

Summary of the Military and Veteran Mental Health and Traumatic Stress Literature: 2011

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This document presents an annual literature summary for the year 2011 in the field of military and veteran posttraumatic mental health. It was written by the Australian Centre for Posttraumatic Mental Health with the support of the Australian Government, Department of Veterans' Affairs (DVA).

Disclaimer

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Glossary of terms

ADF	Australian Defence Force
Brigade Teams	A brigade is an organisation consisting of two or more regiments or battalions.
Comorbidity	Comorbidity is either the presence of one or more disorders (or diseases) in addition to a primary disease or disorder.
Controlled study	An experiment or clinical trial that includes a comparison (control) group.
Deployers	Military personnel stationed in preparation for combat.
Dual diagnosis	Co-occurring substance use and mental health disorder.
Efficacy study	A study which assesses the effect of an intervention when delivered under ideal conditions (e.g., patients have the target diagnosis and no comorbidity).
Effectiveness study	A study which assesses the effect of an intervention when delivered under 'real world' conditions (e.g., generalist therapists and patients with comorbidity).
Kings Cohort	A group of UK veterans being studied by the King's Centre for Military Health Research.
Millennium study	The US Millennium Cohort Study, begun in 2001, follows a population-based group of approximately 200,000 uniformed personnel from the Army, Navy, Air Force and Marine Corps, including active duty, Reserve and National Guard forces.
National Guard	The military reserve units controlled by each state of the United States.
NHMRC	National Health and Medical Research Council
OEF	Operation Enduring Freedom
OIF	Operation Iraqi Freedom
OND	Operation New Dawn
Polytrauma	Describes the condition of a person who has been subjected to multiple traumatic injuries, such as a serious head injury in addition to a serious burn.
PTSD	Posttraumatic stress disorder
Randomised controlled trial/study	The study subjects, after assessment of eligibility and recruitment, but before the intervention to be studied begins, are randomly allocated to receive one or other of the alternative treatments under study.
STRONGSTAR	Treatment approach for polytrauma involving the integration of exposure treatment into a pain treatment protocol.
SSRI	Selective Serotonin Reuptake Inhibitors
SNRI	Serotonin-Norepinephrine Reuptake Inhibitors
TRiM	Trauma risk management - A system of post incident management intended to allow commanders to provide appropriate support to their subordinates in the aftermath of traumatic events.
Uncontrolled study	A study without a specific control group to compare with a treatment group.
UK	United Kingdom
US	United States
VA	Veterans Affairs - The US Department of Veterans Affairs



Executive summary

This annual summary of the military and veteran mental health and traumatic stress literature for the year 2011 was produced by the Australian Centre for Posttraumatic Mental Health (ACPMH). In preparation for the 2011 annual literature summary, ACPMH consulted with the Department of Veterans' Affairs (DVA) to identify the key topics to focus the review on. These topics were identified as: (1) prevalence of PTSD and traumatic stress reactions; (2) vulnerability and protective factors; (3) injury, pain and PTSD; (4) physical health, older veterans and mortality; (5) traumatic brain injury and neuro-rehabilitation; (6) veterans and gambling; (7) veterans and suicide; (8) veterans and gender; (9) traditional treatments for traumatic stress; (10) complementary treatments for traumatic stress; (11) psychosocial rehabilitation; and (12) utilisation and barriers to care.

Prevalence

- The issue of number of deployments and relationship to mental health was examined in a sample of US military deployed in support of OEF/OIF. Second and/or third deployments (as opposed to first deployment) were associated with worse outcomes. Those deployed in medical care occupations had higher PTSD rates compared with other occupations, with increases from first through to third deployments.
- Delayed onset was examined in a large sample of Canadian forces. Using a highly conservative definition of delayed onset (not having any symptoms until six months), the researchers found a 1% prevalence rate of delayed PTSD which constituted about 8.5% of all PTSD cases. Delayed onset PTSD was associated with serving as land troops, experiencing early childhood trauma, and repeated trauma. Although these rates are rather low, and the study was limited in cross sectional design and retrospective recall, they do not support the argument that delayed onset PTSD only occurs in people who already have subsyndromal symptoms.
- Research in recent years has indicated lower rates of mental and physical health outcomes in UK veterans compared with US veterans. This continued to be evident in 2011, this time in older veterans. There is however, recognition that it is difficult to compare prevalence rates across nations and studies. In 2011, research groups in the UK and US reported on their collaboration to strengthen their ability to provide estimates of true health effects of military service and comparisons of contrasting military cohorts over time.
- A number of studies examined psychiatric comorbidity in veterans. Panic disorder and post-trauma obsessive compulsive disorder were found to be highly comorbid with PTSD. In terms of comorbidity across all mental illness, veterans who served in the post-Vietnam era (1973-1991) had the highest levels of comorbidity compared to



veterans from Vietnam, Gulf War and OEF/OIF deployments. The most common disorder to be comorbid with any mental illness was substance use disorder.

- Substance use disorders and/or alcohol use disorders were identified in 11% of a large sample of OEF/OIF US veterans. Younger males, non-married status, army/marine status, and greater combat exposure were independently associated with both disorders. Alcohol or substance use disorder was up to 4.5 times more likely in veterans with comorbid PTSD or depression.

Vulnerability and protective factors

- The research continues to find risk factors for mental health disorders in military populations which include, exposure to traumatic events, childhood trauma, pre-deployment exposure to violence, multiple deployments, combat stress, lower rank and lack of social support. Additionally, one study found peri-traumatic disgust and fear predicted PTSD symptom severity. Furthermore, taking a life and witnessing a unit member or ally being seriously wounded or killed were associated with mental health problems.
- The literature is continuing to tease out factors that protect against the development of mental health disorders. These include: dispositional optimism, positive family environment, increased unit cohesiveness and support, commissioned officer status, and greater social support post-deployment.
- One study defined resilient soldiers as those who have high combat exposure and low PTSD symptoms. The paper found these soldiers were more likely to be in a relationship, on active duty, have fewer psychosocial problems, have a greater perception of purpose/control, and have high levels of family support.
- Programs which aim to generate resilience in personnel are increasingly being designed and reported in the literature. The Comprehensive Fitness Program (US) is one such program. While a number of descriptive papers suggest the program was valuable, it has not yet been subject to the empirical research necessary to be confident in the reported benefits.

Injury, pain and PTSD

- Pain related disorders are more than three times as common in military settings as psychological disorders. Chronic pain prevalence is anticipated to worsen in the next 10 years. Polytrauma (PTSD, pain and traumatic brain injury) is highly prevalent in individuals sustaining combat related injuries. A review of studies since 2002 into comorbid PTSD and pain reported early pain as a strong predictor of chronic PTSD, while early symptoms of PTSD increased the risk of the development of chronic pain.
- Cognitive factors are central to understanding the relationship between PTSD and chronic pain. There is robust evidence of a relationship between maladaptive use of



avoidance and chronic pain. Catastrophising and diminished beliefs about capacity to control pain are also key factors associated with comorbid PTSD. A meta-analysis of eight neuroimaging studies identified regions associated with the cognitive processes of pain monitoring and discrimination as being implicated in the development of PTSD. These findings suggest that the relationship between pain and PTSD is mediated by shared cognitive factors.

- One randomised controlled trial found a Functional and Occupational Rehabilitation Treatment Program significantly improved functioning in active military personnel with chronic pain. A treatment approach for polytrauma known as STRONGSTAR which integrates exposure treatment into a pain treatment protocol is currently being assessed in a randomised controlled trial. These positive findings may provide a new direction for polytrauma therapy.

Physical health, older veterans and mortality

- Studies found that compared with non-deployed personnel, those deployed report higher levels of new health problems including chronic illness and headache disorders, more frequent clinical visits, and repeated hospitalisations.
- Research found a variety of medical health conditions such as hypertension, circulatory, respiratory, digestive, and musculoskeletal diseases are associated with PTSD in veterans.
- One study found older veterans using five or more medications were at increased risk for adverse drug reactions leading to unplanned hospitalisation.

Traumatic brain injury and neuro-rehabilitation

- A systematic review of the relationship between traumatic brain injury and PTSD reported that PTSD occurs in up to 20% of traumatic brain injury cases. Among traumatic brain injury cases, the presence of PTSD is 32-66% when the trauma is military related and 14-56% when it is non-military related. When traumatic brain injury is contained to 'mild' injuries, PTSD occurs in 33-39% of those injured.
- Studies have observed that rates of self-reported traumatic brain injury increase from 9.2% on returning from combat to 22.0% at one year post combat. It was hypothesised that current levels of distress may lead to this increase along with potential secondary gain factors.
- Cognitive behavioural therapy was found in the systematic review to be effective in reducing symptoms and preventing onset of PTSD in people with comorbid mild traumatic brain injury (mTBI) and acute stress disorder (early PTSD). Another study showed that cognitive processing therapy is a promising effective treatment for PTSD in veterans with a history of traumatic brain injury, particularly in those who report blast injuries. Longitudinal studies, improved accuracy of PTSD diagnosis in traumatic



brain injury populations, and randomised controlled trials are still needed to improve the effectiveness of PTSD treatment in mild traumatic brain injury populations.

- Understanding the relationship between postconcussive syndrome (a disorder whereby usually transient brain injury symptoms persist) and traumatic brain injury is complicated by the diagnostic overlap between postconcussive syndrome and PTSD/depression. Studies do show that the relationship between PTSD and postconcussive syndrome explains in part the developing mental health difficulties that may occur in a person suffering traumatic brain injury.
- Studies are finding evidence that personnel may underreport their traumatic brain injury symptoms to protect against being removed from the battlefield.

Veterans and problem gambling

- One study found pathological gambling was at a lower rate in a veteran sample compared with previous research into community rates. Two studies found alcohol use, bipolar disorder, depression and schizophreniform disorders were associated with pathological gambling.
- Homelessness was found to be a risk factor for gambling problems in one study. In a separate study, pathological gambling was the strongest predictor of homelessness, second to illicit drug use.
- A review of pharmacological treatments for pathological gambling found that in the absence of comorbid mental health disorders, there is little evidence for any effectiveness. Cognitive behavioural therapy based studies were producing evidence of benefit for problem gamblers, but the studies published require replication employing a more rigorous and controlled design.

Veterans and suicide

- Several papers found rates of suicide were increasing in military populations and were now greater than rates amongst civilians. OEF/OIF conflicts in particular appear to be associated with higher rates of suicide. Specific challenges in suicide prevention and intervention have been identified in these operations.
- Studies are finding risk factors for suicide in veterans include: previous attempt(s), combat exposure, access to firearms, multiple trauma exposure, financial strain, physical and mental disorders, substance use, homelessness, lack of social support and being an OEF/OIF veteran with PTSD. Protective factors include being married, higher levels of education, higher income, employment, and increased community cohesiveness.



- Studies are beginning to assess the effectiveness of pre-deployment screening as a suicide intervention strategy. Early studies are generating evidence that this procedure may be helpful, but more rigorous research is required.

Veterans and gender

- Military sexual trauma perpetrated against males and females was the focus of many studies. Females are more likely to be the victims of military sexual trauma and one study suggested this may be an important component in the link between PTSD and post-deployment physical health in females. In another study, female veterans utilised primary health care services more than male veterans.
- Suicidal behaviour was associated with sexual harassment in both males and females.
- Research into the relationship between PTSD and gender produced conflicting results over the past year. One study found males are more likely to suffer PTSD, another showed females are more likely to suffer PTSD, whilst a third found no difference. Different sample characteristics such as presence of a traumatic brain injury and exposure to combat may explain the inconsistent findings.

Treatment outcome studies – Traditional therapies

- Prolonged exposure, cognitive processing therapy and eye movement desensitisation and reprocessing were identified in a literature review as having the most empirical support for their efficacy and utility with veterans. Virtual reality for exposure therapy was identified as having economic barriers to use along with a lack of research that compares virtual reality with traditional exposure techniques.
- Multiple studies were published that observed cognitive behavioural therapy treatments leading to reduced symptoms of PTSD and other mental health disorders. This includes both group and individual based therapies. One study focused on behavioural activation, a specific component of cognitive behavioural therapy, and found a reduction of anxiety and depressive symptoms.
- A literature review of psychoeducation found that it was not sufficient to be used as a standalone therapy or to prevent the development of mental health disorders. It is often used in conjunction with other effective therapies, although its specific contribution toward useful outcomes is unknown.
- Early intervention programs that target personnel identified as 'at risk' rather than personnel identified with a disorder are becoming more prominent in the literature. Programs such as Battlemind and structured decompression phases as part of post-deployment reintegration are generally finding reported benefits from personnel but limited evidence of reduction in mental health disorders.



- A variety of medications, antipsychotics, selective serotonin reuptake inhibitors and serotonin-norepinephrine reuptake inhibitors, is being assessed to determine their efficacy for the treatment of PTSD. The general conclusion is that there is insufficient evidence to support pharmacotherapy as standalone treatment, and that psychotherapy is a necessary component of treatment.

Treatment outcome studies – Complementary therapies

- Less research is being published in the use of complementary therapies, and generally the studies in this area suffer from small sample sizes and/or uncontrolled designs. Therefore interpretations of study results must be viewed cautiously.
- Mindfulness techniques are beginning to find support for their capacity to enhance emotional regulation. Additionally, a survey of international trauma experts identified mindfulness as an effective second-line therapy.
- In a rigorously designed study of a Chinese herbal formula (Xiao-Tan-Jie-Yu-Fang), earthquake survivors in the intervention group reported greater psychological benefit than those in the placebo group. However, the lack of a specific PTSD measure and non-western sample limits the generalisability of the study.
- Other research into the use of mantrams and a mind-body bridging program for sleeplessness were identified as having design limitations that inhibit confident conclusions.

Psychosocial rehabilitation

- The relationship between mental health factors and psychosocial rehabilitation continues to be noted. In a study assessing the relationship between mental health and work performance, depression, PTSD, generalised anxiety disorder and panic disorder were associated with deficiencies in time management, production output and mental-interpersonal demands. Alcohol dependence and illicit drug use were associated with deficiencies in output and physical demands.
- In the US, community residential treatment services are provided for homeless veterans, whereby a person is housed in a central location and provided with clinical and social services while they are a resident. One study compared the clinical outcomes after one year for female veterans. Longer stays produced better outcomes in employment, social support, housing status and mental health symptoms.
- Trauma Management Therapy combines exposure therapy and social rehabilitation. This combination was shown to be effective in Vietnam veterans with chronic PTSD, when compared to exposure therapy on its own. Trauma Management Therapy appeared to increase time spent engaging in social activities; however, both treatment modes had equivalent reductions in PTSD symptoms. This research supports the



focus of Australia's PTSD treatment programs on broader psychosocial rehabilitation as well as trauma-focussed therapy for core PTSD symptoms.

Utilisation and barriers to care

- Given the prevalence of mental health difficulties experienced by veterans, access to health care remains a critical issue. A systematic review found primary mental health and community based outpatient clinics play a key role in helping veterans access care. One important finding in the literature was that the use of telephone modalities for health care can be equally satisfying to veterans when compared to face-to-face care. It is unclear whether reducing barriers to care by improving access is linked to improved clinical outcomes.
- Mental illness stigma and access barriers are consistently raised as deterrents to mental health care in military populations. PTSD patients tend to report more barriers than those with other mental health disorders. The main barriers to care have traditionally included three areas: background characteristics, institutional factors, and stigma-related beliefs about mental illness and treatment. Personal beliefs about mental illness were identified in 2011 as an area modifiable by interventions such as education and contact with stigmatised groups.
- Programs that promote "help seeking as a sign of strength" in the UK were highlighted as reducing barriers to care, as were programs like Trauma Risk Management (TRiM, UK), which assist leaders to signpost and identify vulnerable individuals after trauma exposure.
- Interventions that have greatest potential for improvement are those that are focussed on enhancing the reach of treatment (e.g., engagement, adherence, acceptability). A UK paper identified that understanding the perceptions veterans have concerning mental health care, their willingness to continue with treatment, and ways of communicating with veterans that validate their experiences as warriors, are important.



Introduction

This annual summary of the military and veteran mental health and traumatic stress literature was produced by the Australian Centre for Posttraumatic Mental Health (ACPMH). The aim is to provide a brief summary of key literature pertaining to military mental health, as well as posttraumatic mental health more generally, published during the calendar year of 2011. The review is an informed, rather than critical review of the literature. The literature included in this summary has met the broad inclusion criteria based on regular standards of academic review, but a systematic evaluation of all published research during this time period has not been made. Where there are discrepancies in the literature, these will be discussed, but we caution the reader against assuming that a single paper is sufficient to provide conclusive information. We recommend the reader source the original papers if they are interested in particular findings.

Background

Each year ACPMH produces and presents an annual summary of the veteran/military and traumatic stress literature. In preparation for the 2011 annual literature summary, ACPMH consulted with the Department of Veterans' Affairs (DVA) to identify the key topics to focus the review on. These topics were identified as: (1) prevalence of PTSD and traumatic stress reactions; (2) vulnerability and protective factors; (3) injury, pain and PTSD; (4) physical health, older veterans and mortality; (5) traumatic brain injury and neuro-rehabilitation; (6) veterans and gambling; (7) veterans and suicide; (8) veterans and gender; (9) traditional treatments for traumatic stress; (10) complementary treatments for traumatic stress; (11) psychosocial rehabilitation; and (12) utilisation and barriers to care.

Methodology

The methodology used in this 2011 literature summary included having a defined search strategy and *a priori* inclusion/exclusion criteria.

Literature search strategy

The literature was sourced using the scientific databases of Medline, Web of Science and PsychInfo, with the following search descriptors: veteran* OR defense OR defence OR military AND mental health OR psych* OR posttraumatic stress disorder OR PTSD.



Inclusion and exclusion criteria for papers selected

Papers included in the literature summary were selected according to inclusion and exclusion criteria. These are presented in Table 1. Two assessors provided quality assurance checks for the selection of papers. Papers which could not be agreed upon for inclusion were assessed by a third independent assessor, who also checked the final list of abstracts to be included in the summary. The total number of abstracts derived from the literature search contrasted with the number of papers selected for inclusion is seen in Table 2. The literature search strategy included a prioritisation of review papers in line with NHMRC guidelines for evidence review. That is, systematic reviews and meta-analyses were prioritised over general literature reviews. Priority was given to papers which were published in impactful and prominent journals such as *British Journal of Psychiatry*, *Journal of the American Medical Association*, *Archives of General Psychiatry*, *American Journal of Psychology*, and *Lancet*.

As most studies in this review use US or UK samples, we have reported the key findings from the Australian Defence Force Mental Health Prevalence and Wellbeing Study¹. While we recognise that DVA is already familiar with the findings from this study, the key points from that study have been included in boxed text at the end of each section (where relevant) to act as a reference point for the reader. The reader is directed to the study report for more detail: McFarlane AC, Hodson SE, Van Hooff M, Davies C. *Mental Health in the Australian Defence Force – 2010. ADF Mental Health Prevalence and Wellbeing Study: Executive Report*. Department of Defence: Canberra 2011.

**Table 1. Inclusion and exclusion criteria for selected papers in the annual summary**

Inclusion criteria	Exclusion criteria
Literature published in 2011	Qualitative studies without empirical data
Studies reporting empirical data and findings	Single case studies
Studies published in high quality, impactful journals	Grey literature (e.g., reports, newsletters, conference proceedings)
Relevant review papers (e.g., systematic reviews, meta-analyses)	Studies with no relevance to veteran and military populations
Exceptional commentary pieces	
Papers drawn from other populations where findings are relevant to a veteran/military population	

Table 2. Number of abstracts yielded from search and papers selected for annual summary

Topic	Abstracts yielded	Papers included
Prevalence of PTSD and traumatic stress reactions	53	17
Vulnerability and protective factors	38	13
Injury, pain and PTSD	82	15
Physical health, older veterans and mortality	97	14
Traumatic brain injury and neuro-rehabilitation	101	14
Veterans and gambling	17	8
Veterans and suicide	98	15
Veterans and gender	118	13
Traditional treatments for traumatic stress	453	24
Complementary treatments for traumatic stress	22	8
Psychosocial rehabilitation	119	7
Utilisation and barriers to care	28	10
Total^a	1226	158

Note: ^aThe total number of abstracts and papers reported here exceeds the actual number of articles yielded due to duplications across topics.



Literature review

Prevalence of PTSD and traumatic stress reactions

Prevalence of PTSD and other common disorders

Many papers that report prevalence rates of PTSD and other disorders among military and veteran personnel rely on self-report measures. One notable study using more reliable gold standard diagnostic interviews, assessed prevalence, comorbidity and functioning in US National Guard troops deployed to Iraq mainly in combat or patrol roles (n=348)². The majority (62%) of soldiers did not experience mental health problems. The overall prevalence rates at six months post-deployment however were higher than those reported in epidemiological studies with community populations and non-OIF deployed military samples. A rate of 23% for a single diagnosis was found, while 10% were diagnosed with two disorders. Depressive disorders were most commonly diagnosed at 15%, other anxiety disorders at 13%, and alcohol use disorders at 13%. Among those with PTSD (7%), the mean number of diagnoses was 1.74. When sub-threshold PTSD was considered, this rate increased to 15%. Eighty-seven per cent of those with PTSD had at least one additional diagnosis, mostly depression. Women were diagnosed at twice the rate of men. These findings are in keeping with what is seen in epidemiological studies in the military as well as general populations. The overall rate of mental health disorders among female soldiers is substantially higher than in females in the general population². As these authors noted, this data could reflect a shift in the roles and outcomes of deployed female soldiers, the impact of combat deployments on female soldiers' mental health will therefore be an important area of future study².

Two collaborative prospective studies were reported in 2011 examining two cohorts of active duty and reserve/national guard personnel – the Kings Cohort (UK) and the Millennium Cohort (US)³. In previously published prevalence rates by the Kings group, common mental health disorder occurred at a rate of 20% with alcohol misuse at 13%. PTSD prevalence was 4% overall. By contrast, the Millennium group found prevalence rates for depression at 3.2%, panic at 1%, other anxiety disorders at 2%, and alcohol at 12.6%. PTSD prevalence was reported at 2.4%. The total for any disorder including PTSD was 18.3%. In 2011, these authors reported on the collaboration between these research groups to strengthen their ability to provide estimates of true health effects of military service and comparisons of contrasting military cohorts over time³. Contrary to expectation, the use of self-report measures produced lower prevalence rates than those described in the US study using gold standard interviews with National Guards. This difference might be accounted for by differing methodologies, and National Guards being



a higher risk group. They do, nonetheless, underscore the importance of gold standard interviews as a means of clinical and diagnostic assessment.

Since 2001, 1,347,731 active component US military members were deployed in support of OEF/OIF⁴. One paper documented the proportion of deployers who received mental health diagnoses within one year of returning from their first to fifth OEF/OIF/OND deployment⁴. Gender, age, military occupation and 'dwell times' (period leading up to the next deployment) before repeat deployment were also examined. Across these subgroups, larger percentages of personnel were diagnosed with PTSD or anxiety related disorders after their second and/or third deployments (as opposed to first deployment). Percentages of PTSD were lower after fourth and fifth deployments. Personnel deployed in medical care occupations had higher PTSD rates compared with other occupations, with increases from first to third deployments. This suggests that personnel deployed in health care roles are at more risk for the cumulative psychological effects associated with multiple deployments. Larger percentages of those deployed were diagnosed with drug/alcohol problems after their first, than repeat, deployments. Longer 'dwell times' prior to deployments also corresponded with larger percentages diagnosed with conditions after deployment. For this unexpected finding, the authors proposed that the greater the duration away from combat, the more difficult it is to transition back to combat. Additionally, there may be an unmeasured variable that is related to both increased dwell time and increased risk for mental health disorders, such as physical or psychological conditions.

In a cohort study of Sri Lankan Special Forces (n=259) versus regular navy force troops (n=412), it was found that trauma exposure was common in both groups, with Special Forces experiencing more traumatic events. They had less common mental health disorders however, alongside less fatigue and poor health. Hazardous drinking was the most common mental health disorder among the Special Forces (17%). Prevalence of PTSD was 1.9%, compared to 2.9% in the regular forces. These findings suggest elite troops suffer less negative mental health consequences despite their higher combat exposure. Comradeship and unit cohesion were associated with these better health outcomes in the Special Forces⁵.

Delayed onset PTSD is usually thought of as occurring when subsyndromal PTSD symptoms fluctuate across the diagnostic threshold. To test this assumption, a study using cross-sectional data from a survey of 8,441 Canadian Forces⁶ examined the rate of delayed onset PTSD using a definition of delayed onset as not having any symptoms of PTSD post-deployment and then having PTSD six months later.) They found a 1% prevalence rate of delayed onset PTSD. Delayed onset cases constituted about 8.5% of all PTSD cases. Serving as land troops, experiencing early childhood trauma and



repeated trauma were associated with delayed onset PTSD. These findings add weight to the argument that delayed onset PTSD can occur in the absence of any subsyndromal PTSD symptoms. Notable limitations of this study however were the cross sectional design and the reliance on retrospective recall of participants.

Two studies investigated prevalence of PTSD in older veterans^{7,8}. A US study assessed PTSD and associated health characteristics in 17,205 older veterans (aged 65 or older). PTSD (12%) was associated with poor health and this is consistent with previous reports that show posttraumatic stress symptoms in older adults are not a time limited phenomenon but can be present decades after a traumatic experience⁷. In contrast, a UK study compared 484 male national service veterans (conscripted) to 301 male non-veterans, all aged 65 or over. No differences were found between these groups on physical, behavioural and mental outcomes, except that veterans were less likely to have any disorder than non-veterans⁸. These findings echo previous studies that show lower prevalence rates generally among UK veterans than US veterans. Indeed, in an editorial commentary in the Special Issue of International Review of Psychiatry, titled, "Military and its Psychiatric Challenges", Jones⁹ reported that while it is difficult to compare rates across nations, a consistent finding over the past 20 years is that reported PTSD tends to be higher in US personnel and veterans compared with other western nations. Jones cites prevalence studies that attest to these different rates among US and UK veterans and offers explanations for these differences which include: US personnel are younger and of lower socio-economic status, US troops undertake longer tours of duty, greater number of deployed reservists in the US, differences in health care and benefits delivered, and higher receptiveness to psychological disorder in the US, whereas in the UK, stigma remains evident⁹.

Depression prevalence among men with a history of military service¹⁰ was examined using the Behaviour Risk Factor Surveillance System database (largest national telephone health survey in US) (n=24, 892). Somewhat surprisingly, the prevalence of lifetime and current depression was similar in men with and without a history of military service. A current depression rate for males with a service history was 13.47%, whereas men without a military service history reported 13.05% prevalence.

PTSD and comorbid disorders

The comorbidity and prevalence of PTSD with other anxiety disorders was examined in respective studies in 2011^{11,12}. The first assessed 884 veterans recruited from VA Medical Centers in the US and found an 8.3% prevalence of panic disorder (PD)¹¹. Four and a half percent of the sample had comorbid PD and PTSD. The second study investigated the prevalence of posttraumatic obsessions in a sample of combat and terror related PTSD patients¹². Forty-one percent of this sample had PTSD and comorbid



post-trauma obsessive compulsive disorder. Interestingly, onset of obsessive compulsive disorder symptoms occurred after PTSD onset, raising questions about mechanisms underlying posttraumatic obsessive compulsive disorder. Despite the inclusion of consecutive referrals, the small sample size (n=44) of this latter study limits any major conclusions about the PTSD-obsessive compulsive disorder relationship, and suggests further research is required.

The issue of substance abuse among veterans was investigated in a large scale project using VA data from 1,001,996 US veterans¹³. A 21-35% comorbid substance diagnosis among VA patients with major mental health problems was found. Veterans who served in the post-Vietnam era (1973-1991) had highest comorbidity, compared with Gulf War and OEF/OIF veterans (1991-present). The study found that veterans with a major disorder other than PTSD (e.g., affective, anxiety), were more likely to be dually diagnosed in comparison to veterans with PTSD. Post-Vietnam veterans were also more likely to be dually diagnosed. Within the OEF/OIF group, bipolar disorder and schizophrenia were most associated with a dual diagnosis. Although this study did rely on administrative data, it confirmed the high incidence of substance use disorders among veterans with mental illness.

Substance and alcohol misuse prevalence

In a prevalence study using VA administrative data (US) from OEF and OIF (n=456,502), 11% were diagnosed with a substance use disorder, alcohol disorder or both, while 10% received a diagnosis of an alcohol disorder, 5% a drug use disorder and 3% received both. Younger males, non-married status, army/marine status, and greater combat exposure were independently associated with either disorder. Among those with at least one alcohol or substance disorder, 55-75% also received a PTSD diagnosis. Alcohol or substance use disorder was up to 4.5 times more likely in veterans with comorbid PTSD or depression. Although comorbidity rates are higher than in previous studies reviewed¹³, this is likely to be due to sample differences, such as the current study which investigated a treatment sample¹⁴.

Two other papers also incorporated mental health service utilisation into their studies on dual diagnosis^{15,16}. The first determined the current prevalence of major psychiatric, substance use disorders and comorbidity in an sample of aging veterans treated in VA (US) special mental health programs (n= 911,725)¹⁶. Using registry data as the data source, prevalence of psychiatric and substance disorders decreased with age. Across psychiatric disorders, comorbid substance abuse decreased with age; and those with comorbidity utilised more outpatient services. The second study investigated alcohol use in 585 US National Guards¹⁵. Using self-report data, 36% met criteria for alcohol misuse. Of these, only a third received mental health treatment, and only 2.5% reported specific



substance use treatment. Stigma related concerns alongside practical barriers were cited by members as barriers to receiving treatment. These findings speak to the issue of increasing alcohol misuse, and accordingly lower rates of substance use treatment among National Guard OEF/OIF service members. Lastly, in a large prevalence study of nicotine dependence in VA (US) service users (n=749, 353), a 15% prevalence was found¹⁷. Veterans from OEF/OIF were not found to be at increased risk of nicotine dependence compared to veterans from other war eras.

Other studies

The majority of large prevalence studies in military and veteran traumatic stress rely on administrative data, medical reports and self-report instruments to measure psychopathology. One paper systematically reviewed the scope and quality of self-report instruments for PTSD¹⁸. The authors reported their work in developing a computer adapted item bank for high quality PTSD instruments that might reduce the burden of assessment for researchers and clinicians in the field of traumatic stress¹⁸. This endeavour might also improve the rigour and standards by which self-report measurements are used across the field.



ADF Mental Health Prevalence and Wellbeing Study – Key findings

22% of the ADF population (11,016), one in five, experienced a mental disorder in the previous 12 months.

Approximately 6.8% (760) of this number experienced more than one mental disorder at the same time.

Anxiety disorders are the most common disorder type in the ADF (12.6%), with higher prevalence among females.

PTSD is the most prevalent anxiety disorder (8.3%), with highest rates among ADF males.

ADF males experience higher rates of affective disorders (9.4%) than the Australian community sample. This is mostly accounted for by the experience of depressive episodes (6%).

Alcohol disorder was significantly lower in the ADF (5.2%) compared with the Australian community sample, with most of the disorder in males in the 18-27 age group.

Younger ADF females (aged 18-27) have much lower rates of alcohol disorder than their community counterparts.

There was no significant difference in rates of alcohol dependence disorder between Navy, Army and Air Force.

Navy and Army were significantly more likely than Air Force to experience alcohol harmful use disorder.

* The reported findings among ADF personnel are similar to those described in US and UK samples. Though it is noted that there is a high degree of variation in sample characteristics across military and veteran cohorts.

Vulnerability and protective factors

Risk factors

Risk factors for PTSD and other psychopathology in military/veteran populations are well established. These include exposure to traumatic events, childhood trauma, prior mental illness, neuroticism, pre-deployment exposure to violence, worries about family and civilian life while deployed, multiple deployment, subsequent life stressors, lack of social support, combat stress, and rank¹⁹. More recent prospective studies with troops deployed to OEF/OIF suggest that new-onset PTSD is associated with female gender, younger age, enlisted (non-rank), National Guard status, and pre-deployment reported PTSD or physical symptoms.



In one study examining factors implicated in higher rates of psychological disorder, National Guard soldiers were found to experience more psychological problems 12 months post deployment than active component soldiers²⁰. This study also confirmed financial hardship and unemployment as independent correlates of PTSD and depression. Consistent with previous literature, National Guard soldiers who perceived lack of support from employers were more likely to be depressed three and 12 months post-deployment. Although this study did not assess pre-deployment mental health status and other risk factors to PTSD and depression, it does highlight the unique concerns for National Guard soldiers (and potentially other reservist populations).

The impact of disgust was examined by one study examining risk factors²¹. This study found greater peri-traumatic disgust and fear levels were independently predictive of PTSD symptom severity at six months following deployment to Afghanistan (n =138). In a first study to examine the aetiology of antisocial behaviours in a random sample of UK armed forces, MacManus and colleagues demonstrated that pre-enlistment antisocial behaviour was associated with severe alcohol use, violence/aggression and risk taking among personnel²². Another study linked pre-existing mental conditions with in-theater mental health problems in a sample of US marine, army, navy and airforce personnel (n=1078)²³. The authors found that 29% (n=308) of personnel who received mental health services in Iraq had a prior mental health diagnosis. Recurrence of previously diagnosed disorders (i.e., attention deficit and hyperactivity disorder (ADHD) and PTSD) was high. A prior diagnosis, however, was not associated with diminished functional competence. Over 50% of personnel with a pre-deployment diagnosis received the diagnosis in the nine months before their mental health service encounter in Iraq.

One prospective study advanced the literature in aetiologic factors related to combat-related PTSD in National Guard troops deployed to Iraq (n=522)¹⁹. It found that new onset PTSD was predicted by combat exposure and combat exposure aftermath (such as handling human remains), and stressful life events after deployment. Social support following deployment was protective. Although combat cannot be avoided, interventions focused on enhancing a sense of preparedness, bolstering social support and building capacity to face adversity, may help reduce new cases of PTSD.

The relationship between killing and post-deployment PTSD, depression and alcohol use in 317 Gulf War veterans was examined by Maguen and colleagues. Even after controlling for variables such as perceived danger, exposure to death and witnessing killing, taking a life was found to directly predict frequency of alcohol use, alcohol problems and posttraumatic stress symptoms²⁴. The particular impact of witnessing a unit member or ally being seriously wounded or killed was also found to be strongly associated with PTSD in another study with National Guard (reservist) OEF/OIF



veterans²⁵. This latter study also found combat-related friendly fire increased the likelihood of PTSD.

Vogt and colleagues found a range of direct and indirect relationships between risk factors and posttraumatic stress symptoms. The study comprising 579 US OEF/OIF personnel identified that many risks originated from pre-deployment experiences. These findings underscore intervention efforts to bolster pre-deployment resources for those at highest risk because of pre-existing factors (e.g., trauma histories, troubled family background)²⁶.

Protective factors

Of protective factors, the 2011 literature illustrated positive family environment, unit cohesion and support, commissioned officer status, military preparedness, and greater social support following deployment, as factors mitigating against PTSD¹⁹. In one study, dispositional optimism was also found to buffer the impact of combat stress on PTSD and depression in US active duty brigade teams following deployment to Iraq (n=2439)²⁷. This highlights the utility of optimism as a cognitive resource to those exposed to trauma.

To examine determinants of resilience, one study used statistical techniques (cluster analysis) to describe three distinct populations among OEF/OIF National Guard veterans²⁸: (1) Controls (low combat exposure, low PTSD symptoms); (2) PTSD (high combat exposure, high PTSD symptoms); and (3) Resilient soldiers (high combat exposure, low PTSD symptoms). Compared to the PTSD group, the Resilient group was more likely to be in a relationship and in active duty, have fewer psychosocial difficulties, a greater perception of purpose/control, and high family support. This study suggested that resilience could be improved by enhancing perceptions of purpose and control, and bolstering family support and understanding.

Resilience

To assist in the measurement of resilience within the military, Johnson and colleagues validated a 22-item scale measuring individual differences in cognitive, emotional, and behavioural responses to stressful life experiences in a large military sample (n=1014). The factor analysis indicated that the underlying structure was best represented by five factors, including, meaning-making and restoration, active coping, cognitive flexibility, spirituality and self-efficacy. These findings documented an inverse association between resilience and mental health disorders.

Whereas traditional approaches such as screening and enhanced mental health services are focussed on treatment rather than prevention, Cornum and colleagues²⁹ developed the Comprehensive Fitness Program for the US military which is a proactive population



based prevention strategy aimed at mitigating PTSD and other combat-related disorders. Modelled after the US Army's physical fitness approach, the Comprehensive Fitness Program is a universal program aimed at increasing resilience in soldiers and their families. Program elements include assessment of emotional, social, spiritual and family fitness, individual learning modules across these domains, formal resilience training, and the training of resilience masters to guide resilience in subordinate soldiers. In 2011, there were some descriptive papers attesting to the utility of the Comprehensive Fitness Program, but to date this program requires more empirical support to clearly demonstrate its efficacy in preventing mental health problems. Hourani and colleagues³⁰ comprehensively reviewed the approaches that aimed to target primary prevention of PTSD in the military (i.e., those interventions that target the whole population of military personnel). They found that approaches that utilised inoculation via simulated exposure to traumatic events (e.g., role plays), particularly when utilised with education and stress reduction training, were most promising.

Despite the emergence of positive psychology and resilience programs, in a commentary published in the Special Issue on military mental health published in the International Journal of Psychiatry, Creamer and colleagues stated there is, at this point, no evidence to support the effectiveness of primary prevention interventions (that target the whole population of military personnel) to prevent combat-related PTSD³¹.

ADF Mental Health Prevalence and Wellbeing Study – Key findings

43% of ADF members reported multiple deployments, 19% only one, and 39% had never been deployed.

Those with deployment experience were 10% more likely to seek care for mental health or family problems.

Deployed personnel did not report greater rates of mental disorder than those who had not been deployed*.

*** This final point is inconsistent with the literature reported from the previous year in UK and US samples. This might reflect the varying degrees of combat exposure in deployments between Australian, US and UK personnel.**



Injury, pain and PTSD

Pain and PTSD comorbidity

A study evaluating treatment of comorbid pain and PTSD³² noted that pain-related disorders were more than three times as common as psychological disorders in military settings, with the prevalence expected to worsen in the next 10 years. Comorbid PTSD, pain and traumatic brain injury was found in over 40% of individuals sustaining combat-related injuries³³. Supporting this finding, is a review of research into the complicating factors associated with a mild traumatic brain injury which identified that studies consistently observe high co-prevalence rates among pain, PTSD and mild traumatic brain injury³⁴.

A limitation of the literature reporting comorbidities between pain and PTSD is the failure to indicate whether the two conditions result from the same or different incidents³⁵. A review of studies since 2002 into comorbid PTSD and pain observed that early pain was a strong predictor of chronic PTSD, while early symptoms of PTSD increase the risk of development of chronic pain³⁵. A study by Paltsev and colleagues³⁶ identified chronic headaches and lower spinal pain as most commonly comorbid with anxiety, depression and sleep disorders. Whereas comparatively chronic neck pain, chest pain, abdominal pain and limb pain were less predictive of psychological disorders.

Cognitive factors in experience of pain and associated psychopathology

Beck and Clapp³⁵ identified that factors in the experience of pain and related mental health disorders include attention and reasoning biases along with avoidance behaviour. The maladaptive use of avoidance was identified as a problematic behaviour in a Korean civilian study in persons with chronic pain³⁷. The study observed that elevated pain was a reminder of trauma which triggered hyperarousal symptoms of PTSD with the subsequent use of avoidant strategies to minimise the pain potentially contributing to the maintenance of both pathologies. Similarly, in a sample of 194 veterans suffering chronic pain, Alschuler and Otis³⁸ found catastrophising (exaggerated negative expectations) and diminished beliefs about capacity to control pain were associated with comorbid PTSD.

Neurological studies

A functional magnetic resonance imaging (fMRI) study by Mickleborough and colleagues³⁹ of 17 individuals with PTSD and 26 healthy trauma-exposed controls, observed activation regions previously implicated in stress-induced analgesia.



Correspondingly, veterans with PTSD displayed a stronger analgesic response to traumatic reminders than veterans without PTSD, which was mediated by pain-related neural regions⁴⁰. Likewise, a meta-analysis of eight neuroimaging studies identified regions associated with the cognitive processes of pain monitoring and discrimination as being implicated in the development of PTSD⁴¹. These findings support the understanding of the relationship between pain and PTSD as via shared cognitive factors.

Treatment

A randomised controlled study (n=66) found the Functional and Occupational Rehabilitation Treatment Program significantly improved functioning in active military personnel with chronic pain⁴². This intervention involves an interdisciplinary team approach consisting of three major components: physical therapy, occupational therapy, and psychosocial intervention, which is guided by a supervising nurse and physician team. McGeary³² and colleagues describe a treatment approach for polytrauma (comorbid chronic pain, PTSD and traumatic brain injury) known as the STRONGSTAR initiative, which integrates exposure aspects of PTSD treatment into a pain treatment protocol; it is currently being assessed in a randomised controlled study. Positive findings may provide a new direction for polytrauma therapy.

Other studies of note

In a Croatian war veterans sample, the impact on quality of life of PTSD and lower back pain was assessed. Quality of life was reduced by 9.9% in patients with lower back pain, by 26.6% in patients with PTSD, and by 37.1% in patients with PTSD and lower back pain⁴³. The results indicate the cumulative effects of lower back pain and PTSD in diminishing quality of life. In another study, a similar step-wise relationship was found with subjective pain severity scores being highest in persons with PTSD, then lower in persons with trauma exposure but no PTSD, and lowest in a non-trauma control group⁴⁴. Additionally, studies have identified the misuse of medication for chronic pain management as being problematic in veteran groups⁴⁵.

Physical health, older veterans and mortality

The role of deployment and combat in health

A 10 year longitudinal study following 5469 deployed and 3353 non-deployed Gulf War-era US veterans was completed by Li, Mahan, Kang, Eisen, and Engel⁴⁶. Deployed veterans were more likely to report repeated hospitalisations, functional impairment, frequent clinic visits, and new health problems, including chronic diseases. The study



concluded that the overall health of deployed veterans worsened over time in comparison with non-deployed veterans. Conflictingly, a study of UK male veterans and non-veterans over the age of 65 found no difference in mental, physical or behavioural outcomes, with the exception that veterans were less likely to have 'any mental disorder'⁸. However, this study did not control for the specific role of deployment and combat.

In a study of over 70,000 US military personnel, those who were deployed and experienced combat were found to have higher odds of developing a new headache disorder than military personnel not deployed, whereas personnel deployed without combat exposure were not found to be at the same risk⁴⁷.

Psychopathology and health factors

In a study of 90,558 OEF/OIF US male and female veterans, the number of medical health conditions was greater in those with PTSD than those without PTSD⁴⁸. Along with the large sample, a strength of the study was the identification of specific illnesses that are more prevalent in the PTSD group. These include, but are not limited to: infectious disease, obesity, neurologic, circulatory, respiratory, digestive, and musculoskeletal diseases. Similarly, an association was found between PTSD and cardiovascular illness in a sample of 637 Australian Gulf War veterans⁴⁹, while veterans with a history of PTSD were at a lifetime increased risk for hypertension⁵⁰. Additionally, in a study of veterans, PTSD was found to be a predictor of the existence and the extent of coronary artery disease, with the PTSD group also recording higher rates of mortality⁵¹.

In a survey of 754 OEF/OIF US veterans, nearly 50% reported post-deployment injury, with PTSD, depression and anger problems identified as specific risk factors⁵². Additionally, after controlling for a variety of risk factors, generalised anxiety disorder was associated with poorer lung functioning in a sample of 4256 males used in the Vietnam Experience Study⁵³. These studies would benefit from comparisons with non-deployed personnel to help understand the specific role of deployment in the observations described.

In contrast, a study of 28,300 Royal Norwegian Navy servicemen found mortality rates were lower than expected for all causes combined, including most disease groups and violent causes, but not for cancer⁵⁴. The small excess in incidence of cancers was from prostate and skin cancers. These authors attributed the findings of overall lower mortality rates to the 'healthy soldier effect'. However this may reflect the health checks completed before accepting persons into military service. To control for this confound, one study⁵⁵ compared personnel with active-duty records against those who did not see active duty, or non-veterans who passed the necessary physical exams. After controlling



for confounds, the active duty personnel generated lower self-reported measures of health, thus raising doubts regarding the proposed 'healthy soldier effect'.

Older adults

An interesting study observed that in veterans over 90 years of age, 60% of men and 47% of women abstained from alcohol use⁵⁶. Amongst males, no difference was observed in psychological or physical health across alcohol consumption categories. The study concluded the association between health status and drinking observed in younger males may not be present in very old aged adults.

A novel study assessed whether receiving a Purple Heart or having PTSD effected mortality in older veterans⁵⁷. Older veterans with a Purple Heart, regardless of PTSD status, had lower mortality rates than veterans without a Purple Heart or PTSD. However, veterans without a Purple Heart who had PTSD had higher mortality rates than those without a Purple Heart or PTSD.

Polypharmacy leading to adverse drug reactions was identified in one study as a specific risk leading to unplanned hospitalisations in older veterans⁵⁸.

Traumatic brain injury and neuro-rehabilitation

Systematic reviews

Carlson and colleagues⁵⁹ completed a systematic review of traumatic brain injury and PTSD, diagnostic accuracy and treatment effectiveness. The review included three large US military studies not previously published in a systematic review. The majority of studies reported that 20% or less of persons with traumatic brain injury had comorbid PTSD. The three large military studies reported comorbid traumatic brain injury and PTSD between 5-7%. Amongst cases with traumatic brain injury, presence of PTSD ranged from 32-66% when trauma was military-related and 14-56% when trauma was non-military related. When traumatic brain injury was contained to 'mild' injuries, the three large US military studies observed PTSD in 33-39% of those injured. Non-military studies observed that between 12-27% of those experiencing mild traumatic brain injury met diagnostic criteria for PTSD. The dearth of studies which assessed diagnostic accuracy or treatment effectiveness was identified as limiting the capacity for evidence-based care with the veteran/military population.

The Carlson systematic review also found that while no studies assessed the effectiveness of PTSD treatment in mild traumatic brain injury groups, they identified one randomised controlled study that measured efficacy of cognitive behavioural therapy in



treating acute stress disorder. The study concluded that cognitive behavioural therapy was effective in reducing symptoms and preventing onset of PTSD in persons with comorbid mild traumatic brain injury and acute stress disorder. The authors of the systematic review highlighted that future research needs to include longitudinal studies, studies assessing the accuracy of PTSD diagnosis in traumatic brain injury populations, and randomised controlled trials on the effectiveness of PTSD treatment in mild traumatic brain injury populations.

PTSD / Traumatic brain injury / Postconcussive syndrome

Understanding the relationship between postconcussive syndrome (a disorder whereby usually transient brain injury symptoms persist) and traumatic brain injury is complicated by the diagnostic overlap between postconcussive syndrome with PTSD and depression^{34,60}. Furthermore, research has found postconcussive syndrome often occurs in persons with non-brain traumatic injuries⁶¹. A factor analysis study using a sample of 213 OEF/OIF veterans identified the best fit model as one that defined the effects of traumatic brain injury on PTSD and depression as completely mediated by non-overlapping postconcussive symptoms. Many of the mental health disorders which develop after a traumatic brain injury can be explained by the presence of PTSD and postconcussive syndrome. Indeed, there is a high degree of association between PTSD and postconcussive syndrome. This implication is supported by other research using military populations^{62,63}.

Interestingly, studies have observed rates of self-reported traumatic brain injury increase from 9.2% just prior to returning from combat to 22.0% one year post combat⁶³. Current levels of distress were proposed as mechanisms leading to the increase, along with the potential for secondary gain. Other studies have suggested personnel underreport their traumatic brain injury symptoms to protect against being removed from the battlefield⁶⁴.

Blasts versus non-blasts

A comparison of the neuropsychological and psychiatric consequences of a blast-related traumatic brain injury with a non-blast related traumatic brain injury found the primary difference was higher rates of reported current headaches in the non-blast group⁶⁵. A similar study found more severe hearing difficulties in the blast group⁶⁶. There was no difference between the groups on measures of PTSD and postconcussive syndrome. Assuming replicability of these findings, research is necessary to understand the mechanisms that find less severe hearing difficulties are associated with increased risk for headaches.



Headaches

In a cross-sectional study of over 77,000 US military personnel, those deployed for combat had higher ratios for a new headache disorder compared with persons not deployed (ratio for men =1.72, for women =1.84)⁴⁷. The study also found PTSD and mood disorder symptoms were significantly associated with new-onset headache disorders.

Unfortunately, the study did not employ these measures of PTSD and mood disorders to control for psychological symptoms of distress which would allow a better understanding of the relationship between deployment and headache disorders.

Hoge and colleagues⁶⁷ found headache was the only symptom significantly associated with concussion in 2,525 US infantry soldiers returning from deployment to Iraq, after controlling for PTSD and depression. Studies have found 98% of 973 returning soldiers with deployment-related concussion reported ongoing headaches⁶⁸.

Treatment and traumatic brain injury

In 2011, a single group design study was published which examined the usefulness of cognitive processing therapy in treating PTSD in veterans with a history of traumatic brain injury (n=42). It found that PTSD scores declined significantly from pre- to post-test, suggesting that larger, well controlled studies should be conducted⁶⁹. A residential PTSD/traumatic brain injury treatment program successfully decreased PTSD and postconcussive symptoms in a sample of 28 male veterans⁷⁰. The study observed an association between reduction in PTSD and postconcussive symptoms.

Veterans and problem gambling

Epidemiology

The percentage of veterans in specialty mental health programs with pathological gambling (PG) was 0.2%⁷¹. This is significantly lower than community prevalence rates and rates in other treatment samples, which may indicate under-diagnosing or a low income sample. Risk factors found for pathological gambling included, being female, aged 40-47, higher income, and past year homelessness. Additionally, the following disorders were associated with pathological gambling diagnosis: alcohol use, bipolar, depression, schizophrenia, anxiety (but not PTSD), and personality disorders.

Similar psychological disorders were also reported as being more prevalent in pathological gamblers when compared with non-gamblers in a review by Hodgins, Stea, Grant⁷². After illicit drug use, pathological gambling was the strongest predictor of homelessness amongst a sample of VA mental health service users⁷³.



Treatment

One study⁷⁴ found females seeking treatment for pathological gambling were more anxious, had lower self-esteem and more depressive symptoms than males seeking treatment. Additionally, 68.6% of females were victims of intimate partner violence. Males were more impulsive, more affected by substance use, and higher sensation seekers than females. No gender differences were observed regarding motivations for treatment.

Pharmacological treatments for pathological gambling

A critical review of pharmacological treatments for pathological gambling found in the absence of comorbid psychological disorders that the data failed to support the use of antidepressants, mood stabilisers and antipsychotic agents⁶⁶. The review noted that preliminary studies of medications which act on the glutaminergic system have promising results and are recommended for further research.

Psychological treatments for pathological gambling

In a review of pathological gambling research, Hodgins, Stea, and Grant⁷² noted that the combination of motivational interviewing with cognitive behavioural therapy using web-based and telephone modalities for aspects of therapy has positive outcomes. An important caveat for these conclusions is the lack of replication and the studies not being randomised controlled trials. Hodgins and colleagues report a prior meta-analysis observed that psychological treatments for pathological gambling were more effective than no treatment. However, again, none were controlled studies.

A separate study⁷⁵ compared a twelve-step facilitated group therapy (n=11) with a mapping enhanced cognitive behavioural therapy (n=18) for pathological gambling in a controlled study. They found that compared to a waiting list group (n=9), both treatment protocols resulted in significant improvements on measures of self-control, desire to gamble and gambling frequency. There was no significant difference between the treatment protocols on measures. The interpretations are tempered by small sample sizes.

Other treatments for pathological gambling

Steinberg and colleagues⁷⁶ found that uncontrolled noise stimulus decreased desire for gambling in males with comorbid alcohol use disorder and pathological gambling. The authors conclude that an intervention such as aerobic exercise that increases physiological arousal may diminish motivation to gamble in these persons. Whilst the



sample size was small, the study was well designed and would benefit from replication with various stimuli that may be therapeutically administered.

Veterans and suicide

Risk and protective factors for suicide

Several papers maintained that suicide rates in military populations are now greater than civilian populations and that rates within the military are increasing^{24,77-82}. They identified that the demands associated with OEF/OIF conflicts create additional challenges for suicide prevention and intervention⁸³⁻⁸⁵.

In their literature review, Jukapak and colleagues⁸³ identified known risk factors for suicide in veterans to include: prior attempt(s), combat exposure, multiple trauma exposure, having access to firearms, financial strain, physical and mental disorder (particularly PTSD and depression and PTSD comorbidity), substance use problems, homelessness, poor social support, and OEF/OIF veterans with PTSD. Marital status, greater education and income, employment, and community cohesiveness were reviewed as protective⁸³.

Recent empirical studies elaborated further on these risk factors. For example, Maguen and colleagues²⁴ found a suicidal ideation rate of 2.8% in 2,854 US army personnel recently returned from OIF. Suicidal ideation was associated with prior suicide attempt(s), prior psychiatric medication, and killing in combat, with the latter exerting a mediating effect through depression and PTSD symptoms. Post-deployment depression was associated with greater suicidal ideation risk, while PTSD was associated with greater desire for self-harm. Guerra and colleagues⁸⁶ study of 393 OIF veterans found that suicide attempts were uniquely associated with PTSD, depression and prior attempts. The emotional numbing and cognitive-affective clusters of PTSD were uniquely associated with suicidal ideation. Comorbidity between depression and alcohol use disorder did not increase endorsements for suicide ideations. Pietrzak and colleagues⁷⁹ also found numbing and dysphoria symptoms of PTSD were independently related to suicidal ideation. In this study of treatment seeking veterans (n=167), suicide ideation was high at 21% and was associated with older age, positive screen for depression and PTSD, more deployment-related pain, worries, higher self-punishment ideas, and higher avoidance strategies⁷⁹.

In a large OEF/OIF sample (n=1740) utilising mental health screens, Lemaire and Graham reported a 6.5% prevalence rate of suicidal ideation. Risk factors included previous abuse, prior attempts, being female, psychotic disorder, PTSD, depressive disorder, family concerns, deployment environment, deployment concerns, and post-



deployment stressors. Comorbid PTSD and depression elevated the risk more than either alone. The PTSD avoidance cluster again predicted more risk for suicide ideation⁸⁷.

Of protective factors, social support is consistently found to decrease vulnerability to suicide. Using statistical modelling techniques on data collected from 5,155 active Canadian regular, and 3,286 reserve forces, Nelson and colleagues⁷⁸ found a lack of social support and lifetime trauma experiences (including combat exposure) were associated with recent diagnoses of depression, PTSD and suicide ideation. Being diagnosed with PTSD or depression increased likelihood for suicide ideation. Depression (but not PTSD) mediated the relationship between traumatic events and suicide. These findings indicate a significant role for social support both pre- and post-deployment, as well as comprehensive post-deployment screening and early intervention.

Two studies looked at the relationship between posttraumatic growth and suicide ideation^{88,89}. The first, by Bush and colleagues, examined electronic health records of 5,302 mostly US army personnel who had been deployed to a combat zone. The second study, also using US army soldiers (n=1,834), looked at combat experiences, posttraumatic growth and suicidal ideation. Higher combat experience was associated with posttraumatic growth whereas recent suicidal ideation was associated with lower levels of posttraumatic growth. Thus, an inverse relationship exists between suicidal ideation and posttraumatic growth resulting from deployment, and service members with deployment/combat related posttraumatic growth are more 'suicide-resilient'.

Suicide screening, prevention and intervention

Warner and colleagues⁹⁰ reported on the first study to determine whether pre-deployment screening using new US Department of Defense criteria effectively decreased negative outcomes for Iraq deployed soldiers. This study focussed on pre-deployment psychiatric diagnoses, severity and risks, and treatment needs, to improve mental health care for soldiers by linking them to ongoing treatment during deployment. Six active duty brigades (n=10,678) were given pre-deployment screens in their standard readiness evaluations. At six months, pre-deployment screening was associated with lower rates of mental health evacuations, suicidal ideation, combat operational stress reactions and occupational impairment. It was also associated with increased coordination of mental health support during deployment and decreased need for clinical care for combat stress, psychiatric and behavioural disorders, and suicidal ideation⁹⁰.



ADF Mental Health Prevalence and Wellbeing Study – Key findings

ADF personnel reported thinking of committing suicide and making a suicide plan at a higher rate than the Australian community sample.

The number of suicide attempts is not significantly greater than in the general community.

The number of reported deaths by suicide in the ADF is lower than in the general community.

***The latter two points are inconsistent with the reviewed literature, which is finding higher rates of suicidal behaviour in military and veterans compared with civilians in US and UK studies. This may be due to differences in the nature of OEF/OIF deployments, such as duration of deployment, multiple deployments, and levels of combat exposure. It may also reflect ADF and DVA policies in relation to suicide prevention and intervention.**

Veterans and gender

Systematic review

A systematic review of female veterans noted that from 2004-2008, more papers (195) were published covering female veterans' health than in the preceding 25 years⁹¹. Furthermore, amongst returning OEF/OIF female veterans, a high rate of PTSD symptoms (10%-19%) and other psychological disorders was found. The review noted the statistically positive relationship between military sexual traumas and PTSD, with associated negative health effects.

Suicidal behaviour

In a large study (n=2,348) of US OEF/OIF veterans, a positive association between combat exposure and suicidal ideation was observed for both males and females⁹². The study reported combat exposure was also positively associated with suicide attempts in female veterans (there were insufficient cases in the male sample to facilitate an analysis). Additionally, sexual harassment during deployment was associated with suicidal behaviour in both males and females.

Military sexual trauma

Hoyt and colleagues⁹³ completed a systematic review of sexual trauma amongst male service members and found, on average, military sexual trauma is reported by 0.09% of male service members each year (0.02% to 6.0%), and by 1.1% over the course of their



career (0.03% to 12.4%). Furthermore, in a study of 7,251 active OEF/OIF personnel, females reported greater exposure to military sexual trauma than males⁹⁴. This is reflected in a large study of more than 900,000 veterans in VA outpatient mental health care that found 35.8% of females compared with 2.4% of males reported military sexual trauma⁹⁵. A study of female Gulf War veterans found evidence that posttraumatic stress symptomatology may be an important explanatory variable between military sexual trauma and post-deployment physical health in females⁹⁶.

Mental health disorders

Studies into the relationship between gender and PTSD have produced indeterminate results in analyses utilising veteran samples. In a sample of OEF/OIF veterans who suffered a traumatic brain injury, females were less likely than males to have a PTSD diagnosis, whilst females were more likely to have a non-PTSD anxiety disorder or depression⁹⁷. The differences in rates between males and females may be accounted for by exposure to a blast during deployment. A structural equation modelling study found however, that risk factors for PTSD were predominantly similar in male and female OEF/OIF veterans²⁶.

Maguen, Luxton, Skopp, and Madden⁹⁴ found males were more likely to report problem drinking, with females more likely to report depressive symptoms, and no gender differences for PTSD symptoms. The reported greater exposure for males to high intensity combat may be an unaccounted-for mediating variable between gender and the reported findings. Finally, Skopp and colleagues⁹⁸ observed an overall increase in risk for post-deployment PTSD in females at 2.5 times the risk for males. Therefore, the studies reviewed into mental health disorders and gender have separately found that PTSD is more likely in males, PTSD is more likely in females, and that there is no gender difference in PTSD. The contradictory findings may reflect different measurement characteristics, different approaches to controlling for confounding variables, or different sample characteristics.

Healthcare utilisation

In a study of 163,812 OEF/OIF veterans, females were found to have more post-deployment visits to primary care and mental health clinics in addition to a higher use of community care⁹⁹. A related study¹⁰⁰ found that after adjusting for factors such as age, ethnicity, education and rank, inpatient costs were lower for females compared with males, while outpatient and pharmacy costs were higher.



Other important studies

There is concern that most combat exposure test instruments were developed and validated with female veterans substantially under-represented in the procedure¹⁰¹. The resultant gender bias creates additional uncertainty around interpretations from the test instruments for female personnel. This same primary author group in a separate study described a deployment cycle-specific suicide prevention program used during a US army division's Iraq deployment¹⁰². They argued a strong need to standardise deployed suicide prevention programs in order to enhance effectiveness across all points of the deployment cycle, but studies are required to test the efficacy of such programs.

Treatment outcome studies: Traditional therapies

Therapy review

One paper reviewed the general literature covering treatment of returning veterans with PTSD¹⁰³. The review concluded that prolonged exposure, cognitive processing therapy, and eye movement desensitisation and reprocessing (EMDR) have the most empirical support for their efficacy and utility with veterans. The more novel components of EMDR however, are highlighted as being limited in theoretical and empirical support. This study also noted that the package of techniques known as Stress Inoculation Training produced some promising results with male veterans and female sexual assault victims. However, more randomised controlled trials using a consistent compilation of available techniques in the package is required. The use of virtual reality techniques to facilitate exposure therapy was described as economically prohibitive with further research necessary to compare efficacy against traditional exposure techniques.

Cognitive behavioural therapy

Khoo and colleagues¹⁰⁴ assessed the 12 month outcomes of 496 Australian combat veterans with PTSD who participated in a six week group based cognitive behavioural therapy program. Sustained improvements were observed in measures of PTSD, depression, anxiety, anger, alcohol use, relationship satisfaction and quality of life.

In 2011, further empirical support was found for individual cognitive behavioural therapy in treating PTSD in veteran and other populations. A preliminary study which combined cognitive behavioural therapy with specific intervention for sleep difficulties was found to reduce both PTSD symptoms and insomnia severity in a veteran sample¹⁰⁵. Kar¹⁰⁶ reviewed the effectiveness of cognitive behavioural therapy in treating PTSD in a variety of populations and consequential to diverse traumatic events. The conclusion was that cognitive behavioural therapy is effective and safe for both acute and chronic PTSD from



childhood to adulthood and in a variety of cultures. A limitation of cognitive behavioural therapy observed in the studies reviewed was that non-responsive rates can be as high as 50%.

In an uncontrolled study¹⁰⁷, the efficacy of cognitive behavioural therapy in treating individuals with comorbid PTSD and depression was assessed. The manualised therapy program comprised behavioural activation skills initially, with exposure therapy and cognitive restructuring in later sessions. The program observed a decrease from pre- to mid-treatment assessments in PTSD and depression severity, with PTSD further decreasing from mid- to post-treatment assessments.

Behavioural activation is a quick and easy to administer component of cognitive behavioural therapy. In an uncontrolled study, veterans who completed a behavioural activation program were found to have a significant reduction in post treatment scores of anxiety and depression¹⁰⁸. The authors suggest that behavioural activation programs may be useful as a screening device to determine whether a person is ready to engage in the behavioural components of cognitive behavioural therapy¹⁰⁹.

Cognitive processing therapy

In 2011, an effectiveness study was published on individual cognitive processing therapy in veterans with PTSD treated in a residential rehabilitation program¹¹⁰. After controlling for symptom levels at intake, and cohort differences, cognitive processing therapy participants (n=103) showed greater PTSD symptom improvement over usual care participants (n=93). Significantly more participants in the cognitive processing therapy condition were classified as “recovered” or “improved” at discharge. This study demonstrated the feasibility and effectiveness of cognitive processing therapy as a treatment in VA settings.

Prolonged exposure

The efficacy of prolonged exposure for PTSD was further confirmed in 2011 in a randomised controlled study using combat or terror related chronic PTSD patients (n=30)¹¹¹. Significant reductions in PTSD, depression and anxiety symptoms were found in the prolonged exposure group relative to participants in a usual care control condition. These effects were maintained over time for the prolonged exposure group. Thus, prolonged exposure continues to be effective in chronic PTSD and depression symptoms. Another study also assessed the effectiveness of 65 patients treated for PTSD in a VA Medical Center using prolonged exposure¹¹². The findings suggest that prolonged exposure can be as effective in regular VA mental health care contexts as when carefully implemented in a randomised controlled trial.



The efficacy of exposure (including prolonged exposure) versus cognitive therapy in anxiety disorders was the subject of a meta-analysis and systematic review by Ougrin and colleagues¹¹³. Twenty randomised controlled trials were identified, comprising about 1,308 participants that directly compared the efficacy of cognitive therapy versus exposure in anxiety disorders. No significant differences were revealed in the relative efficacy of cognitive therapy versus exposure for PTSD, obsessive compulsive disorder or panic disorder. There was a difference favouring cognitive therapy for social phobia in short- and long-term outcomes.

Eye Movement Desensitisation Reprocessing

There was a small pilot study (n=18) examining the efficacy of Brief Eye Movement Desensitisation Reprocessing (EMDR) on survivors of a 7.2 earthquake in Mexico¹¹⁴. Survivors who scored highly on a self-report scale of posttraumatic stress symptoms were given a single-session of modified EMDR. One session of EMDR produced significant improvements in symptoms of posttraumatic stress for the intervention condition relative to a wait list/delayed condition. At 12-week follow-up, when both groups had received the EMDR treatment, no differences were observed between the groups and improvement in symptoms was observed for both groups. This study provided preliminary evidence for the use of eye movement desensitisation reprocessing in a disaster care context. More controlled research, however, is required to evaluate the efficacy of eye movement desensitisation reprocessing in the post-disaster context. The small sample and no longer term follow-up were limitations of this study.

A first controlled comparison between EMDR (n=23) and emotional freedom techniques (n=23) for posttraumatic stress disorder was published in 2011¹¹⁵. Emotional freedom techniques are embedded in a meridian-based therapy where light manual stimulation to the endpoints of traditional acupuncture meridians on the face, upper body and hands is administered, alongside the patient focussing on the traumatic event. Participants were recruited from a waitlist for a psychotherapy service of the National Health Service (NHS) in Scotland. Following allocation to a treatment condition, both interventions produced therapeutic gains following treatment and effects were maintained three months later. Similar treatment effect sizes were observed in both treatment groups. A slightly higher proportion of participants who received eye movement desensitisation and reprocessing reported substantial clinical changes compared with the emotional freedom techniques group. As these authors noted, the theoretical basis of emotional freedom techniques is speculative, and dismantling studies on its active ingredients are necessary to examine this first seen therapeutic effect comparable to a traditionally efficacious treatment for posttraumatic stress symptoms¹¹⁵. Again, further controlled studies are required to replicate these effects.



Psychoeducation

In an important paper, Mulligan and colleagues¹¹⁶ completed a systematic efficacy review of well-designed psychoeducation intervention studies that aim to prevent the development of psychological illnesses in deployed military personnel. Interventions were provided post-deployment with the timing of interventions varying from 48 hours after incident to immediately following return from deployment. Psychoeducation therapies included single session small group debriefing, peer support plus defusing and a debriefing session, single session group stress education, and individual and group TRiM. The review found some evidence of efficacy but this was not consistent across studies or outcomes and the effects were small. There was some evidence that beneficial effects are greater for those who experience a high number of potentially traumatic events. Importantly, there was little evidence to suggest the interventions cause harm.

Other therapies

A pilot study using a convenient sampling method assessed 20 veterans at a VA Medical Center using a biofeedback technique known as Heart Rate Therapy. Participants were randomly allocated to a treatment as usual or treatment as usual plus Heart Rate Therapy group. Heart Rate Therapy provided further reduction in PTSD symptomology in veterans¹¹⁷. A limitation of the study was the vague definition of treatment as usual and no control for treatment as usual intervention. Further trials are required to test Heart Rate Therapy against evidence-based treatments.

A different preliminary randomised controlled study found evidence for the benefits of a Resilience-Oriented Treatment for PTSD in a small sample of veterans suffering anxiety and depressive symptoms (n=39)¹¹⁸. In this study, Resilience-Oriented Treatment was run in groups where initial resilience resources such as awareness of positive emotions and social connectedness were fostered, and individuals were encouraged to draw upon these resources in later sessions when they revisited their traumatic experiences. Compared with a waitlist control group, the intervention was observed to generate benefits in the domain of affective symptoms, positive emotional health, memory and executive functions. It was unclear whether the revisiting of traumatic experiences in this intervention was similar to prolonged exposure. Therefore, future studies that include a controlled prolonged exposure component are necessary before firm conclusions can be made.

Boden and colleagues¹¹⁹ reported positive outcomes in their randomised controlled effectiveness trial using a manualised treatment called Seeking Safety program, for comorbid substance use disorder and PTSD (n=98). The Seeking Safety program



participants received treatment as usual with one exception – that the twice weekly recovery groups were replaced with a program defined as “a present-focused, manualised, cognitive-behavioural integrated treatment”. Treatment as usual comprised three group sessions focussed on motivation enhancement and treatment engagement. Twice-weekly recovery group sessions focussed on building abstinence, with as-required, group sessions for other issues such as smoking cessation, cognitive behavioural therapy, relaxation, health education, etc. Those diagnosed with PTSD and involved in the Seeking Safety program, relative to treatment as usual, showed better drug use outcomes as measured by the Addiction Severity Index. Importantly, the intervention was also associated with increased treatment attendance, client satisfaction, and active coping. In both groups, PTSD decreased over time, however no difference was observed between treatment groups. Limitations of the study were the use of an all male sample, and there were cognitive behavioural elements to treatment in both comparison groups. It was also unclear whether the cognitive behavioural elements included any exposure therapy.

There is evidence that disrupted sleep is a core component of PTSD¹²⁰. In a review of current evidence for nightmares and insomnia associated with PTSD, the authors concluded that while there are some behavioural and pharmacological interventions which show promise, especially for nightmares, there are fewer studies that actually include valid sleep measures or attempt to identify treatment mechanisms. As such, further rigorous studies are required.

Early intervention

An interesting study by Warner and colleagues⁹⁰ showed pre-deployment screening might be beneficial. The authors found lower rates of suicidal ideation, combat stress and psychiatric disorders in a group of 10,678 soldiers who passed through a screening procedure compared with 10,353 unscreened soldiers during their first six months of deployment in Iraq. The outcome from screening included, not being deployed (n=74), those deployed with restriction (n=96), and those who were further evaluated before being accepted for deployment (n=649). These findings suggest that the process of screening can identify persons at risk and protect those identified from the potentially traumatic effects of deployment.

A literature review was published in 2011 by Fertout and colleagues¹²¹ examining UK strategies to prevent post-deployment mental health problems in veterans. The review concluded that it is unclear whether screening expedited access to mental health treatments. It found that post-deployment psycho-education approaches showed occasional small but inconsistent positive benefits. This is consistent with the review by Mulligan and colleagues¹¹⁶ which incorporated US and UK studies. Fertout and



colleagues' review also concluded that while the post-deployment protection strategy of decompression is perceived as beneficial by personnel, the research is lacking high quality evidence that it prevents mental health difficulties. Similarly, Jones and colleagues¹²² found decompression was well received by veterans but the study did not incorporate measures of the impact on psychiatric disorders. Battlemind training is a US post-deployment program that aims to educate personnel about the post-deployment transition process using a cognitive skills-based approach whilst incorporating elements from positive psychology. Studies of the efficacy of Battlemind are reporting mixed results. Adler and colleagues¹²³ found evidence that the Battlemind model produced reductions in psychological distress symptoms compared with stress education in a US study of 1,060 OIF veterans. However, Fertout and colleagues¹²¹ noted the effect sizes were small and personnel experiencing lower levels of combat exposure were not found to benefit from Battlemind programs.

Early pilot studies found that pharmacological treatments may protect against psychiatric disorders in high risk groups. Propranolol (a beta-blocker) originally used to treat hypertension, has been proposed as a prophylactic treatment for PTSD. In 2011, Sones and colleagues¹²⁴ reviewed the research and concluded that the findings of two placebo-controlled studies do not support efficacy for Propranolol administration after trauma to prevent PTSD. The authors also noted the serious ethical concerns around using Propranolol for PTSD prevention due to the attenuation of emotional responses and memories of the traumatic event.

A separate study found psychological benefits associated with morphine use. In an uncontrolled study with a military sample, the administration of morphine was associated with a reduced risk for PTSD¹²⁵. However, as pain is a risk factor for PTSD, without a controlled study it is unclear whether the morphine reduces the risk of PTSD independently of the reduction in experienced pain. Importantly, Sones and colleagues¹²⁴ raised a variety of concerns about pre-emptive use of pharmacological intervention, such as unnecessary medicating, and interactions with other required medication along with possible side effects.

Pharmacotherapy

Sharpless and Barber¹⁰³ reviewed the PTSD literature and compiled a clinician's guide to treatments for returning veterans. In the pharmacotherapy section they highlight that 35 randomised controlled trials have examined pharmacological agents for PTSD with paroxetine (Paxil), sertraline (Zoloft), and venlafaxine (Effexor) listed as first-line treatments in at least four different practice guidelines. However, the guide notes that the US National Center for PTSD encourages pharmacotherapy be completed in conjunction



with psychotherapy, and the Institute of Medicine concluded there is insufficient evidence for the efficacy of pharmacotherapy for PTSD.

In another general review of atypical antipsychotic medications for PTSD, Ahearn and colleagues examined randomised controlled trials and open label trials for the treatment of combat-related PTSD. Eighteen clinical trials were identified. Effect sizes for randomised controlled trials were small but positive for resperidone and quetiapine. Intrusive and hypervigilance symptoms showed the most improvements. These authors recommended larger randomised controlled trials are required to clarify the potential of antipsychotics in PTSD treatment, alongside investigations of side effects.

A comprehensive literature review was completed to update PTSD treatments within the Psychopharmacotherapy Algorithm Project at the Harvard South Shore Program¹²⁶. It concluded that SSRI's and SNRI's were less effective than previously supposed, and that there is now an increased awareness of their long-term side effects.

Treatment outcome studies: Complementary therapies

In 2011, there were few papers that reported on complementary therapies for traumatic stress. In general, the rigour applied to the majority of these studies was compromised in terms of the study being uncontrolled or utilising small sample sizes. The findings presented, therefore, are difficult to interpret.

Among the studies which were more controlled, mindfulness and meditation were identified as promising treatments. Specifically, the capacity for mindfulness techniques in enhancing emotional regulation while decreasing symptoms of depression and anxiety was proposed to support its use for treating PTSD¹²⁷. Additional support for these techniques was found in an expert opinion survey conducted by a prominent international trauma expert¹²⁸. This study looked into best practices for the treatment of complex PTSD. The survey found meditation and mindfulness were often identified as an effective second-line therapy. Mindfulness emphasises attending to present moment experience, including thoughts, emotions, and physical sensations, in a non-judgmental manner¹²⁹.

In a small sample of three groups of veterans (combat veterans with PTSD, combat veterans without PTSD, and non-combat veterans without PTSD), mindful non-judging (an attitude of openness and curiosity) was found to be related to lower PTSD symptoms. The authors concluded that therapies that focussed on mindful non-judging may have useful outcomes¹³⁰. Despite the use of standardised interviews such as the Clinician Administered PTSD Scale, and age and gender matches across the three groups, the cross sectional nature and small sample size (n=45) limits interpretability of



this study. In a better designed, but still uncontrolled study, with 92 veterans (70 males and 22 females) who completed a mindfulness program to reduce stress, decreased PTSD and depression symptoms at six months after enrolment were observed¹²⁹. As participants continued their usual psychiatric and psychological care during the study, it is not certain whether the small to medium effect sizes observed would be replicated in a randomised controlled study.

In a pilot randomised controlled study, an intervention directed at sleep disturbance in 63 US veterans, mind-body bridging (MBB) treatment, was compared to a sleep education program¹³¹. MBB is a novel intervention that teaches skills to help calm the mind and identify dysfunctional mind-body states (such as high states of arousal). While sleep disturbance improved in both groups, MBB performed significantly better. Self-reported PTSD symptoms and measures of mindfulness also improved with MBB. The application of mindfulness techniques within MBB may have explained this benefit.

In a large randomised, double-blind, placebo controlled study¹³² (n=123, control group =122) a Chinese herbal formula (Xiao-Tan-Jie-Yu-Fang) was compared with a placebo in earthquake survivors with PTSD. The study found evidence of psychological benefit in patients from the herbal medication group not observed in the placebo group. The exclusion of a PTSD symptom measure is, however, a limitation of the study.

One study concluded that repeating a mantram increased levels of existential spiritual wellbeing and this was a contributing mechanism in the reduced PTSD symptom severity observed in a veterans sample (n=66)¹³³. The study was well designed using random allocation, a control group and independent assessors who were unaware of participant group allocations. The concept of a mantram appears similar to cognitive rehearsal used to alter maladaptive negative automatic thoughts in CBT. At present, the existential spiritual wellbeing construct is vague and not well measured.

A survey of 500 adults visiting a primary care military clinic found a self-reported benefit from employing complementary and alternative medicines (CAM) in treating presenting symptoms¹³⁴. CAM was broadly defined as various medical and health care systems, therapies and products not considered conventional treatments. They were described as comprising four domains: mind-body medicine, body-based/manipulative therapies, biological practices, and energy therapy along with medical systems that traverse several domains. The lack of specific information describing pathologies, treatments and explicit measures of symptom severity diminished the utility of the study.

A directed search (at the request of DVA) for supported assistance, such as animal assisted, pet therapy, or yoga, failed to yield any empirical papers in this area.



Psychosocial rehabilitation

Employment

A study of 797 OEF/OIF US veterans analysed the relationships between mental health disorder and work performance across four domains: time management, output, physical demands and mental-interpersonal demands¹³⁵. The study found depression, PTSD, and generalised anxiety disorder or panic disorder were associated with deficiencies in time management, output and mental-interpersonal demands, while alcohol dependence and illicit drug use were associated with deficiencies in output and physical demands.

Another study¹³⁶ compared three programs (basic vocational services, self-study of a manual, and group intervention with vocational staff using the manual) to assist job-finding in 67 veterans with mental health disorders and at least one felony conviction. The group format was superior to the self-study and basic services, while the self-study and basic services were equivalent.

Substance use

In a sample of 432 male veterans who were treated for PTSD, avoidance/numbing and hyperarousal symptom severity during treatment predicted greater frequency of cannabis use at a four month follow-up¹³⁷. However, these effects were not observed for other substance use, such as alcohol and opiates.

Homelessness

Community residential treatment services are provided for homeless veterans whereby a person is housed in a central location and provided with clinical and social services while they are a resident. One study¹³⁸ compared the clinical outcome after one year for female veterans who were in the program for at least 30 days, with females who were in the program for less than 30 days. The participants in the program for at least 30 days had better outcomes on employment, social support, housing status and mental health disorder symptoms. Likewise, another study¹³⁹ observed that longer length of stay in a residential treatment facility and a positive social environment were associated with better outcomes for homeless veterans.

General psychosocial benefits of therapy

Beidel and colleagues¹⁴⁰ compared Trauma Management Therapy which combined exposure therapy and social rehabilitation, with exposure therapy only in 35 male Vietnam veterans with chronic PTSD. Social rehabilitation included conversational skills, developing social networks, anger management strategies and problem solving skills.



Compared to the exposure therapy group, Trauma Management Therapy participants displayed increases in both frequency of, and time spent engaging in, social activities. Both treatment groups had equivalent and clinically important reductions in PTSD measures.

Lifeguard is a two-hour workshop based on Acceptance and Commitment Therapy principles designed to assist in post-deployment reintegration. A single group design pilot study comprising 144 OEF/OIF US veterans found preliminary evidence for reduced symptoms of depression, anxiety and PTSD along with increases in relationship satisfaction amongst those who completed Lifeguard¹⁴¹. More controlled studies are required.

ADF Mental Health Prevalence and Wellbeing Study – Key findings

ADF members reported more partial, rather than total, days out of role due to psychological distress compared to the Australian community sample.

Panic attacks, depressive episodes, specific phobias and PTSD account for the greatest number of days out of role.

***The same types of mental health problems are associated with reduced work performance in the reviewed literature.**

Utilisation and barriers to care

Systematic and other literature reviews

The US VA has identified access to health care as a critical issue. A systematic review¹⁴² examined interventions that improved health care access for veterans, and whether these interventions led to improved clinical outcomes. Sixteen studies were included, comprising community-based outpatient clinics, primary care mental health, and telemedicine. Co-location or walk-in models, as part of primary care mental health, were consistently found to improve access. Community-based outpatient clinics were found to increase initiation of care and primary care visits, while primary care mental health led to increases in primary care visits and preventative care. Veterans reported being equivalently satisfied with care received via the telephone and in person. All reviewed studies observed positive outcomes on measures of satisfaction and utilisation, however the limited data reported suggested that improved access does not necessarily lead to improved outcomes.



Despite the increased risk of mental health disorders in military and veteran personnel, the research found that this population often failed to seek appropriate care, with half of those in need not utilising mental health services¹⁴³⁻¹⁴⁶. Vogt reviewed the literature and broadly categorised barriers to health care into three domains: background characteristics, institutional factors, and stigma related beliefs about mental illness and treatment. Vogt concluded that while evidence suggested concerns about public stigma along with personal beliefs about mental illness and treatment were important barriers, research required psychometrically improved measures to assess these beliefs. Notably, inhibitive beliefs about mental health were considered modifiable by interventions such as education and contact with stigmatised groups, the latter of which has been a promising strategy¹⁴³.

Stigma and other barriers to care

As described above, barriers to care due to access and the stigma of mental illness are consistently raised as deterrents to mental health care in military populations¹⁴⁵. In a sample of UK armed forces (n=821), Iversen and colleagues¹⁴⁶ explored anticipated public stigma, attitudes towards mental health providers and practical barriers to care in those with and without mental health disorders. Four main findings emerged: (1) public stigma was the most commonly reported barrier; (2) scheduling appointments and taking leave for treatment were practical barriers; (3) barriers of care continue after leaving the military; and (4) veterans had the additional burden of not knowing where to get help, and were concerned about blame from employers for their problems. Additionally, those with PTSD symptoms reported more barriers to care relative to those with other disorders. Programs such as Battlemind in the US, and that promote “help seeking as a sign of strength”, were highlighted as reducing barriers to care. Finally, Iversen and colleagues identified the usefulness of TRiM¹⁴⁷, which assists leaders to signpost and identify vulnerable individuals after trauma exposure.

A study of healthy (US) combat OEF/OIF veterans found negative attitudes to treatment were more important than stigma in predicting help-seeking behaviour¹⁴⁸. Similarly, a survey of 577 OIF combat veterans with PTSD, depression or anxiety, found negative attitudes towards mental health care were related to less desire to access help¹⁴⁵. However, unexpectedly, the study observed more perceived stigma from the unit was related to greater interest in help. It is important to appreciate that expressing an ‘interest’ in help is different to ‘actual’ help-seeking behaviour.

Quimette and colleagues¹⁴⁹ examined institutional and stigma related barriers among US Vietnam and OEF/OIF veterans diagnosed with PTSD (n=490). The reasons provided for not seeking help by those who had not received treatment in the previous two years were investigated. Stigma barriers (e.g., concerns about social consequences) were



more salient than institutional factors (e.g., not fitting into VA care, staff skill). The paper suggested outreach efforts may benefit those who are less likely to perceive they 'fit in' at the VA, such as younger, female and OEF/OIF veterans¹⁴⁹.

Pfeiffer and colleagues¹⁵⁰ investigated the impact of distance and facility of initial diagnosis on treatment for depression in US veterans. Veterans residing further away were more likely to receive medication and less likely to receive psychotherapy. Initial diagnosis at a small community clinic (versus VA Medical Center) was not associated with a difference in receipt of psychotherapy, but was associated with decreased likelihood of receiving eight or more sessions and an increased likelihood of receiving antidepressant treatment. These findings imply that veterans who present at smaller clinics should be provided with evidence-based treatment alternatives, which in consideration of distance barriers, could be implemented in alternative ways such as telephone delivery or videoconferencing.¹⁵⁰

Targeting barriers in treatment and treatment retention

In an editorial published in the Journal of the American Medical Association summarising interventions for war-related PTSD, Hoge¹⁴⁴ argued that interventions that have greatest potential for improvement are those that are focussed on enhancing the reach of treatment (e.g., engagement, adherence, acceptability). Enhancing such treatments requires moving beyond screening and stigma reducing strategies, to understanding reasons for negative perceptions in veterans such as the lack of trust in mental health professionals, thinking less of others receiving mental health care, and consideration that treatment is ineffective or a last resort. Hoge suggested that treatments can be enhanced with a better understanding of perceptions that veterans have concerning mental health care, willingness to continue with treatment, and ways of communicating with veterans that validate their experience as warriors.

Britt and colleagues¹⁵¹ used the well-known theory of planned behaviour to predict whether reservist veterans reported seeking treatment for a psychological problem. Their data revealed that a big factor in seeking treatment was whether veterans believed their problem was severe enough to warrant treatment, and believing that they could and should handle psychological problems themselves. The paper concluded that identifying interventions that encourage military personnel to seek treatment before symptoms undermine functioning might be helpful.



ADF Mental Health Prevalence and Wellbeing Study – Key findings

In the previous year, 17.9% of ADF members sought help for stress, emotional, mental health or family problems.

The highest perceived stigmas were, being treated differently (27.6%), and harm to career (26.9%).

The highest rated barrier to seeking help was concern it would reduce deployability (36.9%).

***These findings are consistent with the literature reviewed in the past year in US and UK samples.**



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