

Military and Veteran Mental Health Annual Literature Scan: 2015

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This document presents an annual literature scan for the year 2015 in the field of military and veteran posttraumatic mental health. It was produced for the Australian Government, Department of Veterans' Affairs (DVA), by Phoenix Australia: Centre for Posttraumatic Mental Health.

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Contents

Glossary of terms	1
Executive summary	2
Introduction	6
Background.....	6
Methodology	6
Literature scan	9
1. Sleep and mental health disorder comorbidity	9
2. Intergenerational impact of mental health	12
3. Impact of physical activity on mental health	15
4. Employment and mental health.....	17
5. Veterans utilisation of mental health services	21
6. Digital technologies in the prevention and treatment of mental health disorders	25
References	29

Glossary of terms

Term	Definition
ADF	Australian Defence Force
CBT	Cognitive Behavioural Therapy
CBT-I	Cognitive Behavioural Therapy for insomnia
CPAP	Continuous Positive Airway Pressure
DVA	The Australian Department of Veterans Affairs
e-mental health	Mental health care supported by electronic communication
FOCUS	Families Overcoming Under Stress
LAST	Life Adaption Skills Training
MDD	Major depressive disorder
MFFM	Military Family Fitness Model
MST	Military sexual trauma
OSA	Obstructive Sleep Apnoea
OUC	Optimised usual primary care
POW	Prisoner of war
PTSD	Posttraumatic Stress Disorder
SAH-F	Strength at Home Friends and Families
SES	Socio-economic status
US	United States
VA	Veterans Health Administration
W-CBT	Work-related Cognitive Behavioural Treatment

Executive summary

The annual scan of the military and veteran mental health and traumatic stress literature for 2015 was produced by Phoenix Australia - Centre for Posttraumatic Mental Health, for the Australian Government, Department of Veterans' Affairs (DVA). This executive summary provides an overview of the literature scan for each topic of review. The topics, chosen in consultation with DVA, for 2015 were:

- Sleep and mental health disorder comorbidity
- Intergenerational impact of mental health
- Impact of physical activity on mental health
- Employment and mental health
- Veterans utilisation of mental health services
- Digital technologies in the prevention and treatment of mental health disorders

Overall summary

In the 2015 literature there was a multitude of studies that examined utilisation of mental health services amongst veterans. The barriers to treatment seeking, in particular mental health stigma continued to be an area of interest, there were also some promising findings regarding the facilitators of treatment seeking. The impact of physical activity on mental health, in particular PTSD, was an emerging area of interest in the literature, with most studies on the topic being published within the past two years. The use of technology in treating mental health issues continues to be an area of interest in the literature, with promising developments but also associated barriers and issues. The majority of the studies across all topics reported in the 2015 literature were conducted among US veterans and therefore the limitation on generalisability to Australian veteran population needs to be acknowledged, particularly where the studies make reference to veteran mental health services.

Sleep and mental health disorder comorbidity (Pages 9 to 12)

- Patients with PTSD experienced less predictable and more fragmented sleep relative to patients with insomnia only.
- PTSD symptom severity was associated with poor sleep. One study suggested that the relationship may be bidirectional, PTSD can contribute to sleep disruption and in turn, poor sleep may impede recovery from PTSD, highlighting the need for sleep to be a focus of treatment.
- Two studies reported a link between insomnia and suicide risk in veterans. The studies were divided as to whether this association occurs independently of other mental health conditions such as depression or PTSD or not. Regardless of the nature of the

relationship, insomnia may be a useful indicator of suicidal ideation as it could signal hyperarousal and agitation, which are known suicide risk factors.

- Evidence suggests that cognitive behavioural therapy (CBT-I) is a promising treatment for insomnia. In addition, there was preliminary evidence for its utility in reducing suicidal ideation and symptoms of depression.
- Obstructive sleep apnoea is common in individuals with PTSD, even when they do not have the typical health-related risk factors. The reasons for this are unclear, but one review suggested that it may be related to physiological changes caused by psychiatric disorders.

Intergenerational impact of mental health (Pages 12 to 15)

- There is evidence to suggest that the children of veterans may be at risk of poorer mental and physical health compared to their peers.
- Parental trauma or PTSD may impact on a child's mental health via parenting style or a home environment marked by excessive anxiety or interpersonal conflict. The parenting style theorised to lead to negative outcomes was characterised by excessive control coupled with emotional distance.
- There is emerging evidence for the role of epigenetics. Exposure to trauma has been associated with changes to DNA, and a small study of Holocaust survivors indicated these changes appeared in the DNA of the next generation, potentially increasing their risk of psychopathology. However, researchers are unclear as to the mechanism of the intergenerational transmission of these changes.
- The long absences caused by deployment may also have an impact on the mental and physical health of children, particularly among young children who require a high degree of attention from caregivers.
- There were a few preliminary studies that focussed on developing programs to build resilience in families. Programs that focus on improving parental relationships may also be beneficial in limiting the impact of parental trauma on children.

Impact of physical activity on mental health (Pages 15 to 17)

- Observational studies indicate that individuals who are physically active also seem to have a lower prevalence of mental health conditions. This finding was reported in a range of military populations, including currently serving soldiers, older veterans and veterans with disabilities.
- The evidence for exercise as a useful adjunct to treatment as usual for mental health conditions is mixed. Systematic reviews of the topic were limited by a lack of high quality, rigorous studies and large control group effects.
- There are emerging studies examining the usefulness of exercise in treating the symptoms of PTSD. A systematic review found that all studies examining this question were conducted in 2014 and 2015 and preliminary results indicated similar results to those seen in other mental health disorders.

Employment and mental health (Pages 17 to 21)

- Participation in work was associated with better mental health outcomes in veterans. This may be related to the structure, social contact, sense of purpose and level of activity that work provides.
- Compensation seeking and having negative expectations about being able to return to work can compromise an individual's ability to return to work.
- Treatments for depression that are focused on the reintegration to work have the potential to improve return to work outcomes without impeding recovery from depression symptoms. In particular, interventions that draw on evidence based treatments such as cognitive behavioural therapy and exposure therapy were most effective.

Veterans utilisation of mental health services (Pages 21 to 25)

- Although stigma related to mental illness may be prevalent in military populations, it does not appear to have a large impact on treatment seeking. The factors that facilitate treatment seeking, such as positive beliefs about treatment, functional impairment and social support seem to be better predictors of engaging in treatment.
- Stigma may be strongest when individuals are at the early stages of a psychiatric illness, the precise time when they would benefit from seeking help. The potential negative effects of stigma should not be discounted, and needs particular attention in individuals who are becoming unwell.
- Although it may be difficult to shift internal beliefs, practical measures such as screening for psychiatric symptoms, better integration of mental health services and having more mental health resources can increase rates of utilisation of mental health services.
- Older age was associated with decreased likelihood of engaging in mental health treatment. Encouragingly, one study found that utilisation of mental health services in veterans aged 65 and over had increased over the past 10 years.
- A consistent finding in the literature was that symptom severity was related to better service utilisation. That is, the more severe an individual's symptoms were and the greater functional impairment they experienced as a result, the more likely they were to seek help.

Digital technologies in the prevention and treatment of mental health disorders (Pages 25 to 28)

- Video games are being trialled to deliver components of PTSD treatment. These games may have utility in exposure treatment, stress inoculation and assessment as they simulate stressful situations
- Web-based psychotherapy has the potential to deliver evidence based treatments for mental health disorders to individuals who cannot access face to face treatment. A German study demonstrated that online tools based on CBT for PTSD could effectively treat PTSD in individuals who could not access mental health services.

- There is a relatively high attrition rate from studies that utilise online methods to deliver psychotherapy. Although online delivery of the treatment has the potential to overcome some logistical barriers to care, it may also involve a unique set of barriers in terms of access to and confidence with technology.

Introduction

This annual scan of the military and veteran mental health and traumatic stress literature was produced by Phoenix Australia: Centre for Posttraumatic Mental Health for the Australian Government, Department of Veterans' Affairs (DVA). The aim is to provide an overview of literature pertaining to key topics of interest identified by DVA in consultation with Phoenix Australia. The scan is a narrative review of literature published in 2015 alone (any literature published prior to, or after 2015 is not included in this report), which is deemed to be of quality and interest to DVA. The literature included in this scan has met broad inclusion criteria based on regular standards of academic review, but it was not a systematic evaluation of all published research during this time period. Where there are discrepancies in the literature, these will be discussed, but the reader is cautioned against assuming that a single paper is sufficient to provide conclusive information. It is recommended that the reader source the original papers if they are interested in particular findings.

Background

In preparation for the 2015 annual literature scan, Phoenix Australia consulted with DVA to identify the key topics on which to focus the review. Topic selection was based on relevance to the current work of DVA and the availability of relevant publications during the previous calendar year. The six topics selected were:

- (1) Sleep and mental health disorder comorbidity
- (2) Intergenerational impact of mental health
- (3) Impact of physical activity on mental health
- (4) Employment and mental health
- (5) Veterans utilisation of mental health services, and
- (6) Digital technologies in the prevention and treatment of mental health disorders.

Methodology

The 2015 literature scan had a defined literature search strategy and *a priori* inclusion/exclusion criteria. The search strategy included the following databases; PubMed, PsycINFO, Web of Science, Medline, Embase. The search terms used for each topic are outlined in Table 1:

Table 1. Search terms by topic

Topic Area	Search Terms
Sleep and mental health disorder comorbidity	Sleep AND mental health OR psychiatric disorder AND veteran
Intergenerational impact of mental health	Veteran AND mental health OR psychiatric AND intergenerational OR transgenerational
Impact of physical activity on mental health	Physical activity OR exercise AND mental health OR psychiatric AND veteran OR military
Employment and mental health	Employ* OR occupation* OR work* AND mental health OR psychiatric AND recovery OR rehab AND effectiveness
Veterans utilisation of mental health services	Barriers OR access OR seek OR utilisation AND care OR treatment AND mental health OR psychiatric AND veteran
Digital technologies in the prevention and treatment of mental health disorders	Internet OR online OR web OR computer* OR smartphone AND treatment OR therapy AND mental health OR psychiatric AND veteran OR military

Inclusion and exclusion criteria for papers

Abstracts that were found in the initial search were screened using the inclusion and exclusion criteria presented in Table 2. In line with NHMRC guidelines for evidence review, systematic reviews and meta-analyses were prioritised for inclusion over general literature reviews. Papers which were published in impactful and prominent journals were also prioritised for inclusion, these included *American Journal of Psychiatry*, *Psychological Medicine*, *Journal of the American Academy of Child and Adolescent Psychiatry*, *Journal of Clinical Psychiatry*, *Medical Care*, *Epidemiologic Reviews*. Literature that explored themes that were considered to be of particular interest to DVA was also prioritised for inclusion. The total number of abstracts derived from the literature search and the number of papers selected for inclusion is presented in Table 3. Articles which were published online first in 2015 were also included.

Table 2. Inclusion and exclusion criteria for papers

Inclusion Criteria	Exclusion Criteria
Literature published in 2015	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	Studies published in languages other than English
Papers drawn from other populations where findings are relevant to a veteran/military population	

Table 3. Number of abstracts yielded from search and papers selected for annual literature scan

Topic Area	Abstracts Yielded	Papers Included
Sleep and mental health disorder comorbidity	82	16
Intergenerational impact of mental health	24	17
Impact of physical activity on mental health	88	14
Employment and mental health	84	12
Veterans utilisation of mental health services	121	24
Digital technologies in the prevention and treatment of mental health disorders	53	9
Total	451	88

Literature scan

1. Sleep and mental health disorder comorbidity

Complaints of poor sleep are common among veterans who experience mental health disorders¹. A review of the 2015 literature revealed a number of papers focusing on the relationship between mental health disorder and insomnia, sleep disturbance, sleep apnoea and their treatment. These topics are reviewed in the section below.

Insomnia and sleep disturbance

Good quality sleep serves a vital function for overall health and wellbeing². Both the quality and quantity of sleep are considered to be important in maintaining good physical and mental health. Sleep disturbance can encompass a range of complaints including poor sleep quality, frequent waking and difficulty getting to sleep³. In addition to this, sleep disturbance is a key feature of many mental health disorders and has the potential to exacerbate the psychological symptoms that an individual is experiencing as a result of their disorder⁴. By contrast, insomnia is a diagnosable disorder that comprises dissatisfaction with sleep and significantly impaired daily functioning which is not explained by a coexisting mental disorder⁵. For the purpose of this review, any subjective sleep complaints that were not defined as insomnia are referred to as sleep disturbance. The prevalence of sleep disturbance, insomnia and comorbid mental health disorders was of particular interest in the literature in 2015.

An interesting study investigated sleep variability amongst US veterans and active duty personnel. Patients were separated into three groups, those with PTSD and sleep disturbance (n=45), patients with primary insomnia (n=25), and healthy controls (n=27). Sleep complaints were found to be more marked in veterans with PTSD compared to patients without PTSD³. Compared to controls, PTSD patients had consistently greater sleep complaints, worse sleep quality, more night-to-night inconsistency and greater variation in sleep within the group. A key finding was that patients with PTSD seemed to experience less predictable and more fragmented sleep relative to patients with insomnia only. It is worth noting that while all PTSD patients had been deployed at least once, deployment history was not assessed for the other groups, meaning that it is possible that sleep disturbance was related to deployment related factors. Another study that examined self-reported sleep disturbance in US veterans and active duty military personnel with and without mental health disorders required that all participants had been deployed at least once⁶. In this sample, sleep was impaired in both groups compared to population norms, and was worse among those with a mental health diagnosis. In particular, those with a mental health diagnosis had shorter sleep duration and lower sleep efficiency (less of the time in bed was spent asleep). The authors emphasised the need to address sleep problems in the veteran population, regardless of mental health status.

There has also been an increasing focus in the literature on the link between insomnia and suicide risk in veterans, however the nature of this association is unclear. One study examining the effectiveness of cognitive behavioural therapy for insomnia (CBT-I) for suicidal ideation among 405 US veterans with insomnia found a decrease in suicidal ideation following CBT-I⁷. As insomnia severity improved, a corresponding reduction in the likelihood of suicidal ideation was observed. There was also a concurrent reduction in depressive symptoms. The authors maintained that even after accounting for the reduction in depressive symptoms, insomnia severity had a significant effect on suicidal ideation. The authors stated that poor sleep results in emotional instability and poor decision making, factors which may increase suicide risk. However, this study lacked a control group, therefore it is possible that the reduction in suicidal ideation was not due to CBT-I but was instead due to some other cause, for example the passing of time.

In contrast to this, another study of 380 US veterans indicated insomnia severity alone was not directly related to suicide risk, instead depression symptomology could explain the relationship between insomnia severity and suicide ideation⁸. The study examined secondary data in the form of psychiatric outcome measures of patients who had participated in three separate trials of mental health treatments, and as such, the treatment that participants received was not consistent. The authors interpreted increasing symptoms of insomnia as a by-product of worsening depression which led to increased suicidal ideation. Nonetheless, the authors suggested that insomnia severity had utility as a clinical indicator, as it could signal hyperarousal and agitation, which are known suicide risk factors.

Studies of US veterans have indicated that sleep disturbance was more prevalent and severe amongst veterans who met criteria for mental health disorders, including depression and PTSD^{6,9-11}. Veterans with mental health disorders experienced sleep marked by short duration, poor quality, waking frequency, difficulty getting to sleep and nightmares. This may have implications for the course and severity of PTSD. In a study of 324 US veterans, excessive rumination was associated with increased symptoms of PTSD and depression, and sleep disturbance contributed to this relationship¹². The authors suggested that excessive worry and perseverative cognition may contribute to hyperarousal and difficulty sleeping. This in turn could lead to increased psychological symptoms because of the role sleep may play in the emotional processing of negative memories.

Given the impact of insomnia and sleep disturbance on mental health outcomes for veterans, studies which examine the effectiveness of CBT-I among veterans are particularly relevant. One such study of US veterans found that both older (n=121) and younger (n=536) veterans experienced improvements in symptoms of insomnia and depression following CBT-I¹³. Although this study was also limited by a lack of a control condition, the results suggest that CBT-I is useful for treating insomnia and related mental health conditions.

Sleep apnoea

There is an emerging body of literature investigating the link between mental health disorders and obstructive sleep apnoea (OSA). A systematic review of OSA and psychiatric disorders found evidence to suggest that there may be an increased prevalence of OSA in individuals with major depressive disorder (MDD) and PTSD, but not in other psychiatric disorders¹⁴. In relation to veterans specifically, a recent study of US veterans found that those with PTSD had an elevated risk of developing OSA, despite not having the typical physical risk factors for OSA such as being older, a smoker or overweight¹⁵. Another study, which was based on self-reported symptoms only, found that while OSA risk was elevated in veterans with PTSD, it was not significantly correlated with PTSD symptom severity¹⁶.

There were some notable studies in 2015 that proposed explanations for the apparent association between OSA and psychiatric disorders. A retrospective review of the subjective sleep measures and polysomnographic data of 130 US veterans diagnosed with PTSD found that sleep difficulties were almost universal (98.5%), the majority reported a comorbid depression (88.5%) and more than half were diagnosed with insomnia and OSA¹. There were significantly higher rates of OSA among soldiers without physical injuries, which led the authors to hypothesise that an underlying sleep disordered breathing condition could predispose individuals to be less resilient to the challenges of combat and more likely to develop PTSD. The authors posited that impaired sleep may limit an individual's ability to manage stress, lead to hyperarousal and prevent them from experiencing restorative sleep which may be required for recovery from traumatic events.

Other possible links between PTSD and OSA have also been proposed. In the previously mentioned systematic review, Gupta et al.¹⁴ suggested that a number of factors combine in a process that results in the development of OSA. Specifically, psychiatric disorders increase oxidative stress, inflammation and neurotransmitter imbalances that can lead to conditions that are known physical risk factors for OSA such as obesity and cardiovascular disease. They also suggested that hyperarousal and impaired sleep could contribute to the development of OSA via upper airway instability and psychiatric medications may impact on breathing during sleep.

The review by Gupta et al.¹⁴ also highlighted evidence to indicate that effective treatment of OSA, via continuous positive airway pressure (CPAP) therapy, may reduce PTSD symptomology. However the efficacy of this treatment is limited by poor CPAP adherence in patients with PTSD. In their retrospective review of veterans with PTSD, Williams et al.¹ suggested that this poor compliance may also be related to comorbid insomnia that often occurs in PTSD.

It is also possible that the link between OSA prevalence and psychiatric disorders is overinflated. Gupta et al.¹⁴ found some selection bias in the studies included in their systematic review. The following potential sources of bias were identified: studies requiring participants with psychiatric disorders to also have sleep symptoms; studies recruiting from

sleep clinics; and the high prevalence of obesity in psychiatric populations. The authors also noted a lack of good quality evidence in this area of the literature, as the majority of the included studies were case studies, single assignment trials and retrospective reviews.

2. Intergenerational impact of mental health

The extent and nature of the intergenerational impact of trauma is still being investigated and understood. It is a topic that is challenging to research, as intergenerational consequences can take years to emerge. The phenomenon of intergenerational trauma has been most researched in the children of holocaust survivors^{17,18} however research is beginning to focus on the children of veterans of more recent conflicts. Evidence suggests that the children of some veterans experience poorer mental and physical health¹⁹. These consequences may be related to parental trauma or PTSD²⁰, or to the prolonged parental absence associated with deployment²¹. The following section will consider studies that looked at the potential impact of these two factors.

A systematic review of the impact of parental deployment on young children in the US found that deployment was associated with increased parental stress, problematic child behaviours and child maltreatment¹⁹. The authors argued that young children were particularly vulnerable to adverse outcomes as a result of deployment because of their dependence on their parents and limited capacity to understand their parent's absence. If veterans were recovering from physical or emotional injuries, the reintegration process was particularly stressful for the family and associated with negative outcomes for the child. It is worth noting that the findings of this review were based on a narrative synthesis of the included studies, and accordingly are not as robust as findings derived from a meta-analysis. The study's authors remarked upon the lack of research into the mental health needs of the young families of veteran's.

A retrospective study found further evidence of the impact of deployment on children. Examination of the medical records of children who had accessed the military health system in the US indicated that children who experienced parental deployment had higher rates of mental health diagnoses, injuries and child maltreatment compared to other children²². These incidences were higher again for children whose parents were injured in combat. As this was a retrospective study, the study sample was limited to individuals who sought medical help, however the comparison between the two groups does suggest an impact on children from parental deployment. The authors suggested that the impact on children was related to parental absence during deployment as well as veteran health problems which could contribute to child maltreatment.

Two studies were conducted with the adolescent children of Croatian war veterans with PTSD who had been admitted to a psychiatric outpatient unit. This population was found to have high levels of non-suicidal self-injury which was associated with psychological symptoms, such as anxiety and depression as well as poor family functioning and

maladaptive parenting²³. In addition, they were found to have more behavioural problems and issues in terms of family functioning and parental control compared to the children of veterans who did not have PTSD²⁴. The authors posited that these poor outcomes occurred because parents with PTSD had a tendency to be more controlling and yet also emotionally detached. Both studies were limited by self-report data and cross sectional design, and all participants were recruited from a psychiatric outpatient unit which limits the generalisability of the study to all children of veterans.

A related study of Israeli ex-prisoner of war (POW)'s children found a higher degree of secondary traumatisation symptoms compared to children of veterans who had not been POWs²⁵. Secondary traumatisation refers to emotional distress that results from having knowledge of a traumatic event that a significant other has experienced and the symptoms mimic those of PTSD²⁶. Children who had more exposure to stress through their fathers' care and behaviours were found to experience more secondary traumatisation symptoms. A separate study of the same cohort found that the children who experienced more secondary traumatisation had more difficulty emotionally isolating themselves from others²⁷. The authors suggested that this inability to isolate themselves emotionally provided them with greater exposure to stress via their fathers behaviours and the anxiety created in their households. However, they also noted that the study design limited their ability to infer causality. Both studies showed that the effects of secondary traumatisation had extended for forty years post conflict^{25,27}. The authors suggested that the intergenerational effects of trauma were particularly pronounced in ex POW's children because of the severe, complex and prolonged trauma that prisoners of war endure.

Epigenetics

Epigenetics are another possible explanation for the observed intergenerational impacts of trauma. Epigenetics refers to a process whereby environmental factors can change gene function without changing the underlying genetic code²⁸. Psychological trauma can cause epigenetic changes that impact on an individual's brain function and behaviour. Preliminary evidence indicates these changes may also influence the biological and psychological development of their children. Several developments in this emerging area of research were reported on in the 2015 literature.

A 2015 narrative review examined the current body of evidence for the role of epigenetics in PTSD. The review revealed that most epigenetic studies of PTSD have examined changes to DNA methylation (i.e. the process by which methyl groups are added to DNA), which modifies the function of DNA²⁸. These changes can interact with an individual's genetic background and trauma exposure to impact upon stress responses, immune function and neurotransmitter function. The authors highlighted that research in the area is limited by the need to examine brain tissue to understand how epigenetic changes impact on the brain, and currently a lot of studies are limited to animal models or human blood tissue. In addition, there is a need for longitudinal studies to examine the crucial periods of life where exposure

to trauma causes epigenetic changes and to also examine the effect of cumulative trauma over the lifetime.

Epigenetic changes have been observed in veterans with PTSD. In a study of 122 combat veterans, changes to DNA methylation was observed in those with PTSD compared to those who did not have PTSD²⁹. These changes were associated with alterations to cortisol levels, psychological distress, and poorer sleep quality. Another study tested 96 soldiers pre- and post- deployment and found that trauma and PTSD were associated with changes to DNA methylation³⁰. No studies were located within the 2015 literature which examined the intergenerational transmission of these epigenetic changes amongst military populations. However, a study of holocaust survivors (n=32) and their adult children (n=22) demonstrated that both survivors and children had changes to methylation at a certain site of their DNA, that were not present in control parents (n=8) and their children (n=9)³¹. These epigenetic changes had the potential to increase the risk of psychopathology in the survivor's children. The authors were unable to ascertain the mechanism of the transmission of the epigenetic changes. They stated that it did not seem to be related to the survivor's children personal experiences, as their self-reported trauma exposure and psychopathology was no greater than the controls. However, the authors also noted that as it was a cross sectional study, it could not be ruled out that these similarities were due to indirect trauma related causes, such as emotional abuse during childhood.

Interventions

A number of the above studies concluded that there was a need for interventions to enhance the resilience of military families and prevent the development of adverse mental health outcomes in the children of veterans^{19,22,24}. However, few such interventions were found in the literature. Studies that did relate to building family resilience were small and preliminary, and provide a starting point as to how mental health issues in future generations may be mitigated.

The military family fitness model (MFFM) was developed in the US to increase resilience in families by targeting areas across three tiers; individual, family and external strength³². It focuses on skill building and communication at each of the three tiers. The MFFM is intended to be a framework for existing family fitness and resilience programs, identifying potential gaps and resources that could be utilised. Articles evaluating family resilience interventions were not found in the 2015 literature, however one study described a program at the early stages of implementation. The Families Over Coming Under Stress (FOCUS) is a US developed program that is a military and trauma informed preventative intervention which helps parents to manage deployment and reintegration in a way that is healthy for the parent-child relationship²¹. Pilot data indicated that the FOCUS program for early childhood was acceptable for veterans and their families.

Studies of adolescents in US military families indicated that having higher levels of family support and social connectedness was associated with better mental health outcomes^{33,34}.

Accordingly, interventions which focus on improving parental relationships and parenting competence have the potential to buffer the effects of growing up in a military household. One such intervention, the Strength at Home Friends and Families (SAH-F) intervention was designed to reduce aggression between US veterans and their loved ones³⁵. The authors found that there were significant reductions in aggression for both veterans and their significant others (partners, spouse, friends, family members and parents) following the SAH-F intervention, however there was no comparison group in this study. A Canadian study examined the impact of cognitive behavioural conjoint therapy for PTSD on parenting competency and found mild improvements in PTSD symptomology and parenting competency following treatment²⁰. The sample of parents was small (n=14) and contained unequal numbers of patients and partners (6 individuals with PTSD and 8 partners), due to some participants having had children with previous partners and missing data. Thus the results of this study should be considered very preliminary.

3. Impact of physical activity on mental health

Engaging in physical activity has clear health benefits in terms of better cardiovascular health and lowered risk of disease, and in addition, individuals who are physically active tend to experience fewer mental health problems compared to those who are sedentary³⁶. Accordingly, there is increasing interest in incorporating physical activity into treatments for mental health disorders particularly in relation to depressive symptoms³⁷ and anxiety³⁸. In 2015, there were some notable studies investigating the association of physical activity with mental health in veterans.

Associations of physical activity with mental health in veterans

Observational studies of military populations have indicated that regular physical activity and physical fitness are associated with better quality of life³⁹ and lower levels of depressive symptoms^{40,41}. There is also evidence that engaging in physical activity could promote psychological resilience. A study of US veterans of the Vietnam war, including former POWs, electronically tracked sleep and activity levels over a seven day period³⁶. Psychologically resilient veterans, that is, those who were free of psychiatric diagnoses over the past 40 years, were found to have higher activity levels compared to those who were not resilient. This finding is interesting, however it does not reveal anything about the nature of the relationship between resilience and exercise. Engaging in physical activity may promote psychological health, or it is possible that those who are psychologically well are better equipped and predisposed to incorporate daily exercise into their life. A separate observational study examined the association between physical fitness and psychological resilience in a group of soldiers who were undertaking basic combat training⁴². Soldiers who were identified as “high fitness” prior to starting basic training had lower self-reported depressive symptoms at the end of training than those identified as “low fitness”. This suggests that physical fitness could serve as a protective factor against psychological distress⁴². However, the authors also noted that as physical training is an important component of basic training, individuals who started in the higher fitness group may have

experienced less difficulties as a direct result of their level of fitness, not because their fitness independently conferred psychological resilience. In addition, physical fitness was only measured at baseline, and was not reassessed at the completion of training, so the study could not determine whether changes in fitness were matched by concurrent changes in mental health.

A recent systematic review focussed on the association of PTSD with physical activity and eating behaviours in both veteran and civilian populations. The review concluded that positive changes to physical activity could have a beneficial effect on recovery from PTSD⁴³. The authors found substantial heterogeneity in the methodologies of the studies and consequently, a meta-analysis was not considered feasible. The results of the review therefore could only provide an indication of the efficacy of exercise. Nonetheless, the authors suggested that more attention should be paid to promoting an active lifestyle in this population.

Exercise based interventions for mental health disorders

The above mentioned observational studies do not reveal the direction of the relationship between physical activity and psychological health. Studies which trial exercise as a treatment for PTSD have the capacity to provide more information about the nature of the relationship. In 2015, there were a number of systematic reviews that investigated whether exercise was an effective treatment for a variety of mental health disorders.

A systematic review of the role of exercise in reducing anxiety indicated that the benefits of exercise was comparable to current treatments and superior to placebo³⁸, however the review was limited by a lack of rigorous studies and a meta-analysis was not conducted. Similarly, a systematic review of exercise based interventions in alcohol use disorders found inconsistent results in terms of efficacy, and the authors found it difficult to conduct analysis or draw conclusions because of the lack of quality studies available⁴⁴.

In contrast, a number of randomised control trials have examined the impact of exercise interventions on depression. The evidence for its effectiveness is mixed, with some studies demonstrating it is superior to other types of treatment whilst other studies do not support that conclusion. A recent systematic review and meta-analysis of these studies proposed an explanation for these mixed results³⁷. In studies that examined exercise as a treatment for depression, control groups, which often received treatment as usual in the form of medication and/or psychotherapy, experienced significant improvement in depressive symptoms. Interestingly, the improvement in the control groups was far more than is seen in antidepressant studies, suggesting that exercise interventions need to achieve a higher level of effectiveness to surpass treatment as usual. In light of these results, the authors suggested that it is premature to dismiss exercise as a treatment for depression, particularly when there are known health benefits. Instead, they suggested that researchers should use study designs that adjust for control group improvement and are more sensitive to detecting improvements in mood as a result of exercise.

Less is known about how physical activity may be useful in the treatment of PTSD. A recent systematic review examined the association of physical activity with PTSD and found preliminary evidence that physical activity was an effective adjunct to usual care for people with PTSD⁴⁵. The types of activities that were examined were yoga, aerobic exercise and combined aerobic and resistance based intervention⁴⁶. Only four studies were included in the review and all were published in 2014 and 2015, emphasising that this is a new area of research. Despite the preliminary nature of the studies, the results of the meta-analysis led the authors to suggest that the effect of exercise on PTSD symptoms is comparable to other mental illnesses. That is, physical activity seemed to complement usual care (including psychotherapy, medications, group therapy) and lead to better outcomes for individuals with mental health disorders. There was not sufficient evidence to indicate that there was an impact on physical health.

There were additional studies that were not included in the above systematic review because of their relative poor quality, however they were considered relevant for this literature scan as they examined exercise as a treatment for PTSD in US veterans. One examined a VA residential rehabilitation program using CBT for PTSD where 217 US veterans were offered participation in a bike-exercise program⁴⁷. Patients self-selected participation into a bike riding program, creating the potential for bias in the results. There was no difference in PTSD symptoms or sleep quality between those who did and did not cycle, however, exercise was associated with a reduction in hyperarousal symptoms over the course of treatment in veterans who reported relatively poor sleep quality at intake. Among veterans with good sleep quality, exercise did not change hyperarousal symptoms. This led the authors to posit that exercise may help to reduce insomnia in PTSD and promote recovery from symptoms. In another US study, yoga was found to reduce PTSD symptoms, but not increase mindfulness or resilience in a small sample (n=12) of veterans⁴⁸. The authors suggested that this was due to the positive impact that yoga has on stress and the physiology of the body.

4. Employment and mental health

Work can play an integral role in overall wellbeing. Aside from material gain, individuals derive a range of intangible benefits from work including a sense of achievement, regular social contact and improved self-efficacy⁴⁹. Given these benefits, it may be expected that work would assist in recovery from mental health disorders. In the 2015 literature, there was a lack of research examining the impact of return to work on mental health outcomes, however other aspects of the relationship between work and psychological health were studied. Notably, there were a few studies that examined whether there was a positive association between mental health and employment in veterans.

Association of work with mental health outcomes in veterans

In the 2015 literature, there were two notable studies that considered whether employment is associated with better mental health outcomes for veterans. In a study of disabled Israeli veterans, those who were employed (n=101) reported higher levels of hope and acceptance

of their disability compared to their non-employed counterparts (n=111)⁵⁰. This indicates that employment status is important for psychosocial functioning. The authors stated that a number of benefits are conveyed by work including: structure; social contact; providing a sense of purpose; providing identity; and encouraging activity. In addition, higher unemployment rates were present among veterans with mental health impairment in comparison to those with physical disabilities. The authors suggested that this may occur because vocational rehabilitation services are often not tailored to the specific needs of veterans with PTSD. Interestingly, employment was not related to social integration.

Another study of 1605 US women veterans found that those with depression were nearly five times more likely to be unemployed compared to veterans who did not screen positive for depression⁵¹. The authors noted that it was unclear whether this association occurred because depression impaired an individual's ability to find or maintain work, or whether depression occurred as a result of unemployment. They also observed that the rate of unemployment was higher among veteran women (11.2%) compared to civilian woman (8.3%). The authors claimed that identifying and treating depression in women veterans may lead to better employment outcomes. The study also found that unemployment was more prevalent among individuals who served in the regular military versus the National Guard or army reserve. The authors contended that those who were in the regular army had more difficulty transitioning to the civilian workforce because they were less connected to civilian workplaces and did not have as many opportunities or transferrable skills compared to their counterparts.

The difficulty of adjusting to civilian work following military service was highlighted by another study of US veterans. The study found that the extent to which reintegration into civilian work was stressful was related to the seniority of the individual concerned. Officers experienced less identity strain in reintegration compared to enlisted soldiers⁵², and this was associated with having better developed political skills (being socially astute, flexible, and trustworthy). The authors reasoned that this was also related to the higher level of education and the wider base of transferrable skills that officers tend to have.

The association of mental health with return to work

The above mentioned studies are limited by their cross-sectional design, making it unclear whether employment leads to better psychosocial outcomes or better adjustment is a predictor of being able to undertake and maintain employment. Our search failed to identify any studies published in 2015 that examined whether return to work had a direct impact on the mental health of veterans. However, there were a number of studies conducted in the general population that examined how mental health disorders can impact on productivity and the ability of an individual to maintain employment. In general, mental health disorders tend to be associated with longer absences from work compared with physical illnesses⁵³. There are many possible explanations for this association, the articles described below outline some of the correlates of long term disengagement with work and mental health disorders.

In a longitudinal study of 332 Australian patients claiming compensation for transport accidents (76%) and work injuries (23%), compensation seeking was associated with long term disability, particularly in instances where individuals were suffering from PTSD or depression⁵⁴. The authors posited that this relationship existed because individuals who were impaired by mental health disorders would have experienced more stress trying to manage the claims process in comparison to those who were not experiencing any mental health difficulties. This lower capacity to deal with the stress of a compensation claim leads to further disability in the long term. The authors suggested that such individuals may benefit from intervention early on in the claims process to manage the amount of stress that they experience.

Two recent longitudinal studies indicated that mental health disorders can lead to greater disability and poorer occupational outcomes over the longer term. A study of 109 Canadians with musculoskeletal injuries found that severity of depression symptoms predicted lower probability of being at work one year later⁵⁵. Interestingly, expectations about recovery mediated the role between depression and return to work. That is, individuals who had depressive symptoms and predicted that they would have a slower recovery tended to have longer absences from work. The authors argued that these negative predictions could be related to the negative cognitions that tend to be a feature of depression. In a 5-year prospective study of 137 Finnish employees, longer duration of depression, comorbid psychiatric disorders and having received social assistance predicted leaving the workforce⁵⁶. The authors emphasised that identifying and treating depression was crucial to preventing individuals from becoming more seriously disabled and leaving the workforce altogether. However, neither of these studies controlled for any psychological treatment that the patients may have received. Therefore it is difficult to conclude whether treatment would have been effective in terms of preventing long term unemployment, or whether the people who were still out of the workforce at follow up were treatment resistant. Studies that examine how treating mental health disorders affects future disability and participation in employment have the potential to provide more information about the nature of the relationship between psychiatric symptoms and long term disengagement from work.

Work focussed interventions for mental disorders

Interventions that are focussed on the reintegration to work have the potential to be beneficial for mental health recovery. The following studies have relevance to the overall topic in that they examine how standard psychological treatments, such as CBT, have been adapted to focus on successful reintegration to a workplace. The relative success of these interventions is examined below.

One noteworthy paper was a meta-review (a systematic review of existing literature reviews) of workplace initiated or facilitated interventions for depression and anxiety disorders. The review revealed that interventions with a specific focus on work were effective in improving mental health symptomatology⁵⁷. In particular, therapies that had an established evidence based treatment such as CBT or exposure therapy were found to have strong evidence for

their efficacy. Some preventative workplace-based interventions, such as promoting physical activity and increasing employee control over their work had moderate positive effects. It is worth noting that they did not conduct a meta-analysis, so the authors' conclusions were based on a subjective synthesis of the evidence rather than any objective analysis. The authors did not find any studies of sufficient quality for inclusion in their meta-review that examined resilience and highlighted the need for more intervention studies examining the effectiveness of such programs.

There were other studies in the 2015 literature that reported on individual trials of work focused treatment for mental health disorders. A study of 26 German employees compared the effectiveness of work-related cognitive-behavioural treatment (W-CBT) with CBT as usual in the treatment of employees on sick leave as a result of major depressive disorder⁵⁸. W-CBT differed from CBT in that it focussed on return to work throughout the course of therapy. For example, the workplace was emphasised as a source of social contact and self-esteem, problem solving and skills training was practised in terms of the workplace and a graded return to work plan was developed with the support of the employer. Participants in both treatment groups experienced improvements in depressive symptoms and a reduction in absent days from work. However at 1 year follow-up, individuals in the W-CBT group had fewer days absent and a higher proportion were employed compared to CBT as usual. This was a small, initial study, where participants were not randomised to treatment arms, however it indicated that using W-CBT could enhance return to work without impeding recovery from depression. A larger, randomised clinical trial investigated the utility of a phone based depression intervention in improving work functioning in 380 US adults aged 45 and over with depression and limited ability to work⁵⁹. The intervention, which included care coordination, work focused CBT and work coaching was effective in reducing self-reported symptoms of depression. Occupational outcomes also improved, in terms of work productivity, absent days and work limitations. These changes were measured at four months post baseline, immediately following completion of the intervention so it was not determined whether those improvements were maintained in the long term.

A small study conducted in Taiwan described a "Life Adaption Skills Training (LAST)" program which was designed to build strategies and skills to improve occupational participation for people with depression⁶⁰. Participants were assigned to receive the intervention which was delivered via 24 group sessions and 24 supportive phone calls (n=33), or a control condition, where they were contacted by phone on 24 occasions (n=35). Preliminary findings indicated that there was not a large treatment effect as the intervention group had greater improvements in anxiety and suicidal ideation, however both groups had improvements on other measures of psychological symptoms and quality of life. In addition, a substantial number of the participants (11, 33%) dropped out of the treatment arm of the study. This raises the potential for bias in the results, for example it is possible that only those participants who experienced an improvement in symptoms completed the intervention.

A large randomised control trial of 430 Danish employees who were on sick leave and at risk of developing a mental disorder evaluated the effectiveness of psychoeducation as an adjunct to case management⁶¹. Psychoeducation was delivered to groups in weekly two hour sessions over six weeks, and was based on coping strategies for managing stress and work life. Interestingly, compared to the control group, the intervention participants were slower to return to work. They were less likely to have returned to work 3 months after the intervention, and 6 months following the intervention they were equally as likely to have returned to work. The authors inferred that the differences at 3 month may have occurred because participants delayed returning to work in order to complete the intervention. Potential reasons suggested for the overall ineffectiveness of the group delivered psychoeducation included the content potentially being too broad or not focussed sufficiently on return to work.

5. Veterans utilisation of mental health services

Many individuals who experience psychiatric disorders do not seek help from mental health services. Underutilisation of mental health services may lead to individuals unnecessarily experiencing prolonged or exacerbated psychological distress⁶², potentially worsening the impact on their relationships, employment and physical health. It has been estimated that less than half of veterans who would benefit from mental health services actually engage in treatment⁶³. In Australia, male veterans do not utilise mental health services more than other men, despite reporting poorer lifetime mental health⁶⁴. Utilisation of mental health services was a rich area of research in the 2015 literature, with a number of studies conducted exclusively in military populations. The majority of these studies were conducted in the US and investigated a range of reasons to explain why not all veterans with psychiatric disorders receive appropriate care.

Stigma

The stigma that is attached to mental illness can be a major barrier to seeking help for mental health services. Stigma about mental health can manifest in a variety of ways. For example, some individuals may be reluctant to enter treatment because they believe that they will be viewed differently by their peers as a result. For others, pre-existing negative beliefs about sufferers of mental illness, such as believing that they cannot be relied upon, could be a barrier to disclosing their own mental health problems. Some researchers have suggested that stigma may be particularly relevant in military environments where masculine stereotypes of needing to appear strong and self-reliant are widespread⁶⁵. Stigma has been a focus of a research over recent years, particularly in the US. The 2013 Annual Literature scan covered this topic, and Phoenix undertook an Evidence Compass review for DVA on effective strategies for reducing the stigma associated with mental health disorder in 2013. There is some evidence of progress being made since that time, for example, destigmatising efforts in Canadian armed forces have seen lower levels of stigma compared to other military organisations⁶⁶. However, in the 2015 literature, there were a number of studies that found persistent links between the underutilisation of psychiatric services and mental health stigma^{65,67-69}. Stigmatising beliefs found in military populations included: the perception that

seeking help for a mental health disorder would harm their career⁶⁷; fear of diagnosis or treatment appearing on military records⁶⁸; personal embarrassment⁶⁸; and being perceived as weak or lesser⁶⁹.

A systematic review and meta-analysis investigated the association of stigma with help-seeking for mental health problems among military personnel⁷⁰. The most commonly reported barriers were concerns about being treated differently or being seen as weak. Although stigmatising beliefs were prevalent, the review found that in the majority of studies there was no association between perceived stigma and help seeking. Surprisingly, individuals who believed that they would experience stigma still sought help or expressed interest in seeking help. The authors suggested that these counter-intuitive results may reflect differences in individual's intentions versus their actual behaviour. The authors postulated that even if individuals prefer not to seek psychiatric help, when psychiatric symptoms become overwhelming and impact on the ability to function, people tend to seek help regardless of their preference. That is, the factors that facilitate help seeking are more powerful than the barriers. However, it may also be an indication that individuals delay help seeking because of stigmatising beliefs until they have accumulated symptomatology so severe that are forced to seek help. Hence, stigma may impact on timely uptake or accessing of mental health treatment. Methodological issues and variation in relation to the measurement of stigma across studies were noted by the authors and these may have had an influence on the results of the meta-analysis.

A separate study of 927 US veterans may provide further support for these conclusions. In this study, veterans with mental health problems were asked to report on the barriers and facilitators of treatment seeking and their service use behaviour over the past 12 months⁷¹. Embarrassment about seeking treatment was a highly rated barrier to help seeking, however, it was not related to actual treatment seeking. Instead stigmatising perceptions of treatment seekers and self-reliance were negatively associated with treatment seeking. Notably, the facilitators to treatment seeking, such as positive beliefs about treatment and support from others were more highly rated than the barriers, and were significantly associated with actual treatment seeking. The cross sectional design of the study makes causal interpretations difficult, however it does underline the power of facilitators of treatment to override pre-existing negative perceptions about mental illness or its treatment.

A longitudinal study of British military personnel provided information on how stigma may vary according to symptom severity and stage of the disorder⁷². Military personnel were surveyed immediately following deployment and 6 months later. In this study, people who had recovered from mental illness reported lower levels of stigma and barriers to care compared to those who had never developed a mental illness. Interestingly, individuals who were at the early stages of onset and were considering seeking treatment had the highest levels of stigma and barriers to care. Taken at face value, these results are concerning and suggest that individuals who are becoming mentally unwell are most in need of stigma reducing strategies. However, the authors reasoned that this relationship exists because as

people become psychologically unwell they begin to think more seriously about possible adverse consequences of seeking help. Whilst this provides interesting information about stigma through the cycle of a disorder, the authors noted that the study used self-report data, which is not as robust an assessment of mental illness as a structured clinical interview. In a related cross sectional study of US soldiers, those who screened positive for psychiatric disorders reported a higher level of stigma perceptions⁷³. In addition, stigmatising perceptions of other soldiers who sought treatment was negatively associated with treatment seeking and self-stigma was related to treatment dropout.

Concerns about how sensitive health information will be handled may prevent disclosure of mental health issues. In a study of 160 treated and 119 untreated US veterans with PTSD, there was a high prevalence of stigma, however privacy concerns was the only barrier associated with service underutilisation⁷⁴. A related study of 789 US National guard personnel found that a higher proportion of individuals endorsed current suicidal thoughts when they were assured that the information would not be reported to onsite military mental health professionals (6% vs 9.4%)⁷⁵. These studies suggest that processes that reinforce privacy may help to increase use of mental health services.

Age related differences in utilisation of mental health services

Research suggests that utilisation of mental health services may differ by age; in particular, there appears to be a tendency for older people to have lower levels of psychiatric service use.

A study of US veterans revealed that age was the greatest predictor of utilisation of mental health services, with younger adults (aged between 18 and 35) being three times more likely to use mental health services compared to older adults⁷⁶. The authors drew on previous research to suggest reasons why older adults had a lower rate of utilisation, these included; concern about the cost of treatment, difficulty travelling to appointments, doubt regarding treatment efficacy, stigma about mental health and poor knowledge of mental health services. A retrospective review of 2,205 US veterans aged 60 and older found that only a quarter of those who screened positive for a current psychiatric disorder were utilising mental health services⁷⁷. Those who were currently engaged in treatment were likely to be younger, be experiencing current suicidal ideation and have fewer negative beliefs about mental health care. In the full sample, current utilisation was associated with the presence and severity of psychiatric symptoms, and lower perceptions of stigma. Interestingly, the majority (72%) of veterans who were utilising treatment did not screen positive for psychiatric disorders, prompting the authors to speculate that their distress had subsided during treatment or that individuals had engaged in treatment for reasons other than treating a psychiatric disorder. Another retrospective study of US veterans aged 50 and older and recently diagnosed with PTSD indicated that increasing age was associated with decreased likelihood of any mental health treatment⁷⁸. However, psychiatric comorbidities were associated with increasing likelihood of treatment beyond the effect of older age. Among those who received treatment, older age was associated with fewer psychotherapy visits and

longer waiting times. The authors did not have a clear explanation for these associations, however they suggested that it could be related to restricted mobility or other logistical barriers. These studies emphasised the need for mental health outreach in this population so that they have access to effective treatment.

Encouragingly, a study of US veterans aged 65 and older indicated that between 2005 and 2013 their utilisation of mental health services had increased⁷⁹. The authors suggested reasons for this may be related to an increase in screening for psychiatric symptoms and integration of mental health services into primary care settings. The authors also noted that the sample used in the study were treatment seeking, so the increased utilisation probably reflects changes in external factors such as access and availability and not internal factors such as stigma or negative beliefs about treatment.

Gender related differences for utilisation of health services

In the 2015 literature there were a number of studies specifically examining female veteran's utilisation of mental health services, and the associated factors.

A one year study of female US veterans who had a diagnosis of PTSD and commenced mental health care found that less than half completed minimally adequate care⁸⁰. Minimally adequate care was defined as nine or more mental health visits, or 12 consecutive weeks of medication use. The authors found that certain factors were associated with attrition, including: having no other mental health comorbidities; lower symptom severity; lower use of general VA care; and higher emotional numbing. This indicated that feeling distressed and being functionally impaired was a strong facilitator of treatment seeking. Another study of 6,287 US female veterans found that approximately half of those surveyed perceived a need for mental health care⁸¹. Encouragingly, 84% of those who were in need of care accessed care, which was a better rate compared to the general US population (50-60%). However, only half of those who used VA mental health services reported that it met their needs very well or completely. Those whose needs were not met tended to be younger and non-white and 1 in 5 stated that they felt uncomfortable at treatment services because of their gender. Another cross sectional study of female US veterans found that the majority of veterans who experienced a sexual assault had engaged in mental health counselling in the past 12 months, however only a minority received care immediately after the incident⁸². The authors suggested that this may be related to a number of factors including, logistical barriers, stigma and the time that it takes for an individual to recognise an incident as sexual trauma. Whilst these studies provide some information about how women access mental health care, they were conducted exclusively in US veteran mental health services, so it is unclear whether the same issues or barriers exist within Australian services.

Access and funding

Some recent studies have examined how increasing funding to mental health services impacts on the service utilisation and outcomes for veterans and military personnel.

To examine how changes to a mental health service impacted on service utilisation, a Canadian study conducted secondary analysis of medical records of veterans who deployed between 2001 and 2008⁶⁶. Analysis found that longer delays in mental health care were associated with poorer outcomes. They also found that individuals who had been treated more recently had experienced better outcomes. The authors suggested that this was related to the investment that the Canadian armed forces had made in mental health services over the past 15 years including increasing the number of providers, integrating mental health assessment and treatment into standard care and providing training about resilience and mental health.

An examination of the funding of substance use treatment revealed that as funding increased, so did access to and intensity of care⁸³. The study examined funding data from the US Veteran Health Administration against patient records, and so the evidence was correlational. Still, these findings are promising in terms of providing solutions to underutilisation, particularly in light of evidence that suggests that soldiers with substance use disorders access treatment at lower rates compared to individuals with anxiety or mood disorders⁸⁴. Logistical causes of underutilisation may also be amenable to funding and resource based solutions. A study of VA databases comparing the utilisation of psychotherapy in rural vs urban US veterans found that between 2007 and 2010 utilisation for both groups had increased, and the gap between urban and rural utilisation was shrinking⁸⁵. The authors suggested this was related to specific efforts to engage rural veterans, such as increasing the amount of rural mental health clinics and increasing the resources of these clinics as well as increasing telehealth services. Although the above mentioned studies suggest a relationship between enriched mental health services and better mental health outcomes, it is important to note some limitations of the research. These studies were not longitudinal and so they did not provide evidence of causal relationships. In addition, the studies drew on secondary data from military health care administrative databases, so if veterans sought help outside those systems it would not have been captured within the data. Finally, as the research was US based, and related to a health service and funding model that is different to Australian veteran services it may be of limited relevance. Nonetheless, the research does indicate that investing in mental health services leads to increased utilisation.

6. Digital technologies in the prevention and treatment of mental health disorders

Digital technology has a growing role in the treatment and prevention of mental health disorders. It has the capacity to deliver mental health care via the internet to psychiatric populations who are otherwise unable to access treatment⁸⁶. In addition, technology has the capacity to present established treatment techniques in innovative ways, for example using virtual reality to conduct exposure therapy⁸⁷. There were some noteworthy articles in 2015

which reported on advances in the use of technology to treat and prevent mental health issues.

Computerised tools

There were a number of interesting studies in 2015 which described the use of computer software to treat and prevent PTSD. Researchers adapted known treatments for the disorder to come up with novel ways to approach treatment using simple computer-based games.

A well conducted study used computerised tools to reduce the symptoms of threat vigilance and avoidance in PTSD⁸⁸. Threat vigilance is common in anxiety disorders and attention bias modification tools reduced these symptoms by training an individual's attention away from threat stimuli. The authors in this study argued that PTSD attention can fluctuate between threat vigilance and threat avoidance, and reflects an issue of attentional control. A randomised controlled trial was employed where participants completed either attention bias modification tasks or attention control training. Two trials were completed separately with US and Israeli veterans across either four or eight sessions. In both trials attention control training was superior in reducing PTSD symptoms compared to attention bias modification. The authors suggested that this occurred because threat avoidance is a key diagnostic feature of PTSD, therefore a tool which trains individuals to control their attention, rather than consistently direct it away from threats would be more successful in overcoming PTSD symptomology.

There was emerging evidence of video games as a novel treatment for PTSD. Although there were no studies in the 2015 literature that comprehensively evaluated the efficacy of a video game treatment, two studies examined their usability and feasibility as a treatment method. A preliminary study of a video game aimed at treating and preventing PTSD was trialled in 14 Danish veterans⁸⁹. The game required players to go through various simulated stressful experiences while skin conductance and blood volume pulse was measured as a proxy for stress. There was no control group and the researchers did not measure a reduction in symptoms, however, they did find a correspondence between PTSD diagnosis and physiological measures of stress. The authors suggested that the game may have utility in the future for exposure therapy, stress inoculation and assessment of PTSD.

Another study described a game that was designed to prevent the development of PTSD by teaching behavioural and cognitive skills in situations that simulate real life situations⁹⁰. The study found that in a group of 60 US university students their confidence in playing video games mediated their expectancies and reactions toward the game. The authors noted that the findings had potential implications for the game as an effective prevention technique in participants who had low expectations for the treatment. That is, treatments that rely on video game type interfaces may have limited effectiveness for people who are not confident playing video games.

Internet delivery of psychotherapy

The internet is increasingly being trialled as a medium for delivering psychotherapy to individuals who would benefit from mental health treatment but cannot access face to face treatment because of geographical, financial or other constraints. The following studies detail trials of treatment for PTSD delivered via the internet.

A preliminary study investigated a CBT-based intervention for PTSD that was delivered via the internet to US veterans⁹¹. In an uncontrolled pre-post-test design, participants completed the *Post-Traumatic Stress Workshop* from the website afterdeployment.org and had brief weekly phone calls. Of the 24 veterans who were recruited, only 8 completed all sessions and 12 completed at least 5 of the 8 sessions. The high attrition rate was cause for concern, however the authors stated it is similar to other online interventions and common in the studied population. Following treatment, 40% of completers experienced a reduction in symptoms. Although these outcomes indicated that this service may not be as acceptable or effective as standard care for PTSD, the study provided tentative evidence that it is preferable to no care for individuals who do not access face to face services.

A randomised controlled trial examined the effectiveness of an online, nurse assisted cognitive-behavioural self-management program for veterans with PTSD⁹². The online intervention, DESTRESS-PC consisted of non-trauma focussed CBT and was monitored by a study nurse. The comparison group received optimised usual primary care (OUC) which consisted of low intensity primary care management and monitoring by a nurse. The online treatment was more effective than OUC in reducing PTSD symptoms, and the effect was greatest at 12 weeks and disappeared at the 18 week follow up. Whilst there was no evidence that DESTRESS-PC was superior to standard PTSD treatment, it did indicate it could be useful for patients who are unable or opposed to engaging in standard treatment. It is worth noting that refusal rate in this study was also high and 34 of 43 participants completed the course.

German researchers reported on a trial of web-based psychotherapy for Iraqi adults who had been exposed to war trauma⁹³. In the trial, 159 individuals were randomised to treatment group or a waiting list control group. Treatment was based on CBT for PTSD and was designed in the Netherlands, translated into Arabic and delivered by Arabic speaking psychotherapists or psychiatrists. The treatment consisted of two writing activities per week over a period of five weeks, in three treatment phases, 1) confrontation of the traumatic event, 2) cognitive restructuring and 3) social sharing. PTSD symptoms were reduced in the treatment group relative to the control group and were sustained at three month follow up. In addition, 62% of the treatment group no longer met diagnosis for PTSD compared to 2% of the control group. In this study the attrition rate at posttreatment assessment was approximately 40% for both the control and treatment group, the authors posited that this was related to issues with electricity and internet connection. Despite these difficulties, this study provided a promising method of delivering psychological assistance to individuals in areas of conflict where access to other treatments is very limited.

An important consideration in the utility of internet based psychotherapy for veterans is how acceptable this type of treatment is for the military population. The high rate of attrition reported in these studies indicates that there are some barriers to completing treatment. Collectively, the barriers that were suggested in these studies included; technical problems such as unstable internet connections⁹³, lack of privacy in the home⁹³, and a low motivation to engage in treatment, particularly in the veteran population^{91,92}. A US study investigated the factors that were associated with the willingness of veterans to engage in different types of technologies for e-mental health including, video conferencing, internet, smartphones and social networking⁹⁴. Approximately one third of veterans with probable PTSD were interested in online interventions or social network based interventions. Interestingly, veterans who screened positive for PTSD were less likely to want to use e-mental health modalities compared to those who did not have PTSD. Fewer years of formal education was also associated with reduced willingness to use e-mental health resources, which the authors suggested may be related to a lower level of familiarity with technology. The results of this study underline that not all barriers to care are logistical and access to technology based mental health care is likely to have a unique set of barriers.

References

1. Williams SG, Collen J, Orr N, Holley AB, Lettieri CJ. Sleep disorders in combat-related PTSD. *Sleep Breath*. 2015;19(1):175-182.
2. Gilbert KS, Kark SM, Gehrman P, Bogdanova Y. Sleep disturbances, TBI and PTSD: Implications for treatment and recovery. *Clin Psychol Rev*. 2015;40:195-212.
3. Straus LD, Drummond SP, Nappi CM, Jenkins MM, Norman SB. Sleep variability in military-related PTSD: A comparison to primary insomnia and healthy controls. *J Trauma Stress*. 2015;28(1):8-16.
4. Brownlow JA, Harb GC, Ross RJ. Treatment of sleep disturbances in post-traumatic stress disorder: A review of the literature. *Curr Psychiatry Rep*. 2015;17(6).
5. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 5th ed: Arlington, VA : American Psychiatric Publishing; 2013.
6. Ulmer CS, Van Voorhees E, Germain AE, Voils CI, Beckham JC. A comparison of sleep difficulties among Iraq/Afghanistan theater veterans with and without mental health diagnoses. *J Clin Sleep Med*. 2015;11(9):995-1005.
7. Trockel M, Karlin BE, Taylor CB, Brown GK, Manber R. Effects of cognitive behavioral therapy for insomnia on suicidal ideation in veterans. *Sleep*. 2015;38(2):259-265.
8. Bryan CJ, Gonzales J, Rudd MD, et al. Depression mediates the relation of insomnia severity with suicide risk in three clinical samples of U.S military personnel. *Depress Anxiety*. 2015;32(9):647-655.
9. Gehrman PR, Harb GC, Cook JM, Barilla H, Ross RJ. Sleep diaries of Vietnam War veterans with chronic PTSD: The relationships among insomnia symptoms, psychosocial stress, and nightmares. *Behav Sleep Med*. 2015;13(3):255-264.
10. Lippa SM, Fonda JR, Fortier CB, et al. Deployment-related psychiatric and behavioral conditions and their association with functional disability in OEF/OIF/OND veterans. *J Trauma Stress*. 2015;28(1):25-33.
11. Jenkins MM, Colvonen PJ, Norman SB, Afari N, Allard CB, Drummond SP. Prevalence and mental health correlates of insomnia in first-encounter veterans with and without military sexual trauma. *Sleep*. 2015;38(10):1547-1554.
12. Borders A, Rothman DJ, McAndrew LM. Sleep problems may mediate associations between rumination and PTSD and depressive symptoms among OIF/OEF veterans. *Psychol Trauma*. 2015;7(1):76-84.
13. Karlin BE, Trockel M, Spira AP, Taylor CB, Manber R. National evaluation of the effectiveness of cognitive behavioral therapy for insomnia among older versus younger veterans. *Int J Geriatr Psychiatry*. 2015;30(3):308-315.
14. Gupta MA, Simpson FC. Obstructive sleep apnea and psychiatric disorders: A systematic review. *J Clin Sleep Med*. 2015;11(2):165-175.
15. Colvonen PJ, Masino T, Drummond SPA, Myers US, Angkaw AC, Norman SB. Obstructive sleep apnea and posttraumatic stress disorder among OEF/OIF/OND veterans. *J Clin Sleep Med*. 2015;11(5):513-518.
16. Forbus L, Kelly UA. Screening for obstructive sleep apnea in veterans seeking treatment of posttraumatic stress disorder. *ANS Adv Nurs Sci*. 2015;38(4):298-305.
17. Fossion P, Leys C, Vandeleur C, et al. Transgenerational transmission of trauma in families of Holocaust survivors: The consequences of extreme family functioning on resilience, sense of coherence, anxiety and depression. *J Affect Disord*. 2015;171:48-53.

18. Danieli Y, Norris FH, Lindert J, Paisner V, Engdahl B, Richter J. The Danieli inventory of multigenerational legacies of trauma, Part I: Survivors' posttrauma adaptational styles in their children's eyes. *J Psychiatr Res.* 2015;68:167-175.
19. Trautmann J, Alhusen J, Gross D. Impact of deployment on military families with young children: A systematic review. *Nurs Outlook.* 2015;63(6):656-679.
20. Landy MSH, Pukay-Martin ND, Vorstenbosch V, Torbit L, Monson CM. A pilot study of the effects of cognitive-behavioral conjoint therapy for posttraumatic stress disorder on parenting. *J Aggress Maltreat Trauma.* 2015;24(4):454-465.
21. Mogil C, Hajal N, Garcia E, et al. FOCUS for early childhood: A virtual home visiting program for military families with young children. *Contemp Fam Ther.* 2015;37(3):199-208.
22. Hisle-Gorman E, Harrington D, Nylund CM, Tercyak KP, Anthony BJ, Gorman GH. Impact of parents' wartime military deployment and injury on young children's safety and mental health. *J Am Acad Child Adolesc Psychiatry.* 2015;54(4):294-301.
23. Marsanic VB, Margetic BA, Bulic SO, et al. Non-suicidal self-injury among psychiatric outpatient adolescent offspring of Croatian posttraumatic stress disorder male war veterans: Prevalence and psychosocial correlates. *Int J Soc Psychiatry.* 2015;61(3):265-274.
24. Vukovic IS, Marsanic VB, Margetic BA, Paradzik L, Vidovic D, Flander GB. Self-reported emotional and behavioral problems, family functioning and parental bonding among psychiatric outpatient adolescent offspring of Croatian male veterans with partial PTSD. *Child Youth Care Forum.* 2015;44(5):655-669.
25. Zerach G, Aloni R. Secondary traumatization among former prisoners of wars' adult children: The mediating role of parental bonding. *Anxiety Stress Coping.* 2015;28(2):162-178.
26. Figley CR. Compassion fatigue as secondary traumatic stress disorder: An overview. In: Figley CR, ed. *Compassion fatigue: Coping with secondary traumatic stress disorder in those who treat the traumatized.* New York, NY: Brunner/Mazel; 1995:1-20.
27. Zerach G. Secondary traumatization among ex-POWs' adult children: The mediating role of differentiation of the self. *Psychol Trauma.* 2015;7(2):187-194.
28. Zannas AS, Provencal N, Binder EB. Epigenetics of posttraumatic stress disorder: Current evidence, challenges, and future directions. *Biol Psychiatry.* 2015;78(5):327-335.
29. Yehuda R, Flory JD, Bierer LM, et al. Lower methylation of glucocorticoid receptor gene promoter 1F in peripheral blood of veterans with posttraumatic stress disorder. *Biol Psychiatry.* Feb 2015;77(4):356-364.
30. Boks MP, van Mierlo HC, Rutten BP, et al. Longitudinal changes of telomere length and epigenetic age related to traumatic stress and post-traumatic stress disorder. *Psychoneuroendocrinology.* Jan 2015;51:506-512.
31. Yehuda R, Daskalakis NP, Bierer LM, et al. Holocaust exposure induced intergenerational effects on FKBP5 methylation. *Biol Psychiatry.* Aug 12 2015.
32. Bowles SV, Pollock LD, Moore M, et al. Total force fitness: The military family fitness model. *Mil Med.* 2015;180(3):246-258.
33. Lucier-Greer M, Arnold AL, Mancini JA, Ford JL, Bryant CM. Influences of cumulative risk and protective factors on the adjustment of adolescents in military families. *Fam Relat.* 2015;64(3):363-377.
34. Mancini JA, Bowen GL, O'Neal CW, Arnold AL. Relationship provisions, self-efficacy and youth well-being in military families. *J Appl Dev Psychol.* 2015;40:17-25.

35. Hayes MA, Gallagher MW, Gilbert KS, et al. Targeting relational aggression in veterans: The strength at home friends and family intervention. *J Clin Psychiatry*. 2015;76(6):e774-e778.
36. Fields AJ, Hoyt RE, Linnville SE, Moore JL. Physical activity, sleep, and C-reactive protein as markers of positive health in resilient older men. *J Health Psychol*. Published online ahead of print February 10 2015.
37. Stubbs B, Vancampfort D, Rosenbaum S, et al. Challenges establishing the efficacy of exercise as an antidepressant treatment: A systematic review and meta-analysis of control group responses in exercise randomised controlled trials. *Sports Med*. Published online ahead of print December 29 2015.
38. Stonerock GL, Hoffman BM, Smith PJ, Blumenthal JA. Exercise as treatment for anxiety: Systematic review and analysis. *Ann Behav Med*. 2015;49(4):542-556.
39. Laferrier JZ, Teodorski E, Cooper RA. Investigation of the impact of sports, exercise, and recreation participation on psychosocial outcomes in a population of veterans with disabilities: A cross-sectional study. *Am J Phys Med Rehabil*. 2015;94(12):1026-1034.
40. Du WJ, Tan JP, Yi F, et al. Physical activity as a protective factor against depressive symptoms in older Chinese veterans in the community: Result from a national cross-sectional study. *Neuropsychiatric Dis Treat*. 2015;11:803-813.
41. Hoerster KD, Millstein RA, Hall KS, et al. Individual and contextual correlates of physical activity among a clinical sample of United States veterans. *Soc Sci Med*. 2015;142:100-108.
42. Crowley SK, Wilkinson LL, Wigfall LT, et al. Physical fitness and depressive symptoms during army basic combat training. *Med Sci Sports Exerc*. 2015;47(1):151-158.
43. Hall KS, Hoerster KD, Yancy WS. Post-traumatic stress disorder, physical activity, and eating behaviors. *Epidemiol Rev*. 2015;37(1):103-115.
44. Giesen ES, Deimel H, Bloch W. Clinical exercise interventions in alcohol use disorders: A systematic review. *J Subst Abuse Treat*. 2015;52:1-9.
45. Rosenbaum S, Vancampfort D, Steel Z, Newby J, Ward PB, Stubbs B. Physical activity in the treatment of post-traumatic stress disorder: A systematic review and meta-analysis. *Psychiatry Res*. 2015;230(2):130-136.
46. Rosenbaum S, Sherrington C, Tiedemann A. Exercise augmentation compared with usual care for post-traumatic stress disorder: A randomized controlled trial. *Acta Psychiatr Scand*. 2015;131(5):350-359.
47. Babson KA, Heinz AJ, Ramirez G, et al. The interactive role of exercise and sleep on veteran recovery from symptoms of PTSD. *Ment Health Phys Act*. 2015;8:15-20.
48. Johnston JM, Minami T, Greenwald D, Li C, Reinhardt K, Khalsa SBS. Yoga for military service personnel with PTSD: A single arm study. *Psychol Trauma*. 2015;7(6):555-562.
49. Law M. Participation in the occupations of everyday life. *Am J Occup Ther*. 2002;56(6):640-649.
50. Araten-Bergman T, Tal-Katz P, Stein MA. Psychosocial adjustment of Israeli veterans with disabilities: Does employment status matter? *Work*. 2015;50(1):59-71.
51. Hamilton AB, Williams L, Washington DL. Military and mental health correlates of unemployment in a national sample of women veterans. *Med Care*. 2015;53(4 suppl 1):S32-S38.
52. McAllister CP, Mackey JD, Hackney KJ, Perrew PL. From combat to khakis: An exploratory examination of job stress with veterans. *Mil Psychol*. 2015;27(2):93-107.

53. de Vries G, Koeter MW, Nieuwenhuijsen K, Hees HL, Schene AH. Predictors of impaired work functioning in employees with major depression in remission. *J Affect Disord.* 2015;185:180-187.
54. O'Donnell ML, Grant G, Alkemade N, et al. Compensation seeking and disability after injury: The role of compensation-related stress and mental health. *J Clin Psychiatry.* 2015;76(8):e1000-e1005.
55. Carriere JS, Thibault P, Sullivan MJ. The mediating role of recovery expectancies on the relation between depression and return-to-work. *J Occup Rehabil.* 2015;25(2):348-356.
56. Riihimaki K, Vuorilehto M, Isometsa E. A 5-year prospective study of predictors for functional and work disability among primary care patients with depressive disorders. *Eur Psychiatry.* 2015;30(1):51-57.
57. Joyce S, Modini M, Christensen H, et al. Workplace interventions for common mental disorders: A systematic meta-review. *Psychol Med.* 2015;46(4):683-697.
58. Kroger C, Bode K, Wunsch E-M, Kliem S, Grocholewski A, Finger F. Work-related treatment for major depressive disorder and incapacity to work: Preliminary findings of a controlled, matched study. *J Occup Health Psychol.* 2015;20(2):248-258.
59. Lerner D, Adler DA, Rogers WH, et al. A randomized clinical trial of a telephone depression intervention to reduce employee presenteeism and absenteeism. *Psychiatr Serv.* 2015;66(6):570-577.
60. Chen Y-L, Pan A-W, Hsiung P-C, et al. Life Adaptation Skills Training (LAST) for persons with depression: A randomized controlled study. *J Affect Disord.* 2015;185:108-114.
61. Pedersen P, Sogaard HJ, Labriola M, Nohr EA, Jensen C. Effectiveness of psychoeducation in reducing sickness absence and improving mental health in individuals at risk of having a mental disorder: A randomised controlled trial. *BMC Public Health.* 2015;15(1):1-12.
62. Clement S, Schauman O, Graham T, et al. What is the impact of mental health-related stigma on help-seeking? A systematic review of quantitative and qualitative studies. *Psychol Med.* 2015;45(1):11-27.
63. Ramchand R, Rudavsky R, Grant S, Tanielian T, Jaycox L. Prevalence of, risk factors for, and consequences of posttraumatic stress disorder and other mental health problems in military populations deployed to Iraq and Afghanistan. *Curr Psychiatry Rep.* 2015;17(5):37.
64. McGuire A, Dobson A, Mewton L, Varker T, Forbes D, Wade D. Mental health service use: Comparing people who served in the military or received Veterans' Affairs benefits and the general population. *Aust N Z J Public Health.* 2015;39(6):524-529.
65. Fox AB, Meyer EC, Vogt D. Attitudes about the VA health-care setting, mental illness, and mental health treatment and their relationship with VA mental health service use among female and male OEF/OIF veterans. *Psychol Serv.* 2015;12(1):49-58.
66. Boulos D, Zamorski MA. Do shorter delays to care and mental health system renewal translate into better occupational outcome after mental disorder diagnosis in a cohort of Canadian military personnel who returned from an Afghanistan deployment? *Bmj Open.* 2015;5(12).
67. Mengeling MA, Booth BM, Torner JC, Sadler AG. Post-sexual assault health care utilization among OEF/OIF servicewomen. *Med Care.* 2015;53(4 suppl 1):S136-142.

68. Bonar EE, Bohnert KM, Walters HM, Ganoczy D, Valenstein M. Student and nonstudent national guard service members/veterans and their use of services for mental health symptoms. *J Am Coll Health*. 2015;63(7):437-446.
69. Tsai J, Mota NP, Pietrzak RH. U.S. female veterans who do and do not rely on VA Health Care: Needs and barriers to mental health treatment. *Psychiatr Serv*. 2015;66(11):1200-1206.
70. Sharp ML, Fear NT, Rona RJ, et al. Stigma as a barrier to seeking health care among military personnel with mental health problems. *Epidemiol Rev*. 2015;37:144-162.
71. Zinzow HM, Britt TW, Pury CLS, Jennings K, Cheung JH, Raymond MA. Barriers and facilitators of mental health treatment-seeking in US active duty soldiers with sexual assault histories. *J Trauma Stress*. 2015;28(4):289-297.
72. Jones N, Keeling M, Thandi G, Greenberg N. Stigmatisation, perceived barriers to care, help seeking and the mental health of British Military personnel. *Soc Psychiatry Psychiatr Epidemiol*. 2015;50(12):1873-1883.
73. Britt TW, Jennings KS, Cheung JH, Pury CLS, Zinzow HM. The role of different stigma perceptions in treatment seeking and dropout among active duty military personnel. *Psychiatr Rehabil J*. 2015;38(2):142-149.
74. Crawford EF, Elbogen EB, Wagner HR, et al. Surveying treatment preferences in US Iraq-Afghanistan veterans with PTSD symptoms: A step toward veteran-centered care. *J Trauma Stress*. 2015;28(2):118-126.
75. Anestis MD, Green BA. The impact of varying levels of confidentiality on disclosure of suicidal thoughts in a sample of United States national guard personnel. *J Clin Psychol*. 2015;71(10):1023-1030.
76. DiNapoli EA, Cully JA, Wayde E, Sansgiry S, Yu HJ, Kunik ME. Age as a predictive factor of mental health service use among adults with depression and/or anxiety disorder receiving care through the Veterans Health Administration. *Int J Geriatr Psychiatry*. Published online ahead of print September 22 2015.
77. Blais RK, Tsai J, Southwick SM, Pietrzak RH. Barriers and facilitators related to mental health care use among older veterans in the United States. *Psychiatr Serv*. 2015;66(5):500-506.
78. Smith NB, Cook JM, Pietrzak R, Hoff R, Harpaz-Rotem I. Mental health treatment for older veterans newly diagnosed with PTSD: A national investigation. *Am J Geriatr Psychiatry*. Published online ahead of print March 17 2015.
79. Wiechers IR, Karel MJ, Hoff R, Karlin BE. Growing use of mental and general health care services among older veterans with mental illness. *Psychiatr Serv*. 2015;66(11):1242-1244.
80. Hebenstreit CL, Madden E, Koo KH, Maguen S. Minimally adequate mental health care and latent classes of PTSD symptoms in female Iraq and Afghanistan veterans. *Psychiatry Res*. 2015;230(1):90-95.
81. Kimerling R, Pavao J, Greene L, et al. Access to mental health care among women veterans: Is VA meeting women's needs? *Med Care*. 2015;53(4 suppl 1):S97-S104.
82. Kintzle S, Schuyler AC, Ray-Letourneau D, et al. Sexual trauma in the military: Exploring PTSD and mental health care utilization in female veterans. *Psychol Serv*. 2015;12(4):394-401.
83. Frakt AB, Trafton J, Pizer SD. Maintenance of access as demand for substance use disorder treatment grows. *J Subst Abuse Treat*. 2015;55:58-63.
84. Fink DS, Sampson L, Tamburrino MB, et al. Lifetime and 12-month use of psychiatric services among U.S. Army National Guard soldiers in Ohio. *Psychiatr Serv*. 2015;66(5):514-520.

85. Mott JM, Grubbs KM, Sansgiry S, Fortney JC, Cully JA. Psychotherapy utilization among rural and urban veterans from 2007 to 2010. *J Rural Health*. 2015;31(3):235-243.
86. Ruggiero KJ, Price M, Adams Z, et al. Web intervention for adolescents affected by disaster: Population-based randomized controlled trial. *J Am Acad Child Adolesc Psychiatry*. 2015;54(9):709-717.
87. Aboujaoude E, Salame W, Naim L. Telemental health: A status update. *World Psychiatry*. 2015;14(2):223-230.
88. Badura-Brack AS, Naim R, Ryan TJ, et al. Effect of attention training on attention bias variability and PTSD symptoms: Randomized controlled trials in Israeli and US combat veterans. *Am J Psychiatry*. 2015;172(12):1233-1241.
89. Holmgard C, Yannakakis GN, Martinez HP, Karstoft K-I, Andersen HS. Multimodal PTSD characterization via the StartleMart game. *J Multimodal User Interfaces*. 2015;9(1):3-15.
90. Kreutzer CP, Bowers CA. Attitudes toward a game-based approach to mental health. *Cyberpsychol Behav Soc Netw*. 2015;18(1):20-24.
91. Belsher BE, Kuhn E, Maron D, et al. A preliminary study of an internet-based intervention for OEF/OIF veterans presenting for VA specialty PTSD care. *J Trauma Stress*. 2015;28(2):153-156.
92. Engel CC, Litz B, Magruder KM, et al. Delivery of self training and education for stressful situations (DESTRESS-PC): A randomized trial of nurse assisted online self-management for PTSD in primary care. *Gen Hosp Psychiatry*. 2015;37(4):323-328.
93. Knaevelsrud C, Brand J, Lange A, Ruwaard J, Wagner B. Web-based psychotherapy for posttraumatic stress disorder in war-traumatized Arab patients: Randomized controlled trial. *J Med Internet Res*. 2015;17(3).
94. Whealin JM, Seibert-Hatalsky LA, Howell JW, Tsai J. E-mental health preferences of veterans with and without probable posttraumatic stress disorder. *J Rehabil Res Dev*. 2015;52(6):725-737.