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Veterans' needs in aged care

Final report

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List of abbreviations

AD	Alzheimer's disease
ADF	Australian Defence Force
ADNI	Alzheimer's Disease Neuroimaging Initiative
ADRD	Alzheimer's disease-related Dementias Diagnoses
AIBL	Australian Imaging Biomarker and Lifestyle
AIFS	Australian Institute of Family Studies
APOE	Apoenzyme / apolipoprotein
APM	Attention Psychomotor
ATOA	Attitude Towards One's Own Aging
CASI	Cognitive Abilities Screening Instrument
CD-RISC	Connor-Davidson Resilience Scale
CHF	Congestive Heart Failure
CVD	Cardiovascular Disease
Defence	Department of Defence
DNA	Deoxyribonucleic acid
DVA	Department of Veterans' Affairs
EOL	End-of-Life Care
GOALS	Goal-oriented attentional self-regulation
HCP	Home Care Package
HPC	Hospice and palliative care
HR	Hazard Ratios
IQR	Interquartile Range
IRT	Item Response Theory
IVT	In-home video telehealth
LST	Life-Sustaining Treatment
LSTDI	Life-Sustaining Treatment Decisions Initiative
LWM	Learning/Working Memory
MELSHA	Melbourne Longitudinal Study of Healthy Aging
MetS	Metabolic syndrome
MFH	Medical Foster Home
MH	Mental Health
MI	Myocardial Infarction
MST	Military sexual trauma
POW	Prisoners of war
PCL	PTSD Checklist
PCS	Physical Composite Summary
PTSD	Post-traumatic stress disorder
PTSS	Post-traumatic stress symptoms
PTS	Post-traumatic stress
PVD	Peripheral Vascular Disease
SI	Suicidal Ideation
SRH	Self-Rated Health
TBI	Traumatic brain injury
TIC	Trauma Informed Care

UK	United Kingdom
US/USA	United States of America
VA	United States Department of Veterans Affairs
VCN	Veterans Affairs Community Nursing
WEAVE	Weaving Evidence into Action for Veterans
WHODAS	World Health Organization Disability Assessment Schedule
WWII	World War II

Overview

This report reviews available research on veterans' needs in aged care, based on evidence published in Australia and similar countries between 2014 and July 2024. Using a scoping review methodology, the report maps research by topic, country and methodology and synthesises findings by thematic area.

Key messages

The majority of identified research focused on the impact of military experiences on veterans' health in old age and experience of ageing. Research focusing on veterans' experiences in the aged care system was less common, highlighting the need for more work in this area.

Other gaps included research on abuse and/or mistreatment of older veterans (elder abuse), for which no studies were found in Australia or internationally.

Studies on veteran health in later years generally found:

- Older veterans have higher rates of diagnosed physical and mental health conditions than comparable non-veterans (Yeung et al., 2019), including PTSD, depression, anxiety, hearing loss and other disabilities. However, they do not significantly differ from non-veterans on self-reported measures of health and wellbeing.
- Veterans have not been found to be at greater risk of cognitive decline or dementia than the civilian population in studies examining the veteran population as a whole.
- Veterans with specific military experiences, such as experiences of combat or captivity, or with serious service-related illness or injury (including TBI or PTSD) have poorer physical and mental health and cognitive functioning in later life, on a range of objective and subjective measures, than veterans (and civilians) without these experiences. Studies identify a range of complex pathways by which these experiences affect veterans' health and functioning in later life.
- The partners of veterans with military-related trauma are also at higher risk of PTSD, which can affect their needs in aged care and capacity to support veterans.

Research on veterans' experiences and needs in aged care showed:

- Due to specific military-related experiences, some older veterans have a range of complex health problems and high care needs.
- Veterans often access services from multiple systems (veteran and mainstream), complicating care coordination, especially in the home care system.
- Veterans highly value independence, including support to age at home and choice and autonomy in residential care settings. This emphasis on autonomy and self-reliance can make veterans reluctant to seek help, which can undermine health outcomes.

Management of veterans and their care quality in aged care settings could be improved by:

- thorough assessment of veterans' status and service history
- trauma-informed practice, including training for staff
- improved understanding of military culture, or cultural awareness, among care staff, which has been shown to improve communication with and management of veterans
- family inclusive care – including better communication between clinicians, families and veterans regarding veteran care.

1. Introduction

There are over 4 million military service veterans in Australia, approximately 2.6 million of whom are at least 65 years or older (Australian Bureau of Statistics [ABS], 2021). Many of these veterans served for Australia during World War II (WWII), the Korean War or the Vietnam War.

Supporting veterans through the life cycle, including in later life, is the key policy focus of the Department of Veterans' Affairs (DVA). It works closely with the Department of Defence, the Australian Defence Force and other key agencies to ensure that veterans and their families are serving, living and ageing well, and empowers health professionals to deliver the best care possible. DVA also funds a range of care services for older veterans in their home and in residential accommodation.

To further understand the support needs of older veterans, DVA commissioned AIFS to undertake a quick scoping review of published research on veterans' experiences and needs in the aged care sector. The review covered residential and in-home care, as well as relevant evidence on the mental health and wellbeing or support needs of older veterans generally, and experiences of abuse and mistreatment of older veterans.

This report maps existing research by the topic areas that were prevalent in the research, including by subtopics such as suicide, post-traumatic stress disorder (PTSD) and dementia.

This report begins by outlining the key questions guiding the review, the methodology used, and a description of the nature and volume of material sourced on each topic area, broken down by study type and location. It then synthesises the findings by topic/thematic area. The report concludes with a summary of findings, research gaps and insights for policy.

2. Research questions

The following questions were developed to guide the review:

1. What are the needs and experiences of Australian veterans and their family members in the aged care sector?
2. How do veterans' needs and experiences in the aged care sector differ from civilian populations?
3. What is known about veteran mental health and wellbeing in aged care (residential and in-home care)?
4. What are the experiences and aged care needs of veterans living with dementia and their family members?
5. What is known about the experiences of abuse and mistreatment of older veterans (elder abuse) in the aged care sector?

These questions were used to inform the methodology for the review, including the approach to selecting and synthesising the literature, and are returned to at the end of the report in summarising the results.

3. Methodology

The project followed a scoping review methodology, as outlined by Mak and Thomas (2022) and Arksey and O'Malley (2005). This method uses a systematic and iterative approach to identify and synthesise existing literature and knowledge and is useful for a broad topic with

multiple research questions. This approach allowed us to map the extent, range, nature and gaps in the literature on veterans' needs in aged care (Mak & Thomas, 2022; Munn et al., 2018) and provide a high-level summary of what is known and non-known.

The search strategy adopted in this review aimed to identify relevant studies that discuss the needs of veterans in aged care. The search strategy, including the inclusion and exclusion criteria (Table 1) and a list of key words (Table 2), was developed in consultation with the AIFS librarian and with DVA.

We identified relevant academic literature and grey material via searches of multiple databases (SocINDEX, PsycInfo, Medline, the Australian Family and Society Abstracts database) and government websites (Australian and international). The searches were limited to articles in English, published in the last 10 years (between January 2014 and July 2024) and where the sample population was from one of the included countries (see Table 1).

A screening process was used to select relevant studies for inclusion in the review. Inclusion and exclusion criteria were developed to identify studies that would assist in answering the agreed research questions (see Table 1). Using Covidence, an online research tool, 2 researchers applied the inclusion/exclusion criteria by screening the titles and abstracts of the identified studies/literature. Where the 2 researchers could not come to agreement on whether to include an item of literature, a third researcher was brought in to decide.

Following the abstract/title screening, the full text of each of the included literature was screened to ensure it still met the inclusion/exclusion criteria. A final list of included studies was then created.

Table 1: Search strategy

Databases	<ul style="list-style-type: none"> ▪ SocINDEX ▪ PsycInfo ▪ Medline ▪ Australian Family and Society Abstracts
Inclusion dates	2014–2024
Publication language	English
Countries	<ul style="list-style-type: none"> ▪ Australia ▪ New Zealand ▪ United States of America ▪ Canada ▪ United Kingdom (England, Scotland, Wales, Northern Ireland) ▪ Israel ▪ European Union members ▪ Switzerland
Excluded	<ul style="list-style-type: none"> ▪ Studies that use a veteran sample, or veteran datasets, but are not specific to veterans (i.e. studies from the USA that recruit participants in public Veteran Hospitals and Aged Care, or use available datasets on veterans but the studies are not veteran-specific inquiries and provide general findings for the entire older population) ▪ Other literature reviews ▪ Studies specifically about younger veterans and that have no implications for future aged care and/or are not related to ageing ▪ Books, book chapters, dissertations/thesis, and editorials

Table 2: Search terms

Search 1	Veteran OR Military OR "Defence force" OR "Defense force" OR "Armed forces" AND "Age care" OR "Aged care" OR "home care" OR "nursing home" OR "home based care" OR "residential care" OR "care homes"
Search 2	Veteran OR Military OR "Defence Force" OR "Defense force" OR "Armed Forces" AND Ageing Or Aging or elder AND PTS OR PTSD OR "traumatic stress" OR abuse OR mistreatment OR wellbeing OR suicid* OR dementia OR Alzheimer* OR cognitive OR "long term care" OR "care needs"
Search 3	Veteran OR Military OR "Defence Force" OR "Defense Force" OR "Armed Forces" AND Ageing Or Aging or elder AND Family OR families OR partner OR wife OR wives OR husband OR spouse

The next stage, 'charting the data', involved synthesising and interpreting the literature by sifting, charting and sorting material according to key issues, themes and topics – also known as 'data extraction' (Arksey & O'Malley, 2005). Extraction categories were developed to capture the data for the chosen research question(s) and also capture study details such as year, geographical location, study population, main results, implications and study limitations (Mak & Thomas, 2022).

We also tagged studies based on having content relevant to different domains of the DVA (2020) wellbeing framework – recognition and respect, health, education and skills, housing, social support and connection, employment, income and finance – to help identify what the literature could tell us about these domains for veterans in aged care.

This charting of the literature provided an overview of the breadth and depth of the knowledge base. It also aimed to shed light on the dominant areas of research, where significant gaps exist, and the themes found in the analysis that relate to the research question(s). The final stage of the scoping review involved summarising, synthesising and reporting on the results.

The report presents the synthesis of material by the main topic areas. The final chapter then synthesises the material by research question, and across various domains of veteran wellbeing.

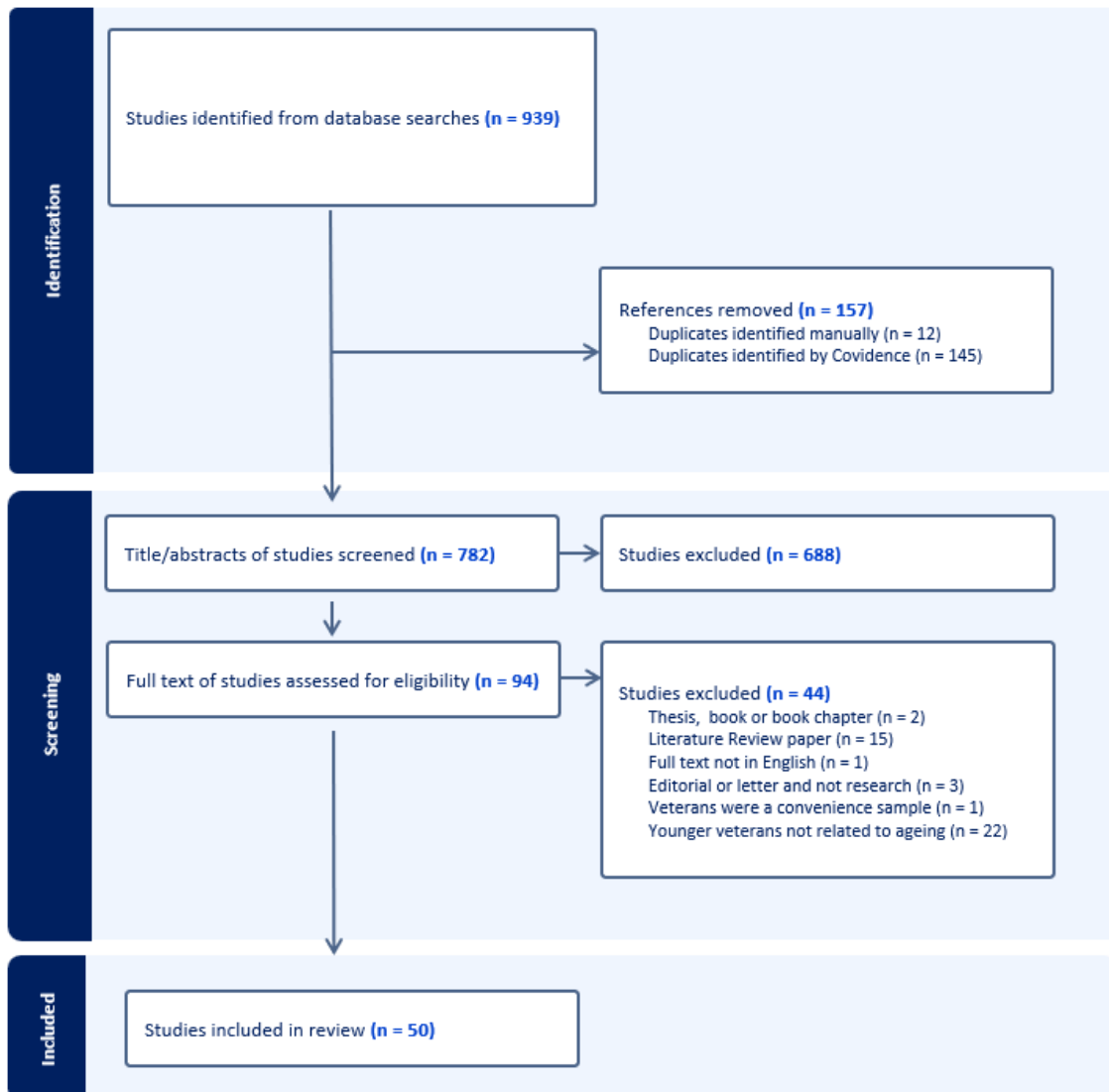
4. Search results

In this section we outline the results of the search and screening process and provide an overview of the nature and volume of research articles included in the review, broken down by thematic area, study type (e.g. quantitative vs qualitative) and location (Australia vs international).

4.1. Screening

The database searches identified 939 potential items of literature. Of these, 157 duplicates were removed. The remaining 782 had their title and abstract screened by 2 researchers, resulting in 688 articles being excluded in the initial screen. The full text of 94 articles were then reviewed. Of these, 44 were excluded, resulting in 50 being selected for inclusion in the review (see Figure 1).

Figure 1: Flow chart of the searches and screening process



4.2. Thematic areas

During the screening, each of the 50 studies were grouped into their broad thematic areas to assist in the data extraction phase (some sit in more than one theme). Some of the themes were created inductively as they emerged from the studies being screened, while others were created deductively to match specific research question themes (Table 3).

The largest grouping of articles discussed the impact on older veterans of post-traumatic stress disorder (PTSD), general military-related trauma and or combat exposure ($n = 24$). The other main groupings included: studies that explore dementia and other cognitive decline in veterans

($n = 10$), studies on veterans' experiences or needs in aged care (residential and in home care) and/or staff in those settings ($n = 9$), and studies that discussed other general and unique ageing needs and/or issues for older veterans (a broad grouping of topics) ($n = 15$). Despite our search strategy specifically targeting articles on the abuse and mistreatment of older veterans (elder abuse), none of the included articles covered this topic.

Table 3: Thematic area

Thematic area	Number of studies ^a
PTSD/PTSS, general trauma, combat exposure	24
General unique ageing needs/issues	7
Dementia or other cognitive decline	9
Experiences of aged care (including home care) and staff related research	8
Veteran self-perceptions of health or ageing	7
Traumatic brain injuries (TBI)	4
End of life (EOL) care needs	3
Family members	2

Note: ^a The articles do not add up to 54 as some articles covered several themes.

4.3. Australian studies

To allow us to respond to the research questions, we also tagged any study that was conducted in Australia (Table 4), with only 9 studies identified as being Australian. Of these, the majority were quantitative, 3 were qualitative, and 1 used mixed methods. Most of the Australian studies were published in the last 3 years. None of these studies compared older veterans to older civilian populations.

The Australian studies covered a wide range of thematic areas, including PTSD, trauma and/or combat exposure, dementia and other cognitive decline, TBI, general unique ageing needs/issues, and veterans' experiences and preferences towards care, including EOL care.

Table 4: Australian studies

First author surname	Year of publication	Title of article	Journal or publication name
Cummins	2023	Tau, β -amyloid, and glucose metabolism following service-related traumatic brain injury in Vietnam war veterans: The Australian Imaging Biomarkers and Lifestyle Study of Aging-Veterans Study (AIBL-VETS)	Journal of Neurotrauma
de la Perrelle	2022	Characterising trauma-informed aged care: An appreciative inquiry approach	International Journal of Geriatric Psychiatry
Feldman	2015	The health and service needs of older veterans: A qualitative analysis	Health Expectations: An International Journal of Public Participation in Health Care & Health Policy
Jeon	2023	Investigating community-based care service factors delaying residential care home admission of community dwelling older adults and cost consequence	Age and Ageing
Johnstone	2023	Use of home care services by older Veterans and dependents in Melbourne, Australia, 2007–2016	Journal of Military, Veteran and Family Health
Mehta	2018	Accelerated DNA methylation aging and increased resilience in veterans: The biological cost for soldiering on	Neurobiology of Stress

Meyer	2023	Weaving Evidence into Action for Veterans with Dementia (WEAVE): Evaluation of implementation into long-term care practice	Journal of Evaluation in Clinical Practice
O'Connor	2014	Vulnerability at the end of life: Australian veterans requiring home-based palliative care	Home Health Care Management & Practice
O'Toole	2015	Suicidality in Australian Vietnam veterans and their partners	Journal of Psychiatric Research

4.4. Veteran and civilian comparison

Seven studies included a veteran and civilian comparison, 2 of which were conducted in Australia (Johnstone et al., 2023; O'Connor et al., 2014). These studies covered a range of topics; 2 examined differences in the health and wellbeing of older veterans and civilians using self-report and/or other (objective) measures; 2 examined the impact of military service or particular experiences during service (e.g. combat exposure) on cognitive decline in old age; and the Australian studies compared rates of home care service use by DVA and non-DVA clients, and EOL care at home needs of veterans and non-veterans. These studies will be discussed in more detail in the findings chapter.

Table 5: Studies that compare older veterans with older civilians

First author surname	Year of publication	Title of article	Journal or publication name
Beucke	2024	A late-life neurogenetic signature of exposure to combat stress: A monozygotic discordant twin study	Journal of Psychiatric Research
Choi	2016	Social participation and self-rated health among older male veterans and non-veterans	Geriatrics & Gerontology International
Jeon	2023	Investigating community-based care service factors delaying residential care home admission of community dwelling older adults and cost consequence	Age and Ageing
Johnstone	2023	Use of home care services by older Veterans and dependents in Melbourne, Australia, 2007–2016	Journal of Military, Veteran and Family Health
O'Connor	2014	Vulnerability at the end of life: Australian veterans requiring home-based palliative care	Home Health Care Management & Practice
Power	2023	Association of military employment with late-life cognitive decline and dementia: A population-based prospective cohort study	Military Medicine
Yeung	2019	Risk and protective factors for wellbeing in older veterans in New Zealand	Aging & Mental Health

5. Findings

This chapter summarises the findings from the studies included in this review. The chapter groups the findings into the following sections: Mental health; Cognitive health; Physical health; Self-perception of health or ageing; Care needs and experiences; and Family members (including experience or needs in aged care, end-of-life care and family members).

5.1. Mental health

Key findings:

- Older veterans referred for geriatric mental health services in the USA form a subgroup of high-needs patients due to comorbidities of primary mental health conditions (Atkinson et al., 2020)

- High rates of depression and anxiety have been found among Israeli Yom Kippur War veterans, with higher rates among those who are former prisoners of war (Aloni et al., 2022).
- Older veterans with TBI score poorly on several psychiatric measures including anxiety, obsessive compulsive behaviours, interpersonal sensitivity, depression, hostility, paranoid ideations and psychoticism (Cummins et al., 2023).
- PTSD is a risk factor for suicide for veterans and their partners, even in the presence of other psychiatric disorders (O'Toole et al., 2015).
- Social support, connection and purpose in life may minimise the risk of suicidal ideation among combat-exposed veterans with PTSD (O'Toole et al., 2015) or those living in isolation (Fischer et al., 2023).
- Educational videos to educate hospice and palliative care providers about PTSD in military veterans nearing their end of life can help clinicians to identify and respond to PTSD and use trauma-informed care (O'Malley et al., 2023).
- Older veterans with a history of sexual trauma are less likely than younger veterans to accept a referral for military sexual trauma (MST) specific care (Porter et al., 2022).
- Veterans with higher levels of PTSD use services at a higher rate than those without (Schlenger et al., 2016).

Mental health conditions

One study presented a review of psychiatric diagnoses among US veterans assessed for outpatient geriatric mental health intake within the Minneapolis Veterans Affairs (VA) Health Care System (Atkinson et al., 2020). They found a high prevalence and comorbidity of primary mental health conditions among older war veterans referred for geriatric mental health services, with depression (47%), neurocognitive (42%) and anxiety disorders (22%) the most common.

While Vietnam veterans had a higher prevalence of depression, post-traumatic stress and alcohol use disorders, World War II veterans had a higher prevalence of neurocognitive disorders – which was also correlated with the age of this cohort (Atkinson et al., 2020).

Depression and anxiety

Research has shown high rates of depression and anxiety among Israeli war veterans, with even higher rates among those who have been prisoners of war. Aloni and colleagues (2022) examined depression and anxiety trajectories among Israeli Yom Kippur War veterans (former prisoners of war and other veterans not held captive) and identified 3 different trajectories of comorbid depression and anxiety among veterans.

The majority (approx 58%) were defined as 'resilient', where they had depression and anxiety scores below the clinical cut-off at all time points (after service and into older age). Approximately 30% were described as 'delayed onset', which included individuals whose depression anxiety scores were below the clinical cut-off at time 1 and above the cut-off between time 2 and time 4. A third group, called 'chronic comorbidity', included individuals with values above the clinical cut off for depression and anxiety at every time point.

The delayed onset and chronic comorbidity trajectories were composed mostly of ex-prisoners of war; the resilience trajectory group included more veterans with high levels of education (with an academic degree), and there were no differences between the groups by family status. In assessing veterans needs in aged care, it is important to be aware of these potential trajectories of PTSD and the fact that many veterans might not show symptoms until later life.

Another study found that veterans with TBI performed poorly in measures of depression and anxiety and, subsequently, were a cohort of older people who had high aged care needs (Cummins et al., 2023). In the study, veterans with TBI also performed poorly on a wide range of other psychiatric measures including obsessive compulsive behaviours, interpersonal sensitivity, hostility, paranoid ideations and psychoticism (Cummins et al., 2023). This study is described in more detail in the [chapter on cognitive health](#).

Suicide

Two studies explored veteran suicide including one Australia study. O'Toole and colleagues (2015) found that Australian Vietnam veterans and their partners have a high risk of suicidality due to PTSD, even in the presence of other psychiatric disorders. This risk of suicidality was shown to be stronger for the Vietnam-era veterans than for their partners. The researchers recommend that health care providers treating Australian Vietnam-era veterans, or their partners, be aware of the increased risk of suicidality and vigilant for signs of PTSD and a lack of social connectedness (a further risk factor for suicide).

Similarly, Fischer and colleagues (2023) examined the prevalence and correlates of suicidal thoughts and behaviours in a nationally representative sample of older US military veterans. They found that a total of 6.6% of the sample had experienced some suicidal ideation in the past year, 8.0% had made a suicide attempt in their lifetime, 4.1% had made a suicide plan in their lifetime, and just under 1.0% of the veterans indicated that they had a future suicide intent.

The study found that loneliness and a lack of purpose were most strongly associated with past year suicidal ideation. A lifetime history of major depressive disorder was most strongly associated with having made a suicide plan or suicide attempt in their lifetime, and future suicide intent was most strongly associated with frequency of past year suicidal ideation and more negative expectations regarding emotional ageing.

The researchers found that purpose in life, the extent to which a person's life is motivated by valued goals and life aims, may be an important target for suicide prevention efforts, given its empirical links to stress regulation and preventative health behaviours (e.g. physical exercise). Given these findings, they suggest that interventions to promote purpose in life and social connection should attenuate suicide risk.

PTSD and pain intensity

O'Connor and colleagues (2023) examined how PTSD symptoms affect the association between age and reported pain intensity in a cross-sectional study of US veterans. They found that while PTSD symptoms declined with age, both age and PTSD symptoms independently predict increased pain intensity (i.e. veterans with PTSD symptoms at older ages experience significantly higher pain intensity).

These findings highlight the significance of clinical providers assessing trauma history and PTSD symptoms in older veterans who report experiencing pain and adopting a trauma-informed care approach.

Interventions for veterans with PTSD and their carers

Three studies examined interventions for older veterans with PTSD. Two of these explored using a 'life review' within a PTSD group therapy program for older war veterans in the US (Daniels et al., 2015a; Daniels et al., 2015b). The researchers described a 'life review' as

sharing one's story by integrating memories in narrative form through facilitated reminiscence within a group setting.

In one study, Daniels and colleagues (2015b) found that adding a life review before a regular PTSD group therapy session led to a statistically significant reduction in depression and improvement in self-assessed wisdom, relative to standard treatment. In the other study, Daniels and colleagues (2015a) found that adding a life review before a regular PTSD group therapy session may contribute to clinically and statistically significant reductions in PTSD and late onset stress symptoms, as well as improved life satisfaction.

While the studies were small, they provide evidence that adding a structured life review to PTSD therapy can provide additional benefits for the wellbeing of ageing war veterans who are experiencing traumatic stress symptoms. The researchers point out that this is consistent with previous research on the benefits of a life review for ageing adults generally that has shown that it can increase morale, self-esteem, a sense of control over the environment and a sense of shared understanding and support from others with common experiences.

In another intervention study, O'Malley and colleagues (2023) described the development of videos aimed at educating US hospice and palliative care (HPC) providers about PTSD in military veterans who are nearing the end of life. Health professionals found these videos helpful in demonstrating essential skills, such as listening, responding and displaying empathy. The videos also displayed case presentations involving cognitive impairment and the patient's experience.

However, carers expressed a desire for more information, including a wider range of PTSD presentations and comorbidities. This approach could be beneficial for teaching HPC nurses and other clinicians how to identify and respond to PTSD and use trauma-informed care practices for this population.

Trauma and use of health services

One study by Schlenger and colleagues (2016) examined whether US Vietnam veterans' use of outpatient services for general medical concerns varies according to the level of PTSD symptomatology over time. They found that veterans with high or increasing PTSD symptomatology over time were more likely than those with low PTSD symptomatology to use US VA outpatient general health services.

Males in the increasing and high categories were also more likely to discuss behavioural health issues at general medical visits. The researchers concluded that attention to stressors of the ageing process and to the persistence of PTSD symptoms is important for staff working with Vietnam veterans in the context of outpatient general medical care (as is addressing PTSD and other psychiatric and medical comorbidities).

Another study examined the impact of military sexual trauma on the use of mental health services among older (65+ years) and younger (<65 years) veterans (Porter et al., 2022). They found that the use of any mental health services was similar, overall, between the younger and older veteran cohorts. However, older veterans received fewer mental health sessions and were significantly less likely to accept a referral for military sexual trauma (MST) specific care.

These findings emphasise the need for aged care providers to develop customised mental health interventions that address the unique needs and preferences of older veterans with a history of MST. The researchers also suggest that training programs for caregivers are needed to help them understand the impact of MST and the importance of providing sensitive and appropriate care to veterans who have experienced this type of trauma.

Finally, the researchers concluded that providers should be encouraged to reflect on potential biases or discomfort they may have around discussing these topics with older veterans, as well as clinicians' perceptions regarding the need to address sexual trauma and sexual violence in this population, as it is possible that provider beliefs may influence conversations regarding treatment options.

5.2. Cognitive health

Key findings:

- PTSD, chronic depression and anxiety, which are more common among veterans, are linked to an increased risk of cognitive decline and dementia (Aloni et al., 2022; Green et al., 2016; Lawrence et al. 2023; Prieto et al., 2022).
- Exposure to combat stress in early adulthood affects brain function in later life, independent of the effect of PTSD and other factors (Beucke et al., 2024).
- Military service is associated with an increased risk of TBI, with up to 10% of Australian service personnel reported to have experienced TBI in recent conflicts (Cummins et al., 2023).
- There is inconsistent evidence on whether TBI is associated with increased risk of cognitive decline or dementia. Two studies in this review found no evidence that the experience of TBI was associated with an increased risk of cognitive decline (Power et al., 2023) or Alzheimer's disease (Cummins et al., 2023). However, Cummins and colleagues (2023) noted that previous research had found a positive association between TBI and dementia.
- One study found that veterans with a history of moderate-to-severe TBI had a stronger negative association between subjective and objective attention relative to participants without a TBI. However, there was no moderating effect of TBI history on the association between subjective and objective memory and language functions (Rantins et al., 2024).
- Manualised group cognitive rehabilitation training programs have been found to improve executive function and emotional regulation among veterans with TBI and can be delivered successfully via in-home video telehealth (as well as other formats) (Kornblith et al., 2023).
- An Australian evaluation of a non-pharmacological intervention for veterans with dementia (the Weaving Evidence into Action for Veterans with Dementia (WEAVE) program) found that this treatment significantly improved outcomes for participating veterans on all measures (functional capacity, neuro psychiatric and depression/mental health) (Meyer et al., 2023).
- Qualitative studies suggest veterans often have little understanding of Alzheimer's disease or of behaviours (diet, exercise regimes) that sustain and improve cognitive functioning (Bundy et al., 2018).

Depression/anxiety and cognitive decline

In the longitudinal study of Israeli Yom Kippur War veterans, Aloni and colleagues (2022) examined the effects of depression and anxiety trajectories on the cognitive performance of war veterans and ex-prisoners of war. They found that those suffering from a chronic comorbidity of depression and anxiety (approximately 13% of all veterans in the study) had greater cognitive impairment than the other veterans and were disproportionately ex-prisoners of war. There was no difference in cognitive performance/impairment between those with delayed onset depression and anxiety and those with resilient mental health trajectories.

Combat stress and brain function in later life

A US study by Beucke and colleagues (2024) examined the impact of combat stress on brain function late in life, independent of PTSD, in a study of 16 US male monozygotic twin pairs in their sixties where one, but not the other, sibling had been exposed to combat stress in early adulthood (and neither had PTSD).

The researchers noted that while previous research had found strong evidence that PTSD involves a distinct neurobiological signature, few studies had isolated the effect of exposure to traumatic events on brain function in those without PTSD. In their study, Beucke and colleagues (2024) found that those exposed to combat stress had a blunted amygdala function later in life,¹ suggesting that traumatic combat exposure has prolonged effects on the function of the brain, and its own neural signature, independent of PTSD effects.

Cognitive decline/dementia and PTSD

Several studies explored cognitive decline and/or dementia and its relationship with PTSD among veterans. One study (Lawrence et al., 2023) explored whether there was a three-way interaction between genetics, PTSD and age on cognitive functioning, another explored the association between PTSD symptom severity and cognitive outcomes, and one study examined health care for veterans with co-occurring dementia and PTSD symptoms (Ritchie et al., 2022).

Genetics, PTSD and age on cognitive functioning

Lawrence and colleagues (2023) examined whether there was a three-way interaction between apolipoprotein (APOE) ε4 (a gene associated with a higher risk of Alzheimer's type dementia), PTSD and age on cognitive functioning. In a large nationally representative sample of US military veterans, they found that older veterans who were APOE ε4 gene carriers and with probable PTSD exhibited significantly poorer learning/working memory cognition than their counterparts without probable PTSD.

The researchers argue that their findings highlight the importance of early identification and treatment of PTSD in veterans to mitigate age-related cognitive decline. They further note that past research suggests that PTSD is associated with approximately a two-fold greater risk of all types of dementia in addition to the increased incidence of several risk factors for dementia including cardiovascular disease, obesity and diabetes.

Cognitive outcomes and PTSD symptom severity

In another study on US veterans, Prieto and colleagues (2022) examined the association between PTSD symptom severity, the number of stressors experienced and cognitive outcomes in a sample of US Vietnam War veterans. They found that higher PTSD symptom severity was associated with poorer cognitive functioning but that the number of reported stressors was not associated with cognitive functioning.

These findings suggest that treating symptoms of PTSD following trauma may be essential in preserving cognitive function into older age.

¹ Blunted amygdala function is associated with depression severity and can lead to noticeable changes in behaviour and emotional responses, such as impaired emotional processing, altered social behaviour, decision-making difficulties, memory issues and reduced anxiety, stress and fear responses in reaction to stimuli/stressors (which can be potentially dangerous/harmful) (Beucke et al., 2024).

Health care for veterans with dementia and PTSD

One small qualitative study in Canada (Ritchie et al., 2022) examined how well health care providers can identify co-occurring PTSD symptoms and dementia in veterans and how this influences care of veterans with PTSD and dementia. Ritchie and colleagues (2022) revealed that health care providers in Canada had difficulty distinguishing PTSD symptoms from dementia symptoms due to symptom overlap and that none of the providers had training in this area. Most providers tended to focus on dementia-related symptoms rather than the possibility of other co-occurring mental health issues.

The researchers noted that this could lead to inappropriate responses to managing behaviours of older veterans with PTSD as well as dementia. For example, flashbacks could be interpreted as hallucinations and hyperactivity as agitation, and this could result in the use of unneeded medication.

They argue that assessing for PTSD is an essential part of caring for veterans with dementia. They also found that once health care providers recognised the presence of symptoms relevant to PTSD and dementia in veterans, and understand the differences in these symptoms, staff modified their care approach to include more tailored interventions (including non-pharmacological approaches).

Study participants further noted that building trust was important for veterans with PTSD and dementia and that validation was a specific and useful intervention for veterans during moments of reliving past war experiences.

Traumatic brain injuries

Traumatic brain injuries (TBI) and their impact on veterans as they age was discussed by 4 studies in this review. Most were quantitative studies that explored the association between TBI and dementia, or discussed PTSD, trauma and/or combat exposure in relation to TBI. One of the studies was conducted in Australia (Cummins et al., 2023).

TBI and Alzheimer's disease

In their Australian study of 70 male Vietnam war veterans, Cummins and colleagues (2023) found that there was no increase in the later life accumulation of the neuropathological markers of Alzheimer's disease in veterans with a remote history of TBI. Comparing veterans with a TBI and those without, they found no significant differences in β -amyloid or tau levels, or F-FDG uptake (markers of Alzheimer's disease), 3 to 5 decades after experiencing the TBI, even in veterans with more severe injuries.

These results suggest TBI is not a risk factor for Alzheimer's disease. The researchers note that veterans with TBI may still form a subgroup with high care needs since moderate or severe TBI has been associated with an increased risk of dementia in previous studies that may capture other types of dementia (e.g. Lewy body or frontal temporal dementias). The study also found that those with TBI scored significantly lower on several psychiatric measures, including anxiety, obsessive-compulsive behaviours, interpersonal sensitivity, depression, hostility, paranoid ideations and psychoticism (Cummins et al., 2023).

TBI and objective and subjective cognitive decline

Rantins and colleagues (2024) examined the mediating effect of TBI on the association between objective and subjective cognitive decline among US Vietnam-era veterans. Their measure of subjective cognitive decline was based on participants ratings of their ability to

perform everyday tasks relative to 10 years ago, across memory, language and attention domains. Objective (neuro-psychological) cognition and decline was assessed based on performance in memory, attention and language tasks.

This study found that veterans with a history of moderate-to-severe TBI had a stronger negative association between subjective and objective attention relative to participants without a TBI. However, there was no moderating effect of TBI history on the association between subjective and objective memory and language functions. The researchers noted that the reason for the moderating impact of TBI history on subjective and objective attention is unclear but in the context of a moderate to severe TBI history there may be more consistency between their real-world experience of attention difficulties and objective performance because the TBI caused more severe cognitive difficulties earlier in life and they are therefore more aware.

They suggest that their research can be used to tailor and refine assessment and treatment approaches for older veterans with TBI. The researchers note that subjective cognitive decline is associated with higher risk for progressing to dementia and is considered one of the earliest symptoms to emerge in preclinical Alzheimer's disease, and memory and language functions are 2 domains impacted early in Alzheimer's disease.

Group cognitive rehabilitation interventions

One paper explored the benefit of a group-format cognitive rehabilitation intervention delivered through in-home video telehealth (IVT) to US veterans with a TBI (Kornblith et al., 2023). They found that older male veterans with a history of TBI and cognitive complaints derived subjective benefit from the intervention when they were able and willing to participate.

Goal-oriented attentional self-regulation (GOALS) is a 10-session manualised group cognitive rehabilitation training program that improves executive function and emotional regulation among veterans with TBI and among other older adults. The program had not previously been tested or adapted for delivery via IVT.

The study demonstrates it is feasible to deliver with minimal adaptations, with qualitative data highlighting the importance of managing the logistics (technology, sound due to hearing loss) and facilitators prioritising interpersonal connection with participants.

Military service and later life cognition

Using data from a US longitudinal study, Power and colleagues (2023) examined whether there were any observed effects of military service on later life cognition, independent of early life factors associated with both the likelihood of military service and poor cognitive health in later life, including childhood health and socio-economic status.² They found that military employment was not associated with an increased risk of cognitive decline or dementia later in life, when controlling for these factors.

Power and colleagues (2023) also found no evidence that TBI with loss of consciousness (LOC) was associated with increased risk of incident dementia, or that the association between military service and cognitive decline in later life was moderated by a history of TBI. They noted this finding was consistent with a previous study (Crane et al., 2016), which also found no association between TBI with LOC and Alzheimer's disease.³

² The researchers note that in countries where enlistment is voluntary, enlistment rates are lower among those with a strong academic record and higher among those from lower socio-economic backgrounds (Power et al., 2023).

³ Crane et al. (2016) did find that TBI with LOC was associated with neurodegenerative conditions including Lewy body accumulation (a cause of Lewy Body Dementia) and the risk for incident Parkinson's Disease.

However, Power and colleagues (2023) remarked that their research was unable to look more closely at the association between specific types of military service (such as combat exposure) and late life cognitive health. They also noted that their sample consisted of people who had access to routine medical care, were dementia free at enrolment in the study (at the age of 65), and had begun their military service before WWII (so findings may not apply to active-duty military servicemen or those who have sustained a TBI in more recent military conflicts).

They noted that prior studies have identified several other risk factors for cognitive decline and dementia that are more common in the veteran population compared to the general population, including smoking, post-traumatic stress disorder, sleep disorders, cardiovascular disease, diabetes, depression and exposure to agent orange (Power et al., 2023).

Housing insecurity and dementia

One study explored housing insecurity among veterans in the USA (Jutkowitz et al., 2022). The researchers found that housing-insecure US veterans had a higher prevalence of Alzheimer's disease (AD) and AD-related dementias diagnoses (ADRD) compared to veterans with stable housing. Moreover, housing-insecure veterans with AD/ADRD used more acute care (emergency department, hospitalisations, psychiatric hospitalisations) and were more likely to be admitted to a nursing home compared to stably housed veterans.

The study concluded that the prevalence of AD/ADRD among veterans with housing insecurity can help with planning and allocating resources to the needs of more vulnerable veterans.

Interventions for veterans with dementia

An Australian study by Meyer and colleagues (2023) evaluated the implementation of the Weaving Evidence into Action for Veterans with Dementia (WEAVE) program. The WEAVE program delivers a range of non-pharmacological interventions (e.g. music therapy, exercise, reminiscence therapy and sensory modulation) to veterans with dementia.

The study explored WEAVE's impact in Australia on a range of outcomes – responsive behaviour, physical wellbeing, cognitive status, emotional state, medications and falls. The evaluation found that this treatment significantly improved outcomes for participants on all measures (functional capacity, neuro psychiatric and depression/mental health).

Knowledge of health behaviours and interventions for healthy ageing

In a qualitative study of older US male veterans, Bundy and colleagues (2018) found that many were unable to describe dementia, what constitutes a healthy diet or exercise regime or the effect of these activities on the brain.

The researchers argue that providing veterans with education on healthy lifestyles and the relationship between healthy lifestyles and cognitive function would be a useful intervention for veterans. They further note that some veterans may need to be provided with an estimate of their own cognitive function to motivate them to engage in healthier choices and in health care services.

5.3. Physical health

Key findings:

- Combat trauma and PTSD are independently associated with vascular and cardiovascular diseases, congestive heart failure and myocardial infarction, suggesting an increased need for screening of these disorders in older veterans with combat exposure and/or PTSD (Beristianos et al., 2016; Bukhbinder et al., 2020).
- DNA age acceleration was not found to be different between veterans with and without PTSD. However, DNA age acceleration was found to be significantly higher among veterans with higher resilience scores, suggesting this personal characteristic can accelerate ageing and be (in some ways) counterproductive for veterans later in life (Mehta et al., 2018).
- Metabolic syndrome (a cluster of conditions including high blood pressure, high blood sugar, excess body fat around the waist) and PTSD are highly prevalent in older veterans. Both independently increase the risk for cognitive decline. Like PTSD, metabolic syndrome should be a target for screening and intervention in older veterans (Green et al., 2016).
- Several studies have found PTSD in older veterans is negatively associated with self-reported physical and mental function (Goldberg et al., 2014; Hall et al., 2014; Moye et al., 2023).
- Combat exposure, independent of PTSD status, was also associated with lower physical and mental health functioning and increased disability (Goldberg et al., 2014).

Cardiovascular disease

Two of the studies in our review examined the relationship between PTSD and cardiovascular disease or its risk factors in older veterans.

Beristianos and colleagues (2016) explored whether late life PTSD is associated with cardiovascular disease among older US veterans and whether the association is independent of medical and psychiatric comorbidities. The study used administrative data from the US VA national patient care database and adjusted results for demographics, medical comorbidities, substance use and psychiatric comorbidities. It found that veterans with PTSD have a significantly higher risk of developing cardiovascular diseases, congestive heart failure, myocardial infarction and peripheral vascular disease compared to those without PTSD.

Similar evidence was presented in a retrospective cohort study of older US veterans by Bukhbinder and colleagues (2020). This study found that chronic PTSD and combat trauma were associated with increased vascular risk factors and diseases. It also showed that having a PTSD diagnosis was associated with a greater incidence of several vascular risk factors (hyperlipidaemia, diabetes mellitus and hypertension), which, in turn, were associated with greater rates of ischemic heart disease and cerebrovascular disease.

The researchers conclude that these findings highlight the value of increased screening and treatment for vascular disorders for veterans with PTSD.

Epigenetic ageing

One Australian study examined the relationship between epigenetic ageing and PTSD, as well as potential risk and protective factors for accelerated epigenetic ageing among Australian veterans (Mehta et al., 2018). Mehta and colleagues (2018) performed a genome-wide DNA

methylation analysis of 211 individuals including 96 combat-exposed Australian veterans (with and without PTSD) and 115 trauma-exposed civilians.⁴

The study found no differences in the DNA age acceleration between the PTSD and non-PTSD groups. Evaluating potential protective factors, they found that DNA age acceleration was significantly associated with higher resilience scores in veterans with PTSD as well as in the trauma-exposed civilian cohort. The study found that this association was likely driven by self-efficacy and the researchers suggest that while resilience has previously been shown to have a protective effect,⁵ it might also come with a biological cost in terms of accelerated ageing.⁶

Metabolic syndrome and PTSD

One study explored the independent and interactive effects of PTSD and metabolic syndrome (MetS) on the cognitive functioning of veterans aged 55 to 89 years (Green et al., 2016). MetS is a cluster of conditions including high blood pressure, high blood sugar, excess body fat around the waist and abnormal cholesterol or triglyceride levels that increase your risk of heart disease, stroke and type 2 diabetes.

The researchers noted that PTSD and MetS are highly prevalent in older veterans, and both increase the risk of cognitive decline. The study found that veterans with MetS demonstrated poorer performance on tasks of executive function and immediate verbal memory regardless of their PTSD status. MetS was found to be associated with poorer verbal learning and executive functioning independent of PTSD, with MetS having a negative impact on verbal memory only among the veterans who were not classified as having PTSD.

Physical and mental function

Several studies found PTSD negatively associated with poorer physical and mental functioning in older veterans.

In a study of Vietnam-era male veterans, Hall and colleagues (2014) found that PTSD is negatively associated with self-reported physical functioning, daily activities and general health. Veterans with PTSD performed worse on tests of lower limb function and had comparable scores on gait speed, aerobic endurance, grip strength and bodily pain as those without PTSD.

The study highlights the importance of ongoing monitoring of physical activity performance among veterans with PTSD and intervening with older overweight veterans with PTSD whose physical performance test results are indicative of accelerated risk of premature ageing.

Another study of veterans found that those with PTSD symptoms reported more medical conditions, cognitive difficulties, functional disability, lifetime nicotine use and negative expectations regarding physical and emotional ageing (Moye et al., 2023).

Similarly, Goldberg and colleagues (2014) examined the association of PTSD with physical and mental health functioning and disability among male Vietnam-era veterans and found that those

⁴ Accelerated epigenetic ageing occurs when an individual's DNA methylation-predicted age is older than their chronological age. Accelerated epigenetic ageing is associated with increased risk for all-cause mortality. Epigenetic ageing is likely to be a key mechanism linking chronic stress with accelerated ageing and heightened disease risk for stress-related disorders. Previous findings on the association in veterans have been mixed, with one finding that only PTSD hyperarousal symptoms but not total PTSD symptoms severity, or trauma exposure, were associated with accelerated epigenetic ageing (Mehta et al., 2018).

⁵ Some previous studies have found high resilience to be associated with improved social functioning after PTSD and reduced depression severity, and others have found resilience to be a protective factor against PTSD symptoms in high-risk groups (Mehta et al., 2018).

⁶ The researchers note this is consistent with research on other populations experiencing stress, e.g. a study of children in low socio-economic strata found self-control acts as a two-edged sword both facilitating psychosocial adjustment while simultaneously undermining physical health as reflected by increased epigenetic ageing.

with PTSD had poorer health function across all domains (physical and mental) compared with veterans without PTSD. However, combat exposure, independent of PTSD status, was also associated with lower physical and mental health functioning and increased disability, highlighting the need for physical and mental treatment programs that consider both PTSD and combat experience (Goldberg et al., 2014).

5.4. Self-perception of health or ageing

Key findings:

- Older male veterans in the USA had similar self-rated health as older male non-veterans (Choi et al., 2016).
- Social activities and connections to broader communities can improve self-perceptions of health and attitudes to ageing for veterans and non-veterans (Choi et al., 2016).
- Older veterans in New Zealand had similar self-reported physical and mental health and subjective wellbeing as older non-veterans, despite having significantly higher rates of smoking and diagnosed chronic illness (Yeung et al., 2019).
- Veterans with experience of combat or captivity (ex-prisoners of war (POWs)) report higher subjective age (independent of objective age measures) and more negative attitudes towards ageing, than other veterans (Lahav et al., 2020).
- Post-traumatic stress symptoms (PTSS) contribute to higher subjective age and mediate the link between objective and subjective age and health measures (Avidor et al., 2016)
- Those with PTSD and attachment insecurity have more negative attitudes towards ageing, with attachment insecurity playing a mediating role (and being a useful point of intervention for veterans with PTSD) (Avidor et al., 2021).
- High resilience and 'grit' characteristics correlate with negative ageing attitudes and stereotypes among veterans – so while grit may be productive and beneficial for serving members, it might also come with a cost in terms of negative perceptions of ageing in later life (Georgescu et al., 2024).

Veterans' attitudes and/or self-perceptions of health and ageing were explored by several studies – none of which were Australian. This includes studies on veterans' assessment of their subjective ageing (their appraisal of their age, independent of objective age measures), definitions of healthy ageing and attitudes towards ageing (including negative stereotypes), and their association with wellbeing outcomes for veterans.

Self-rated health and subjective wellbeing

In a cross-sectional study of the association between age and self-reported physical, cognitive and mental health among US veterans ($n = 4,069$), Overstreet and Pietrzak (2022) found that self-reported physical health scores were consistent and stable until around age 80 and then declined. In contrast, cognitive and mental health scores were markedly lower in young veterans and then improved in later life.

The researchers suggest that because younger veterans score lowest on indicators of mental and cognitive health, prevention and treatment efforts geared toward bolstering functioning in these health domains for younger veterans may help promote healthy ageing and preservation of functioning in later life. The study also had more specific findings by age ranges of older veterans: mental health was notably lower among 80–89 year olds and cognitive health was notably lower among 70–79 year olds.

The researchers also suggest that veterans in these age groups may be more vulnerable in terms of their cognitive and or mental health and that it may be beneficial to tailor assessment and intervention efforts to older veterans in these age groups.

One study examined self-rated health and its association with demographic factors, social participation and physical and mental health indicators among US male veterans and non-veterans aged 65 plus. (Choi et al., 2016). Choi and colleagues (2016) found that US male veterans generally reported similar self-rated health to male non-veterans. However, they found that there were significant ethnic disparities in self-rated health among veterans, with “Black and Hispanic veterans”⁷ reporting lower self-rated health than “White veterans”.

They also found that involvement in formal group activities and connections to broader communities could improve health among older adults and was positively associated with better self-reported health for both veterans and non-veterans.

Similarly, Yeung and colleagues (2019) compared indicators related to ageing and health among veterans and non-veterans in New Zealand and identified factors associated with subjective wellbeing. They found that veterans had higher rates of smoking and chronic health conditions but did not differ from non-veterans on other indicators of wellbeing including levels of alcohol consumption, frequency of exercise, purpose in life, activity participation, self-reported physical or mental health, housing satisfaction, social provision, loneliness, depression and subjective wellbeing.

They also demonstrated that mental health was the strongest and most important predictor of subjective wellbeing. While the findings were generally positive for veterans, the researchers note that attention to the needs of veterans should remain a priority as other military-related factors (e.g. service type, service status, cohort membership and historical events) may accelerate older veterans' ageing process.

Perceptions of healthy or successful ageing

In a qualitative study of perceptions of ageing among older US male veterans, Bundy and colleagues (2018) found that male veterans defined healthy ageing to include both physical and cognitive wellbeing. However, a significant subset viewed intact cognitive faculties to be more important to successful ageing, giving examples of people that aged well despite physical limitations. Most saw having a good memory as the key measure of healthy cognition.

In this study, participants were evenly divided among those who saw military service as having a positive impact on successful ageing and those who felt it had a negative impact.

Those who saw it as a positive impact highlighted the discipline that is learnt in military service and how it could contribute to habits that assist with successful ageing. They also spoke of the support networks that exist between veterans that support healthy ageing.

Those who believed military service had a negative impact on successful ageing frequently based this on the occurrence of psychiatric distress, such as trauma and PTSD, among veterans and believed that this could undermine successful ageing.

Similarly, Rozanova and colleagues (2015) examined older US veterans' perceptions of factors that contributed to successful physical emotional and cognitive ageing. They found that older US veterans emphasised potentially modifiable health behaviours, personal characteristics and social engagement as key determinants of successful ageing. Health behaviours were seen to

⁷ Ethnic/racial names are those used by Choi et al. (2016).

impact physical and cognitive ageing, while social engagement was described as crucial for emotional ageing.

The researchers suggest that targeting these factors may promote successful ageing in this population. They also found that few veterans mentioned that health care could contribute to successful ageing (physical, emotional or cognitive) and instead placed an emphasis on individual behaviour. The researchers note that this emphasis on self-reliance might present a barrier for service use as veterans may perceive seeking help as a sign of personal failure.

Another US study (Pietrzak et al., 2014) examined the prevalence and correlates of self-rated successful ageing among a nationally representative sample of older US veterans (aged 60–69 years). It showed that most older veterans in the USA rate themselves as ageing successfully, with physical health difficulties and current psychological distress most strongly negatively associated with self-reported successful ageing.

Protective psychosocial characteristics such as resilience, gratitude and purpose in life were most strongly positively associated with self-reported successful ageing. Additional predictors of successful ageing included being married or living with a partner, having an active lifestyle and lack of a substance abuse history.

The researchers conclude that by addressing physical health difficulties, reducing psychological distress and enhancing protective psychological characteristics, such as resilience and purpose in life, aged care can significantly contribute to the health and wellbeing of older veterans.

Subjective age

Two studies discussed subjective age of veterans. In their study on Israeli Yom Kippur War veterans, Avidor and colleagues (2016) found that those who were ex-POWs reported higher subjective age⁸ (above and beyond chronological age), as well as lower self-rated health and higher rates of health conditions compared to a matched control group of veterans who were not held captive.

Avidor and colleagues (2016) also found that the relationship between self-reported health conditions and subjective age was stronger for those with high levels of PTSS. Possible explanations provided for this association were that people with PTSS often have negative self-perceptions, which may contribute to older physical and mental age identities and to a sense that one cannot cope well with the challenges that come with age. The study highlights the importance of mental health interventions for minimising health decline in older veterans in need of aged care services.

Similarly, in another study on Yom Kippur War veterans, Lahav and colleagues (2020) examined the relationship between impostorism (the subjective experience that one is less adequate than others perceive), subjective age and perceived health. This found that veterans' impostorism was associated with a relatively old subjective age and poor perceived health that was above and beyond the effects of age, health-related behaviours, combat exposure, depressive symptoms and PTSD symptoms.

The researchers conclude that impostorism may contribute to veterans' stress and negatively affect their evaluations regarding age and health.

⁸ Subjective age is assessed by 5 statements concerning subjective perceptions of felt age, appearance, behaviour, interests and vitality (i.e. 'I feel as though I am ..', 'I look as though I am ...', 'I behave as though I am ...').

Attitudes to ageing

Finally, 2 papers discussed veterans' attitudes towards ageing. In their longitudinal study of Israeli Yom Kippur War veterans, Avidor and colleagues (2021) found that male veterans with combat-related PTSD symptoms have more negative attitudes towards ageing than veterans not exposed to combat. The researchers suggest that this may be explained by psychological vulnerabilities following exposure (i.e. trauma symptoms).

The study also found that attachment insecurity (a lack of ability to connect to others) predicted negative attitudes towards ageing among participants with high levels of combat exposure. Therefore, veterans exposed to war who also have anxiety attachment issues are likely to go on to have fewer positive attitudes towards ageing. The researchers argue that attachment insecurity plays a mediating role in the persistence of PTSD symptoms among older adults, possibly due to its impact on emotional regulation and likelihood of seeking or obtaining support.

In their study of US veterans, Georgescu and colleagues (2024) also examined the prevalence and correlates of negative ageing stereotypes. The researchers found an association between grit (e.g. self-control, self-regulation, perseverance of efforts and consistency of interest) and negative ageing stereotypes. Similar to Mehta and colleagues (2018), these findings indicate that while grit may be productive and beneficial for serving members, it might also come with a cost in terms of negative perceptions of ageing and loss of ability associated with old age.

The researchers in these studies suggest that the findings underscore the importance of targeting correlates of negative ageing stereotypes among older veterans, such as grit, emotional stability and purpose in life, as part of efforts to promote positive health and functioning. Georgescu and colleagues (2024) argue that as grit is potentially modifiable, intervention strategies such as the cultivation of a growth mindset (the belief that one's abilities can change or improve over time through effort) may help counteract negative ageing stereotypes and potentially help mitigate risk for adverse health outcomes.

5.5. Care needs and experiences

Key findings:

- Integrating trauma-informed care principles into the training and operations of aged care staff in residential care settings improves management of veterans with trauma histories, enhancing resident safety and trust and fostering high staff morale and effective communication (de la Parrelle et al., 2022).
- DVA clients receiving the Veterans Affairs Community Nursing (VCN) package live in their homes in the community for longer than matched people receiving the standard Commonwealth Home Care Package, suggesting the higher level of support provided through the VCN is effective in assisting them to remain in their homes longer (Jeon et al., 2023).
- DVA-supported clients use home care services at a higher rate than similar non-DVA clients, which may indicate that they have higher need for assistance with personal care activities; or may be because of the additional funding they receive (Johnstone et al., 2023).
- Managing/coordinating health needs of veterans can be more complex than for non-veterans because veterans are often receiving services from multiple service systems (veteran and mainstream) (Elliott, 2019).

- Research on the Veterans' Health Administration's Medical Foster Home (MFH) program in the USA suggests that it is a high quality and effective alternative to residential care for veterans with high care needs (Haverhals et al., 2016).
- Research suggests older Australian veterans highly value independence and self-sufficiency, which can make them reluctant to seek help when they may need it. They value the support they receive from DVA to help them remain living independently (Feldman et al., 2015).
- Veterans with comfort EOL care goals and preferences are less likely to use acute care at the EOL (Miller et al., 2021).
- US research finds that compared to prior generations, higher percentages of Vietnam-era veterans had mental health/substance use diagnoses and disability. Although current VA EOL practices largely meet the needs of Vietnam-era veterans, greater focus on mental health comorbidity, including PTSD, is warranted (Kutney Lee et al., 2021).
- Australian research found that there were some differences in the EOL care at home needs of veterans compared to non-veterans – however, there were many commonalities between the two groups. (O'Connor et al., 2014)

A total of 8 studies in this review explored the experiences or needs of veterans in aged care.^{9,10} Half of these were Australian and most used qualitative research methods; however, none of them used co-design approaches to respond to the needs of veterans and their families in aged care. A further 3 studies explored the EOL care needs of veterans. While this is one of the smaller groups of studies, they appear to be highly relevant and likely indicate a need for more research in this area – particularly as we see a generational shift in the older veteran demographic in Australia.

Trauma-informed care

An Australian study evaluated the benefits of trauma-informed care in a residential aged care service catering for veterans and others with trauma histories (de la Perrelle et al., 2022).¹¹ The study included observation of care behaviours, interviews with staff and residents and organisational policy mapping.

The study found that the organisation had effectively embedded the principles of trauma-informed care in its staff training, which meant that staff understood how trauma could affect residents' experiences in care and were able to adapt care where appropriate to provide safety for residents with trauma histories. This approach was found to enhance resident safety, choice and trust, and to foster high staff morale and effective communication.

The researchers conclude that there are significant benefits of integrating trauma-informed care principles into the training and operations of aged care staff in residential care settings.

⁹ We have used the [Department of Health and Aged Care definition of aged care](#) as 'the support provided to older people who need help in their own home or who can no longer live at home. It can include help with everyday living, assistive equipment and home modifications, personal care and health care and accommodation'.

¹⁰ One paper on experiences or needs in aged care, O'Malley et al. (2023), is discussed in the [mental health chapter](#).

¹¹ The researchers note that trauma-informed services are organised in a way that engender safety and do not re-traumatise survivors. Two criteria central to trauma-informed care are: (1) the capability of staff to identify when psychological trauma may be affecting a person's experience of care; and (2) organisational processes that maximise the person's control (de la Perrelle et al, 2022). The researchers assessed the service against 6 practices that support a trauma-informed lens to care: (1) understanding individual's trauma experiences and implementing strategies to prevent or minimise triggers, (2) focusing on resident's strengths, (3) understanding the personal significance of the trauma and how prior problem-solving methods were used by the person, (4) facilitating choice and control in daily care, (5) understanding the persons privacy needs, and (6) promoting safety and trusting in care tasks.

Home care service use

Two Australian studies explored home care service use. One study examined whether home care services contributed to delayed residential care admissions (Jeon et al., 2023), while the other compared home care service use between DVA and non-DVA supported older people (Johnstone et al., 2023).

Jeon and colleagues (2023) compared rates of admission and cost consequences between 2 government-subsidised Australian programs: Veterans Affairs Community Nursing (VCN) and Home Care Package (HCP).¹² The study found that compared to a HCP model, VCN services helped veterans to remain at home longer and provided potential cost savings.

The researchers found that two factors associated with a lower risk of residential care admission for VCN recipients was receiving care from skilled registered nurses and having uncapped access to clinically necessary care services with no user fees. The researchers believe that this likely led to more timely and frequent support that was based on more comprehensive and effective assessment, tailored to the person's care needs and with care plans regularly updated.

The researchers note the importance of early comprehensive clinical assessment and regular review of care plans by registered nurses, as this can delay development of disability and entry into residential care.

In the other Australian study, Johnstone and colleagues (2023) compared the home care use of older people supported by the DVA to age and gender matched non-DVA supported clients.¹³ The study found that veterans and their dependants used more home care assistance than non-DVA supported individuals and were more likely to use a diverse range of care activities.

The researchers note this is inconsistent with previous research that has shown that DVA funding does not necessarily result in greater use of other health services such as General Practitioners (DVA clients have previously been shown to use these services at a rate similar to non-DVA clients matched on age and disability).

The study found that compared to non-DVA clients, DVA clients were more likely to use person care activities¹⁴ and suggested that this is a particular area of need for DVA clients. The researchers note that the time intensive nature of these activities may explain the additional overall hours of home care used by DVA clients. However, they also suggest that the additional financial support available to DVA clients may potentially explain the higher use of services.

Independence/self-determination and health and service use

Feldman and colleagues (2015) examined the health and service usage of older Australian war veterans and their widows who receive Australian Government support for their health care needs and conditions.¹⁵ The study also explored participants' perspectives about their ageing and life trajectories with regard to their independence, self-determination and choice in relation to their overall health and wellbeing and service use.

¹² The study was a population-based retrospective cohort study using administrative data.

¹³ The study drew on 10 years of data (2007–16) on episodes of care provided by a single metropolitan home care organisation.

¹⁴ Compared to non-DVA supported clients, the demand for help with personal care activities, such as showering or bathing, dressing or shopping, was 3 times higher with DVA supported clients.

¹⁵ The study was based on qualitative data with 25 older veterans ($n = 20$) and/or their widows ($n = 5$) who received a repatriation or veterans' pension (a DVA Gold card), drawn from the larger Melbourne Longitudinal Study of Healthy Ageing (MELSHA).

All participants were over 80 but lived independently in their own homes within the community at the time of interview. Participants reported being grateful for the support they received from the DVA (including home care services such as cleaning, home maintenance and subsidised reliable transport), which played an integral role in ensuring they were able to continue to live as independent older people (consistent with Jeon et al., 2023). However, many struggled with notions of dependence, which could affect their mental health. Despite health declines, veterans were found to employ various strategies to sustain their way of life and social engagement with as little intervention from others as possible.

The study found that the high value veterans placed on independence and self-determination could be a barrier to the use of services or to asking for help from family and friends. While participants used a range of health services (depending on their needs), many considered 'having a good GP' as being particularly important to their health and quality of life.

Nurses and paid caregivers of veterans

Three US studies explored the experiences of nurses and caregivers in aged care services – including home care programs. In a small qualitative study, Elliott (2019) found that home care nurses in the USA face unique challenges providing home care to veterans due to difficulty coordinating care services from a mix of VA and civilian providers and challenges building rapport and trust with veterans. Nurses reported that the VA health system was difficult to navigate, that many veterans did not know what benefits they were entitled to and had to 'jump through too many hoops' to access the supports they needed.

Some nurses in the study failed to assess patients' veteran status upon admission to services and some didn't know how to. Others felt it was imperative to assess veteran status to identify and manage issues more common among the veteran population. Nurses felt that it was important to have some knowledge of military culture and veteran-specific health care issues, and to recognise the impact of service on the patient's health and world view, to ensure quality of care for older veterans.

Another qualitative study from the USA explored nurses' experiences of caring for veterans in US rural home care/hospice settings (McMillan et al., 2022). The researchers found that nurses often went above and beyond their traditional duties to provide comprehensive and empathetic support and accepted greater risks.

Home care nurses played a crucial role in adapting rural area considerations into patient health care delivery and ensuring the voice of veterans was incorporated into care. Nurses in rural areas needed strong advocacy and change agent skills to meet the health care needs of veterans and improve outcomes while maintaining personal and patient safety.

Finally, a third study from the USA examined the skills and backgrounds of caregivers in the Veterans' Health Administration's Medical Foster Home (MFH) program, their motivations to take on this caring role and how well they functioned as caregivers (Haverhals et al., 2016).

The MFH program offers a unique long-term care option for veterans who require nursing home or assisted living level care, whereby veterans can remain in the medical foster home until their end of life and receive 24-hour a day care and monitoring. The caregivers working in MFH were found to have extensive skills due to previous experience in long-term care settings and/or caring for family members.

The study found that a strong desire to serve veterans was a primary motivation for carers who took on this work (other motivations included needing to work from home due to family issues such as caring for school-aged children). The researchers note these characteristics meant

carers were able to provide high-quality personalised care for veterans in a family-like environment and concluded that this was an effective alternative to residential care for veterans with high care needs.

End-of-life care

A quantitative study by Miller and colleagues (2021) explored US veterans' comfort care¹⁶ goals in the context of the Life-Sustaining Treatment Decisions Initiative (LSTDI) of the US Veteran Health Administration.¹⁷ The study found that veterans with comfort care goals and preferences were less likely to use hospital intensive care and emergency departments near EOL than veterans without such goals. The researchers concluded that their findings endorse the benefits of adapting the LSTDI model as a pathway for improving veterans' end-of-life care, ensuring they receive appropriate palliative care and reducing unnecessary acute care interventions.

Another quantitative study from the US explored whether EOL care needs and outcomes of Vietnam-era veterans differed from previous generations (Kutney Lee et al., 2021). The researchers found that while current VA EOL practices are largely meeting the needs of Vietnam-era veterans, there is a need for greater focus on mental health comorbidity, Agent Orange-related conditions and ensuring access to quality EOL care in the community.

The researchers concluded that policy makers and health care professionals should anticipate more physical and mental health comorbidities among ageing Vietnam-era veterans. The findings from this study are intended to inform the development of standardised EOL care protocols and training programs for non-VA health care providers tailored to the needs of the veteran population.

An Australian qualitative study by O'Connor and colleagues (2014) explored the home-based palliative care needs of veterans as they face their EOL compared to non-veterans. The researchers found that there were differences in home-based EOL care requirements between veterans and non-veterans – however, they also found many commonalities.

The study revealed that Australian veterans had more health issues and were older at the time of their death. The researchers argue that palliative care clinicians need to consider the veteran's service history and how this may impact their care needs and care delivery. Likewise, they suggest that there needs to be an exploration into how care can be provided collaboratively linking existing support provided by DVA and the specialist care by palliative care clinicians.

They argue that tailored care for veterans could be improved with better awareness and communication (e.g. improved communication between clinicians, families and the veteran) and that this is particularly relevant to home-based palliative care where family members are expected to be the primary caregivers. O'Connor and colleagues (2014) also note that while veterans were less likely to be concerned with the financial burden of supports due to their entitlements, non-veterans had significant concerns related to their care costs.

5.6. Family members

Key findings:

¹⁶ Comfort care is care given to people who are near the end of life and have stopped treatment to cure or control their disease. It includes physical, emotional, social and spiritual support for patients and their families. The goal of comfort care is to control pain and other symptoms so the patient can be as comfortable as possible. Comfort care may include palliative care, supportive care and hospice care. It is also called end-of-life care.

¹⁷ The Life-Sustaining Treatment Decisions Initiative (LSTDI) is a national VHA quality improvement project that promotes personalised, proactive, patient-driven care for veterans with serious illnesses by eliciting, documenting and honouring their values, goals and life-sustaining treatment decisions.

- The partners of Vietnam veterans, as well as Vietnam veterans themselves, are at greater risk of suicide than age and sex matched non-veteran counterparts (O'Toole et al., 2015).
- PTSD is a risk factor for suicide even in the presence of other psychiatric disorders for veterans and their partners. A range of other factors are also associated with suicide risk for partners including depression, social phobia and panic disorder (O'Toole et al., 2015).
- Veterans' spouses who are indirectly exposed to their partners' aversive details of war trauma and/or PTSS and related behaviours can present long-term secondary PTSS trajectories that echo that of the primarily traumatised war veterans (Zerach et al., 2022).

Only 2 qualitative studies were identified that explored the experiences or needs of the family members of older veterans. One of these studies was conducted in Australia and explored the suicidality of Australian Vietnam veterans and their partners (O'Toole et al., 2015). The other study was from Israel and explored secondary post-traumatic stress syndrome among spouses of war veterans (specifically the 1973 Yom Kippur War) (Zerach et al., 2022).

While only 2 studies focused specifically on family members of veterans, some of the other studies covered in this review included information on how the family circumstances of veterans affect their outcomes and/or care needs in old age and/or the role of family in caring for older veterans (and the importance of aged care providers communicating with family members as well as the veteran). Nevertheless, no studies were located that explored how partners' (in)ability to maintain social networks and careers potentially impact their social supports in later life, their retirement savings and their ability to access/finance their own aged care in later life.

As discussed in the [mental health chapter](#), an Australian study by O'Toole and colleagues (2015) examined lifetime suicidality among a cohort of ageing Australian Vietnam veterans and their female partners with comparison to age and sex matched (non-veteran) Australians. They found that Australian Vietnam veterans and their partners had a high risk of suicidality due to PTSD, even in the presence of other psychiatric disorders.

Australian Vietnam veterans' relative risk for suicidal ideation, planning and attempts were 7.9, 9.7 and 13.8 times higher for veterans compared with the non-veteran Australian population, and for partners were 6.2, 3.5 and 6.0 times higher. This risk of suicidality was shown to be stronger for veterans than their partners. However, the researchers recommend that health care providers treating Australian Vietnam-era veterans, or their partners, should be aware of the increased risk of suicidality and vigilant for signs of PTSD and a lack of social connectedness.

Similarly, an Israeli study examined the prevalence of trajectories of secondary PTSS in female spouses of male Israeli combat veterans from the 1973 Yom Kippur War (Zerach et al., 2022). The researchers explored the association between PTSS trajectories and spouses' self-perceived health.

Zerach and colleagues (2022) found that most spouses (68.4%) showed low and stable secondary PTSS overtime (referred to as the 'resilient trajectory'). Around 10% had a 'recovered' trajectory, with initial high levels of PTSS that decreased significantly over time. Approximately 10% had a 'chronic' course of secondary PTSS and another 10% showed a 'delayed trajectory' – having low initial levels that increased significantly over time.

Spouses in the chronic and delayed PTSS groups reported a higher severity of general negative subjective health perceptions and health-related social malfunctioning (Zerach et al., 2022). They also reported a higher number of negative life events, which may have explain some of the variability in secondary PTSS.

The researchers conclude that secondary PTSS is an enduring clinical phenomenon that can continue into later years. As such, aged care providers and other health professionals should be

aware of the potential experience of secondary PTSS among family members of veterans, and its effects on their care needs in their later years.

6. Discussion

The scoping review has revealed a substantial body of research on older veterans' health and wellbeing and a diverse body of evidence on the needs of veterans, and occasionally their family members, in later life. However, research which examines veterans' specific experiences and needs in the aged care system (including home care), a key focus of this review, was less common. This chapter discusses the overall findings from the literature with a focus on answering the key research questions, highlighting research gaps and identifying insights relevant to various domains of veteran wellbeing. It finishes with a brief statement on limitations.

6.1. What is known about veteran health and wellbeing in later life?

The research included in this review generally found that while older veterans do not significantly differ from non-veterans in self-reported physical and mental health and wellbeing (Choi et al., 2016; Yeung et al., 2019), they do have higher rates of smoking and diagnosed chronic illnesses (Yeung et al., 2019). This is consistent with research on the broader Australian veteran population.

For example, national surveys have shown that Australian male veterans are more likely to report a long-term mental or behavioural condition than male non-veterans and are more likely to have a disability with a limitation or restriction than male non-veterans, regardless of age (Australian Institute of Health and Welfare [AIHW], 2024).

The research therefore highlights differences between veterans' objective and subjective health in old age. Studies of veterans' subjective health showed that many veterans perceive themselves to be relatively healthy, and ageing successfully, despite the presence of diagnosed health conditions. These studies found that most veterans define healthy ageing as maintaining both physical and mental health functions but, overall, place more emphasis on maintaining cognitive faculties than on physical functioning (Bundy et al., 2018).

Studies also found that veterans have mixed views on the impact of military service on ageing. They identify positive impacts of habits formed via military discipline and from the support network that exists between veterans. Key negative impacts they identified resulted from distress related to trauma and PTSD (Bundy et al., 2018).

Studies further showed that the relationship between self-reported health conditions and subjective age is stronger for those with high levels of PTSS (Lavav et al., 2020), with possible explanations being that people with PTSS often have negative self-perceptions that contribute to older physical and mental health self-assessments.

Studies confirmed that there is a subset of older veterans who experience significant comorbid or co-existing psychological and physical health issues. In particular, studies of veterans with experiences of combat or captivity, or injury during service (including TBI), showed this cohort have significantly worse physical and mental health in later life, on objective and subjective measures.

In addition, while population studies have found that military employment per se is not associated with a higher risk of cognitive decline or dementia (Power et al., 2023), they

establish that PTSD is negatively associated with other subjective and general health conditions and outcomes among older veterans, including increased risk of vascular disease, cognitive decline (Lawrence et al., 2023), cognitive difficulties (Moye et al., 2023) and dementia (Prieto et al., 2022).

Studies in the review identified a range of mechanisms by which specific military experiences and exposures affect veterans across their lives, and how physical and mental health issues can become mutually reinforcing or compounding. For example, studies showed that poor physical health (e.g. chronic illness or injury) limits social interaction which, in turn, affects mental health and cognitive functioning. Similarly, medical studies in the review identified specific pathways by which psychological stressors related to military service are associated with poorer physical health of veterans in later life. For example, Bukhbinder and colleagues (2020) found that PTSD and experience of combat are both associated with increased risk of vascular disease and risk factors which, in turn, are associated with greater rates of ischemic heart disease and cerebrovascular disease.

Studies also showed that PTSD and combat exposure both have independent and long-lasting effects on the brain (Beucke et al., 2024), and that combat-exposed veterans with or without PTSD have increased disability and diminished health functioning as they age, relative to those not exposed to or experiencing these issues (Goldberg et al., 2014). Studies showed that, for some, symptoms of PTSD only appear in later life or get worse as people age (sometimes triggered by later life events such as loss of a partner).

6.2. How does the research align with the DVA wellbeing framework?

Due to the specific research questions at the centre of this project, most of the research in the review focused on the health domain, including veterans' physical and mental health in old age, and their risk factors, and how these determine their service use and support needs in aged care.

Synthesising the research in the review, the findings are also relevant to the following domains of the veteran wellbeing framework (DVA, 2020):

- housing
- social support
- recognition and respect
- justice and safety
- education
- finances/income.

Many of the studies in this review are relevant to both health and housing, because of the explicit focus on experiences and needs of veterans living in residential care and those who are living at home and receiving home care services.

Consistent with previous research, this research highlighted the importance of housing to veterans' wellbeing, including sense of safety and security of living arrangements, and having a sense of autonomy and choice over one's living arrangements where possible.

The research showed that veterans value autonomy and appreciate the support they receive to live at home. In one study of the veterans' home care service, the researchers concluded that the additional support they receive through the veterans' home care service is effective at

supporting them to live in their own homes longer than they otherwise would be able to (if they only had access to mainstream home care services).

The reviewed studies addressed some themes relevant to the justice and safety domain, including the importance of feeling safe in services and aged care environments (McMillan et al., 2022). Studies touched on how practices of aged care staff can increase feelings of safety from physical and emotional danger. In particular, studies showed how respectful, veteran-informed and trauma-informed services improve feelings of physical and emotional safety for veterans.

Among others, the study of the US foster care program for veterans, run by carers with high levels of respect for and understanding of veterans, illustrated these characteristics in an innovative model of EOL care for veterans.

The review also included several studies covering veterans' social wellbeing, noting that aged care is included in the social support domain in the original veteran-centred wellbeing framework (AIHW, 2018). The research in the review highlighted the importance of social support and connections to veteran wellbeing in older age (also for non-veterans) (e.g. Choi et al, 2016), the significance of social support and connection in supporting healthy ageing, and some of the challenges that veterans can face maintaining social support and connection, due to specific health issues, such as PTSD or hearing loss, and/or difficulties engaging with the civilian community.

Other studies examining group interventions for older veterans highlighted the benefits of social engagement including peer support, recognition and shared experiences. Several studies highlight the value of voluntary work, community engagement and formal group activities and outings as meaningful activities that support healthy ageing and improve veteran mental health and wellbeing in old age (e.g. Choi et al., 2016). Several studies point to the value of these as potential interventions for building the social connections of older veterans.

Regarding the education domain, studies showed that higher levels of education are a protective factor for veteran wellbeing in later life, supporting healthy behaviours, coping skills and capacity to interact online, and reducing suicide risk among those with PTSD (O'Toole et al., 2015).

Other studies drew attention to the training and skills required by staff to effectively care for older veterans in services, in their homes or other aged care settings. They show that training in trauma-informed care and knowledge and awareness about military/veteran culture, for home care nurses, residential care staff and clinicians, can improve engagement with veterans and the care provided for them (Elliott, 2019; McMillan et al., 2022). These studies are also relevant to the recognition and respect elements of the wellbeing domain – focusing on how staff understanding, respect and recognition of veterans' experiences supports engagement and improves the care of veterans.

None of the studies in the review focused specifically on the income and financial domains of wellbeing for veterans. However, studies highlighted how access to affordable low-cost quality services improves outcomes for veterans and suggest that the additional funding that veterans receive to access services at low or no cost can reduce barriers to service use and contribute to the wellbeing for older veterans.

6.3. Needs and experiences of Australian veterans and their family members in aged care

The research examined in this review suggests older veterans are more likely than older non-veterans to have a range of physical and mental health issues that are important to manage in aged care settings. It is therefore important for aged care providers to assess veteran status and service history and incorporate this in care plans. Studies of aged care services (residential care, home care services, and a range of more specific services and interventions for older veterans) also showed that the following can improve care quality for older veterans:

- trauma-informed care, including training for staff
- improved understanding of military culture, or cultural awareness, among care staff
- family inclusive care
- additional support for veterans with complex care needs
- support for mental health and management of risks associated with poor mental health (including suicide).

Trauma-informed care

The research in this review suggests the importance of a trauma-informed approach to the care of veterans and their partners in aged care settings. As described in this report, veterans and their partners are at increased risk for PTSD, with some experiencing symptoms throughout their lives and into old age, and others not experiencing symptoms until late in life, with symptoms sometimes triggered by issues or transitions common at this stage. Regardless of whether someone in an aged care setting has a former PTSD diagnosis, knowledge of veteran status is helpful in developing care plans and assessing and managing risks. Similarly, studies conclude that clinicians should assess older veterans who report experiencing pain for trauma history and PTSD symptoms and adopt a trauma-informed care approach.

Studies examined in this review showed that integrating trauma-informed practices into aged care services improves the quality of care for, and experiences of services by, veterans (and non-veterans) with PTSD. For example, an Australian study (de la Perrelle et al., 2022) on effective care practices for veterans in residential care found that integrating trauma-informed principles into the service improved resident safety, choice and trust, as well as staff morale and perceived ability to communicate with and effectively manage veterans. A Canadian study showed that without PTSD training, carers in aged care settings often cannot distinguish PTSD symptoms from symptoms of other age-related conditions such as dementia. Training, therefore, substantially improved their ability to care for veterans with PTSD (Ritchie et al., 2022).

Similarly, a US study found that PTSD training was valuable for hospice and palliative care providers caring for veterans who are nearing the end of life, helping them to identify PTSD from other comorbidities (cognitive); and how to respond to veterans with PTSD using essential skills such as listening, responding and displaying empathy (McMillan et al., 2022).

Other studies identified a range of non-pharmacological interventions that can improve the wellbeing of older veterans with PTSD and/or PTSD and dementia– such as the WEAVE program, which combines music therapy, exercise, reminiscence therapy and sensory

modulation (Meyer et al., 2023), and 'life review' (structured story telling) when integrated into other forms of group-based PTSD therapy (Daniels et al., 2015a, 2015b).

Culturally informed care

The research included in this review supports a culturally informed approach to care of veterans in aged care. Studies showed that if care providers understand and respect the experiences of veterans, this improves veterans' experiences of care (de la Perrelle et al., 2022; Elliot, 2019; McMillan et al., 2022).

Other research suggested that veterans often have preferred communication styles, and that understanding military culture helped aged care staff to understand veterans' preferred communication styles and more effectively engage (Elliot, 2019). Studies also found that attitudes and personal traits learned through the military, including a strong sense of self-reliance common among veterans, can make veterans reluctant to seek help, so they might need additional encouragement to use available supports (Rozanva et al., 2015).

Family-inclusive care

While there were few studies in the review that focused on families, studies showed the significance of family to veterans' health and wellbeing, with relationship status being a significant predictor of wellbeing and successful ageing over the life course (e.g. Pietrzak et al., 2014). (Although there were exceptions, e.g. Aloni et al. (2022) found no difference in depression and anxiety trajectories of veterans by family status.)

O'Connor and colleagues (2014) noted that better communication between clinicians, families and veterans could improve tailored care for veterans. This is particularly relevant in home-based care, including palliative care, where family members are likely to be the primary caregivers. This is consistent with previous research on care for veterans generally that found family-inclusive practice supports the rehabilitation of seriously ill or injured veterans (Muir, 2018). It is also consistent with research on home care for older people with dementia which has demonstrated a critical need to consider the views and opinions of each stakeholder involved in providing/receiving dementia care from home care workers – including family members (Goh et al., 2022).

Complex care needs

As noted, while some studies examined in this review suggested many veterans age well and have similar care needs in later life as civilians; the studies also showed there is a group of high-risk older veterans with complex care needs.

Australian studies of DVA-supported clients using Home Care Services confirmed they use services at a higher rate than similar non DVA clients, especially personal care activities (Johnstone et al., 2023). The researchers note this may be because they have higher need for personal support and assistance; or be because of the additional funding they receive as a veteran (Johnstone et al., 2023).

Australian and US studies suggested that the coordination of health care for veterans is more complex than for civilians, because they receive services from multiple systems.

Mental health support

The research examined in this review showed that veterans with specific service experiences have higher rates of diagnosed mental health conditions like anxiety, depression and PTSD,

and that veterans' mental health is a strong predictor of subjective wellbeing in later life (Cummins et al., 2023; Fischer et al., 2023; O'Toole et al., 2015).

Aged care providers should consider interventions that enhance and improve their psychological wellbeing, which can, in turn, improve the health and subjective wellbeing of older veterans (Avidor et al., 2016; Avidor et al., 2021).

Aged care providers should also be aware of the increased risk of suicidality and vigilant for signs of PTSD and a lack of social connectedness among veterans, which are additional suicide risks (O'Toole et al., 2015).

6.4. Research gaps and needs

The review has highlighted several gaps in the available research on veterans' needs in aged care. In particular, the review did not identify any research that explored the abuse and or mistreatment (elder abuse) of older veterans. There was also a lack of research exploring the needs and experiences of family members of veterans – either on their own needs in aged care, or their needs as carers of older veterans.

Overall, there was also a lack of studies with a specific focus on veterans' experiences in aged care, with most studies focusing instead on health issues among older veterans or veteran experiences of ageing. There was correspondingly less qualitative than quantitative research; and a lack of research that embeds the lived experiences of veterans within the study design and implementation.

Other specific areas for which the available research appears limited include:

- EOL care needs of veterans and their family members
- Australian research with veteran and civilian comparisons (including only 2 studies from Australia)
- research on management of suicide risk among older veterans – with no qualitative studies identified.

6.5. Limitations

This brief scoping review sought to identify the volume and breadth of recent research on veterans' needs in aged care, synthesise findings from the sourced material, and summarise what is known and not known. As the research questions extended to experiences and needs of older veterans (and their families) with dementia or TBI, the inclusion and exclusion criteria were broad enough to include studies of older veterans experiencing these specific health issues.

As noted, the scoping review revealed a limited volume of research on the specific experiences and needs of veterans in the aged care system (residential or home based). And a larger body of research on health and wellbeing of older veterans generally, and of their experience of ageing. While we have synthesised this additional research to draw insight on veterans' needs in aged care, we are aware that there is a much larger volume of research on many of the health issues covered in this report (PTSD, TBI) among the veteran population generally; which we have not cross-referenced or reviewed in this report. This should be borne in mind when considering the findings.

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Appendix

First author surname	Year of publication	Title of article	Journal or publication name	Method, population, sample size	Findings	Thematic areas
Aloni	2022	Trajectories analysis of comorbid depression and anxiety among Israeli veterans: The implications on cognitive performance	Journal of Psychiatric Research	Quantitative, longitudinal <i>N</i> = 355 Israeli veterans from the 1973 Yom Kippur War, including 196 veterans held captive (POWs) and 159 veterans not held captive (mean age veterans: 64)	Three distinct profiles of depression and anxiety were identified: resiliency (57.5%, <i>n</i> = 204), delayed onset (29.6%, <i>n</i> = 105), and chronic (13.00%, <i>n</i> = 46). The chronic profile identified mostly among ex-POW (91.3%, <i>n</i> = 42) veterans with lower education at T1, and with more cognitive impairment compared to the other profiles (<i>p</i> < .0001). No differences were found between the age and family status profiles at T1.	<ul style="list-style-type: none"> ▪ Dementia or cognitive decline ▪ General, unique aging needs and issues
Atkinson	2020	Mental health diagnoses in veterans referred for outpatient geriatric psychiatric care at a Veterans Affairs medical center	Military Medicine	Quantitative <i>N</i> = 1,059 veterans who underwent an initial intake assessment with the outpatient geriatric mental health services in the Minneapolis Veterans' Affairs health care system between 1 May 2011 and 30 April 2016 (mean age veterans: 73.5)	Depressive (47%), neurocognitive (42%), and anxiety disorders (22%) were the most common mental health conditions. Vietnam veterans showed a higher prevalence of depressive (56%), post-traumatic stress (11%), and alcohol use (10%) disorders. World War II veterans showed a higher prevalence of neurocognitive disorders (71%). Neurocognitive disorder prevalence was significantly correlated with age.	<ul style="list-style-type: none"> ▪ General, unique aging needs and issues
Avidor	2016	Subjective age and health in later life: The role of posttraumatic symptoms	The Journals of Gerontology: Series B: Psychological Sciences and Social Sciences	Quantitative, <i>N</i> = 278 Israeli Yom Kippur War veterans (111 ex-POWs and 167 matched veterans) (mean age veterans: 57)	Controlling for age, ex-POWs endorsed higher subjective age than control, and ex-POWs with post-traumatic stress disorder (PTSD) endorsed higher subjective age than ex-POWs and control without PTSD. PTSS and health measures besides health-risk behaviours predicted subjective age. Significant interactions were found between PTSS and each health measure, suggesting that health only predicts subjective age for those reporting high PTSS.	<ul style="list-style-type: none"> ▪ PTSD, trauma and/or combat exposure
Avidor	2021	The longitudinal associations between attitudes to aging and	American Journal of Orthopsychiatry	Mixed (qualitative and quantitative), <i>N</i> = 171 (<i>n</i> = 160 after eliminating missing	A regression analysis revealed that T1 attachment insecurities, T2 health problems, and post-traumatic stress	<ul style="list-style-type: none"> ▪ PTSD, trauma and/or combat exposure

		attachment insecurities among combat veterans		values), Veterans who participated in the 1973 Yom Kippur War (mean age veterans: 68.4)	disorder (PTSD) symptoms predicted more negative T2 attitudes toward one's own ageing (ATOA). A significant interaction was found between combat exposure and attachment avoidance, suggesting that the effect of attachment avoidance on ATOA was only significant among participants with high levels of combat exposure.	▪ Self-perception of health or ageing
Beristianos	2016	PTSD and risk of incident cardiovascular disease in aging veterans	The American Journal of Geriatric Psychiatry	Quantitative, <i>N</i> = 138,341 US veterans (mean age veterans: 67.8, 64.5 (with PTSD); 67.9 (without PTSD) 3% of veterans (<i>n</i> = 4,041) had a baseline diagnosis of PTSD.	Unadjusted increased risk of incidence of cardiovascular disease (CVD) was 80%, congestive heart failure (CHF) was 56%, myocardial infarction (MI) was 82%, and peripheral vascular disease (PVD) was 60% in veterans with PTSD compared with those without PTSD. After adjustment for demographics, medical comorbidities, substance use and psychiatric comorbidities, veterans with late-life PTSD were at a 45% increased risk for incident CVD, 26% increased risk for incident CHF, 49% increased risk for incident MI, and 35% increased risk for PVD compared with veterans without late-life PTSD.	▪ PTSD, trauma and/or combat exposure
Beucke	2024	A late-life neurogenetic signature of exposure to combat stress: A monozygotic discordant twin study	Journal of Psychiatric Research	Quantitative, <i>N</i> = 32 US male veterans with combat exposure (mean age veterans: 62.4)	Forty years after combat experience, a generally blunted amygdalar response was observed in combat-exposed veterans compared to their non-exposed twin siblings. Spatial associations between these phenotypical changes and patterns of gene expression in the brain were found for genes involved in the synaptic organisation and chromatin structure. Protein-protein interactions among the set of identified genes pointed to histone modification mechanisms.	▪ PTSD, trauma and/or combat exposure ▪ Civilian/Veteran comparison
Bukhbinder	2020	Increased vascular pathology in older veterans with a purple heart commendation or chronic post-traumatic stress disorder	Journal of Geriatric Psychiatry and Neurology	Quantitative <i>N</i> = 10,255 US veterans aged 65 and older, mostly males (mean age 73.3–73.8 for 4 cohorts of veterans)	In comparison to the control group [aging veterans without chronic PTSD (cPTSD) or purple heart (PH) commendation (an indicator of experience of combat)], the veterans with PH commendation but without cPTSD had increased odds ratios for incidence and prevalence of diabetes mellitus, hypertension and hyperlipidemia. The ageing veterans with cPTSD but	▪ PTSD, trauma and/or combat exposure

				(i.e. PH+/cPTSD-; PH-/cPTSD+, PH+/cPTSD+; PH-/cPTSD-)	without PH commendation had increased odds ratios for the prevalence of diabetes mellitus and the incidence and prevalence of hyperlipidemia. The ageing veterans with cPTSD but without PH commendation, and the veterans with PH commendation but without cPTSD, were associated with ischemic heart disease and cerebrovascular disease but not independently of the other risk factors. The ageing veterans with both cPTSD and PH commendation were associated only with an increase in the incidence and prevalence of hyperlipidemia, though this group's much smaller sample size may limit the reliability of this finding. The researchers conclude that certain physical and psychological stressors related to military service are associated with a greater incidence of several vascular risk factors in veterans aged 65 years or older, which, in turn, are associated with greater rates of ischemic heart disease and cerebrovascular disease.	
Bundy	2018	Perceptions of cognitive aging among older veterans	GeroPsych: The Journal of Gerontopsychology and Geriatric Psychiatry	Qualitative, $n = 12$ Caucasian community-dwelling male veterans in the United States (New England) aged 62–83 (mean age veterans: 69.3)	Veterans equated healthy ageing with being both physical and cognitive, although a significant subset viewed, especially, intact cognitive faculties as a sign of successful ageing despite physical limitations. Two of the most widely cited concerns about ageing were loss of functional independence and the progression of cognitive decline into dementia. However, most of the participants were unable to describe dementia or Alzheimer's disease accurately. Military service was associated with both positive (e.g. social support) and negative (e.g. trauma) associations with ageing. Most participants noted the importance of a healthy diet and exercise in ageing. Still, they could not accurately describe a healthy diet or exercise regimen or the effect of these activities on the brain.	<ul style="list-style-type: none"> ▪ Dementia or other cognitive decline ▪ Self-perception of health or ageing
Choi	2016	Social participation and self-rated health among	Geriatrics & Gerontology International	Quantitative, $N = 2,845$ US veterans aged 65 or more	Despite their older age, veterans did not differ from non-veterans in their physical,	<ul style="list-style-type: none"> ▪ Civilian/Veteran comparison

		older male veterans and non-veterans		years (veteran and non-veteran males) (mean age veteran men: 75–76; civilian men: 73)	mental and cognitive health, and they had better self-rated health (SRH). However, Black and Hispanic veterans had lower SRH than non-Hispanic white veterans. Formal group activities and outings for enjoyment were positively associated with better SRH for veterans, non-veterans and all veteran cohorts.	<ul style="list-style-type: none"> Self-perception of health or ageing
Cummins	2023	Tau, β -amyloid, and glucose metabolism following service-related traumatic brain injury in Vietnam war veterans: The Australian Imaging Biomarkers and Lifestyle Study of Aging-Veterans Study (AIBL-VETS)	Journal of Neurotrauma	Quantitative, case-control study, $N = 70$ Australian Vietnam War male veterans, including 40 with traumatic brain injury and 30 controls with no prior diagnosis of dementia or cognitive impairment (mean age 68 for male veterans with TBI and 69.5 for male veterans without TBI and PTSD)	There were no significant nor trending differences in b-amyloid or tau levels or F-FDG uptake between the TBI and control groups before and after controlling for covariates. The b-amyloid and tau findings were replicated in the Department of Defence (DOD) Alzheimer's Disease Neuroimaging Initiative (ADNI) validation cohort and persisted when the Australian Imaging Biomarkers and Lifestyle study of aging-Veterans study (AIBL-VETS) and DOD ADNI cohorts were combined (114 TBI vs 87 controls in total).	<ul style="list-style-type: none"> Australian study Traumatic brain injury
Daniels	2015a	Life-review and PTSD community counselling with two groups of Vietnam War veterans	Traumatology	Quantitative, $N = 9$ Vietnam war male veterans at a community-based Veteran Centre in the USA (mean age veteran: 60 approx.)	Findings suggest that the sequence of life review attendance before regular PTSD group therapy may contribute to a clinically and statistically significant reduction in PTSD and late-onset stress symptoms and improved life satisfaction. Both group conditions also appeared to have some slight benefit for morale.	<ul style="list-style-type: none"> PTSD, trauma and/or combat exposure
Daniels	2015b	Aging, depression, and wisdom: A pilot study of Life-Review Intervention and PTSD Treatment with two groups of Vietnam veterans	Journal of Gerontological Social Work	Quantitative, $N = 12$ US Vietnam War male veterans with PTSD (mean age veteran: 65.2)	Findings suggest that a life review prior to PTSD group therapy has clinical benefits for reducing symptoms of depression and increasing self-assessed wisdom.	<ul style="list-style-type: none"> PTSD, trauma and/or combat exposure
de la Perrelle	2022	Characterising trauma-informed aged care: An	International Journal of Geriatric Psychiatry	Qualitative observation and interviews with staff, residents and family members at a	The aged care provider embedded the principles of trauma-informed care (TIC) into its staff training (i) to promote understanding of how trauma may affect experiences in	<ul style="list-style-type: none"> Australian study

		appreciative inquiry approach		residential aged care service in South Australia	care, and (ii) to adapt care when appropriate to promote safety. The service promoted a calm atmosphere where residents could choose and feel safe. Uniforms and signage provided consistency, clarity and transparency for residents. Staff behaviours demonstrated respect, fostered trust and anticipated needs without unnecessarily imposing care. Staff consistently offered choices, used residents' names, sought permission before providing care, and offered reassurance. Staff reported high morale and a commitment to delivering high-quality care and feedback to management. Effective communication promoted information sharing and trust among staff.	<ul style="list-style-type: none"> Experiences or needs in aged care (including home care) and staff-related research
Elliott	2019	civilian nurses' experiences caring for military veterans: Qualitative data from a mixed-methods study	Home Healthcare Now	Qualitative, US Home care nurses, $N = 9$ (mean age nurses: 46)	Home care nurses care for veterans every day. Although similarities exist, nurses readily described differences in caring for veterans compared with non-veterans that can impact patient outcomes. Home care nurses face challenges coordinating care and building a rapport, but they recognise the impact of military service on patient's world view	<ul style="list-style-type: none"> Experiences or needs in aged care (including home care) and staff-related research
Feldman	2015	The health and service needs of older veterans: A qualitative analysis	Health Expectations: An International Journal of Public Participation in Health Care & Health Policy	Qualitative, $N = 25$ older veterans ($n = 20$) and/or their widows ($n = 5$) with DVA Gold card (mean age veterans: 87)	Participants in this study were determined to maintain a sense of control and independence about their living circumstances and service usage. In doing so, they attempted to maintain their current community living circumstances and independence while minimising their utilisation of services and perceived 'burden' on family members and friends. Participants accepted that a decline in health status was inevitable but engaged in a number of different strategies to maintain their current way of life for as long as possible.	<ul style="list-style-type: none"> Australian study Experiences or needs in aged care (including home care) and staff-related research
Fischer	2023	Suicidal thoughts and behaviours in older US Military veterans: Results from the national health	The American Journal of Geriatric Psychiatry	Quantitative, $N = 3,356$ US military veterans aged 55 or older	A total of 6.6% (95% CI = 5.7%–7.8%) of the sample endorsed past-year suicidal ideation (SI), 4.1% (CI = 3.3%–5.1%) a lifetime suicide plan, 1.8% (CI =	<ul style="list-style-type: none"> General unique ageing needs/issues

		and resilience in veterans study		(mean age veterans: 70.6)	1.4%–2.3%) a lifetime suicide attempt, and 0.9% (CI = 0.5%–1.3%) future suicide intent. Higher levels of loneliness and lower levels of purpose in life were most strongly associated with past-year SI; lifetime history of major depressive disorder with suicide plan and suicide attempt; and frequency of past-year SI and more negative expectations regarding emotional aging with future suicide intent.	
Georgescu	2024	Negative aging stereotypes in US Military veterans: Results from the national health and resilience in veterans study	International Psychogeriatrics	Quantitative, <i>N</i> = 4,069 US veterans surveyed between November 2019 and March 2020 (nationally representative) (mean age veterans: 62.2)	Results revealed that 82.3%, 71.1% and 30.0% of veterans endorsed negative ageing stereotypes related to physical, cognitive and emotional health, respectively. Older age (36.6% relative variance explained), grit (23.6%) and optimism (17.5%) explained the majority of the variance in negative age stereotypes related to physical ageing; grit (46.6%), openness to experiences (31.5%), and older age (15.1%) in negative age stereotypes related to cognitive ageing; and emotional stability (28.8%), purpose in life (28.8%), and grit (25.3%) in negative age stereotypes related to emotional ageing.	▪ Self-perception of health or ageing
Goldberg	2016	Prevalence of post-traumatic stress disorder in aging Vietnam-era veterans: Veterans administration cooperative study 569. Course and consequences of post-traumatic stress disorder in Vietnam-era veteran twins	The American Journal of Geriatric Psychiatry	Quantitative, <i>N</i> = 5,598 US Vietnam-era male veterans	The lifetime prevalence of PTSD in theatre veterans aged at least 60 years was 16.9% (95% CI: 13.9%–20.5%) and higher than the 5.5% (95% CI: 4.3%–7.0%) among non-theatre veterans. Among veterans younger than 60, the comparable prevalence was 22.0% for theatre (95% CI: 16.7%–28.4%) and 15.7% for non-theatre (95% CI: 13.4%–18.2%) veterans. Similar results were found for theatre service and current PTSD prevalence (past 12 months). PTSD checklist scores (PCL) scores were significantly higher in theatre compared to non-theatre veterans in younger and older cohorts. In both the younger and older cohorts, significant differences in lifetime and current PTSD prevalence and PCL scores persisted in theatre service discordant twin pairs.	▪ PTSD, trauma and/or combat exposure

Goldberg	2014	The association of PTSD with physical and mental health functioning and disability (VA Cooperative Study #569: The course and consequences of posttraumatic stress disorder in Vietnam-era Veteran twins)	Quality of Life Research: An International Journal of Quality-of-Life Aspects of Treatment, Care & Rehabilitation	Quantitative, <i>N</i> = 5,574 US Vietnam-era male veterans (2,102 Vietnam theatre and 3,472 non-theatre) (mean age veterans: 61)	Veterans with PTSD had poorer health functioning across all domains of VR-36 and increased disability for all subscales of the World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0) (all <i>p</i> < .001) compared with veterans without PTSD. Veterans with PTSD were in poorer overall health on the VR-36 physical composite summary (PCS) (effect size = 0.31 in theatre and 0.47 in non-theatre veterans; <i>p</i> < .001 for both) and mental composite summary (MCS) (effect size = 0.99 in theatre and 0.78 in non-theatre veterans; <i>p</i> < .001 for both) and had increased disability on the WHODAS 2.0 summary score (effect size = 1.02 in theatre and 0.96 in non-theatre veterans; <i>p</i> < .001 for both). Combat exposure, independent of PTSD status, was associated with lower PCS and MCS scores and increased disability (all <i>p</i> < .05, for trend). Within-pair analyses in twins discordant for PTSD produced consistent findings.	<ul style="list-style-type: none"> PTSD, trauma and/or combat exposure
Green	2016	Effects of posttraumatic stress disorder and metabolic syndrome on cognitive aging in veterans	Gerontologist	Quantitative, <i>N</i> = 204 US Vietnam-era male veterans (mean age veterans: 62.5)	Veterans with metabolic syndrome (MetS) demonstrated poorer performance on tasks of executive function (response inhibition and cognitive set shifting) and immediate verbal memory regardless of PTSD status. There was an interaction between MetS and PTSD on delayed verbal memory, suggesting that the negative impact of MetS on verbal memory was only significant for veterans not classified as having PTSD.	<ul style="list-style-type: none"> Dementia or other cognitive decline General unique ageing needs/issues PTSD, trauma and/or combat exposure
Hall	2014	PTSD is negatively associated with physical performance and physical function in older overweight military Veterans	Journal of Rehabilitation Research and Development	Quantitative analysis of medical records of eligible individuals from 2 large Department of Veterans' Affairs clinics in the United States, <i>N</i> = 302 Vietnam-era male veterans aged 60 or more years (mean age veterans: 62.9)	PTSD was negatively associated with self-reported physical function, functioning in daily activities, and general health (<i>p</i> < 0.01). Those with PTSD also performed significantly worse on tests of lower limb function (<i>p</i> < 0.05). Despite being significantly younger, Veterans with PTSD had comparable scores on gait speed, aerobic endurance, grip strength, and bodily pain compared with veterans without PTSD.	<ul style="list-style-type: none"> General unique ageing needs/issues PTSD, trauma and/or combat exposure

Haverhals	2016	Caregivers create a veteran-centric community in VHA Medical Foster Homes	Journal of Gerontological Social Work	Qualitative, US veterans with complex needs (requiring assisted living-level care) <i>N</i> = 20 veterans across 7 medical foster home (MHF) caregiver programs	Caregivers interviewed had worked in long-term care settings and/or cared for family members. A strong desire to serve veterans was a primary motivation for caregivers rather than financial gain.	<ul style="list-style-type: none"> Experiences or needs in aged care (including home care) and staff-related research
Jeon	2023	Investigating community-based care service factors delaying residential care home admission of community dwelling older adults and cost consequence	Age and Ageing	Quantitative, all VCN clients who received their first VCN service from Jan 2010 to Dec 2014 aged 65–100 (<i>N</i> = 20,980) and a random selection of 20,980 HCP clients matched on age and sex (mean age VCN clients: 86.6; HCP clients: 86–87)	Service factors associated with lower risk of care home admission in the Veteran Affairs Community Nursing (VCN) cohort were periodic (versus continuous) service delivery (HR 0.27 [95% CI, 0.24–0.31] for ≤18 months; HR 0.89 [95% CI, 0.84–0.95] for >18 months), and majority care delivered by registered nurses (versus personal care workers) (HR 0.86 [95% CI, 0.75–0.99] for ≤18 months; HR 0.91 [95% CI, 0.85–0.98] for >18 months). In the matched cohorts, the time to care home admission for VCN clients (median 28 months, IQR 14–42) was higher than for HCP clients (14, IQR 6–27). Within 5 years of service access, 57.6% (95% CI, 56.9–58.4) of HCP clients and 26.6% (95% CI, 26.0–27.2) of VCN clients had care home admission. The estimated cost saving for VCN recipients compared to HCP recipients over 5 years for relevant government providers was over A\$1 billion.	<ul style="list-style-type: none"> Australian study Civilian/Veteran comparison Experiences or needs in aged care (including home care) and staff-related research
Johnstone	2023	Use of home care services by older veterans and dependents in Melbourne, Australia, 2007–2016	Journal of Military, Veteran and Family Health	Quantitative, 12,525 DVA-supported clients aged 65+ years & their dependents) (<i>N</i> = 12,525) and matched non-DVA clients (mean age clients: 88)	Of 26,093 episodes, 45.3% involved veterans (91.7% male) and 54.7% involved dependents (99.6% female). The median hours of care per episode for veterans and dependents were 60% and 62% more, respectively, than for non-DVA-supported individuals. Veterans and dependents were 3.3 and 3.8 times more likely to utilise assistance with personal care, respectively. After adjusting for confounding, veterans and dependents were associated with 16% and 14% more hours of home care per episode, respectively. Cognitive dysfunction and complex care requirements increased the hours of care by, on average, 17% and	<ul style="list-style-type: none"> Australian study Experiences or needs in aged care (including home care) and staff-related research Civilian/Veteran comparison

					52%, respectively. Compared with episodes involving non-DVA-supported clients, episodes with veterans and dependents were 35% more likely to result in a transfer to hospital.	
Jutkowitz	2022	Prevalence of Alzheimer's disease and related dementias among veterans experiencing housing insecurity	Alzheimer's & Dementia: The Journal of the Alzheimer's Association	Quantitative, $N = 6,580,126$ US veterans with Alzheimer's disease (AD) and AD-related dementias (AD/ADRD)	The overall prevalence of AD/ADRD diagnoses for homeless, at-risk and stably housed veterans was 3.66%, 13.48% and 3.04%, respectively. Housing insecure veterans with AD/ADRD used more acute care and were more likely to have a nursing home admission compared to stably housed veterans. At-risk but not homeless veterans were more likely to use the US Department of Veterans Affairs paid home and community-based care than stably housed veterans.	<ul style="list-style-type: none"> ▪ Dementia or cognitive decline
Kornblith	2023	Telehealth delivery of group-format cognitive rehabilitation to older veterans with TBI: A mixed-methods pilot study	Applied Neuropsychology: Adult	Mixed (Qualitative and Quantitative), $N = 6$ US male veterans (mean age veterans: 73)	Older veterans with a history of TBI and cognitive complaints were able to derive subjective benefit from a group-format cognitive rehabilitation intervention delivered via in-home video telehealth (IVT) if they were able and willing to participate.	<ul style="list-style-type: none"> ▪ Traumatic brain injuries
Kutney-Lee	2021	Quality of end-of-life care for Vietnam-era Veterans: Implications for practice and policy	Healthcare (Amsterdam, Netherlands)	Quantitative, $N = 87,526$ (Vietnam-era veterans = 45,860; WWII/Korean War veterans = 41,666) (mean age veterans: 76.7)	Compared to prior generations, higher percentages of Vietnam-era veterans had mental health/substance use diagnoses and disability. Similar percentages of family members in both groups reported that overall EOL care was excellent; however, post-traumatic stress disorder management ratings by families of Vietnam-era veterans were significantly lower.	<ul style="list-style-type: none"> ▪ End-of-life care
Lahav	2020	Impostorism, subjective age, and perceived health among aging veterans.	Social Science & Medicine	Quantitative, $N = 146$ Israeli veterans from the Yom Kippur War (mean age veterans: 68.4)	The veterans' impostorism was associated with relatively old subjective age and poor perceived health, above and beyond the effects of age, health-related behaviours, combat exposure, depressive symptoms and PTSD symptoms.	<ul style="list-style-type: none"> ▪ PTSD, trauma and/or combat exposure ▪ Self-perception of health or aging
Lawrence	2023	Interactive association of posttraumatic stress disorder, apolipoprotein $\epsilon 4$	International Journal of Geriatric Psychiatry	Quantitative, $N = 1,244$ US military veterans (mean age veterans: 61.8)	A significant three-way interaction between apoenzyme (APOE) $\epsilon 4$, PTSD, and age on the learning/working memory (LWM) composite ($\eta_p^2 = .011$) was observed. The	<ul style="list-style-type: none"> ▪ Dementia or other cognitive decline

		enotype, and age on cognitive functioning			main effect of APOE ε4 on LWM was only significant for older participants with PTSD. In addition, a significant two-way interaction between PTSD and age on the attention/psychomotor (APM) composite ($\eta_p^2=.011$) was observed, indicating that the main effect of PTSD on APM was only significant in older participants.	<ul style="list-style-type: none"> PTSD, trauma and/or combat exposure
McMillan	2022	Above and beyond the call of duty: Rural home care and hospice nurses' experiences caring for veterans	Home Healthcare Now	Qualitative, $N = 14$ US nurses in rural settings (mean age nurses: 41)	Nurses play a unique and critical role in the care of veterans. They often go above and beyond their traditional duties to provide comprehensive and empathetic support and accept greater risks.	<ul style="list-style-type: none"> Experiences or needs in aged care (including home care) and staff-related research
Mehta	2018	Accelerated DNA methylation aging and increased resilience in veterans: The biological cost for soldiering on	Neurobiology of Stress	Quantitative, $N = 96$ Vietnam Era Australian veterans (Mean age veterans: 68.7)	Veterans with PTSD had increased PTSD symptom severity (P -value = 3.75×10^{-34}) and lower Connor-Davidson Resilience Scale (CD-RISC) scores (P -value = 7.5×10^{-8}) than veterans without PTSD. DNA M age was significantly correlated with the chronological age (P -value = 3.3×10^{-6}), but DNA M age acceleration was not different between the PTSD and non-PTSD groups (P -value = 0.24). Evaluating potential protective factors, we found that DNA M age acceleration was significantly associated with CD-RISC resilience scores in veterans with PTSD; these results remained significant after multiple testing corrections (P -value = 0.023; $r = 0.32$). This finding was also replicated in an independent trauma-exposed civilian cohort (P -value = 0.02; $r = 0.23$). Post-hoc factor analyses revealed that this association was likely driven by "self-efficacy" items within the CD-RISC (P -value = 0.015; $r = 0.35$).	<ul style="list-style-type: none"> Australian study PTSD, Trauma, and/or combat exposure
Meyer	2023	Weaving Evidence into Action for Veterans with Dementia (WEAVE): Evaluation of implementation into long-term care practice.	Journal of Evaluation in Clinical Practice	Mixed methods evaluation, $N = 38$ veterans and 10 staff members (mean age veterans: 91.4)	Thirty-eight veterans participated in the 24-week program, with high levels of engagement in interventions of their choice. Statistically significant improvements were seen across all veteran-level outcome measures for functional capacity and reduced neuro-psychiatric and depressive symptoms. Ten staff members were	<ul style="list-style-type: none"> Australian study Dementia or other cognitive decline

					interviewed, highlighting that co-designed core elements were feasible and acceptable, and that the momentum was generated by resident and staff enthusiasm. Cost analysis included costs of program set-up and running the 24-week intervention.	
Miller	2021	Honoring veterans' preferences: The association between comfort care goals and care received at the end of life	Journal of Pain and Symptom Management	Quantitative, $N = 18,163$ US veterans	Sixty-four per cent of the 18,163 Veterans had comfort-care goals; 80% with comfort-care goals received hospice and 57% PC consultations (versus 57% and 46%, respectively, for decedents without comfort-care goals). In adjusted analyses, comfort care documented on the Life-Sustaining Treatment (LST) template before death was associated with significantly lower odds of hospital, intensive care unit, and emergency department use near the end of life. In the last 30 days of life, veterans with comfort care	<ul style="list-style-type: none"> ▪ End-of-life care
Moye	2023	Characteristics and correlates of ten-year trajectories of posttraumatic stress symptoms in older US military veterans	The American Journal of Geriatric Psychiatry	Quantitative, $n = 1843$ US veterans with PTSD (mean age veterans: 67)	Most of the sample had no/low PTSD symptoms (88.7%), while 6.0% had consistently sub-threshold symptoms, 2.7% had consistently high symptoms, and 2.6% had increasing symptoms. Relative to the no/low symptom group, the sub-threshold and high symptom groups reported more medical conditions and cognitive difficulties, with younger age and more lifetime traumatic events additionally linked to the high symptom trajectory. Relative to the no/low symptom group, veterans with increasing symptoms were more likely to report functional disability and lifetime nicotine use disorder, cognitive difficulties, negative expectations regarding physical and emotional ageing, and traumatic events over the study period.	<ul style="list-style-type: none"> ▪ PTSD, trauma and/or combat exposure
O'Connor	2023	Time doesn't heal all: PTSD symptoms exacerbate the relationship between age and pain intensity	Frontiers in Psychiatry	Quantitative cross-sectional $N = 450$ US veterans who served after September 11, 2001. (mean age veterans: 50.7)	Age ($B = 0.04, p < 0.001$) and PTSD symptoms ($B = 0.05, p < 0.001$) were positively associated with pain intensity. Age and PTSD symptoms were inversely correlated ($r = -0.16, p < 0.001$). PTSD symptoms exacerbated the relationship between age and pain intensity ($\Delta R = 0.01$,	<ul style="list-style-type: none"> ▪ PTSD, trauma and/or combat exposure ▪ General unique ageing needs/issues

					p = 0.036). Specifically, when greater PTSD symptoms were reported at older ages, pain intensity was significantly higher.	
O'Connor	2014	Vulnerability at the end of life: Australian veterans requiring home-based palliative care	Home Health Care Management & Practice	Qualitative, N = 20 deceased veterans (10 = veteran; 10 = non-veterans)	Veterans had significantly more comorbidities and were older at death. Qualitative data indicated common concerns, including the role of families and practical aspects of care. Some differences were found between veterans and non-veterans in their end-of-life care requirements.	<ul style="list-style-type: none"> ▪ Australian study ▪ End-of-life care ▪ Civilian/Veteran comparison
O'Malley	2023	Advancing trauma-informed care education for hospice and palliative staff: Development and evaluation of educational videos	Journal of Hospice and Palliative Nursing: JHPN: The Official Journal of the Hospice and Palliative Nurses Association	Mixed (Qualitative and Quantitative), N = 345 hospice and palliative care (HPC) and other health care professionals (analyses conducted on 155 persons who participated in the survey)	Approximately 75% rated videos as 'very much' relevant to their needs, having helped them learn something new and realistic. Analysis of chat responses showed that videos conveyed most content objectives (92%). In addition, participants stated videos were helpful in demonstrating nursing skills of listening, responding and displaying empathy, as well as case presentations involving cognitive impairment and the patient's experience.	<ul style="list-style-type: none"> ▪ PTSD, trauma and/or combat exposure ▪ Experiences or needs in aged care (including home care) and staff-related research
O'Toole	2015	Suicidality in Australian Vietnam veterans and their partners	Journal of Psychiatric Research	Quantitative, N = 448 ageing Australian Vietnam veterans and 237 female partners in comparison with age and sex-matched Australian population (mean age veterans and their partners: 60.4)	Relative risks for suicidal ideation, planning and attempts were 7.9, 9.7 and 13.8 times higher for veterans compared with the Australian population, and for partners, were 6.2, 3.5 and 6.0 times higher. Odds ratios between psychiatric diagnoses and suicidality were computed using multivariate logistic regression, and suicidality severity scores were assigned from ideation, planning and attempt and analysed using ordinal regression. PTSD, depression, alcohol disorders, phobia and agoraphobia were prominent predictors of ideation, attempts and suicidal severity among veterans, while depression, PTSD, social phobia and panic disorder were prominent predictors among partners.	<ul style="list-style-type: none"> ▪ Australian study ▪ Family members ▪ General unique ageing needs/issues ▪ PTSD, trauma and/or combat exposure
Overstreet	2022	Paradoxical age-related improvement in mental health in U.S. military veterans: Results from the	International Journal of Geriatric Psychiatry	Quantitative, N = 4,069 US veterans with trauma exposure	Physical health scores were consistently average and stable until around age 80 when they declined. In contrast, cognitive and mental health scores were markedly	<ul style="list-style-type: none"> ▪ General unique ageing needs/issues

		national health and resilience in veterans study		(mean age veterans: 62.2)	lower in young veterans and then increased linearly and positively well into late life.	
Pietrzak	2014	Successful aging among older veterans in the United States	The American Journal of Geriatric Psychiatry	Quantitative cross-sectional web survey, $N = 2,025$ US veterans aged 60–96 (mean age veterans: 71)	Most older veterans (82.1%) rated themselves as ageing successfully. A unidimensional latent factor composed of seven measures of self-rated successful ageing, quality of life and physical, mental, cognitive and social functioning provided a good fit to the data. Physical health difficulties ($\beta = 0.39$) and current psychological distress ($\beta = 0.33$) were most strongly negatively related to scores on this latent factor of successful ageing, while protective psychosocial characteristics ($\beta = 0.22$), most notably resilience, gratitude and purpose in life, were most strongly positively related to these scores. Additional positive predictors of successful ageing included White, non-Hispanic race, being married or living with a partner, perceiving a positive effect of the military on one's life, having an active lifestyle, having positive expectations regarding ageing, and conscientiousness; additional negative predictors included substance abuse history.	▪ Self-perception of health or ageing
Pless Kaiser	2024	Enhancing social functioning in older veterans with PTSD: Rationale and design of an intervention and initial RCT	Contemporary clinical trials	Qualitative, veterans with PTSD	The Enhancing Social Functioning Program (ESVP) intervention is being developed iteratively to enhance social functioning in older veterans with PTSD. Feasibility analysis is ongoing, and findings from the randomised trial will guide future implementation.	▪ PTSD, trauma and/or combat exposure
Porter	2022	Differences in mental health care service utilization in older veterans with a history of military sexual trauma	Professional Psychology: Research & Practice	Quantitative, administrative data on $N = 3,607$ veterans who screened positive for military sexual trauma at a Veterans Healthcare Administration hospital between 2006 and 2016. (mean age veterans: 51.6)	Older participants received fewer mental health sessions and were significantly less likely to accept a referral for military sexual trauma (MST)-specific care. Differences in patterns of mental health care utilisation exist between older and younger veterans with a history of MST.	▪ PTSD, trauma and/or combat exposure PTSD, trauma and/or combat exposure

Power	2023	Association of military employment with late-life cognitive decline and dementia: A population-based prospective cohort study	Military Medicine	<p>Quantitative ongoing prospective cohort study of a random sample of 4,370 Kaiser Permanente Washington (formerly Group Health Cooperative) members over age 65 in the central area of Seattle King county, United States (all community-dwelling and free of dementia at time of study enrolment).</p> <p>6% were veterans (classified as veterans if their first or second longest occupation was with the military); and of these, 76% were male</p> <p>Mean age of veterans: 74.4 years</p>	<p>Military employment was not significantly associated with cognitive change (difference in modelled 10-year cognitive change in Cognitive Abilities Screening Instrument-Item Response Theory (CASI-IRT) scores in SD units (95% confidence interval [CI]): -0.042 (-0.19, 0.11), risk of dementia (hazard ratio [HR] [95% CI]: 0.92 [0.71, 1.18]), or risk of Alzheimer's disease dementia (HR [95% CI]: 0.93 [0.70, 1.23]). These results were robust to additional adjustment and sensitivity analyses. There was no evidence of effect modification by age, gender or traumatic brain injury with loss of consciousness.</p>	<ul style="list-style-type: none"> ▪ Civilian/Veteran comparison ▪ Dementia or cognitive decline ▪ Traumatic brain injuries
Prieto	2022	Posttraumatic stress disorder symptom severity is associated with reduced Montreal Cognitive Assessment scores in a sample of Vietnam War Veterans.	Journal of Traumatic Stress	Quantitative, $N = 274$ US Vietnam War veterans aged 60–85 years	Higher Clinician-Administered PTSD Scale (CAPS)-IV scores were associated with worse cognitive outcomes on the MoCA, $\Delta F(1, 264) = 12.686, p < .001, R = .142$. In contrast, the number of reported stressful experiences was not associated with cognitive outcomes. After accounting for multiple comparisons, findings indicated that CAPS-IV severity scores were significantly related to the Montreal Cognitive Assessment (MoCA) memory index. In a sample of older veterans, PTSD symptom severity, but not the number of reported stressors, was associated with poorer performance on a well-established cognitive function screening tool. Analyses of specific MoCA domains indicated that memory may be driving this association.	<ul style="list-style-type: none"> ▪ Dementia or other cognitive decline ▪ PTSD, trauma and/or combat exposure
Rantins	2024	Research Letter: TBI severity moderates the association between	The Journal of Head Trauma Rehabilitation	<p>Quantitative, $N = 242$ US Vietnam Era veterans</p> <p>(mean age veterans: 70)</p>	Veterans with a history of moderate-to-severe TBI had a stronger negative association between subjective and objective attention relative to participants without a TBI ($P = .002$). Although this	<ul style="list-style-type: none"> ▪ Traumatic brain injuries

		subjective and objective attention in older veterans			association did not differ between mild TBI and no TBI history groups ($P = .100$), the association between subjective and objective attention for the mild TBI group was intermediate to the no TBI and moderate-to-severe TBI history groups. TBI status did not moderate associations between subjective and objective memory or language.	
Ritchie	2022	Understanding how Canadian healthcare providers have learned to identify co-occurring PTSD symptoms and dementia in veterans	Journal of Psychiatric and Mental Health Nursing	Qualitative, 8 semi-structured interviews with info health care provider staff who treat veterans across Canada	Observed differences in veterans with PTSD and dementia cued health care providers to seek more information, leading to a new understanding of past trauma underlying the symptoms they observed.	<ul style="list-style-type: none"> ▪ Dementia or other cognitive decline ▪ PTSD, trauma and/or combat exposure
Rozanova	2015	Perceptions of determinants of successful aging among older US Veterans: Results from the National Health and Resilience in Veterans Study	The American Journal of Geriatric Psychiatry	Qualitative, $N = 2,025$ US veterans aged 60 or older (analysis of open-ended text data from survey)	A total of 53, 56 and 61 categories of responses were identified in response to questions about successful physical, cognitive and emotional ageing, respectively, with 10 aggregate factors linking these categories. The most prominent theme overall was 'What you do', which received 2,295, 2,210 and 1,247 mentions for each of these domains of successful ageing, with health behaviours as the most common factor for both successful physical and cognitive ageing and social engagement as the most common for successful emotional ageing. The theme 'Who you are' was the second-most common factor (discerned from 376, 247, and 943 total mentions, respectively), with the factors that comprise this theme – personality and explanatory style, moral compass and emotional dispositions – more commonly endorsed for successful emotional ageing. External factors such as health care were least commonly endorsed across all domains.	<ul style="list-style-type: none"> ▪ Self-perception of health or ageing

Schlenger	2016	PTSD and use of outpatient general medical services among veterans of the Vietnam war	Psychiatric Services	Quantitative, $N = 848$ US Vietnam Veterans (mean age veterans: 67.3)	Male and female theatre veterans with high or increasing PTSD symptomatology over the period were more likely than those with low symptomatology to report recent VA outpatient visits. Males in the increasing and high categories were also more likely to discuss behavioural health issues at general medical visits.	<ul style="list-style-type: none"> PTSD, trauma and/or combat exposure
Yeung	2019	Risk and protective factors for wellbeing in older veterans in New Zealand	Aging & Mental Health	Quantitative longitudinal cohort study of older adults in New Zealand, $N = 352$ veterans and 1,500 matched nonveterans aged 55–86 (mean age veterans: 67.8; non-veterans: 64.8)	Apart from being older, smoking more and having more chronic conditions, veterans did not differ from non-veterans on indicators of health and wellbeing. Mental health, physical health, purpose in life, housing satisfaction and capabilities (choice and freedom) accounted for a significant amount of variance in veterans' subjective wellbeing (SWB).	<ul style="list-style-type: none"> Civilian/Veteran comparison
Zerach	2022	Secondary posttraumatic stress symptom trajectories and perceived health among spouses of war veterans: A 12-year longitudinal study.	Psychology & Health	Quantitative longitudinal prospective study, $N = 155$ spouses of the 1973 Israel Yom Kippur War veterans (mean age spouses of veterans: 61.9)	Most spouses were classified to the 'resilient' trajectory with low and stable secondary PTSS over time, followed by recovered, chronic and delayed onset PTSS trajectories. Importantly, spouses in the 'chronic' and 'delayed' secondary PTSS trajectories reported a higher severity of general negative subjective health perceptions and health-related social malfunctioning.	<ul style="list-style-type: none"> Family members PTSD, trauma and/or combat exposure