physiologically and psychologically tasking situations progressively desensitizes the trainees, equipping them with a set of coping strategies from which they can choose those that best suit their needs in a specific occasion. This ensures the transfer of the training from the virtual world to the real world and the remediation of the insufficiently learnt abilities, which has, as a direct effect, the improvement of the troops [109].

Recently SIT has been extended also on the medical staff, who are often members of the initial assault forces and whose mental health is also under threat. This is based on the so-called injury creation science (ICS), which is an injury simulation tool that provides both the programs and prosthetics necessary to adjunctively train medical professionals in a variety of interventions. Now ICS is a validated tool for US Army combat medics that has both important first aid skills training and stress resilience hardening components [110, 111].

Besides SIT, which is a technique that helps soldiers become resilient to potential future stress factors, another way of enhancing resilience before combat may be psychological treating previous trauma, which is known as a predictor of severity of PTSD symptoms in combatants [104]. This constitutes a promising direction that may be the subject for future studies.

While there are obvious achievements in the field of pre-deployment resilience training, enhancing resilience during combat still remains a questionable issue. The empirical evidence indicates that people experience disruptive psychological symptoms immediately following violence. It is well known that acute stress disorder can lead to PTSD and chronic PTSD ([112–114]. It highlights the importance of providing early psychological intervention (EPI) to victims of interpersonal violence [98, 115]. EPI can take many forms, and it is very controversial, as there are contradictory studies about its efficiency [3]. However, it is important to remember that intervention in crisis situation does not mean trauma psychotherapy and that its role is to prevent the development of PTSD and stopping the posttraumatic symptoms from becoming chronic.

Recent studies [116, 117] report the success the eye movement desensitization and reprocessing (EMDR) method has in different crisis situations, from natural disasters to terrorist attacks. Early EMDR intervention (EEI) may be used to treat acute distress and also can prevent complications and strengthen resilience in short interventions, which suggest their possible application in the war zone.

Though there is a progress in SIT and other computerized technologies of resilience training, one must keep in mind that resilience to combat is a very complex feature, which is far beyond these technological approaches. Individual variability in how humans respond to stress and trauma depends on numerous genetic, developmental, cognitive, psychological, and neurobiological risk and protective factors, which implies the whole life trajectory in which special training is only a part [118].

17.6 Mental Health Consequences of War in the Civilian Population

Civilians have always suffered immensely during wartime, but in contrast to traditional wars of the past, in recent wars civilians have been the main target of violence. In previous wars, 90% of casualties were military, while recently 90% are civilians [119]. This is especially true for mental health casualties and long-term mental health consequences. Recently accumulated data from different parts of the world (Afghanistan, the Balkans and former Yugoslavia countries, Cambodia, Iraq, Israel, Lebanon, Chechnya, Palestine, Rwanda, Sri Lanka, Somalia, Uganda, and others) report about severe trauma and inevitable mental health disorders and psychological sequelae in civilians. In different populations percentage of depression ranged from 16% to 68%, while of PTSD – from 25% to 60%, other prevalent conditions were anxiety, somatization, alcohol and drug abuse, different signs of functional disability, and a variety of psychosocial impairments [120]. Rather typical picture of war-related trauma in civilians (Sri Lanka experience) looks as follows. Nearly one-half had experienced between five and nine war stresses and one-quarter experienced over ten (mean 6.66). Only 6% had not experienced any. Sixty-four percent had developed psychosocial sequelae, including somatization (41%), posttraumatic stress disorder (27%), anxiety disorder (26%), major depression (25%),

hostility (19%), relationship problems (13%), alcohol and drug misuse (15%), and functional disability (18%) [121].

It is well established that women and children are at greater risk, that the severity of experienced stress correlates with psychological and psychiatric outcomes, that early life adversities and personal and family psychiatric history are associated with higher risk, while social and psychological support is the main factors that may attenuate war-related traumas, especially with the special role of cultural traditions and religions [47, 104, 120]. Posttraumatic symptoms may be noticed in children aged 1.5–5 years if exposed to daily war-related trauma, with certain peculiarities and usually associated with developmental regression, which implies long-lasting consequences [122].

War conflicts inevitably lead to a massive migration of the civilian population, either trying to escape from direct bombing and shooting inside the country or looking for better economic and secure conditions abroad. Estimations for the year 2013 report that more than 50 million people in various parts of the world were being forced to flee from war, of them 33.3 million were internally displaced persons, 16.7 million refugees worldwide, and 1.2 million asylum seekers [123]. This is associated with a variety of stressful life events, like loss of a family member, loss of a home and shelter, hunger, low access to medical resources, anxiety about future, and many others. Though outcomes of migration may vary, migrants and refugees often find themselves in the situation of lower socioeconomic status, frequent unemployment, cultural conflict, hostility, rejection, etc. Recent studies report of prevalence rates of depression among refugees ranging from 3% to 80%; PTSD, from 5% to 86%; and anxiety disorder, from 20% to 88% [124]. Other frequent consequences are obsessive-compulsive disorder, somatization and persistent pain, complex PTSD, prolonged grief reactions, substance abuse, dissociation, and eating disorders [47]. Mental health disturbances in refugees are long-lasting (years) and depend on post-migration socioeconomic status [124].

Many modern war conflicts have signs of civil or religious wars, which are often associated with atrocities, tortures, sexual violence, extrajudicial killings, captivity, and generally higher level of violence, than interstate conflicts, in which war crimes are more restricted. Moreover, moral justification in the form of dehumanizing of the opposing part is often present. Victims of civil wars experience similar mental health problems as other war victims, with the high prevalence of PTSD, anxiety, sleep disorders, psychological impairment, and paranoid ideation [125, 126]. Historical examples also suggest that rehabilitation and overcoming the consequences of civil conflicts and collective trauma caused by it take decades; several generations have to pass until memories of such conflicts may fade (though they seem to exist for centuries and may be very easily revived).

The mental health consequences are even more severe if wars are associated with acts of genocide [127]. Genocide by definition is an intentional action to destroy the ethnic, religious, or racial group. A number of studies have confirmed that victims of political violence are suffering from severe psychological and mental health problems including PTSD, sleep disturbances, anxiety disorder, mental distress, and suicidal behavior, the severity of which reflects the level of

violence [127]. Tortures are reported as a strong factor that accounts for higher rates of mental health disturbances in populations exposed to mass conflicts with genocide [128].

The civilian population exposed to a war of different type, due to gender and age distribution, which is rather different from the military, may have specific mental health consequences. It is well established that under similar conditions women and children are at greater risk of psychopathologies and mental health disturbances [120, 127]. Children growing in wartime have a higher probability of worse mental health, lower education, impaired cognitive abilities, and lower subjective well-being in older age [129]. Moreover, negative mental health effects may be transgenerational. It is suggested that conflict-driven health harms may be transmitted due to persistent complex environmental factors and feedback loops between sources of harm and individual weaknesses or societal vulnerabilities [130]. Other possibilities of transgenerational effects are associated with severe early life stress (including in utero effects) on developing brain with subsequent mental health problems in children and young adults [131].

In overall, existing studies provide strong evidence that civilian populations subjected to war stressors caused by different types of conflicts, including civil or religious conflicts, genocide, tortures, and political violence, or associated with migration, asylum seeking, and refugee status have severe long-lasting negative mental health consequences. They include all typical trauma-driven disorders and psychological consequences, often in a more severe form than in war veterans, with higher frequency and with the greater tendency toward the transgenerational transmission. It makes an impression how war-related mental health problems propagate in wider populations, thus adding to the general burden of mental health problems in the modern world.

17.7 Global Impact of Instability, Terrorism, War Threat, and Information Wars

One of the signs of modernity is prevailing of local conflicts spreading across the planet and growth of the number of terrorist acts, which are associated with existing war conflicts. This is coinciding with the unprecedented influence of mass media providing extensive coverage of these events and making them globally evident. It should be noted that after the event 9/11, many commentators consider that the world remains in the state of the global terrorist war. This is confirmed by total world count of incidences of terrorist acts, which has grown from 2–3 hundreds in 70–80s to several thousand per year in the first decade of the twenty-first century [132]. There is no doubt that massive media portrayal of terrorism and war becomes a potent source of stress for the wide public. Surveys have revealed that media exposure to 9/11 and Iraq war-related TV images predicted an increase of PTSD symptoms 2–3 years after 9/11 in general population sample [133]. Mental health consequences were mostly inherent to vulnerable individuals with pre-existing mental health problems [133].

It is worth noting that modern mass media themselves are the source of anxiety, sleep problems, and mental health disturbances, for instance, screen time in children [134] and in adults [135] predicts higher depression and anxiety. On the other hand, disaster media coverage, both in the context of terrorism and warfare, is associated with such outcomes as PTSD caseness, posttraumatic stress reactions, depression, anxiety, and substance use [136]. In children, negative outcomes are linked to family context—lower socioeconomic status of the family, a lower educational status of parents, high parental stress, and poor coping being most prominent risk factors [137]. Risk factors for negative outcomes of media coverage of the mass shooting are female gender, pre-existing emotional problems, and lower social support [138]. In some cases (Boston Marathon Bombing) prolonged media exposure (6 or more hours a day) appeared to cause even higher distress in a distant population than direct exposure to the bombing, i.e., inhabitants of Boston [139].

One of the features of the modern war is that it turned into "War Live." It has become technically possible with launching modern satellites that are covering all geographical parts of the world. Another technical achievement in this field—drones and quadrocopters equipped with high-resolution cameras—has made the picture even more spectacular. Moreover, recent conflicts have revealed the availability of mobile means of video recording in the battlefield, due to which there is a growing volume of video streams of martial clashes, which appear in the social media, YouTube, and subsequently in the leading information agencies. All this makes a new reality and adds new destructive quality to the information warfare. Such development may be responsible for more mental health outcomes in the society in general and, largely, in those who are mostly involved in social networks as alternative channels of information distribution. The Internet, social media, and networks are domains, where positive and negative, rational and irrational discourse flourishes without boundaries, where professional comments and moral evaluations do not exist, while anonymity prevails. It may have specific consequences so far as psychological observations suggest that people have a tendency to believe in negative information easier than in positive and our attitudes are more heavily influenced by bad news than by good ones [140]. Moreover, it is already clear, that emotional states can be transferred to others in social networks via emotional contagion, leading people to experience the same emotions without their awareness, and this is true for both depression and happiness [141]. There are many signs that it promotes further differentiation of feelings, attitudes, and evaluations and may contribute to general embitterment, hostility, and animosity in the web. It is just one more manifestation of the conflict that moves emotions, feeling, and attitudes from TV screens to the personal level.

As to the concept of information warfare, it started to develop in the beginning of the 1990s together with the development of the information society [142]. Information warfare has two main strategic components—technical, aimed at computers and information networks, and psychological, aimed at peoples' minds, and can, therefore, be applied in military and civilian context [143]. The psychological information warfare is understood as influencing military and civil population of the

enemy side by distributing quite specific, often distorted, and manipulative information. On the other hand, in the modern world due to global information distribution, such information opposition quickly captures huge contingents, adding to the general feeling of the approaching war or inducing a premonition of the war, which influences the general psychological status of the peoples.

Information warfare is the logical product of the information society, where power and authority are based on communications and management of information flows. Means of communication, which are transforming and dosing information, become the main tool of influence in modern society. Moreover, manipulative information distributed by modern mass media, based mostly on TV, but also utilizing internet, social networks, and other available sources and covering many different aspects of political, economic, and spiritual life of the society has become a powerful weapon in global policy and a tool in achieving geopolitical goals of different warring parties. It is of fundamental importance at the present time that realizing the unreality of a global war, which can lead to the destruction of humanity, opposing parties rely on maintaining low-intensity local conflicts and information opposition. These conflicts may occur on their own on the basis of interethnic, religious, territorial, or other contradictions or may be provoked artificially, which is one of the features of the modern surrogate war. Media coverage of these events is a prerequisite of the general efficacy of hybrid strategy when mutual accusations and statements of the politicians, international organizations' evaluations, political commentators' opinions, and social media groups and individuals' posts, images, and videos create an information mosaic of the conflict.

It is suggested that such information pressure may have both psychological and psychiatric consequences [144]. All these activities often remain covert and are not perceived by the public as specifically aimed actions. On the other hand, they are obviously adding to the general feeling of instability and anxiety, both regionally and globally, and may induce cognitive dissonance, which in turn may contribute to exacerbation of different psychopathologies. In general, reaction to the information warfare may have something in common with the mass psychogenic epidemic, associated with exacerbation of existing psychological and mental health problems, like accentuated traits exasperation and enhancement of neurotic, depressive, histrionic, or anxiety symptoms [144]. Objective evaluation of mental health consequences of information warfare is not an easy task and still waits for being developed.

Conclusion

Another world war did not happen since WW II, but the number of local conflicts is growing, causing accumulating public health problems, mostly long-lasting negative psychosocial outcomes [120, 145]. Moreover, modern wars and conflicts seem to be aiming societies in general rather than military forces of the opposing part. While military may have preliminary selection and training and professionals better understand their mental health problems as veterans, civilians remain almost unprotected. As a result, many thousands of international refugees and internally displaced families, children, women, and older people,

deprived of their homes and shelters, are experiencing severe stress with very high probability of mental health consequences.

Moreover, there is another quality that makes modern situation special. Modern wars have all signs information wars with information becoming the factor of damage. Modern wars, terrorism, online representation of warfare on TV and on the web have an impact on much bigger contingents, which are not directly involved in the conflict, producing fear, anxiety, depression, uncertainty about future, and other psychosocial consequences. Thus, war consequences can be traced even in a wider context, considering huge contingents and populations. War and terrorism, civil wars and religious conflicts, forced migration, and people seeking refuge and asylum all around the world—all this contributes to the general feeling of instability and threat of a bigger and more global war. All this influences psychiatry too and means new challenges for this medical profession.

In March 2016 by the initiative of WPA, an anti-war declaration was formulated and published, which states "War is the worst of human-made disasters and has tragic and unacceptable consequences on the mental health of its victims. The catastrophic impact of war on mental health is longitudinal, transgenerational, and amplified by refugee crises both in countries of origin and elsewhere." The declaration, among other measures, calls for "termination of war conflicts wherever they occur" and has been supported by more than 100 organizations and entities, including military psychiatry section of the WPA. Military psychiatry has accumulated knowledge and practical experience that, though not always can be applied directly, may be useful for identification, management, prevention, and treatment of mental health consequences of war in wider contingents. This knowledge is a one more relevant and strong reason for advocating lowering of international tension and reducing the probability of war conflicts worldwide for the sake of preserving mental health of the humanity and diminishing of the burden of this type of diseases worldwide.

References

1. Ellard J. Principles of military psychiatry. ADF Health. 2000;1:81–4.
2. Litvintsev SV, Shamrey VK, editors. Voennaya Psychiatriya (military psychiatry). Saint-Petersburg: VMA, ELBI-SPb; 2001.
3. Roberts NP, Kitchiner NJ, Kenardy J, et al. Early psychological intervention to treat post-traumatic stress disorder. Cochrane Database Syst Rev. 2010;3:CD007944.
4. Ursano RJ, Holloway HC. Military psychiatry. In: Kaplan HI, Sadock BJ, editors. Comprehensive textbook of psychiatry. 4th ed. Baltimore: Williams and Wilkins; 1985. p. 1902–5.
5. Vermetten E, Greenberg N, Boeschoten MA. Deployment-related mental health support: comparative analysis of NATO and allied ISAF partners. Eur J Psychotraumatol. 2014;5:23732.
6. Iversen AC, Greenberg N. Mental health of regular and reserve military veterans. Adv Psychiatr Treat. 2009;15:100–6.
7. Lopez-Ibor JJ, Christodoulou G, Maj M, et al. Disasters and mental health. Chichester: Wiley; 2005.

8. United Nations Chidlen's Fund (UNICEF). The state of the world's chidren – childhood under threat. New York: UNICEF; 2005.
9. Calderoni ME, Alderman EM, Silver EJ, et al. The mental health impact of 9/11 on inner-city high school students 20 miles north of ground zero. J Adolesc Health. 2006;39:57–65.
10. Wahlström L, Michélsen H, Schulman A, et al. Different types of exposure to the 2004 tsunami are associated with different levels of psychological distress and posttraumatic stress. J Trauma Stress. 2008;21:463–70.
11. Summerfield D. War and mental health: a brief overview. BMJ. 2000;321:232–5.
12. Battesti M. Nostalgia in the Army. Front Neurol Neurosci. 2016;38:132–42.
13. Jones FD. Psychiatric lessons of war. In: Jones FD, Sparacino LR, Wilcox VL, et al., editors. Textbook of military medicine. Falls Church: Office of The Surgeon General U.S. Department of the Army; 1995. p. 1–33.
14. Wooley CF. The irritable heart of soldiers and the origins of Anglo-American cardiology: the U. S. Civil War (1861) to World War I (1918). Burlington: Ashgate; 2002.
15. Binneveld H. From shell shock to combat stress: a comparative history of military psychiatry. Amsterdam: Amsterdam University Press; 1998.
16. Gilbert M. First world war: a complete history. New York: Henry Holt and Company, LLC; 1994.
17. Helmus TC, Glenn RW. Steeling the mind: combat stress reactions and their implications for urban warfare. Santa Monica: Rand Arroyo Center; 2004.
18. Department of Veterans Affairs, Department of Defense. Clinical practice guideline: management of post-traumatic stress, version 2.0. Washington, DC: US Department of Veterans Affairs; 2010.
19. USMC and U.S. Navy (USN). Combat and operational stress control. MCRP 6-11C/NTTP 1-15M. Washington, DC: Department of the Navy, Headquarters, USMC; 2010.
20. US Department of the Army. Leaders' manual for combat stress control. Washington, DC: Field Manual. DA; 1994a. p. 22–51.
21. US Department of the Army. Combat stress control in a theater of operations-tactics, techniques, procedures. Washington, DC: Field Manual. DA; 1994b. p. 8–51.
22. McFarlane AC. One hundred years of lessons about the impact of war on mental health; two steps forward, one step back. Australas Psychiatry. 2015;23:392–5.
23. Shamrey VK, editor. Psychiatriya Voyn I Katastroph (Psychiatry of Wars and Katastrophs). Saint Petersburg: SpetsLit; 2015.
24. Turner MA, Kiernan MD, McKechanie AG, et al. Acute military psychiatric casualties from the war in Iraq. Br J Psychiatry. 2005;186:476–9.
25. Jones N, Fear NT, Wessely S, et al. Forward psychiatry – early intervention for mental health problems among UK armed forces in Afghanistan. Eur Psychiatry. 2017;39:66–72.
26. Vevera J. Trauma coping mechanisms and psychological distress among military personnel deployed in Afghanistan. Ceska Slov Psychiatr. 2012;108(suppl.1):11.
27. Jones E, Thomas A, Ironside S. Shell shock: an outcome study of a first world war 'PIE' unit. Psychol Med. 2007;37:215–23.
28. Grinker R, Spiegel J. Brief psychotherapy in war neuroses. Psychosom Med. 1944;6:123–31.
29. Shephard B. A war of nerves: soldiers and psychiatrists 1914–1994. London: Jonathan Cape Publishers; 2002.
30. Department of Defense. DoD instruction 4690.05: maintenace of psychological health in military operations. Washington, DC: Department of Defense; 2011.
31. Hobfoll SE, Watson P, Bell CC, et al. Five essential elements of immediate and mid-term mass trauma intervention: empirical evidence. Psychiatry. 2007;70:283.
32. US Department of the Army. Combat stress: field manual 6–22.5. Washington, DC: Department of Defense; 2000.
33. Mitchell JT. When disaster strikes: the critical incident stress debriefing process. JEMS. 1983;8:36–9.
34. Everly GS, Mitchell JT. Critical incident stress management: a new era and standard of care in crisis intervention. 2nd ed. Ellicott City: Chevron; 1999.

35. Van Emmerik AA, Kamphuis JH, Hulsbosch AM. Single session debriefing after psychological trauma: a meta-analysis. Lancet. 2002;360:766–71.
36. Wessely S. Risk, psychiatry and the military. Br J Psychiatry. 2005;186:459–66.
37. Davydow DS, Gifford JM, Desai SV, et al. Posttraumatic stress disorder in general intensive care unit survivors: a systematic review. Gen Hosp Psychiatry. 2008;30:421–34.
38. Gelpin E, Bonne O, Peri T, Brandes D, et al. Treatment of recent trauma survivors with benzodiazepines: a prospective study. J Clin Psychiatry. 1996;57:390–4.
39. Mellman TA, Bustamante V, David D, et al. Hypnotic medication in the aftermath of trauma. J Clin Psychiatry. 2002;63:1183–4.
40. Solomon Z, Shlar R, Mikulincer M. Frontline treatment of combat stress reaction: a 20-year longitudinal evaluation study. Am J Psychiatr. 2005;162:2309–14.
41. Gates MA, Holowka DW, Vasterling JJ, et al. Posttraumatic stress disorder in veterans and military personnel: epidemiology, screening, and case recognition. Psychol Serv. 2012;9: 361–82.
42. Richardson LK, Frueh BC, Acierno R. Prevalence estimates of combat-related post-traumatic stress disorder: critical review. Aust N Z J Psychiatry. 2010;44:4–19.
43. Tarabrina NV. Psychologiya posttravmaticheskogo stressa (psychology of post-traumatic stress). Moscow: Institute of Psychology of the Russian Academy of Sciences Publishers; 2007.
44. Jayatunge RM. Shell shock to Palali syndrome. PTSD Sri Lankan experience. Colombo: Sarasavi Publishers; 2014.
45. Post-Traumatic Stress Disorder. National Institute of Mental Health. February 2016. Retrieved Oct 2016.
46. World Health Organization. ICD-10: International statistical classification of diseases and related health problems. 10th revis. Geneva; 2005.
47. Jayatunge RM. EMDR Sri Lankan Experience. Colombo: Sarasavi Publishers; 2008.
48. Herman JL. Trauma and recovery. New York: Basic Books; 1992.
49. Boscarino JA. Posttraumatic stress disorder and physical illness: results from clinical and epidemiologic studies. Ann N Y Acad Sci. 2004;1032:141–53.
50. Dohrenwend B, Turner J, Turse N, et al. The psychological risks of Vietnam for U.S. veterans: a revisit with new data and methods. Science. 2006;313:979–82.
51. Flory JD, Yehuda R. Comorbidity between post-traumatic stress disorder and major depressive disorder: alternative explanations and treatment considerations. Dialogues Clin Neurosci. 2015;17(2):141–50.
52. Kessler R, Sonnega A, Bromet E, et al. Posttraumatic stress disorder in the national comorbidity survey. Arch Gen Psychiatry. 1995;52:1048–60.
53. Levine A, Levine L, Levine T. Posttraumatic stress disorder and cardiometabolic disease. Cardiology. 2014;127:1–19.
54. McFarlane AC. The long-term costs of traumatic stress: intertwined physical and psychological consequences. World Psychiatry. 2010;9:3–10.
55. Rytwinski N, Scur M, Feeny N, et al. The co-occurrence of major depressive disorder among individuals with posttraumatic stress disorder: a meta-analysis. J Trauma Stress. 2013;26:299–309.
56. Shalev A. Posttraumatic stress disorder and stress-related disorders. Psychiatr Clin North Am. 2009;32:687–704.
57. Schmidt U, Kaltwasser SF, Wotjak CT. Biomarkers in posttraumatic stress disorder: overview and implications for future research. Dis Markers. 2013;35:43–54.
58. Van der Kolk BA. Psychobiology of posttraumatic stress disorder. In: Panksepp J, editor. Textbook of biological psychiatry. Hoboken: Wiley-Liss; 2004.
59. Bryant RA. Early predictors of posttraumatic stress disorder. Biol Psychiatry. 2003;53: 789–95.
60. Van Minnen A, Zoellner L, Harned MS, et al. Changes in comorbid conditions after prolonged exposure for PTSD: a literature review. Curr Psychiatry Rep. 2015;17:549.

61. Allen JP, Crawford EF, Kudler H. Nature and treatment of comorbid alcohol problems and post traumatic stress disorder among American military personnel and veterans. Alcohol Res Curr Rev. 2016;38:133–40.
62. McCauley J, Kileen T, Gros D, et al. Posttraumatic stress disorder and co-occurring substance use disorders: advances in assessment and treatment. Clin Psychol (New York). 2012;19(3): 283–304.
63. Back SE, Brady KT, Sonne SC, et al. Symptom improvement in co-occurring PTSD and alcohol dependence. J Nerv Ment Dis. 2006;194:690–6.
64. Jacobsen L, Southwick S, Kosten T. Substance use disorders in patients with posttraumatic stress disorder: a review of the literature. Am J Psychiatry. 2001;158:1184–90.
65. Ouimette P, Read J, Wade M, et al. Modeling associations between posttraumatic stress symptoms and substance use. Addict Behav. 2010;35:64–7.
66. Afari N, Ahumada S, Wright L, et al. Psychological trauma and functional somatic syndromes: a systematic review and meta-analysis. Psychosom Med. 2014;76(1):2–11.
67. Boscarino JA. A prospective study of PTSD and early-age heart disease mortality among Vietnam veterans: implications for surveillance and prevention. Psychosom Med. 2008;70(6):668–76.
68. Boyko E, Jacobson I, Smith B, et al. Risk of diabetes in U.S. military service members in relation to combat deployment and mental health. Diabetes Care. 2010;33(8):1771–7.
69. Cohen BE, Edmondson D, Kronish IM. State of the art review: depression, stress, anxiety, and cardiovascular disease. Am J Hypertens. 2015;28:1295–302.
70. Jakovljevic M, Babic D, Crncevic Z. Metabolic syndrome and depression in war veterans with post-traumatic stress disorder. Psychiatr Danub. 2008;20:406–10.
71. De Assis M, de Mello M, Scorza F, et al. Evaluation of physical activity habits in patients with posttraumatic stress disorder. Clinics (Sao Paulo). 2008;63:473–8.
72. Chwastiak LA, Rosenheck RA, Kazis LE. Association of psychiatric illness and obesity, physical inactivity, and smoking among a national sample of veterans. Psychosomatics. 2011;52:230–6.
73. Bagley SC, Munjas B, Shekelle P. A systematic review of suicide prevention programs for military or veterans. Suicide Life Threat Behav. 2010;40:257–65.
74. Bruce ML. Suicide risk and prevention in veteran populations. Ann N Y Acad Sci. 2010;1208:98–103.
75. Nock MK, Stein MB, Heeringa SG, et al. Prevalence and correlates of suicidal behavior among soldiers: results from the Army study to sssess risk and resilience in servicemembers (Army STARRS). JAMA Psychiat. 2014;71:514–22.
76. Pietrzak RH, Goldstein MB, Malley JC, et al. Risk and protective factors associated with suicidal ideation in veterans of operations enduring freedom and Iraqi freedom. J Affect Disord. 2010;123:102–7.
77. Fuehrlein BS, Mota N, Arias AJ, et al. The burden of alcohol use disorders in US military veterans: results from the National Health and Resilience in Veterans Study. Addiction. 2016;111:1786–94.
78. Maguen S, Madden E, Cohen BE, et al. Suicide risk in Iraq and Afghanistan veterans with mental health problems in VA care. J Psychiatr Res. 2015;68:120–4.
79. Rozanov VA, Carli V. Suicide among war veterans. Int J Environ Res Public Health. 2012;9:2504–19.
80. NATO, Science and Technology Organization, Research Task Group 218. Military suicide prevention: report prepared for NATO leadership (STO-TR-HFM-218). Geneva: STO/NATO; 2016.
81. Nock MK, Deming CA, Fullerton CS, et al. Suicide among soldiers: a review of psychosocial risk and protective factors. Psychiatry. 2013;76:97–125.
82. Kang HK, Bullman TA, Smolenski DJ, et al. Suicide risk among 1.3 million veterans who were on active duty during the Iraq and Afghanistan wars. Ann Epidemiol. 2015;25:96–100.
83. Zøllner L, Jørgensen HO. Risk and protective factors influencing suicidal ideation and suicidal behaviour among Danish veterans. Odense: Center for Suicide Research; 2012.

84. Ejdesgaard BA, Zøllner L, Jensen BF, et al. Risk and protective factors for suicidal ideation and suicide attempts among deployed Danish soldiers from 1990 to 2009. Mil Med. 2015;180:61–7.
85. Bryan AO, Theriault JL, Bryan CJ. Self-forgiveness, posttraumatic stress, and suicide attempts among military personnel and veterans. Traumatology. 2015;21:40–6.
86. Kopacz MS. The spiritual health of veterans with a history of suicide ideation. Health Psychol Behav Med. 2014;2:349–58.
87. Thoresen S, Mehlum L, Røysamb E, et al. Risk factors for completed suicide in veterans of peacekeeping: repatriation, negative life events, and marital status. Arch Suicide Res. 2006;10:353–63.
88. Greden JF, Valenstein M, Spinner J, et al. Buddy-to-buddy, a citizen soldier peer support program to counteract stigma, PTSD, depression, and suicide. Ann N Y Acad Sci. 2010;1208:90–7.
89. Anestis MD, Bryan CJ, Cornette MM, Joiner TE. Understanding suicidal behavior in the military: an evaluation of joiner's interpersonal-psychological theory of suicidal behavior in two case studies of active duty post-deployers. J Ment Health Couns. 2009;31:60–75.
90. Joiner T. Why people die by suicide. Cambridge: Harvard University Press; 2005.
91. Brenner LA, Gutierrez PM, Cornette MM, et al. A qualitative study of potential suicide risk factors in returning combat veterans. J Ment Health Couns. 2008;30:211–25.
92. Bryan CJ, Morrow CE, Anestis MD, et al. A preliminary test of the interpersonal-psychological theory of suicidal behavior in a military sample. Personal Individ Differ. 2010;48:347–50.
93. Coleman P. Flashback. Posttraumatic stress disorder, suicide, and the lessons of war. Boston: Beacon Press; 2006.
94. Pols H, Oak S. War and military mental health. The US psychiatric response in the 20th century. Am J Public Health. 2007;97:2132–42.
95. Hyams KC. Mental health screening before troop deployment: is not supported by current evidence. BMJ. 2006;333:979–80.
96. Rona RJ, Hooper R, Jones M, et al. Mental health screening in armed forces before the Iraq war and prevention of subsequent psychological morbidity: follow-up study. BMJ. 2006;333:991.
97. Jones E, Hyams KC, Wessely S. Screening for vulnerability to psychological disorders in the military: an historical survey. J Med Screen. 2003;10:40–6.
98. Prisacaru A, Macarenco M. Psychological support for the Romanian combat troops before, during and after deployment. In: Coping with posttraumatic stress disorder in returning troops, vol. 68. Brussels: IOS Press; 2010. p. 157–65.
99. Slop H. Military psychology at the Austrian international peace support command. IAMPS 2001 Proceedings, Prague; 2001. p. 98–102.
100. Fraley RC, Fazzari DA, Bonanno GA, et al. Attachment and psychological adaptation in high exposure survivors of the September 11th attack on the World Trade Center. Personal Soc Psychol Bull. 2006;32:538–51.
101. Scarpa A, Haden SC, Hurley J. Community violence victimization and symptoms of posttraumatic stress disorder: the moderating effects of coping and social support. J Interpers Violence. 2006;21:446–69.
102. Stovall-McClough KC, Cloitre M. Unresolved attachment, PTSD, and dissociation in women with childhood abuse histories. J Consult Clin Psychol. 2006;74:219–28.
103. Koopman C, Drescher K, Bowles S, et al. Acute dissociative reactions in veterans with PTSD. J Trauma Dissociation. 2001;2:91–111.
104. Brewin C, Andrews B, Valentine J. Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. J Consult Clin Psychol. 2000;68:748–66.
105. Bonanno GA. Loss, trauma and human resilience – how we underestimate the human capacity to thrive after extremely aversive events? Am Psychol. 2004;59:20–8.
106. Meichenbaum D. Cognitive-behavior modification: an integrative approach. New York: Plenum Press; 1977.

107. Meichenbaum D. Stress inoculation training: a preventative and treatment approach. In: Lehrer PM, Woolfolk RL, Sime WS, editors. Principles and practice of stress management. 3rd ed. New York: Guilford Press; 2007.
108. Druckman D, Swets JA, editors. Enhancing human performance: issues, theories, and techniques. Washington, DC: National Academies Press; 1988.
109. Wiederhold B, Wiederhold M. Virtual reality for posttraumatic stress disorder and stress inoculation training. J Cyber Ther Rehabil. 2008;1:23–35.
110. Wiederhold BK, Bullinger AH, Wiederhold MD. Advanced technologies in military medicine. NATO security through science series E human and societal. Dynamics. 2006;6:148.
111. Wiederhold MD, Wiederhold BK. Using advanced prosthetics for stress inoculation training and to teach life saving skills. San Diego: Virtual Reality Medical Center; 2010.
112. Harvey A, Bryant R. The relationship between acute stress disorder and posttraumatic stress disorder: a 2 year prospective evaluation. J Consult Clin Psychol. 1999;67:985–8.
113. Bryant RA. Acute stress disorder as a predictor of posttraumatic stress disorder: a systematic review. J Clin Psychiatry. 2011;72:233–9.
114. Briere J, Scott C. Principles of trauma therapy: a guide to symptoms, evaluation and treatment. London, New Delhi: Sage Publication, Inc.; 2006.
115. Gore-Felton C, Gil M, Koopman C, et al. A review of acute stress reactions among victims of violence: implications for early intervention. Aggress Violent Behav. 1999;4:293–306.
116. Jarero I, Artigas L, Luber M. The EMDR protocol for recent critical incidents: application in a disaster mental health continuum of care context. J EMDR Pract Res. 2011;5:82–94.
117. Jarero I, Uribe S. The EMDR protocol for recent critical incidents: brief report of an application in a human massacre situation. J EMDR Pract Res. 2011;5:156–65.
118. Southwick SM, Charney DS. The science of resilience: implications for the prevention and treatment of depression. Science. 2012;338:79–82.
119. Ugaide A, Richards PL, Zwi A. Health consequences of war and political violence. Encyclopedia of violence, peace and. Conflict. 1999;2:103–21.
120. Murthy RS, Lakshminarayana R. Mental health consequences of war: a brief review of research findings. World Psychiatry. 2006;5:25–30.
121. Somasundaram DJ, Sivayokan S. War trauma in a civilian population. Br J Psychiatry. 1994;165:524–7.
122. Feldman R, Vengrober A. Posttraumatic stress disorder in infants and young children exposed to war-related trauma. J Am Acad Child Adolesc Psychiatry. 2011;50:645–58.
123. UNHCR. Global trends report: UNHCR; 2014.
124. Bogic M, Njoku A, Priebe S. Long-term mental health of war-refugees: a systematic literature review. BMC Int Health Hum Rights. 2015;15:29.
125. Priebe S, Jankovic Gavrilovic J, Bremner S et al (2013) Psyhological symptoms as long-term consequences of war experiences. Psychopathology 46:45–54.
126. Lecic-Tosevski D, Pejuskovic B, Miladinovic T, et al. Posttraumatic stress disorder in a Serbian community: seven years after trauma exposure. J Nerv Ment Dis. 2013;201:1040–4.
127. Lindert J. Violence exposure and mental health states. In: Lindert J, Levav I, editors. Violence and mental health. Its manifold faces. Dordrecht: Springer; 2015. p. 47–74.
128. Steel Z, Chey T, Silove D, et al. Association of torture and other potentially traumatic events with mental health outcomes among populations exposed to mass conflict and displacement: a systematic review and meta-analysis. JAMA. 2009;302:537–49.
129. Havari E, Peracchi F. Growing up in wartime: evidence from the era of two world wars. Econ Hum Biol. 2016;25:9–32. pii: S1570-677X(16)30122-8. [Epub ahead of print]
130. Devakumar D, Birch M, Osrin D, et al. The intergenerational effects of war on the health of children. BMC Med. 2014;12:57.
131. Vaiserman AM. Epigenetic programming by early life stress: evidence from human populations. Dev Dyn. 2015;244:254–65.
132. Nagdy M, Roser M. Terrorism. Published online at OurWorldInData.org. 2016. Retrieved from: https://ourworldindata.org/terrorism/[Online Resource].

133. Silver RC, Holman EA, Andersen JP, et al. Metnal- and physical-health effects of acute exposure to media images of the September 11, 2001 attacks and the Iraq War. Psychol Sci 24:1623–1634.
133. Neria Y, Sullivan GM. Understanding the mental health effects of indirect mass trauma exposure through the media. JAMA. 2014;306:1374–5.
134. Atkin AJ, Sharp SJ, Corder K, et al. Prevalence and correlates of screen time in youth: an international perspective. Am J Prev Med. 2014;47:803–7.
135. Dempsey PC, Howard BJ, Lynch BM, et al. Associations of television viewing time with adults' well-being and vitality. Prev Med. 2014;69:69–74.
136. Pfefferbaum B, Newman E, Nelson SD, et al. Disaster media coverage and psychological outcomes: descriptive findings in the extant research. Curr Psychiatry Rep. 2014;16:464.
137. Pfefferbaum B, Jacobs AK, Houston JB, et al. Children's disaster reactions: the influence of family and social factors. Curr Psychiatry Rep. 2015;17:57.
138. Lowe SR, Galea S. The mental health consequences of mass shootings. Trauma Violence Abuse. 2015;18(1):62–82.
139. Holman EA, Garfin DR, Silver RC. Media's role in broadcasting acute stress following the Boston Marathon bombings. Proc Natl Acad Sci U S A. 2014;111:93–8.
140. Cacioppo JT. Beyond bipolar conceptualizations and measures: the case of attitudes and evaluative space. Pers Soc Psychol Rev. 1997;1:3–25.
141. Kramer AD, Guillory JE, Hancock JT. Experimental evidence of massive-scale emotional contagion through social networks. PNAS. 2014;111:8788–90.
142. Libicky M. What is information warfare? Washington: National Defense University; 1995.
143. Cronin B, Crawford H. Information warfare: its application in military and civilian contexts. Inf Soc. 1999;15:257–63.
144. Fisun AY, Shamrey VK, Goncharenko AY, et al. Psychology and psychopathology on information warfare. Voen Med Zh (Military-Med J). 2014;6:4–12.
145. Murray CJL, King G, Lopez AD, et al. Armed conflict as a public health problem. BMJ. 2002;324:346–9.
146. Back SE, Killeen TK, Teer AP, et al. Substance use disorders and PTSD: an exploratory study of treatment preferences among military veterans. Addict Behav. 2014;39:369–73.
147. Miller M, Barber C, Azrael D, et al. Suicide among US veterans: a prospective study of 500,000 middle-aged and elderly men. Am J Epidemiol. 2009;170:494–500.