SaxInstitute

Evidence Check

Suicide prevention for men

An Evidence Check rapid review brokered by theSax Institute for the NSW Ministry of Health—June 2020

An Evidence Check rapid review brokered by the Sax Institute for the NSW Ministry of Health.
June 2020.

This report was prepared by: Kylie King[1], Angela Nicholas[2], Karolina Krysinska[2], Anna Ross[2], Jane Pirkis[2]

[1]Turner Institute for Brain and Mental Health, School of Psychological Sciences, Monash University
[2] Centre for Mental Health, Melbourne School of Population and Global Health, The University of Melbourne

June 2020.

Enquiries regarding this report may be directed to the:

Principal Analyst
Knowledge Exchange Program
Sax Institute
www.saxinstitute.org.au
knowledge.exchange@saxinstitute.org.au
Phone: +61 2 91889500

Suggested Citation:

King K, Nicholas A, Krysinska K, Ross A, Pirkis J: Suicide prevention for men: an Evidence Check rapid review brokered by the Sax Institute (www.saxinstitute.org.au) for the NSW Ministry of Health, 2020.

doi:10.57022/gzxb5988

Disclaimer:

This Evidence Check Review was produced using the Evidence Check methodology in response to specific questions from the commissioning agency.

It is not necessarily a comprehensive review of all literature relating to the topic area. It was current at the time of production (but not necessarily at the time of publication). It is reproduced for general information and third parties rely upon it at their own risk.

Suicide prevention for men

An Evidence Check rapid review brokered by the Sax Institute for the NSW Ministry of Health. June 2020.

This report was prepared by Kylie King (Turner Institute for Brain and Mental Health, School of Psychological Sciences , Monash University) and Angela Nicholas, Karolina Krysinska, Anna Ross and Jane Pirkis (Centre for Mental Health, Melbourne School of Population and Global Health, The University of Melbourne).

Contents

Executive summary

Background

In 2018, 3046 people died by suicide in Australia; 899 of these deaths occurred in New South Wales (NSW). Most of these suicide deaths in NSW were by men (684, 76.1%), as they were nationally [2,320 (76.1%) of 3,046 deaths)].[1] This equates to a suicide rate of 16.8/100,000 for males in NSW compared with 5.2/100,000 for females; nationally the rates are 18.6 and 5.7, respectively.[1]

Despite the elevated risk of suicide among men compared with women, there have been very few suicide prevention efforts targeting men, and fewer still targeting those in vulnerable populations. A recent scoping review about men's suicide prevention identified only six interventions specifically focussed on men.[2]

Purpose of this review

The NSW Towards Zero Suicides Premier's Priority aims to reduce the rate of suicide deaths in NSW by 20 per cent by 2023. This review, commissioned by the NSW Ministry of Health (the Ministry) provides evidence for what is known about suicide prevention for men, with regards to three groups identified by Ministry:

1. Male veterans and defence force personnel
2. Separated men
3. Survivors of sexual assault.

It is hoped that the results of this review can support ongoing work in program design, and the review and development of existing suicide prevention initiatives. It can also help to strengthen the case for using targeted, evidence-based initiatives when optimising existing programs and developing new ones.

Review questions

This review was designed to identify what is known about:

- the risk of suicide for male veterans and defence force personnel (Question 1a), for separated men (Question 2a), and for men who are survivors of sexual assault (Question 3a)
- what programs or interventions have been effective in reducing the risk of suicide for male veterans (Question 1b), separated men (Question 2b), and for men who are survivors of sexual assault (Question 3b).

Summary of review methods

Search strategy

We conducted systematic searches of the peer-reviewed literature published between 2010 and 2019, and included relevant papers describing studies conducted in Australia, New Zealand, the United Kingdom, the United States (US), Scandinavia, and western and central Europe. We also conducted a systematic search of Australian grey literature.

This search strategy identified 64 papers related to suicide risk among male veterans and defence force personnel (Question 1a), 26 to suicide risk among separated men (Question 2a), and 14 to suicide risk among men who are survivors of sexual assault (Question 3a). Eight articles were identified relating to programs and interventions aimed at reducing suicide risk among veterans (Question 1b), but no relevant articles were identified for the other two groups (Questions 2b and 3b).

Evidence grading

The quality of the included studies was assessed using the National Health and Medical Research Council (NHMRC) Levels of Evidence.[3] This rating system relates to the five domains of evidence base, consistency, clinical impact, generalisability and applicability of the studies identified which lead to recommendations about the confidence with which the evidence can be used in practice.

Key findings

Veterans and defence force personnel

Question 1a:

On balance, the evidence suggests that veterans have higher rates of suicidal ideation, suicide attempts and suicide death than the general population and defence force personnel, and that defence personnel are at greater suicide risk than civilian men. Grading of the evidence related to suicide risk among male veterans and defence force personnel (Question 1a) and the evidence regarding programs and interventions for reducing suicide risk in this group (Question 1b) lead to the recommendation that the 'body of evidence provides some support for recommendation(s) but care should be taken in its application'.[19]

Veterans

Across studies, a standardised death rate by suicide per 100,000 people was reported that ranged from 26.2/100,000 to 50.0/100.00 for veterans compared with 18.6 per 100,000 for all men in Australia in 2018. Mental health problems, substance use, other life stressors, and involvement in military conflict were associated with suicidality. Firearms were a common method used in suicide attempts by veterans in the US, but one Australian study showed hanging to be the most common method, consistent with other Australian men.[1]

Active defence force personnel

For active defence force personnel, the reported standardised death rates by suicide per 100,000 people ranged from 18.4/100,000 to 26.2/100.00 (compared with 18.6 per 100,000 for all men in Australia in 2018). Among active defence force personnel, there was shown to be a positive association between suicidality and mental health problems and substance use problems; and lower levels of education. Evidence for a relationship between age and suicidality was equivocal. More years of service was reported to be negatively associated with suicidality. Firearms were reported as a common method for suicide, but these studies were only from the US.

Question 1b:

Three studies were identified in the peer-reviewed literature that included data related to the effectiveness of programs or interventions in reducing the suicide risk for defence force personnel. These studies demonstrated decreased suicidal ideation and attempts.

All five included studies relating to the effectiveness of programs or interventions in reducing the suicide risk for male veterans were conducted in the US. Two reported improvements in suicidal ideation and one found improvements in suicidal behaviour. The two further studies did not report suicide-related outcomes. The applicability of the studies to Australian veteran and defence force personnel is not known as there is a lack of Australian studies.

Separated men

Question 2a:

Overall, the identified studies found that for men, being divorced or separated was associated with higher rates of suicidal ideation, suicide attempts and suicide deaths compared with other marital statuses, or was a key life event preceding suicide. Within these studies, other factors were also found to influence suicidality among separated men: conflict, financial issues, age, alcohol or substance use, issues related to child custody, recency of divorce, educational levels, mental health issues, legal issues, feelings of loss and loneliness and loss of social networks, and shame. Three studies reported suicide rates from 13.3 to 41.22 per 100,000 for men who are separated or divorced (compared with 18.6 per 100,000 for all men in Australia in 2018). Grading of the evidence related to suicide risk among separated men suggests that ‘the body of evidence can be trusted to guide practice in most situations’.[19]

Question 2b:

Grey literature searching identified three programs in Australia providing suicide prevention support to separated men (Parents Beyond Breakup, Mensline, Lifeline WA). However, we did not identify any evaluations of programs or interventions regarding suicide for separated men.

Men who are survivors of sexual assault

Question 3a:

Overall, a positive association was found between a history of sexual assault and suicidal ideation, suicide attempts and death. Definitions of sexual assault used in the studies was inconsistent. Few studies explored other risk factors for suicide among survivors of sexual assault.Three studies found rates of sexual assault to be higher among men who identified as gay, bisexual, transgender or as men who have sex with men and this was, in turn, associated with higher rates of suicidality. Grading of the evidence related to suicide risk among men who are survivors of sexual assault (Question 3b) suggests that 'the body of evidence can be trusted to guide practice in most situations'.[19]

Question 3b:

Grey literature searching identified three Australian organisations specifically supporting men who are survivors of sexual assault in managing and improving their mental health and wellbeing (Living Well, Survivors and Mates Support Network, and Service assisting male survivors of sexual assault). However, the search did not identify any evaluations regarding the effectiveness of these programs in reducing suicide risk.

Gaps in the evidence

Several risk factors were found that were associated with suicidal ideation and behaviours among veterans, defence force personnel, and separated or divorced men. However, it is not known how risk factors and life events interact to increase suicide risk and the research does not commonly attend to intersections between membership to the three groups and other sociodemographic variables. The evidence base regarding the risk of suicide for male veterans and defence force personnel in Australia is hampered by the small volume of studies in this area. Most studies have been conducted in the US and generalisability of this research to Australia is arguably limited. The suicide rate seems higher among veterans than among defence force personnel; however, the reason for this increased rate is not clear. The differences in the rate of suicide deaths between defence force personnel and veterans suggest that the aetiology of suicide for each group might be different such that different interventions are needed for each. Research regarding the effectiveness of programs or interventions to reduce suicide risk was also lacking for all three groups in the review. While several interventions are currently being delivered in Australia to reduce suicide risk among veterans and separated men, they have not been evaluated.

Conclusion

In conclusion, the review finds evidence for a higher risk of suicide among veterans, defence force personnel, separated men, and male survivors of sexual assault compared to other men. There is some indication that other factors (such as mental health problems, substance use, relationship conflict and financial issues) are also contributing to the higher risk of suicide by these men; however, evidence is lacking about how these factors interact. Evidence is also scant about the effectiveness of

suicide prevention interventions for men in these groups. More research is needed to understand the pathway to suicide by men in these vulnerable groups and to develop and evaluate targeted suicide prevention interventions.

Background

In 2018, 3,046 people died by suicide in Australia; 899 of these deaths occurred in New South Wales (NSW).[1] Most of these suicide deaths in NSW were by men (684, 76.1%), as they were nationally (2320 (76.1%) of 3046 deaths).[1] This equates to a suicide rate of 16.8/100,000 for males in NSW compared with 5.2/100,000 for females, nationally the rates are 18.6 and 5.7 respectively.[1] This higher rate of suicide by men compared with women is also noted globally.[4]

The reasons for suicide are complex and individual; however, there are some common risk factors including family problems, mental health problems, previous suicide attempts, physical illness, social isolation, and unemployment.[5] While men and women both experience these risk factors, it has been argued that they do so in different sociocultural contexts that result in higher risk of suicide for men.[6] For instance, men often choose more lethal means for suicide, express depression through external symptoms (such as anger and irritability towards others, risk taking, and substance use), use alcohol more heavily, have reduced social connection and lower rates of help-seeking.[7–10] These factors can individually contribute, and interact, to place men at higher risk for suicide. Sociodemographic characteristics have also been associated with higher suicide rates among men, such that some groups of men are at higher risk than others. For example, Aboriginal and Torres Strait Islander men, men aged over 85, military veterans, separated men, men who are survivors of sexual assault and childhood maltreatment, and men in some occupational groups have higher rates of suicide than other men.[1,11–14] Thus, suicide by men is a complex phenomenon influenced by a range of psychosocial factors that are likely interacting to bring about a heightened risk. Suicide prevention efforts focussing on the risk factors and social contexts that contribute to the higher risk of suicide among men are needed.

A gendered approach to suicide was recommended in the late 90s.[15] However, despite this recommendation, and others since[16], there have been very few suicide prevention efforts targeting men, and fewer still targeting those in vulnerable populations. A recent scoping review about men's suicide prevention identified only six interventions specifically focussed on men. These interventions were mostly complex/multimodal and characterised by awareness campaigns, training of community 'gate keepers', general practitioner education and collaboration, community education of men, and psychological support.[2] The target of these interventions were gay men, prisoners, defence force members, men in workplaces, and friends and family of suicidal men. Each intervention demonstrated benefits for men, including reduced suicidal ideation. Despite the compelling case for suicide prevention interventions targeting men and some indications of their effectiveness, there remains a dearth of knowledge in this area. Research is needed to further our understanding about the ways in which interventions can effectively target men and, in particular, men in high-risk groups.

The NSW Towards Zero Suicides Premier's Priority aims to reduce the rate of suicide deaths in NSW by 20 per cent by 2023. This review, commissioned by the NSW Ministry of Health (the Ministry) provides evidence for what is known about suicide prevention for men, with regards to three groups identified by Ministry:

1. Male veterans and defence force personnel
2. Separated men
3. Survivors of sexual assault.

This review brings together the evidence on what is known about suicide risk, services for suicide prevention, and the ways that services have been tailored to support men in these groups. The Ministry requested an Evidence Check of literature on three review questions in regards to each of these groups. It is hoped that this Evidence Check can support ongoing work in program design, and the review and development of existing suicide prevention initiatives. It can also help to strengthen the case for using targeted, evidence-based initiatives when optimising existing programs and developing new ones.

The review aimed to answer the following three two-part questions:

Question 1: Male veterans and defence force personnel

1a. What is known about the risk of suicide for male veterans and defence force personnel?

1b. What programs or interventions have been effective in reducing the risk of suicide for male veterans and defence force personnel?

Question 2: Separated men

2a. What is known about the suicide risk for men who are separated?

2b. What programs or interventions have been effective in reducing the risk of suicide in men who are separated?

Question 3: Men who are survivors of sexual assault

3a. What is known about the risk of suicide for men who are survivors of sexual assault?

3b. What programs or interventions have been effective in reducing the risk of suicide for men who are survivors of sexual assault?

Method

In response to the Proposal for the Research Team, the following method was agreed upon by the researchers and the Ministry. The method followed a systematic review process which was streamlined to facilitate an expediated review of the evidence related to the review questions. This 'rapid review' method seeks to maintain the rigour of a systematic review, whilst producing information in a timely manner that is relevant for evidence-informed health policy and practice.[17,18]

Peer review literature

Search strategy

Key words for the three two-part review questions searches were selected by the research team in consultation with the Ministry. One researcher searched the peer-reviewed literature using three databases (Cochrane, Medline and PsycINFO) for each of the three two-part review questions using the following keywords for each of the searches. These keywords were also matched to database subject headings where possible:

Question 1: Male veterans and defence force personnel

1a. What is known about the risk of suicide for male veterans and defence force personnel?

The original review question was 'what is known about the risk of suicide for male veterans in Australia'. This was expanded to include current defence force members in other countries in addition to Australia following an initial search that yielded very few papers on the topic of suicide of male veterans in Australia. The following search terms reflect this expanded scope.

suicid* OR self harm or self injury or self poison AND men OR male AND active service* or military personnel or return* service* or veteran*AND rate* or prevalen* or inciden* or risk* or protect*

1b. What programs or interventions have been effective in reducing the risk of suicide for male veterans and defence force personnel?

suicid* OR self harm or self injury or self poison AND men OR male AND active service* or military personnel or return* service* or veteran* AND prevent* OR interven* OR program* OR campaign* OR educat* OR train* OR aware*

Question 2: Separated men

2a. What is known about the suicide risk for men who are separated?

suicid* OR self harm or self injury or self poison AND men OR male AND separated OR divorc* OR relationship break OR child custody OR family court AND rate* or prevalen* or inciden* or risk* or protect*

2b. What programs or interventions have been effective in reducing the risk of suicide for men who are separated?

suicid* OR self harm or self injury or self poison AND men OR male AND separated OR divorc* OR relationship break OR child custody OR family court AND prevent* OR interven* OR program* OR campaign* OR educat* OR train* OR aware*

Question 3: Men who are survivors of sexual assault

3a. What is known about the risk of suicide for men who are survivors of sexual assault?

suicid* OR self harm or self injury or self poison AND men OR male AND sexual assault OR rape OR child abuse OR sexual abuse OR sexual trauma OR molest* AND rate* or prevalen* or inciden* or risk* or protect*

3b. What programs or interventions have been effective in reducing the risk of suicide for men who are survivors of sexual assault?

suicid* OR self harm or self injury or self poison AND men OR male AND sexual assault OR rape OR child abuse OR sexual abuse OR sexual trauma OR molest* AND prevent* OR interven* OR program* OR campaign* OR educat* OR train* OR aware*

Inclusion and exclusion criteria

Searches were limited to systematic reviews, meta-analyses or single studies that included primary data about rates/prevalence of suicide deaths, attempted suicides, self-harm, factors associated with increased suicide risk, or interventions aimed at men (either male veterans and defence force personnel, separated men, or survivors of sexual assault) that have a focus on suicide prevention or included suicidal behaviours (suicidal thoughts or ideation, suicide attempts or suicide deaths) as an outcome measure. Only papers related to studies with interpretable data regarding men or, where data was not interpretable by gender, along with papers that included mostly men (over 75%), were included in the review. Included papers were published in English between 2010 and 2019. Included studies were conducted in Australia or countries with similar cultures – the UK, Canada, the US, New Zealand, and western or central Europe (Ireland, France, Spain, Switzerland, Italy, Belgium, Germany, Liechtenstein, Austria, Luxembourg and Monaco) and Scandinavia (Denmark, Norway, Sweden, Finland and Iceland). Excluded papers were based on studies that were not systematic reviews, meta-analyses or single studies (e.g. commentaries, protocols, case studies); were focussed only on clinical treatments such as medications, surgical operations, or other strictly clinical interventions; were about assisted suicide (euthanasia), homicide-suicide or non-suicidal self-injury; included only children or adolescents, or women, or did not include interpretable data about men (unless the study participants were mostly men). Studies about populations less relevant to the Australian general population (e.g. severe or complex mental illness, specific medical illnesses, prison inmates, and in-patient clinical populations) were also excluded.

Screening and selection of studies

In order to expediate the screening and selection process, one researcher undertook the title, abstract and full-text screening of peer-reviewed and grey literature for each of the three two-part review questions. Excluded literature was then reviewed by a second reviewer. Conflicts were resolved between the two reviewers, and with the involvement of a third reviewer if needed.

After removal of duplicates and screening of title, abstract and full-text, 64 articles were included for Question 1a, 8 for 1b, 26 for 2a, none for 2b, 14 for 3a, and none for 3b. Figures 1 to 6 show the search and selection process for each question using a PRISMA diagram.[19] Additional records were identified through grey literature searching or through scanning of reference lists of systematic reviews.

Figure 1—PRISMA flow diagram. What is known about the risk of suicide for male veterans and defence force personnel?

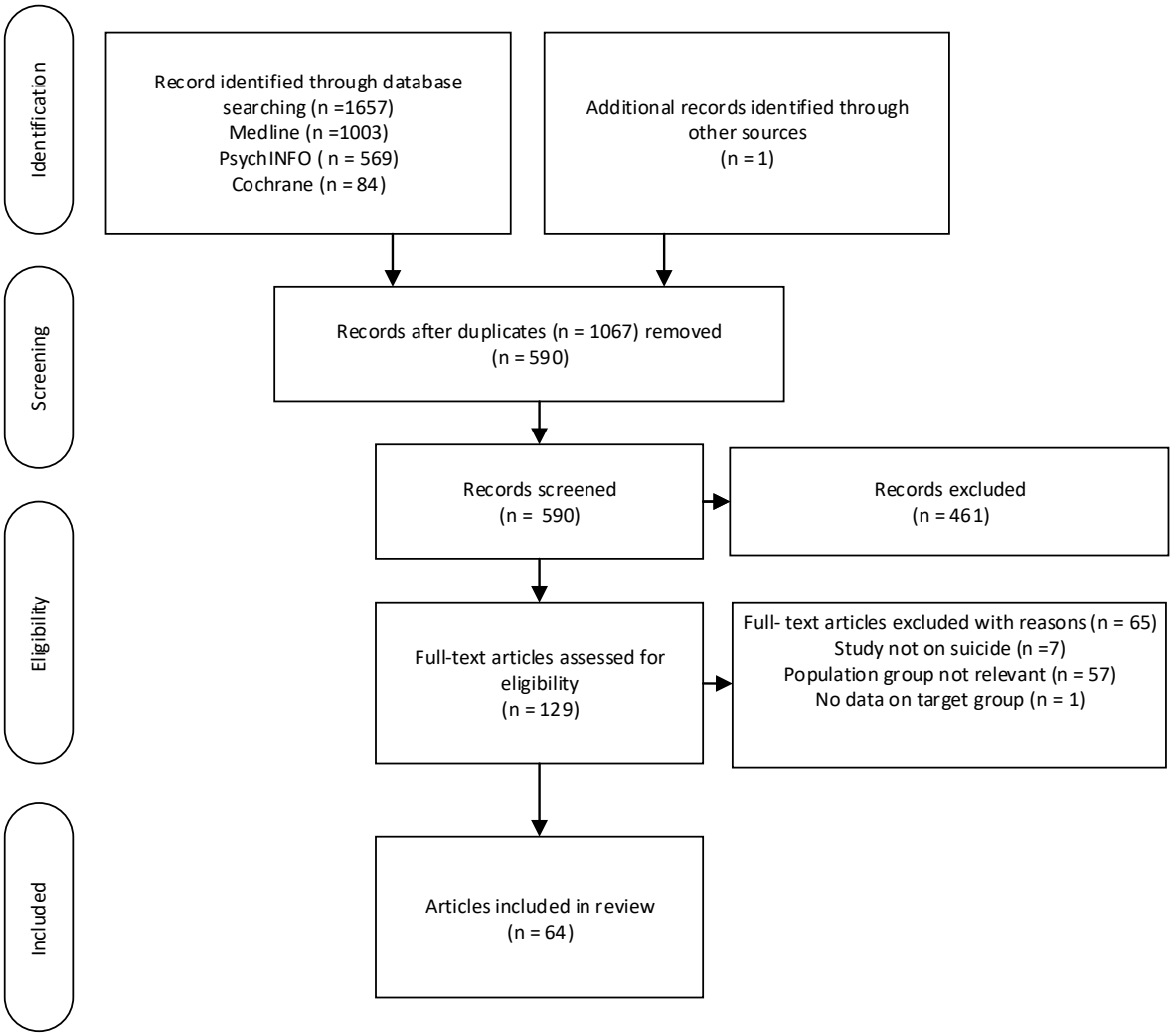


Figure 2—PRISMA flow diagram. What programs or interventions have been effective in reducing the risk of suicide for male veterans and defence force personnel?

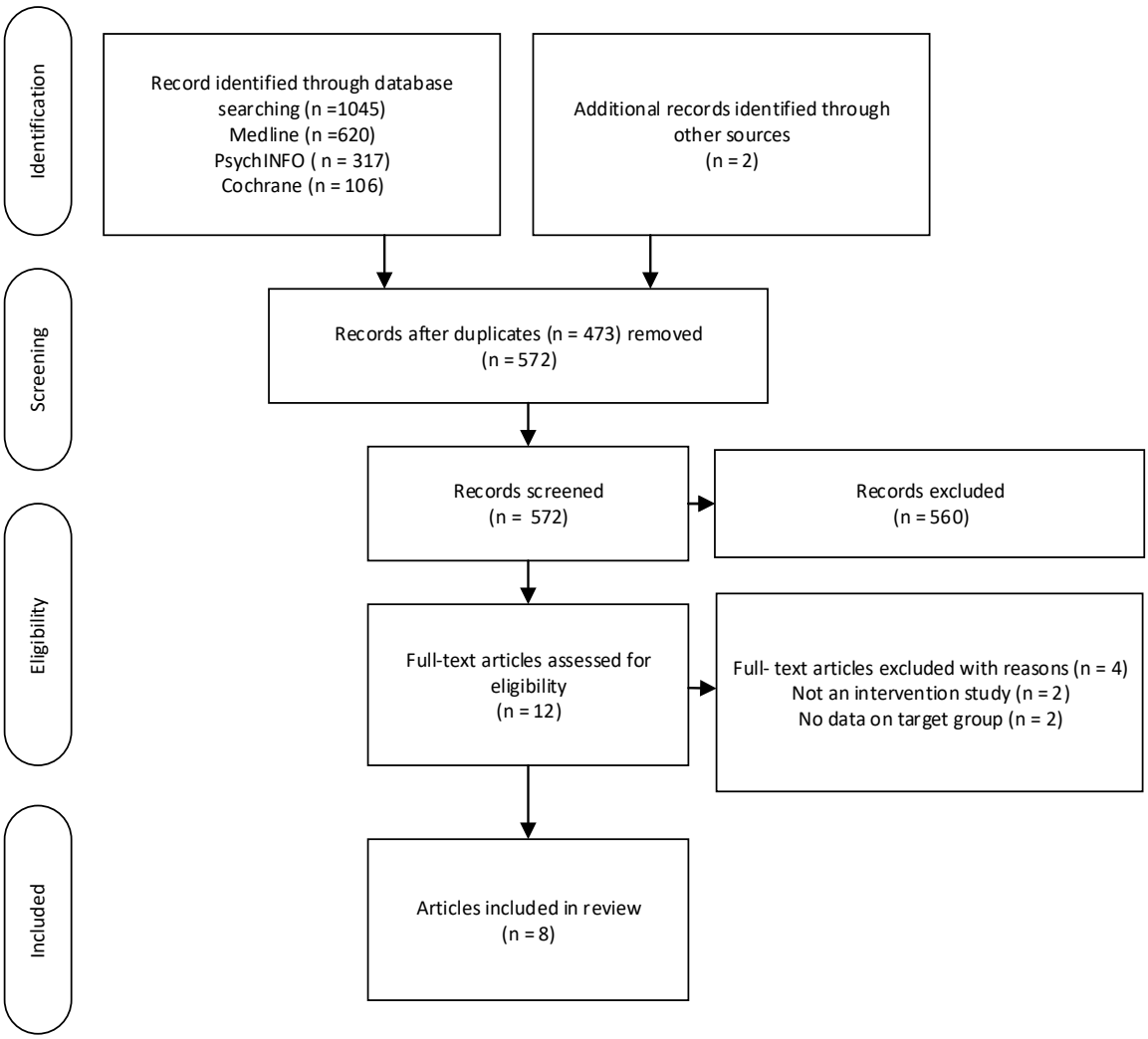


Figure 3—PRISMA flow diagram. What is known about suicide risk for men who are separated?

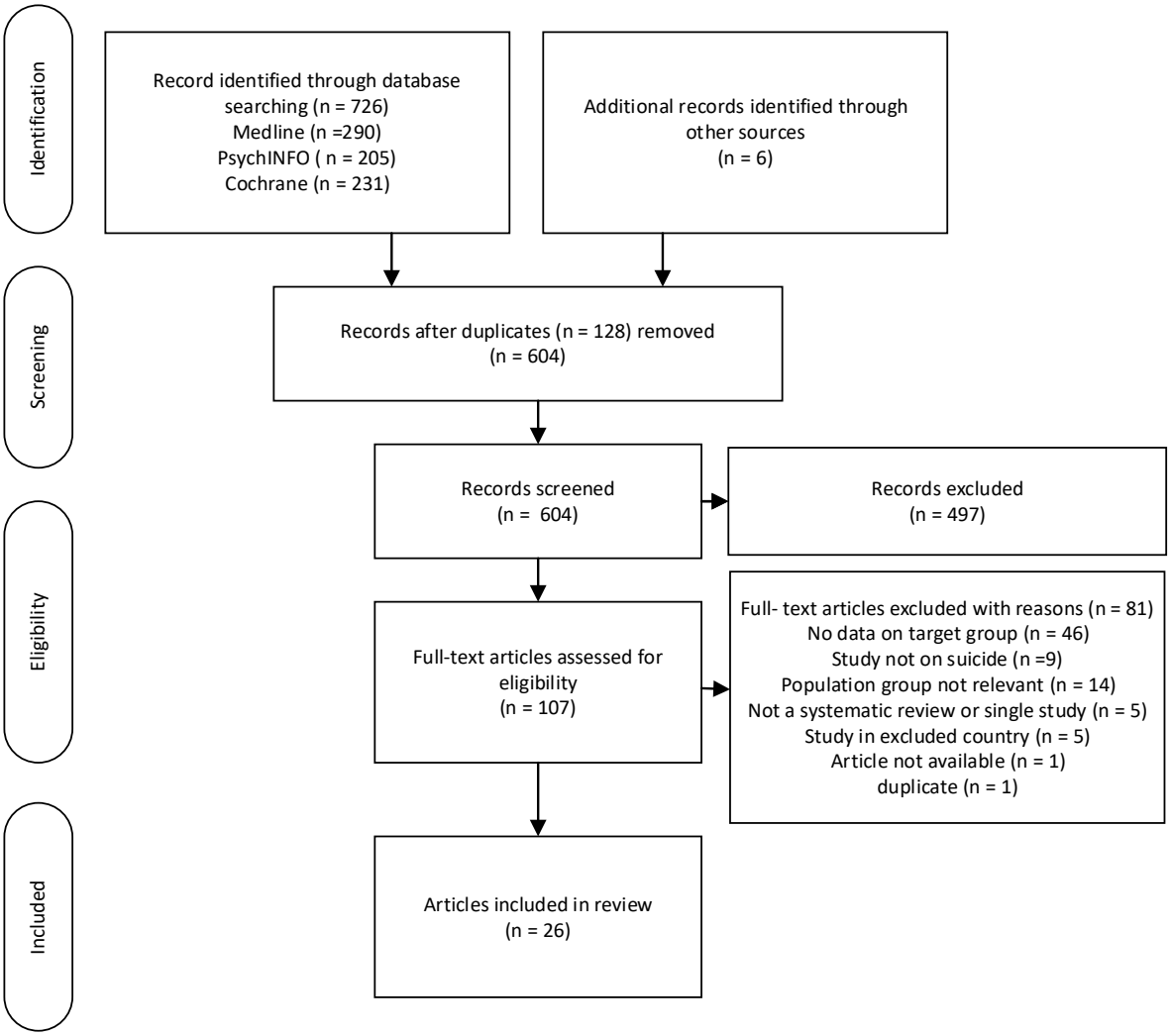


Figure 4—PRISMA flow diagram. What programs or interventions have been effective in reducing the risk of suicide for men who are separated?

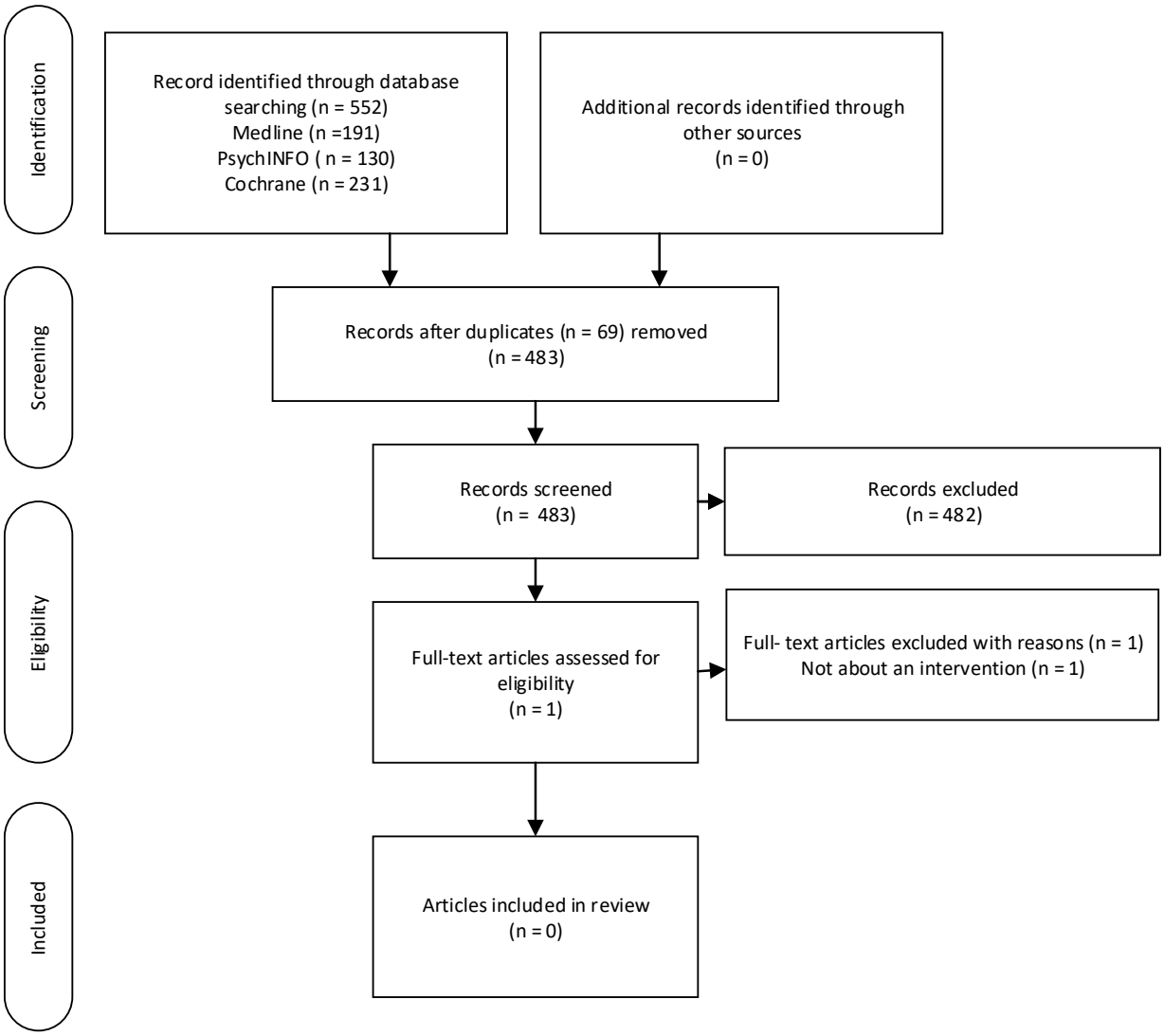


Figure 5—PRISMA Flow Diagram: What is known about the risk of suicide for men who are survivors of sexual assault?

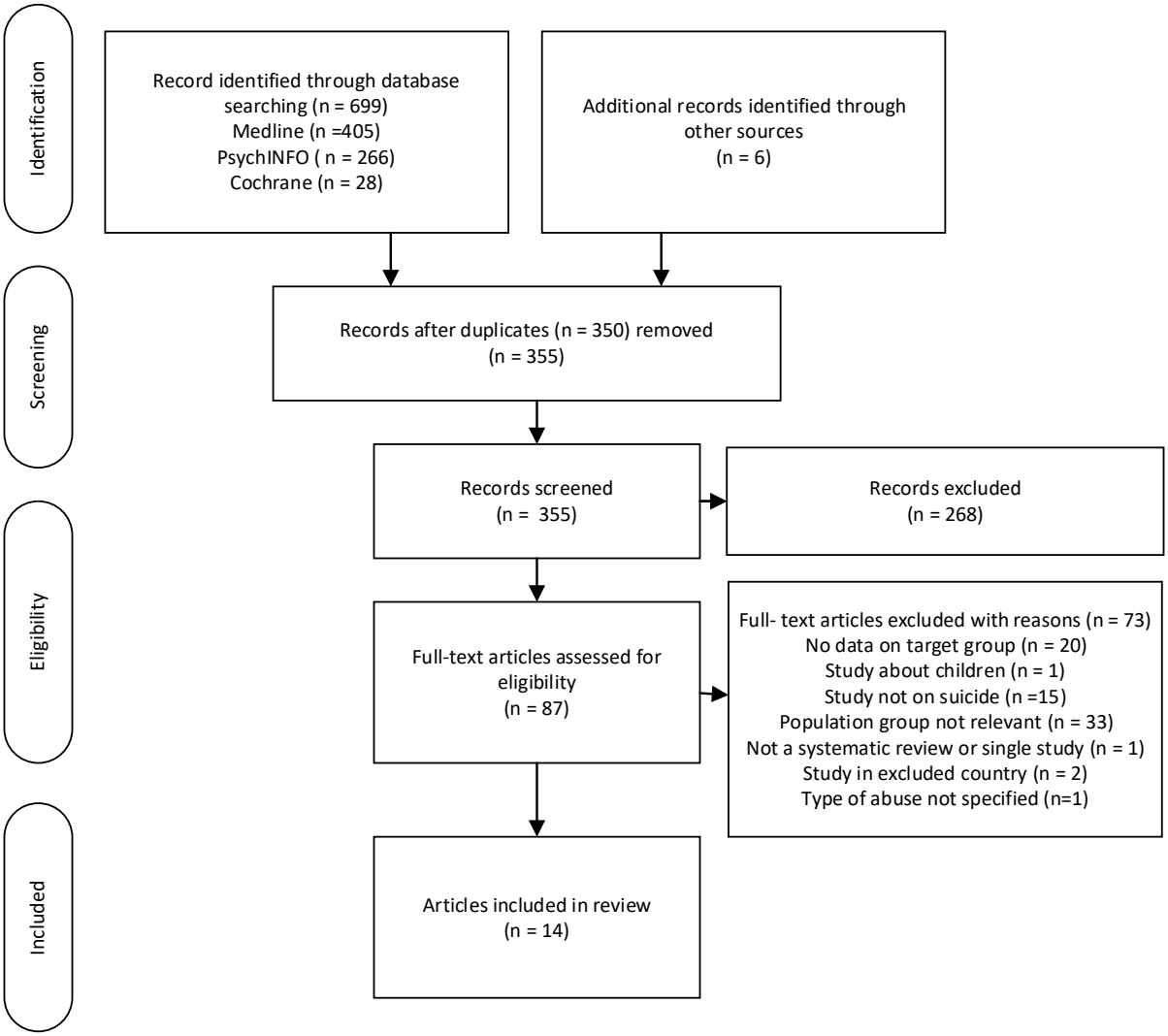
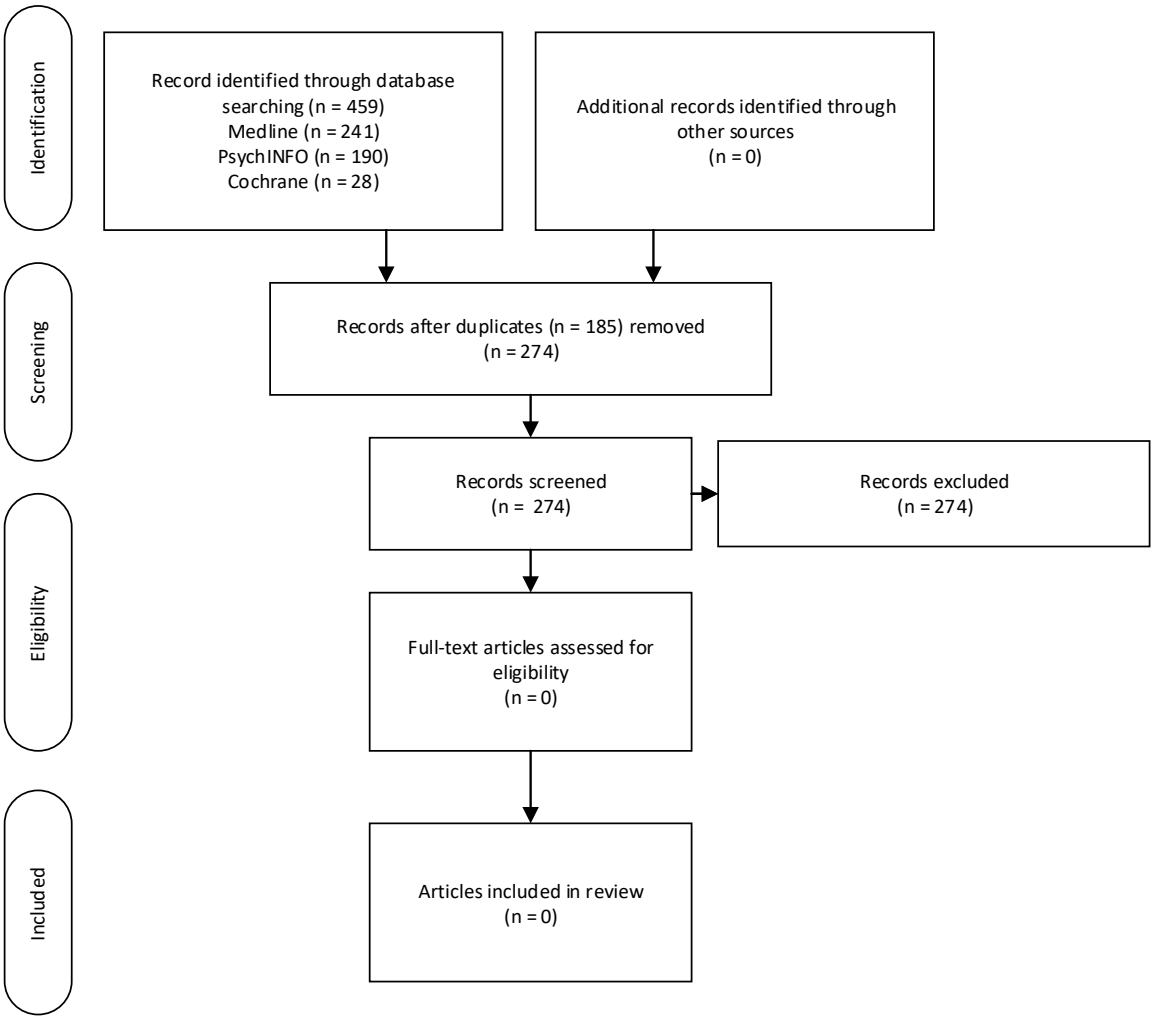


Figure 6—PRISMA flow diagram. What programs or interventions hae been effective in reducing the risk of suicide for men who are survivors of sexual assault?



Data extraction and assessment of quality of evidence

The search yielded systematic reviews, meta-analyses and primary studies. Review papers were narratively synthesised for overarching findings related to the research questions and reference lists were checked for eligible studies to be included in the review (included within the PRISMA diagrams as 'records identified through other sources'). A table was then generated for each research question with included papers after screening (1a, 1b, 2a, 3a) presenting the primary objective, methods, and results of all papers featuring primary studies.

The quality of the included studies was assessed using the National Health and Medical Research Council (NHMRC) Levels of Evidence.[3] Studies were categorised according to six levels of evidence. Systematic reviews of randomised controlled trials are considered the highest levels of evidence, followed by randomised controlled trials (RCT), pseudo-randomised controlled trials, comparative studies with concurrent controls, comparative studies without concurrent controls, and lastly, case series studies. A matrix was then used to summarise the quality of the evidence base for each research question. Two researchers categorised the first five studies for each of the research questions. Consensus was obtained and then one researcher categorised the remaining studies (where there were more than five).

Grey literature

A desktop internet-based search was undertaken of organisational and government content originating from Australia. Google searches were undertaken using key words from the three review questions along with the suffixes '.org.au' and '.gov.au'. The first 30 resulting sites were scanned for information relevant to the three review questions. Peer-reviewed papers identified through this search were added to the papers identified through database searching and are reported alongside these. Other grey literature (e.g. websites, reports) were narratively synthesised and reported upon separately.

Findings

The findings are presented in relation to the three, two-part research questions.

Question 1: Male veterans and defence force personnel

1a. What is known about the risk of suicide for male veterans and defence force personnel?

Systematic reviews

No systematic reviews were identified in the peer-reviewed literature that explored the risk of suicide for male veterans and defence force personnel.

Primary studies

Sixty-four papers related to primary studies were identified in the peer-reviewed literature that included data related to the risk of suicide for male veterans (also referred to as ex-defence force, or ex-Australian Defence Force in the papers) and defence force personnel in Australia and were published between 2010 and 2019.

The findings are presented across two tables. Table 1 (Appendices chapter) shows the authors, title, year, country of study, study design, study population, outcomes and variables, and main results for each paper related to male veterans. Table 2 shows these details for papers related to male defence force personnel. Two of the papers appear in both tables (Allan et al. 2015 and Hoffmire et al. 2015), the rest of the 64 papers appear in either Table 1 or 2.

As shown in Table 1, 30 papers were identified that explored suicide among male veterans: 1 case control study, 12 case series studies, and 17 cohort studies. Twenty-four were regarding studies undertaken in the US, two in Canada, two in Australia, and one each in Scotland and Norway.

Of these 30 papers, 23 reported on rates of suicidal thoughts, attempts or deaths by veterans. However, only 8 of the papers reported a comparison between male veterans and other males – either in the general population or in the defence force. Of these papers,six reported that veterans had higher rates of suicidal ideation, attempts or death than the general population or defence force personnel and two reported no difference between the groups. Seven of these papers reported a standardised death rate by suicide per 100,000 people that ranged from 26.2/100,000 to 50.0/100.00.

Twenty-seven papers explored the factors associated with suicidal thoughts, attempts and deaths by male veterans. Mental health problems (such as depression, anxiety and post-traumatic stress disorder) were found to be associated with either suicidal thoughts, attempts or deaths in 16 papers. Substance use was associated with suicidality in 10 papers. Nine papers reported an association with

other life stressors (such as financial or relationship stress, unemployment, and low social support). Six papers reported an association between involvement in conflict during military service and suicidality as a veteran. Five papers, of which all were regarding studies conducted in the US, reported that firearms were a common method used in suicides by veterans. Neither of the papers based on Australian studies explored suicide methods.

Table 2 shows the authors, title, year, country of study, study design, study population, outcomes and variables, and main results for each paper related to current defence force personnel.

Thirty-seven papers were identified that explored suicide among current male defence force personnel: 3 case control studies, 11 case series studies, and 23 cohort studies. Thirty studies were undertaken in the US, two in Australia, and one each in Germany, France, Finland, Canada, and the UK. Of these 37 papers, 29 reported on rates of suicidal thoughts, attempts or deaths by current defence force personnel. However, only five papers reported a comparison between male defence force personnel and other males. Three of these papers, two of which were from Australia (which were all the papers based on Australian defence force personnel), reported that rates of suicidal thoughts, attempts, or deaths were higher in defence force personnel compared to the general population. One study, in Finland, reported that suicidality was lower among male defence force personnel. One study, in the US, reported no differences between defence force personnel and other males. Three of the papers reported a standardised death rate by suicide per 100,000 people that ranged from 18.4/100,000 to 26.2/100.00 among current male defence force personnel.

Thirty-two of the 37 papers examined the impact of various factors on suicidal thinking, attempts and deaths of current defence force personnel. Thirteen papers explored the association between deployment and suicide. Findings were mixed: four papers reported no association between suicidality and deployment; seven papers reported decreased suicidality with deployment (or increased suicidality with less deployment); and two papers reported that suicidality was increased for those who had been deployed. Two papers looked at the interaction between other personal factors, deployment and suicidality: these papers found that childhood trauma and problem drinking played a role in the association between deployment and suicidality – suggesting that these factors may be more critical in the development of suicidality than deployment. Eight papers explored the association between age and suicidal ideation, attempts or deaths. Ten papers reported that suicidality was more common among younger men, whereas two papers reported it was more common among older men. Nine papers reported an association between mental health problems and suicidality, six reported an association with substance use problems. Lower levels of education were reported to be positively associated with suicidality in seven papers. More years of military service were reported to be negatively associated with suicidality in six papers. Other factors that were identified as playing a role in suicidality included military ranking (five papers), being unpartnered (five papers), experiencing other life stressors (five papers), and prior suicidality or exposure to suicide (four papers). Firearms were reported as a common method for suicide in four papers. Of the two studies conducted in Australia, only one reported on methods of suicide and found that hanging and carbon monoxide were more common methods of suicide than firearms.

Evidence grading

Table 3 and Table 4 summarise the level of evidence of the included studies regarding risk of suicide for male veterans and defence force personnel according to the NHMRC levels of evidence. As shown in Table 3, the highest level of evidence was at III-2. As shown in Table 4, the evidence base,

consistency, generalisability and applicability of the studies were assessed as satisfactory. Grading of the evidence lead to the recommendation that the 'body of evidence provides some support for recommendation(s) but care should be taken in its application'.[19] An assessment of clinical impact was not relevant to the studies as none presented intervention studies of clinical relevance.

Grey Literature

Grey literature searching identified four reports that provide data relevant to the suicide risk of male veterans and defence force personnel in Australia.

A 2011 report by McFarlane and colleagues for the Department of Defence reported on a survey of defence force personnel about their health and wellbeing.[83] They compared the findings of the survey with Australian Bureau of Statistics (ABS) data. In relation to suicidality, the report stated that compared to Australian men in general (ABS data) men in the Australian Defence Force (ADF) had significantly higher suicidal ideation (3.7% ADF vs. 1.5% ABS), and plans (1.1% ADF vs. 0.3%ABS), but there were no differences in suicide attempts (0.4% ADF vs. 0.3% ABS). Higher levels of various mental health disorders were also found in ADF personnel and the authors suggested that higher levels of suicidality among ADF personnel is possibly a function of the higher level of affective disorders and of post-traumatic stress disorder. They did not survey veterans.

A 2015 report by the Australian Institute for Suicide Research and Prevention, 'Suicidal behaviour and ideation among military personnel: Australian and international trends' sought to determine the current literature about suicidal behaviour and ideation in military personnel, both serving and ex-serving, in Australia and internationally.[12,84] The authors undertook a literature review. Fifty-one papers and reports were included, of which 19 were from Australia. Three of the papers and reports dealt with suicide among current Australian defence force personnel (one of which is the McFarlane report mentioned above, the other two were ineligible for the current review). In regards to current Australian defence force personnel, the authors concluded from these three sources that current personnel could be at increased risk of suicidal ideation and plans compared to the general population but have similar or even lower rates of suicide deaths. The authors concluded from the four papers that examined the suicide risk of veterans that veterans are at increased risk of suicide and that there are veteran-specific risk factors such as difficulty returning to civilian life and reluctance to seek help for their problems. The authors noted that there had been very limited research into suicide among both current Australian defence personnel and those who had left the Australian Defence Force, with the majority of research undertaken in the US (16 studies).

A 2017 report by the Australian Government's Australian Institute of Health and Welfare, 'Incidence of suicide among serving ad ex-serving Australian Defence Force personnel', provides data regarding suicide among Australian defence force personnel and veterans and identifies factors that may be associated with suicide risk (85). Data included in the report relate to 325 suicide deaths that occurred between 2001 and 2015 by those with at least one day of service, of which 51% (166) were ex-serving and 84% were men. The report focused primarily on suicide death among men. The report found that suicide rates for men serving full time and in the reserves were significantly lower than for all Australian men. However, the suicide rate for male veterans (referred to as 'ex-serving men') was 14% higher than for men in the general population after adjusting for age (but was not statistically significant); significantly higher for veterans aged 18–29 compared with all Australian men of the same age; more than twice as high for men serving full time in the defence force or in the reserves; and more than twice as high as for female veterans. In regard to risk groups among veterans, they

found that younger age, involuntary discharge (particularly medical discharge), less than one year of service, and discharge in all ranks other than commissioned officer to be associated with higher suicide. When age and other available factors were controlled, only medical discharge and discharge in all ranks other than commissioned officers were associated with significantly higher suicide risk among male veterans.

More recently, another report in 2019 by the Australian Government's Australian Institute of Health and Welfare, 'National suicide monitoring of serving and ex-serving Australian Defence Force personnel: 2019 update' provides an update to the 2017 report and included data related to suicide deaths between 2001 and 2017.[86] The reports concluded that while the suicide rate was lower among serving men compared to other Australian men, the age-adjusted rate of suicide in male veterans was 18% higher than in Australian men.

1b. What programs or interventions have been effective in reducing the risk of suicide for male veterans and defence force personnel?

Systematic reviews

One systematic review (without meta-analysis) was identified that explored the effectiveness of programs or interventions in reducing suicide risk among male veterans and defence force personnel in the US.[87] The authors reviewed papers published between 2008 and 2015. In regards to the effectiveness of interventions, they found eight observational studies and 10 trials of individual-level psychotherapy. The interventions in the observational studies included education, awareness raising, individual health interventions, and individual risk monitoring. Reduction in suicidality was found in six of the observational studies and two of the trials. They concluded that studies of suicide prevention interventions with this population are inconclusive as there were many limitations to the evaluations of intervention effectiveness.

Primary studies

Three studies were identified in the peer-reviewed literature that included data related to the effectiveness of programs or interventions in reducing the suicide risk for defence force personnel, published between 2010 and 2019. Table 5 shows the authors, title, year, country of study, study design, study population, outcomes and variables, and main results for each of the four papers. One study evaluated via a randomised controlled trial (RCT), delivered a text message (plus standard care) intervention. This study demonstrated decreased suicidal ideation and attempts for those who received the study intervention, compared to those who received standard care. The two other studies (cohort study, time series study) evaluated multi-level suicide prevention programs delivered to defence force personnel. Both studies demonstrated reduced suicide rates associated with the programs.

Five primary studies were identified in the peer-reviewed literature that included data related to the effectiveness of programs or interventions in reducing the suicide risk for male veterans and were published between 2010 and 2019. Table 6 shows the authors, title, year, country of study, study design, study population, outcomes and variables, and main results for each paper.

All five of the studies were conducted in the US. One was an RCT and four were cohort studies. Three of the studies evaluated the impact of interventions which included: safety planning and

structured phone follow-up; acceptance and commitment therapy for depression; and small group cognitive behavioural therapy (CBT). Two of these studies reported improvements in suicidal ideation and one study found improvements in suicidal behaviour. The two further studies reported on findings regarding interventions that were not related to evaluating the impact of the intervention. One study examined the nature of calls to a veterans' phone hotline and reported that many callers received referrals for suicide prevention services. Another study examined the impact of varying intensities of follow up after hospitalisation following a suicide attempt and reported inconclusive findings.

Evidence grading

Table 7 and Table 8 summarise the level of evidence regarding the included studies regarding interventions for defence force personnel and veterans according to the NHMRC levels of evidence. As shown in Table 7, the highest level of evidence was at level III in three studies. As shown in Table 8, the evidence base was assessed as satisfactory there were only two RCTs. The consistency of studies was assessed as satisfactory. Clinical impact was assessed as satisfactory, given the varied nature of the interventions and small number of studies. The generalisability and applicability of the studies were assessed as satisfactory given that none of the studies were conducted in Australia. Grading of the evidence lead to the recommendation that the 'body of evidence provides some support for recommendation(s) but care should be taken in its application'.[19]

Grey literature

Grey literature searching found several programs aimed at reducing suicide among male Australian veterans.

Veterans 360 Australia provide immediate support for veterans and their families who are experiencing crisis (https://v360.org.au/). They provide case management in conjunction with clinicians and allied health services, crisis accommodation and emergency housing, and advocacy for veterans and their families. Support is provided through a 24-hour helpline, assertive outreach, financial counselling, and an app that connects veterans with trained people to assist in times of crisis. Their vision is to 'to help today's veterans succeed in tomorrow's world and to provide solutions for veteran homelessness and suicide prevention'. The search failed to find any evaluations of Veterans 360 Australia related to its impact on suicidality or any other outcomes in male veterans.

The Department of Veterans Affairs provide information and links to helping services for veteran suicide prevention (https://www.dva.gov.au/health-and-wellbeing/mental-health/veteran-suicide-prevention-dva-information-support-and-research). They offer a link to 'Open Arms' counselling services for Veterans and families provided by the Department. Open Arms provides phone access to free ad confidential counselling, group treatment programs, suicide prevention training and community and peer networks to support the mental health and wellbeing of current and ex-serving ADF personnel and their families (https://www.openarms.gov.au/). The search failed to find any evaluations of Open Arms (previously known as Veterans and Veterans Families Counselling Service) Australia related to its impact on suicidality or any other outcomes in male veterans. In collaboration with the Department of Veterans' Affairs, Uniting Care Community and Australian Health Care Associates, Open Arms is assisting the research and design of a suicide prevention program for the ex-service community called Operation Life (https://at-ease.dva.gov.au/suicideprevention). This program provides a website with psychoeducation materials, workshops (run by Open Arms), and a mobile app

that is designed to help those at-risk deal with suicidal thoughts with the support of a clinician. No evaluation findings of this program for male veterans were identified in the review.

The Townsville Suicide Prevention Pilot (Operation COMPASS) is a Federal Government funded program that is providing a systems-based approach to reducing the incidence of suicide among ex-ADF members and their families (https://www.primaryhealth.com.au/ex-adf-suicide-prevention-townsville/). This program is underway and no evaluations of its impacts were identified in the search.

Question 2: Separated men

2a. What is known about the suicide risk for men who are separated?

Four systematic reviews and 22 primary studies were included in the review regarding the suicide risk for men who are separated.

Systematic reviews

Four systematic reviews were identified which were published between 2010 and 2019 and included data related to the suicide risk of men who are separated. Two of these included meta-analyses.

A systematic review, published in 2010 by Ide and colleagues, was undertaken to examine how different phases of relationship separation effects the development of suicidal behaviours (96). They reviewed databases for studies published between 2006 and 2008 and identified 14 studies across the US, Italy, Finland, Australia, Norway, Spain, Estonia, Germany. None of these articles were eligible for inclusion in the current review. Ide and colleagues undertook a narrative synthesis of the data in the studies, some of which included data specific to men. The authors found that separated males had a higher risk of suicide death and attempts than divorced men and other men.

In 2015 a meta-analysis was published by Yip and colleagues that aimed to test the role of culture and gender in the relationship between divorce and suicide.[97] The authors conducted a systematic search of electronic databases for papers between Jan 1, 2000 and Dec 31, 2013 to identify ecological studies reporting suicide rates and ratios of those rates within different marital statuses. They identified 10 studies reporting 15 suicide rates. Six were from Asian countries (Hong Kong, Japan, South Korea, Taiwan), the remaining were from Australia, Canada, England and Wales, Northern Ireland, Italy, Serbia and the US. Two of the identified studies, by Yip and colleagues and by Corcoran and Nagar, were eligible for inclusion in the current review and are included in the peer reviewed literature section of this review (shown in Table 9).[98,99] Yip and colleagues reported their findings by region (Asian vs. non-Asian countries) and by gender (male vs. female). They computed the COA (suicide risk ratio of the divorced over the married) and then estimated the pooled COA. Pooling all suicide rate estimates together for non-Asian countries, which are relevant to this review, they found that divorced men had a greater risk of suicide than their married counterparts (Pooled COA=2.44, 95%CI: 1.72, 3.15).

A systematic review, published by Kazan and colleagues in 2016, was conducted to explore the impact of intimate partner relationships on suicidality.[100] A database search was undertaken up to October 2014. Fifty-one articles were identified which included retrospective, cross-sectional, qualitative, longitudinal, prospective, and case control or case crossover studies. Studies were

conducted in a range of countries, most commonly US (14 studies), Australia (5) and the UK (3). None of these studies were eligible for inclusion in the present review. Kazan and colleagues undertook a narrative synthesis of the data in their included studies. They found themes of relationship quality, relationship problems, conflict and separation. Differences between men and women were only reported within the relationship problems and separation themes. Within the relationship problems theme, findings were inconsistent about the role that relationship problems played in men's suicide. One study found that suicide letters by men focused on financial problems, and for women focused on interpersonal relationship problems. Another study found that men more frequently reported romantic relationship problems than women. Within the separation theme, the authors presented several studies that provided evidence of increased risk of suicidal ideation, attempts and deaths for separated men. Men were more likely than women to have identified relationship breakdown as the main trigger, rather than a contributory factor to suicide. One paper included in the review found that men at risk of developing suicidal thoughts and behaviours were more susceptible to the experience of shame.

A meta-analysis, published in 2018 by Kyung-Sook and colleagues, explored the relationship between marital status and suicide risk.[13] A database search of observational studies published between 1 January 2000 and 30 June 2016 was undertaken. Thirty-six studies were identified across 25 countries including: China, Taiwan, Japan, Hong Kong, US, Korea, Iran, Serbia, Ireland, and India. Two of these studies had also been identified in the earlier meta-analysis published in 2015. One of their identified studies, by Masocco and colleagues, was eligible for inclusion in the current review and is included in the peer reviewed literature section of this review (shown in Table 9).[101] Kyung-Sook and colleagues calculated Odds Ratios (ORs) and pooled ORs comparing one marital status with a different one in predicting suicide. The authors estimated pooled ORs by stratifying all the estimates according to gender. In men, the non-married status was identified as a significant risk factor for suicide in all subgroup analyses. The magnitude of the risk was significantly higher for the divorced status than for other non-married statuses in both men and women (OR: 4.08, 95% CI: 3.06–5.43 for men). The comparison between divorced or separated men with married men also show a higher risk for those who were divorced or separated (OR 1.64, 95% CI: 1.42-1.90).

Primary studies

In total 22 primary papers were identified in the peer-reviewed literature that included data related to the suicide risk of men who are separated and were published between 2010 and 2019. Table 9 shows the authors, title, year, country of study, study design, study population, outcomes and variables, and main results for each paper.

Seven of the papers featured studies that were conducted in Australia, two in the USA, two each in Northern Ireland, Sweden, Denmark, and Spain. Others were conducted in Germany, France, Italy, Norway, Finland and the UK. One study included data from Asian countries (Hong Kong, Taiwan, Japan, South Korea) in addition to data from Australia – but only data related to Australia were included in the review.

In regards to study design, 10 were cohort studies (mostly historical cohort), six were case control studies, five were case series studies (of which three were qualitative studies). One study was a time series study with a control group.

All the studies featured in the papers include suicide as a variable of interest. Suicide death (or suicide rates) was a focus in 17 papers, seven examined data related to suicide attempts, and five

examined data related to suicidal ideation. Variables related to intimate partner relationship separation and difficulties included: divorce (10 papers); divorce/separation (5 papers); relationship breakdown (2 papers); separation (1 paper); separated/widowed/divorced (1 paper); relationship difficulties (1 paper); and child custody issues (1 paper).

Of the 22 papers, 17 reported that being divorced or separated was associated with higher rates of suicidal ideation, attempts or deaths compared to other marital statuses. Six papers identified divorce or separation as a key life event preceding suicide. Within the papers other factors were also found to influence suicidality among separated men – conflict (3 papers), financial issues (3 papers), age (3 papers), alcohol or substance use (2 papers), issues related to child custody (2 papers), recency of divorce (2 papers). educational levels (2 papers), mental health issues (1 paper), legal issues (2 papers), feelings of loss and loneliness and loss of social networks (1 paper), and shame (1 paper),

One paper reported no association between marital status and suicidal ideation, and another found no association with attempts. Another paper reported that divorce did not predict suicide death when other variables (income, low education, unemployment, alcohol consumption) were controlled for, and only income predicted suicide death. Two papers reported that that the risk of suicide decreased as time from divorce increased.

Evidence grading

Table 10 and Table 11 summarise the level of evidence regarding the included studies according to the NHMRC levels of evidence. As shown in Table 10, the highest level of evidence was at III-2 and most[17] of the studies were of this level. This is due to the high prevalence of cohort studies that were used to determine suicide risk. The five remaining studies were at level IV. As shown in Table 11, overall the evidence base was assessed as good. The consistency of studies was assessed as satisfactory and the generalisability was assessed as excellent. Grading of the evidence related to suicide risk among separated men (Question 2a) suggests that 'the body of evidence can be trusted to guide practice in most situations'.[19] An assessment of clinical impact was not relevant to the studies as none presented intervention studies of clinical relevance

Grey literature

Grey literature searching identified three reports that provided data relevant to the suicide risk of men who are separated.

The Australian Bureau of Statistics 2019 research paper, 'Psychosocial risk factors as they relate to coroner-referred deaths in Australia, 2017', describes the methods and initial results of a pilot study conducted on deaths that occurred in 2017.[121] The study was conducted on all coroner-referred deaths registered in 2017 and examined the presence of psychosocial risk factors in the deaths. Findings were reported in relation to suicide deaths and by gender. The report identified 20 frequently occurring psychosocial risk factors including personal history of self-harm, disruption of family by separation and divorce, problems in relationship with spouse or partner, problems related to legal circumstances, unemployment, release from prison, social isolation and others. Disruption of family by separation and divorce was identified as a key risk factor for suicide. This factor was present in 14.3% of suicide deaths by men in 2017. It was the most frequently occurring risk factor in the suicide deaths of men aged 35–54. This risk factor included relationship breakdown, separation, and divorce but excluded relationship issues. Problems in relationship with spouse or partner was also identified as frequently occurring and was associated with 10.6% of suicide deaths by men. This risk factor

included intimate partner violence, relationship issues, acute and ongoing events, and domestic violence but excluded separation, divorce, and domestic violence where children and people other than the spouse/partner were affected.

The report 'Men's experiences with suicidal behaviour and depression project. Final report' by beyondblue describes a project that undertook an exploration of men's views of their experiences with suicidal behaviour and depression, as well as the views of family, friends and others who have been impacted by men's depression and suicide.[122] Focus group and interview data with men, and friends and family members of men, who had survived a suicide attempt revealed a range of stressors that may induce suicidality in men including depressed mood, unhelpful conceptions of masculinity, social isolation and other ineffective coping strategies, and stressors. The stressors highlighted by both family, friends and men were relationship problems and rejection, mental health problems, and problems arising from substance use. In addition to these, men identified traumatic events, problems due to gambling, work or financial stress, involvement with the family court system, difficulties finding or keeping employment, boredom and lack of direction as stressors of personal relevance.

'Suicide in Queensland. 2019 annual report' by Leske, Crompton and Kolves provides recent suicide trends in Queensland.[123] The report is based on coronial data from the Queensland Suicide Register for suicide deaths and suspected suicide deaths between 2013–18. An analysis of life events before suicide found that 29.8% of males who died by suicide reportedly experienced relationship separation prior to their death (compared to 21% of females). Other life events experienced were: financial problems (19.0% males vs. 11.8% females), recent or pending unemployment (14.2% vs. 6.8%), legal matters (12.7% vs 5.8%), and child custody disputes (5.9% vs. 4.6%).

2b. What programs or interventions have been effective in reducing the risk of men who are separated?

Systematic reviews

No systematic reviews were identified that explored the effectiveness of programs or interventions in reducing the suicide risk of men who are separated.

Primary studies

No primary studies were identified that explored the effectiveness of programs or interventions in reducing the suicide risk of men who are separated.

Grey literature

Grey literature internet searching found three programs that offer suicide prevention support to separated men.

Parents Beyond Break Up

Parents Beyond Break Up describe themselves as a 'specialised suicide prevention charity' who 'help thousands of parents deal with the trauma of separation; a major cause of suicide in Australia' (https://www.parentsbeyondbreakup.com/). They were founded as 'Dads in Distress' in 1999 and rebranded in 2017 to Parents Beyond Breakup after they widened their work to include women. Parents Beyond Break Up identify that their focus is separated dads due to a lack of national support

in this area. They provide a ‘front line support service’ called Dads in Distress which is described as a ‘national support group for dads experiencing separation’. The service is free and provides support by phone, LiveChat, email, online forum, checklist (online resources), and in person via support groups. The support groups are offered at multiple locations throughout Australia. The search failed to find any evaluations of the Parents Beyond Break program for its impact on suicidality or any other outcomes, or any indication of how many men have received their services.

MensLine Australia

MensLIne Australia describe themselves as ‘a telephone and online counselling service for men with emotional health and relationship concerns’ (http://mensline.org.au/). While providing suicide prevention support for separated men is not explicitly stated as their goal, both suicide and separated dads are highlighted as two areas of focus. The MensLine website provides psychoeducation materials on fathering after separation, suicide, and help available for those with suicidal thoughts. They also provide counselling via phone helpline, online chat, and video chat. The search failed to find any evaluations of Mensline for its impact on suicidality or any other outcomes.

Lifeline WA – Support for separated dads

Lifeline is recognised nationally as a provider of 24-hour crisis support and suicide prevention services. Lifeline WA provide a specialist loss counselling service for separated dads. They describe this service as ‘individual support, education and group workshops for fathers’ in Western Australia (https://www.lifelinewa.org.au/Services/Support-for-Separated-Dads). They run workshops for parents to meet with others and learn more about family law court processes, co-parenting plans, building resilience after separation, and communicating when relationships have broken down. While they do not explicitly state a focus on suicide prevention, the overall vision of Lifeline is ‘an Australia free of suicide’. The search failed to find any evaluations of the Lifeline specialist program for its impact on suicidality or any other outcomes.

Question 3: Men who are survivors of sexual assault

3a. What is known about the risk of suicide for men who are survivors of sexual assault?

One systematic review and 13 primary studies were included in the review regarding the risk of suicide for men who are survivors of sexual assault.

Systematic reviews

Moore et al 2015 conducted a systematic literature review and meta-analysis to assess the prevalence and burden (in Attributable Disability Adjusted Life Years; DALYs: years of life lost due to premature mortality and years lived with disability) of child maltreatment, including childhood sexual abuse, in Australia.[14] This study combined intentional self-poisoning or injury, suicide attempts and suicides as ‘intentional self-harm’. The estimated prevalence of any childhood sexual abuse for males was 4.5% (95% CI, 2.6%–6.9%), but varied depending on the age of the respondents, definition of childhood and type of abuse. The relative risk of intentional self-harm for those males who had

experienced sexual abuse, compared with those who had not, was 1.94, indicating elevated risk in male survivors of sexual abuse. Exposure to multiple forms of maltreatment (sexual abuse, physical abuse, emotional abuse or neglect) was associated with increased risk of intentional self-harm.

Primary peer-review literature

In total 13 primary studies were identified in the peer-reviewed literature that included data related to the suicide risk of men who are survivors of sexual assault and were published between 2010 and 2019. Table 12 shows the authors, title, year, country of study, study design, study population, outcomes and variables, and main results for each paper.

Six studies were conducted in the US, two each in Australia and Iceland, and one each in Switzerland, New Zealand, and France. In regard to study design, 11 were cohort studies, two were case-control studies, and there was one qualitative study.

All quantitative studies include suicidal ideation, suicide attempts or death by suicide as an outcome variable. Seven studies examined data related to suicidal ideation, eight related to attempted suicides and two related to suicide deaths. Studies used varying definitions of sexual abuse, some of which included non-contact (e.g. verbal, witnessed masturbation[124]), While others defined sexual abuse only as occasions of forced sexual intercourse, and the breadth of this definition was related to varying prevalence rates of sexual assault. All but one of the studies found that a history of sexual assault was positively associated with either suicidal ideation, attempts or deaths. That which reported no association reported only one bivariate analysis for men regarding the association between childhood sexual abuse and suicidal behaviour, as there were not enough male cases to conduct further analysis. Three of the studies explored the relationship between sexual assault, sexual orientation and suicidality. Each study found that rates of sexual assault were higher among men who identified as gay bisexual,transgender, or as men who have sex with men, and that these higher rates of sexual assault were then associated with higher rates of suicidality. Some of the studies explored other factors associated with suicide among people with a history of sexual assault but few analysed these factors by gender. The qualitative study, which included interviews with 17 men who had been sexually assaulted identified the primary theme of the men experiencing a strong self-destructive force as a means of escaping their suffering. The men also commonly described ‘shattered’ self-esteem, shame, loneliness, disgust and worthlessness.

Evidence grading

Table 13 and Table 14 summarise the level of evidence regarding the included studies according to the NHMRC levels of evidence. As shown in Table 13, all but one of the studies was rated at level III-2, this was due to the high prevalence of cohort studies that were used to determine suicide risk. As shown in Table 14, overall the evidence base, consistency, and applicability of the studies were assessed as good. Generalisability was assessed as excellent. An assessment of clinical impact was not relevant to the studies as none presented intervention studies of clinical relevance. Grading of the evidence suggests that ‘the body of evidence can be trusted to guide practice in most situations’ (19).

Grey literature

No grey literature was found that related to the risk of suicide for men who are survivors of sexual assault.

3b. What programs or interventions have been effective in reducing the risk of suicide for men who are survivors of sexual assault?

Systematic reviews

No systematic reviews were identified that explored the effectiveness of programs or interventions in reducing the suicide risk of men who are survivors of sexual assualt.

Primary studies

No primary studies were identified that explored the effectiveness of programs or interventions in reducing the suicide risk of men who are survivors of sexual assault.

Grey literature

A search of the grey literature did not identify any specific interventions for men who are survivors of sexual assault. However, we did identify three Australian organisations specifically supporting men who are survivors of sexual assault in managing and improving their mental health and wellbeing.

Living Well

Living Well is an organisation for men who have been sexually abused in childhood or assaulted as an adult, and their supporters (https://www.livingwell.org.au/). Living Well provides online resources; in-person, online and telephone counselling; and community awareness and education.

Survivors and Mates Support Network (SAMSN)

The Survivors and Mates Support Network (SAMSN) 'is a not-for-profit organisation working to increase public awareness of the effects that childhood sexual abuse can have on men in their adult lives' (http://www.samsn.org.au/). SAMSN employs psychologists and social workers who run groups for men who were sexually assaulted as young boys or adolescents. These free groups run for eight weeks. These groups are currently held in Adelaide, Parramatta, Redfern, Fairfield, Chatswood and Wollongong.

Service assisting male survivors of sexual assault (SAMSSA)

The service assisting male survivors of sexual assault (SAMSSA) program is run by the Canberra Rape Crisis Centre (http://www.samssa.org.au/about-samssa.aspx). The program is funded by the ACT Government through the Department of Disability Housing and Community Services under the Community Services Program. SAMSSA offers in-person or telephone counselling, information, referral and education. It also sometimes offers support groups for men who have experienced sexual assault.

The grey literature search also identified a 2012 report by the Institute of Family Studies, titled *Improving policy and practice responses for men sexually abused in childhood'*[13] which discusses the importance of making 'sexual victimisation' of men a public policy issue in order to improve community responses.

Discussion

A summary of the findings of the review in relation to the review questions is provided below.

Question 1: Male veterans and defence force personnel

1a. What is known about the risk of suicide for male veterans and defence force personnel?

Sixty-four papers were identified in the peer-reviewed literature that included data from primary studies related to the risk of suicide for male veterans or defence force personnel.

Thirty papers were identified that explored suicide among male veterans. Only eight of the papers reported a comparison between prevalence rates of male veterans and other males – either in the general population or in the defence force. Of these papers, six reported that veterans had higher rates of suicidal ideation, attempts or death than the general population or defence force personnel and two reported no difference between the groups. Both of the Australian papers reported an increased rate of suicide among veterans. It is worth noting that one of the Australian papers was based on Vietnam War veterans, who arguably have a veteran experience different to that of other veterans given the cultural context of the Vietnam War in Australia. Seven of the papers reported a standardised death rate by suicide per 100,000 people that ranged from 26.2/100,000 to 50.0/100.00 for veterans. As a point of reference, the rate was 18.6 per 100,000 for all men in Australia in 2018.

Twenty-seven papers explored the factors associated with suicidal thoughts, attempts and deaths by male veterans. Mental health problems (such as depression, anxiety and post-traumatic stress disorder), substance use, other life stressors, and involvement in military conflict were reported to be associated with suicidality. Firearms were a common method used in suicide attempts by veterans in the US but one study indicated that this was not so for Australian veterans where the most common method was hanging (as is consistent with other Australian men.[1]

Thirty-eight papers were identified that explored suicide among current male defence force personnel. However, only five papers reported a comparison between male defence force personnel and other males. Three of these papers (two of which were from Australia) reported that rates of suicidal thoughts, attempts, or deaths were higher in defence force personnel compared to the general population. One study reported that suicidality was lower among male defence force personnel, another study reported no differences between defence force personnel and other males. Three papers reported a standardised death rate by suicide per 100,000 people that ranged from 18.4/100,000 to 26.2/100.00.

Thirty-two papers examined the impact of various factors on suicidal thinking, attempts, and deaths of current defence force personnel. Findings about the association between deployment and suicide

were mixed. Ten papers reported that suicidality was more common among younger men, whereas two papers reported it was more common among older men. Nine papers reported an association between mental health problems and suicidality, six reported an association with substance use problems. Lower levels of education were reported to be positively associated with suicidality in seven papers. More years of service was reported to be negatively associated with suicidality in six papers. Firearms were reported as a common method for suicide in four papers that were all based on studies conducted in the US.

Grey literature searching identified four reports that provide data relevant to the suicide risk of male veterans and defence force personnel in Australia. Two of these reports stated that the rate of suicidal ideation, attempts or deaths was higher for men in the defence force compared to other Australian men. However, two of the reports, including the most recent one in 2019 reported that suicide rates were lower among men in the defence forces. Three of the reports reported on an increased risk of suicide for veterans.

In sum, most of the reviewed evidence suggest a higher rate of suicide for male defence force personnel in comparison to the general population, and a higher again rate for male veterans. A wide range of risk factors have been associated with suicidality in both male defence force personnel and veterans, most common risk factors included: mental health problems, substance use problems, other life stressors, being younger and having less education. The association between deployment and suicide was variable.

1b. What programs or interventions have been effective in reducing the risk of suicide for male veterans and defence force personnel?

The review of academic literature yielded nine papers (1 systematic review and 8 primary studies (3 veterans, 5 defence force personnel) that addressed the research question regarding the effectiveness of programs or interventions in reducing the risk of suicide for male veterans and defence force personnel. The systematic review found eight observational studies and 10 trials of individual-level psychotherapy. Reduction in suicidality was found in six of the observational studies and two of the trials. However, there were many limitations to the studies.

Three studies were identified in the peer-reviewed literature that included data related to the effectiveness of programs or interventions in reducing the suicide risk for defence force personnel in the US. One study, evaluated via a randomised controlled trial (RCT), delivered a text message (plus standard care) intervention. This study demonstrated decreased suicidal ideation and attempts for those that received the study intervention, compared to those who received standard care. The two other studies (cohort study, time series study) evaluated multi-level suicide prevention programs delivered to defence force personnel. Both studies demonstrated reduced suicide rates associated with the programs.

Five primary studies were identified in the peer-reviewed literature that included data related to the effectiveness of programs or interventions in reducing the suicide risk for male veterans in the US. Two of these studies reported improvements in suicidal ideation and one study found improvements in suicidal behaviour. The two further studies reported on findings regarding interventions that were not related to evaluating the impact of the intervention.

Overall the evidence base regarding programs and interventions was assessed as satisfactory. The applicability of the studies to Australian veteran and defence force personnel is not known and the lack of studies in an Australian context means that there is nothing known about the effectiveness of any existing programs for Australian defence force personnel or veterans.

Grey literature searching identified several programs in Australia that aim to reduce the suicide risk of male veterans (Veterans 360 Australia, Open Arms, Operation Life, Operation Compass). The search did not identify any evaluations regarding the effectiveness of these programs in reducing suicide risk.

Question 2: Separated men

2a. What is known about the suicide risk for men who are separated?

The review of academic literature yielded 26 papers (4 systematic reviews and 22 primary studies) that addressed the research question regarding the suicide risk for men who are separated. The four reviews included studies conducted globally prior to 2014 and concluded that separated or divorced men had a higher risk of suicide than other men. Within the 22 primary studies, 17 found that for men being divorced or separated was associated with higher rates of suicidal ideation, attempts or deaths by suicide compared with other marital statuses, or was a key life event preceding suicide. Within these studies other factors were also found to influence suicidality among separated men – conflict, financial issues, age, alcohol or substance use, issues related to child custody, recency of divorce, educational levels, mental health issues, legal issues, feelings of loss and loneliness and loss of social networks, and shame.

However, there were some contrary findings. One of the studies found no association between marital status and suicidal ideation, and another study found no association with suicide attempts. One other study found no increased risk of suicide death when other variables were controlled for. Three studies reported suicide deaths as a standardised rate per 100,000 people. These studies reported rates from 13.3 to 41.22 per 100,000 for men who are separated or divorced. Overall, the evidence base was assessed as good and generalisable and applicable to Australian separated men.

Grey literature searching identified three Australian reports that contributed to answering the research question. An Australian Bureau of Statistics report identified that stressors related to disruption to families by separation and divorce, and relationship problems frequently preceded suicides by men. A report based on Queensland suicide deaths also found that men had frequently experienced relationship separation prior to suicide. A beyondblue report found that relationship problems and involvement with the family court system were felt by men to be significant contributors to suicidality among men. In summary, the available literature indicates that separation (and divorce) likely poses a significant risk factor for suicide for men in Australia. However, it is unclear how the other identified key life events (conflict, financial issues alcohol and substance use, child custody issues and others mentioned above) combine to create suicide risk.

2b. What programs or interventions have been effective in reducing the risk of men who are separated?

The review of academic literature did not identify any evaluated programs or interventions regarding suicide for men who are separated. Grey literature searching identified three programs in Australia providing suicide prevention support to separated men (Parents Beyond Breakup, Mensline, Lifeline WA). However, the search did not identify any evaluations regarding the effectiveness of these programs in reducing suicide risk.

Question 3: Men who are survivors of sexual assault

3a. What is known about the risk of suicide for men who are survivors of sexual assault?

One systematic review (including meta-analysis) and 13 primary studies were included in the review regarding the risk of suicide for men who are survivors of sexual assault. The systematic review concluded that there was an increased risk of intentional self-harm (suicide attempts, deaths and self-injury) for males who had experienced childhood sexual abuse. The majority of the 13 primary studies found that a history of sexual assault was positively associated with suicidal ideation, suicide attempts and death. However, one study found no association with suicidality. The synthesis of findings was hampered somewhat by a lack of consensus on definitions of sexual assault. Overall, the evidence base was assessed as good. Few studies explored other risk factors for suicide among survivors of sexual assault. Three of the studies explored the relationship between sexual assault, sexual orientation and suicidality. Each study found that rates of sexual assault were higher among men who identified as gay, bisexual, transgender, or as men who have sex with men, and that these higher rates of sexual assault were then associated with higher rates of suicidality. Overall, the evidence base was assessed as good. The one qualitative study, involving interviews with 17 men described suicidal thoughts following sexual assault as the result of a *'strong self-destructive force'* that arose as a result of unbearable suffering. Suicidal thoughts were described as an escape route from their unbearable pain. No grey literature was identified. In summary, the available literature suggests that the men who are survivors of sexual assault have an increased risk of suicidal ideation, suicide attempts, and of dying by suicide. No studies reported the suicide rate of survivors of sexual assault as a standardised rate per 100,000.

3b. What programs or interventions have been effective in reducing the risk of suicide for men who are survivors of sexual assault?

The review of academic literature did not identify any programs or interventions that aim to reduce the risk of suicide for men who are survivors of sexual assault. Grey literature searching identified three Australian organisations specifically supporting men who are survivors of sexual assault in managing and improving their mental health and wellbeing (Living Well, Survivors and Mates Support Network, Service assisting male survivors of sexual assault). However, the search did not identify any evaluations regarding the effectiveness of these programs in reducing suicide risk.

Limitations to the review

The review is limited by the scope of the search conducted. However, the inclusion of systematic reviews, regarding men who are separated and men who are survivors of sexual assault contributed to an expanded scope as this included evidence from outside the timeframe of published papers included in the review. In regards to programs and interventions that are available for the three target groups, it is likely that more are being delivered globally than were identified within this review. It could also be that programs and interventions taking place are not apparent in the public domain, this could be particularly the case for interventions delivered to defence force personnel by the defence forces.

Gaps in the evidence

The review was able to identify the association between membership to each group (male veterans and defence personnel, men who are separated, and men who are survivors of sexual assault) and an increased risk of suicidal ideation and behaviours. Several risk factors were found that were associated with suicidal ideation and behaviours among veterans, defence force personnel and separated or divorced men. However, caution should be employed when interpreting these findings as it is not known if these are the cause of the suicide death or how risk factors and life events interact.[85] Many studies used a cohort design that explored relationships between variables, but very few studies sought to understand how various factors intersected to contribute to suicide risk. For instance, a few studies in regards to defence force personnel indicate previous life experiences (such as trauma including childhood trauma, childhood abuse and being subject to crime) are likely to be interacting with their military experience to bring about an increased risk of suicide. As mentioned above, the qualitative work undertaken by beyondblue highlights a pathway to suicide wherein risk factors and life events interact on a pathway towards suicide, however more work is needed to confirm this pathway. This is a significant gap in the evidence and is perhaps reflective of the current state of knowledge regarding suicide broadly. More research is needed on this topic for all three of the groups of men in this review. Qualitative or case-study analysis may provide more insight into pathways towards suicide.[85]

The beyondblue ‘Men’s experiences with suicidal and depression’ report describes a process identified through interviews and focus groups wherein depressed mood, unhelpful conceptions of masculinity, social isolation and other ineffective coping strategies and presence of stressors interact with each other and get worse over time, producing greater individual risk of suicidality, and also creating barriers which interfere with attempts to treat depression or interrupt suicidality.[122]

The research does not commonly attend to intersections between membership to the three groups in this review and other sociodemographic variables. This is important because men’s health is differentially impacted by other aspects of their identity (such as age, socioeconomic status, or culture).[138] Variations to these aspects of identity are of course present within the three groups of the review and can act to either increase or reduce suicide risk, and men can of course be a member of more than vulnerable group (For example, a separated military veteran who is also a survivor of childhood sexual assault). A few studies in the review were identified that considered the risk of suicide within populations known to be vulnerable to suicide. For example, within the research related

to separated men one of the studies explored factors associated with suicides by Aboriginal and Torres Strait Islander men[114] and, within the research related to men who had been sexually assaulted, three studies examined the issue in relation to men who have sex with men.[129,130,132] This examination of the intersection between risk factors is an important area for future research so that effective interventions can be designed and then targeted to those who need them.

Research regarding the effectiveness of programs or interventions to reduce suicide risk was lacking for all three groups in the review, however there are some indications from work with veterans that interventions can be effective. The lack of evidence on suicide prevention programs and interventions for the three groups of men in the review is reflective more broadly of a lack of evidence regarding suicide prevention for men. A scoping review of suicide prevention for men was published in 2019, it was the first such review published and identified only 22 studies.[2] It is also not known how other support interventions for men, not specifically targeting suicide prevention, may impact on suicide. For instance, programs that foster social connection, support men post military discharge (e.g. the Department of Veterans Affairs in Australia), support separated men generally, provide counselling for survivors of sexual assault, or attend to other risk factors for suicide, such as mental health problems and substance use, may ultimately impact on suicidality but would not have appeared in these reviews if suicidality was not an explicit target or outcome of the intervention.

Despite these overarching gaps in the evidence, and limitations of the search conducted, this review has nonetheless broadly confirmed the heightened vulnerability to suicide of veterans, men who are separated, and survivors of sexual assault. The positive findings regarding interventions with veterans and defence force personnel indicate some potential for programs to be effective. Gaps in the evidence specific to each of these groups of men are discussed below.

Male veterans and defence force personnel

The evidence base regarding the risk of suicide for male veterans and defence force personnel in Australia is hampered by the small volume of studies in this area - most of the studies have been conducted in the US. The generalisability of this research to Australia is arguably limited.[12] There is also some inconsistency regarding the suicide rate for defence force personnel. Generally, the rate of suicide is higher among veterans than among defence force personnel however, the reason for this increased rate is not clear. Several risk factors have been identified that are associated with the suicide risk for veterans and defence force personnel. However, as mentioned above, it is not known if these are the cause of the suicide death and more research is needed to understand pathways to suicide. In particular, the pathway to the higher suicide rate among veterans needs to be better understood. The differences in the rate of suicide deaths between defence force personnel and veterans suggest that the aetiology of suicide for each group might be different such that different interventions are needed for each. There are even fewer studies about impact of programs and interventions on male veterans' and defence personnel's suicide risk. These have all been conducted in the US and the utility of the findings of these for informing suicide prevention interventions with Australian defence force personnel and veterans is not known. There is no evidence about the effectiveness of any existing suicide prevention programs for Australian defence force personnel or veterans. There are several programs and interventions currently being delivered in Australia to reduce the suicide risk among veterans, however they have not been evaluated. Research is needed to further understand the risk of suicide for veterans in Australia and to evaluate existing suicide prevention programs.

Men who are separated

Of the 22 primary studies included in the review regarding the risk of suicide for men who are separated, seven explicitly focused on the relationship between marital status and suicide. The remaining studies examined a wide range of variables for their effects on suicide, of which marital status was one. Thus, there is just a small body of research that has sought to specifically understand the role of marital status on suicide. However, this work is showing great promise in beginning to understand the complexities of the association between relationship breakdown and suicide. More work is needed to unpack the interplay with the various other factors found to influence the suicidality of separated men (e.g. conflict, financial issues, age, alcohol or substance use, issues related to child custody). It is also possible that the commonly used constructs of 'divorce' and 'separation', and their derivation from national datasets, may not accurately describe all relationship statuses or all forms of relationship breakdown that could be impacting on men's suicidality. Child custody and family court issues are often mentioned in the media as a contributor to suicidality among men, however only two studies explored the contribution of stress related to child custody issues to suicide.[106,119] Very few programs or interventions were identified that targeted suicidality of men who are separated, none of which had been evaluated for their impact on suicide.

Men who are survivors of sexual assault

The review of the literature regarding the risk of suicide for men who are survivors of sexual assault did not identify research regarding some population groups who are of particular relevance within the Australian context. For example, despite their high risk of suicide, we identified no studies regarding sexual assault and suicide risk among Aboriginal and Torres Strait Islander men. There was also little research on the role of other risk factors in the suicidal risk of men who are survivors of sexual assault. The recent report of the Australian Royal Commission states that 63.6% of survivors of institutional child sex abuse are male.[139] Given the commonality of institutional child sex abuse of boys, research on the effects of such abuse on suicide risk is important and timely. We also identified no evidence regarding the effectiveness of interventions to reduce suicide risk among men who are survivors of sexual assault.

Conclusion

In conclusion, the review finds evidence for a higher risk of suicide among veterans, defence force personnel, separated men, and male survivors of sexual assault compared to other men. There is some indication that other factors (such as mental health problems, substance use, relationship conflict and financial issues) are also contributing to the higher risk of suicide by these men; however, evidence is lacking about how these factors interact. Evidence is also scant about the effectiveness of suicide prevention interventions for men in these groups. More research is needed to understand the pathway to suicide by men in these vulnerable groups and to develop and evaluate targeted suicide prevention interventions.

References

1. Australian Bureau of Statistics. 3303.0 - Causes of Death, Australia, 2018. Canberra; 2019.
2. Struszczyk S, Galdas PM, Tiffin PA. Men and suicide prevention: a scoping review. Journal of Mental Health. 2019;28:80-8.
3. National Health and Medical Research Council. NHMRC levels of evidence and grades for recommendations for guideline developers. Canberra; 2009.
4. World Health Organization. Preventing suicide: a global imperative (2014) 2014 [Available from: http://apps.who.int/iris/bitstream/10665/131056/1/9789241564779_eng.pdf?ua=1&ua=1.
5. Van Orden KA, Witte TK, Cukrowicz KC, Braithwaite SR, Selby EA, Joiner TE. The Interpersonal Theory of Suicide. Psychological Review. 2010;117(2):575-600.
6. Emslie C, Ridge D, Ziebland S, Hunt K. Men's accounts of depression: reconstructing or resisting hegemonic masculinity? Social Science & Medicine. 2006;62(9):2246-57.
7. Mergl R, Koburger N, Heinrichs K, Szekely A, Ditta Toth M, Coyne J, et al. What are the reasons for the large gender differences in the lethality of suicidal acts? An epidemiological analysis in four European countries. PLoS ONE. 2015;10(7):e0129062.
8. Rice SM, Fallon BJ, Aucote HM, Moller-Leimkuhler AM. Development and preliminary validation of the male depression risk scale: furthering the assessment of depression in men. Journal of Affective Disorders. 2013;151(3):950-8.
9. Player MJ, Proudfoot J, Fogarty A, Whittle E, Spurrier M, Shand F, et al. What Interrupts Suicide Attempts in Men: A Qualitative Study. PLoS ONE. 2015;10(6):1-13.
10. Burgess P, Pirkis J, Slade T, Johnston A, Meadows G, Gunn J. Service use for mental health problems: Findings from the 2007 National Survey of Mental Health and Wellbeing. Australian and New Zealand Journal of Psychiatry. 2009;43(7):615-23.
11. Milner A, Spittal M, Pirkis J, Lamontagne AD. Suicide by occupation: systematic review and meta-analysis. Br J Psychiatry. 2013;203(6):409-16.
12. Australian Institute for Suicide Research and Prevention. Suicidal behaviour and ideation among military personnel: Australian and international trends. Summary report prepared for the Department of Veterans' Affairs. 2015.
13. Kyung-Sook W, Sangsoo S, Sangjin S, Young-Jeon S. Marital status integration and suicide: A meta-analysis and meta-regression. Social Science & Medicine. 2018;197:116-26.
14. Moore SE, Scott JG, Ferrari AJ, Mills R, Dunne MP, Erskine HE, et al. Burden attributable to child maltreatment in Australia. Child Abuse & Neglect. 2015;48:208-20.
15. Canetto SS, Sakinofsky I. The Gender Paradox in Suicide. Suicide & Life-Threatening Behavior. 1998;28(1):1-23.
16. Oliffe JL, Ogrodniczuk JS, Bottorff JL, Johnson JL, Hoyak K. "You feel like you can't live anymore": suicide from the perspectives of Canadian men who experience depression. Social Science & Medicine. 2012;74(4):506-14.
17. Haby MM, Chapman E, Clark R, Barreto J, Reveiz L, Lavis J. What are the best methodologies for rapid reviews of the research evidence for evidence-informed decision making in health policy and practice: a rapid review. Health Res Policy Syst. 2016;14(1).
18. Khangura S, Konnyu K, Cushman R, Grimshaw J, Moher D. Evidence summaries: the evolution of a rapid review approach. Systematic reviews. 2012;1(1):10.
19. Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. British Medical Journal. 2015;349.
20. Mahar AL, Cramm H, Aiken AB, Whitehead M, Tien H, Fear NT, et al. A retrospective cohort study comparing non-fatal self-harm emergency department visits between Canadian veterans living in Ontario and matched civilians. Int Rev Psychiatry. 2019;31(1):25-33.

21. Mahar AL, Aiken AB, Whitehead M, Tien H, Cramm H, Fear NT, et al. Suicide in Canadian veterans living in Ontario: a retrospective cohort study linking routinely collected data. BMJ Open. 2019;9(6):e027343.
22. Horwitz AG, Smith DL, Held P, Zalta AK. Characteristics of Veteran and Civilian Suicide Decedents: A Sex-Stratified Analysis. Am J Prev Med. 2019;56(5):e163-e8.
23. Bounoua N, Hayes JP, Sadeh N. Identifying Suicide Typologies Among Trauma-Exposed Veterans. Crisis. 2019:1-8.
24. Kerr K, Romaniuk M, McLeay S, Khoo A, Dent MT, Boshen M. Increased risk of attempted suicide in Australian veterans is associated with total and permanent incapacitation, unemployment and posttraumatic stress disorder severity. Aust N Z J Psychiatry. 2018;52(6):552-60.
25. Strand LA, Martinsen JI, Fadum EA, Borud EK. External-cause mortality among 21 609 Norwegian male military peacekeepers deployed to Lebanon between 1978 and 1998. Occup Environ Med. 2017;74(8):573-7.
26. Rasmussen KA, King DA, Gould MS, Cross W, Tang W, Kaukeinen K, et al. Concerns of Older Veteran Callers to the Veterans Crisis Line. Suicide & Life-Threatening Behavior. 2017;47(4):387-97.
27. Gradus JL, King MW, Galatzer-Levy I, Street AE. Gender Differences in Machine Learning Models of Trauma and Suicidal Ideation in Veterans of the Iraq and Afghanistan Wars. J Trauma Stress. 2017;30(4):362-71.
28. Bohnert KM, Ilgen MA, Louzon S, McCarthy JF, Katz IR. Substance use disorders and the risk of suicide mortality among men and women in the US Veterans Health Administration. Addiction. 2017;112(7):1193-201.
29. Bergman BP, Mackay DF, Smith DJ, Pell JP. Suicide in Scottish military veterans: a 30-year retrospective cohort study. Occup Med (Oxf). 2017;67(5):350-5.
30. Allan NP, Conner KR, Pigeon WR, Gros DF, Salami TK, Stecker T. Insomnia and suicidal ideation and behaviors in former and current U.S. service members: Does depression mediate the relations? Psychiatry Res. 2017;252:296-302.
31. McGlade E, Bakian A, Coon H, Yurgelun-Todd D, Callor W, Byrd J, et al. Male suspected suicide decedents in Utah: A comparison of Veterans and nonveterans. Comprehensive Psychiatry. 2016;69:1-10.
32. Blosnich JR, Brenner LA, Bossarte RM. Population mental health among U.S. military veterans: results of the Veterans Health Module of the Behavioral Risk Factor Surveillance System, 2011-2012. Ann Epidemiol. 2016;26(8):592-6.
33. Maguen S, Skopp NA, Zhang Y, Smolenski DJ. Gender differences in suicide and suicide attempts among US Army soldiers. Psychiatry Res. 2015;225(3):545-9.
34. O'Toole BI, Orreal-Scarborough T, Johnston D, Catts SV, Outram S. Suicidality in Australian Vietnam veterans and their partners. J Psychiatr Res. 2015;65:30-6.
35. McCarten JM, Hoffmire CA, Bossarte RM. Changes in overall and firearm veteran suicide rates by gender, 2001-2010. Am J Prev Med. 2015;48(3):360-4.
36. Hoffmire CA, Kemp JE, Bossarte RM. Changes in Suicide Mortality for Veterans and Nonveterans by Gender and History of VHA Service Use, 2000-2010. Psychiatr Serv. 2015;66(9):959-65.
37. Bullman T, Hoffmire C, Schneiderman A, Bossarte R. Time dependent gender differences in suicide risk among Operation Enduring Freedom and Operation Iraqi Freedom veterans. Ann Epidemiol. 2015;25(12):964-5.
38. King DA, O'Riley AA, Thompson C, Conwell Y, He H, Kemp J. Age-related concerns of male veteran callers to a suicide crisis line. Arch. 2014;18(4):445-52.
39. Miller M, Barber C, Young M, Azrael D, Mukamal K, Lawler E. Veterans and suicide: a reexamination of the National Death Index-linked National Health Interview Survey. Am J Public Health. 2012;102 Suppl 1:S154-9.
40. Katz IR, McCarthy JF, Ignacio RV, Kemp J. Suicide among veterans in 16 states, 2005 to 2008: comparisons between utilizers and nonutilizers of Veterans Health Administration (VHA) services based on data from the National Death Index, the National Violent Death Reporting System, and VHA administrative records. Am J Public Health. 2012;102 Suppl 1:S105-10.
41. Conner KR, Bohnert AS, McCarthy JF, Valenstein M, Bossarte R, Ignacio R, et al. Mental disorder comorbidity and suicide among 2.96 million men receiving care in the Veterans Health Administration health system. J Abnorm Psychol. 2013;122(1):256-63.

42. Fanning JR, Pietrzak RH. Suicidality among older male veterans in the United States: results from the National Health and Resilience in Veterans Study. J Psychiatr Res. 2013;47(11):1766-75.
43. Gradus JL, Street AE, Suvak MK, Resick PA. Predictors of suicidal ideation in a gender-stratified sample of OEF/OIF veterans. Suicide & Life-Threatening Behavior. 2013;43(5):574-88.
44. Kaplan MS, McFarland BH, Huguet N, Valenstein M. Suicide risk and precipitating circumstances among young, middle-aged, and older male veterans. Am J Public Health. 2012;102 Suppl 1:S131-7.
45. Blow FC, Bohnert AS, Ilgen MA, Ignacio R, McCarthy JF, Valenstein MM, et al. Suicide mortality among patients treated by the Veterans Health Administration from 2000 to 2007. Am J Public Health. 2012;102 Suppl 1:S98-104.
46. White R, Barber C, Azrael D, Mukamal KJ, Miller M. History of military service and the risk of suicidal ideation: findings from the 2008 national survey on drug use and health. Suicide & Life-Threatening Behavior. 2011;41(5):554-61.
47. Mansfield AJ, Bender RH, Hourani LL, Larson GE. Suicidal or self-harming ideation in military personnel transitioning to civilian life. Suicide & Life-Threatening Behavior. 2011;41(4):392-405.
48. Lemaire CM, Graham DP. Factors associated with suicidal ideation in OEF/OIF veterans. Journal of Affective Disorders. 2011;130(1-2):231-8.
49. Ilgen MA, Bohnert AS, Ignacio RV, McCarthy JF, Valenstein MM, Kim HM, et al. Psychiatric diagnoses and risk of suicide in veterans. Arch Gen Psychiatry. 2010;67(11):1152-8.
50. Zuromski KL, Bernecker SL, Gutierrez PM, Joiner TE, King AJ, Liu H, et al. Assessment of a Risk Index for Suicide Attempts Among US Army Soldiers With Suicide Ideation: Analysis of Data From the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). JAMA netw. 2019;2(3):e190766.
51. Syed Sheriff R, Van Hooff M, Malhi G, Grace B, McFarlane A. Childhood determinants of suicidality: comparing males in military and civilian employed populations. . Psychological medicine. 2019;49:2421-31.
52. Willmund GD, Hes J, Helms C, Wertenauer F, Seiffert A, Nolte A, et al. Suicides between 2010 and 2014 in the German Armed Forces-Comparison of Suicide Registry Data and a German Armed Forces Survey. Suicide & Life-Threatening Behavior. 2019;49(5):1497-509.
53. Ursano RJ, Naifeh JA, Kessler RC, Gonzalez OI, Fullerton CS, Mash HH, et al. Nonfatal Suicidal Behaviors in the Administrative Records of Activated U.S. Army National Guard and Army Reserve Soldiers, 2004-2009. Psychiatry. 2018;81(2):173-92.
54. Ursano RJ, Kessler RC, Naifeh JA, Herberman Mash HB, Nock MK, Aliaga PA, et al. Risk Factors Associated With Attempted Suicide Among US Army Soldiers Without a History of Mental Health Diagnosis. JAMA Psychiatry. 2018;75(10):1022-32.
55. Ursano RJ, Kessler RC, Naifeh JA, Herberman Mash H, Fullerton CS, Aliaga PA, et al. Associations of Time-Related Deployment Variables With Risk of Suicide Attempt Among Soldiers: Results From the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). JAMA Psychiatry. 2018;75(6):596-604.
56. Reimann CA, Mazuchowski EL. Suicide Rates Among Active Duty Service Members Compared with Civilian Counterparts, 2005-2014. Mil Med. 2018;183(suppl_1):396-402.
57. Millner AJ, Ursano RJ, Hwang I, King AJ, Naifeh JA, Sampson NA, et al. Lifetime Suicidal Behaviors and Career Characteristics Among U.S. Army Soldiers: Results from the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). Suicide & Life-Threatening Behavior. 2018;48(2):230-50.
58. May AM, Lawson WC, Bryan A, Bryan CJ. Nonsuicidal self-injury, suicide ideation and suicide attempts in the National Guard. Comprehensive Psychiatry. 2018;86:115-8.
59. Ursano RJ, Kessler RC, Naifeh JA, Herberman Mash H, Fullerton CS, Bliese PD, et al. Risk of Suicide Attempt Among Soldiers in Army Units With a History of Suicide Attempts. JAMA Psychiatry. 2017;74(9):924-31.
60. Rogers ML, Ringer FB, Michaels MS, Chiurliza B, Hagan CR, Chu C, et al. Sex Differences in Suicide-Related Symptoms in a Large Military Sample. Mil. 2017;5(1):73-80.
61. Phillips CJ, LeardMann CA, Vyas KJ, Crum-Cianflone NF, White MR. Risk Factors Associated With Suicide Completions Among US Enlisted Marines. Am J Epidemiol. 2017;186(6):668-78.
62. Griffith J. A Description of Suicides in the Army National Guard During 2007-2014 and Associated Risk Factors. Suicide & Life-Threatening Behavior. 2017;47(3):266-81.

63. Milner A, Witt K, Maheen H, LaMontagne AD. Suicide among emergency and protective service workers: A retrospective mortality study in Australia, 2001 to 2012. Work. 2017;57(2):281-7.
64. Ursano RJ, Kessler RC, Stein MB, Naifeh JA, Aliaga PA, Fullerton CS, et al. Risk Factors, Methods, and Timing of Suicide Attempts Among US Army Soldiers. JAMA Psychiatry. 2016;73(7):741-9.
65. Laukkala T, Parkkola K, Henriksson M, Pirkola S, Kaikkonen N, Pukkala E, et al. Total and cause-specific mortality of Finnish military personnel following service in international peacekeeping operations 1990-2010: a comprehensive register-based cohort study. BMJ Open. 2016;6(10):e012146.
66. Afifi TO, Taillieu T, Zamorski MA, Turner S, Cheung K, Sareen J. Association of Child Abuse Exposure With Suicidal Ideation, Suicide Plans, and Suicide Attempts in Military Personnel and the General Population in Canada. JAMA Psychiatry. 2016;73(3):229-38.
67. Ursano RJ, Kessler RC, Stein MB, Naifeh JA, Aliaga PA, Fullerton CS, et al. Suicide Attempts in the US Army During the Wars in Afghanistan and Iraq, 2004 to 2009. JAMA Psychiatry. 2015;72(9):917-26.
68. Ursano RJ, Kessler RC, Heeringa SG, Cox KL, Naifeh JA, Fullerton CS, et al. Nonfatal Suicidal Behaviors in U.S. Army Administrative Records, 2004-2009: Results from the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). Psychiatry. 2015;78(1):1-21.
69. Kessler RC, Stein MB, Bliese PD, Bromet EJ, Chiu WT, Cox KL, et al. Occupational differences in US Army suicide rates. Psychological Medicine. 2015;45(15):3293-304.
70. Cigrang JA, Balderrama-Durbin C, Snyder DK, Talcott GW, Tatum J, Baker M, et al. Predictors of Suicidal Ideation Across Deployment: A Prospective Study. J Clin Psychol. 2015;71(9):828-42.
71. Anestis MD, Khazem LR, Mohn RS, Green BA. Testing the main hypotheses of the interpersonal-psychological theory of suicidal behavior in a large diverse sample of United States military personnel. Comprehensive Psychiatry. 2015;60:78-85.
72. Gilman SE, Bromet EJ, Cox KL, Colpe LJ, Fullerton CS, Gruber MJ, et al. Sociodemographic and career history predictors of suicide mortality in the United States Army 2004-2009. Psychological Medicine. 2014;44(12):2579-92.
73. Bryan CJ, McNaughton-Cassill M, Osman A. Age and belongingness moderate the effects of combat exposure on suicidal ideation among active duty Air Force personnel. Journal of Affective Disorders. 2013;150(3):1226-9.
74. Bryan CJ, Hernandez AM, Allison S, Clemans T. Combat exposure and suicide risk in two samples of military personnel. J Clin Psychol. 2013;69(1):64-77.
75. Anestis MD, Bryan CJ. Means and capacity for suicidal behavior: a comparison of the ratio of suicide attempts and deaths by suicide in the US military and general population. Journal of Affective Disorders. 2013;148(1):42-7.
76. Bryan CJ, Rudd MD, Wertenberger E. Reasons for suicide attempts in a clinical sample of active duty soldiers. Journal of Affective Disorders. 2013;144(1-2):148-52.
77. Hines LA, Jawahar K, Wessely S, Fear NT. Self-harm in the UK military. Occup Med (Oxf). 2013;63(5):354-7.
78. Haus-Cheymol R, Boussaud M, Jougla E, Verret C, Decam C, Pommier de Santi V, et al. Mortality among active-duty male French Armed Forces, 2006-10. J Public Health (Oxf). 2012;34(3):454-61.
79. Griffith J. Suicide in the army national guard: an empirical inquiry. Suicide & Life-Threatening Behavior. 2012;42(1):104-19.
80. Bryan CJ, Rudd MD. Life stressors, emotional distress, and trauma-related thoughts occurring in the 24 h preceding active duty U.S. soldiers' suicide attempts. J Psychiatr Res. 2012;46(7):843-8.
81. Armed Forces Health Surveillance C. Deaths by suicide while on active duty, active and reserve components, U.S. Armed Forces, 1998-2011. Msmr. 2012;19(6):7-10.
82. Bell NS, Harford TC, Amoroso PJ, Hollander IE, Kay AB. Prior health care utilization patterns and suicide among U.S. Army soldiers. Suicide & Life-Threatening Behavior. 2010;40(4):407-15.
83. McFarlane AC, Hodson SE, Van Hoof M, Davies C. Mental health in the Australian Defence Force: 2010 ADF Mental Health and Wellbeing Study: Full report. Canberra; 2011.
84. Australian Institute for Suicide Research and Prevention. Suicidal behaviour and ideation among miltary personnel: Australia and international trends. Technical report prepared for the Department of Veterans' Affairs. 2015.

85. Australian Institute of Health and Welfare. Incidence of suicide in serving and ex-serving Australian Defence Force personnel: detailed analysis 2001-2015. Cat no. PHE218. Canberra; 2017.
86. Australian Institute of Health and Welfare. National suicide monitoring of serving and ex-serving personnel: 2019 update. PHE 222. Canberra; 2019.
87. Nelson HD, Denneson LM, Low AR, Bauer BW, O'Neil M, Kansagara D, et al. Suicide risk assesment and prevention: a systematic review focusing on veterans. Psychiatric services: a journal of the American Psychiatric Association. 2017;68(10):1003-15.
88. Comtois KA, Kerbrat AH, DeCou CR, Atkins DC, Majeres JJ, Baker JC, et al. Effect of Augmenting Standard Care for Military Personnel With Brief Caring Text Messages for Suicide Prevention: A Randomized Clinical Trial. JAMA Psychiatry. 2019;76(5):474-83.
89. Warner CH, Appenzeller GN, Parker JR, Warner C, Diebold CJ, Grieger T. Suicide Prevention in a Deployed Military Unit. Psychiatry. 2011;74:127-41.
90. Knox KL, Pflanz S, Talcott GW, Campise RL, Lavigne JE, Bajorska A, et al. The US Air Force Suicide Prevention Program: implications for public health policy.(RESEARCH AND PRACTICE)(Author abstract)(Report). The American Journal of Public Health. 2010;100(12):2457.
91. Brenner LA, Forster JE, Hoffberg AS, Matarazzo BB, Hostetter TA, Signoracci G, et al. Window to Hope: A Randomized Controlled Trial of a Psychological Intervention for the Treatment of Hopelessness Among Veterans With Moderate to Severe Traumatic Brain Injury. J Head Trauma Rehabil. 2018;33(2):E64-E73.
92. Stanley B, Brown GK, Brenner LA, Galfalvy HC, Currier GW, Knox KL, et al. Comparison of the Safety Planning Intervention With Follow-up vs Usual Care of Suicidal Patients Treated in the Emergency Department. JAMA Psychiatry. 2018;75(9):894-900.
93. Bernet AC. Postdischarge Behavioral Health Treatment and 6-Month Reattempt Rate for Veterans Hospitalized for Suicide Attempt. J Am Psychiatr Nurses Assoc. 2015;21(3):212-22.
94. Walser RD, Garvert DW, Karlin BE, Trockel M, Ryu DM, Taylor CB. Effectiveness of Acceptance and Commitment Therapy in treating depression and suicidal ideation in Veterans. Behav Res Ther. 2015;74:25-31.
95. Knox KL, Kemp J, McKeon R, Katz IR. Implementation and early utilization of a Suicide Hotline for veterans. Am J Public Health. 2012;102 Suppl 1:S29-32.
96. Ide N, Wyder M, Kolves K, De Leo D. Separation as an important risk factor for suicide. Journal of Family Issues. 2010;31(12):1689-716.
97. Yip PSF, Yousuf S, Chan CH, Yung T, Wu KCC. The roles of culture and gender in the relationship between divorce and suicide risk: A meta-analysis. Social Science & Medicine. 2015;128:87-94.
98. Yip PSF, Chen Y-Y, Yousuf S, Lee CKM, Kawano K, Routley V, et al. Towards a reassessment of the role of divorce in suicide outcomes: Evidence from five pacific rim populations. Social Science & Medicine. 2012;75(2):358-66.
99. Corcoran P, Nagar A. Suicide and marital status in Northern Ireland. Soc Psychiatry Psychiatr Epidemiol. 2010;45(8):795-800.
100. Kazan D, Calear AL, Batterham PJ. The impact of intimate partner relationships on suicidal thoughts and behaviours: A systematic review. Journal of Affective Disorders. 2016;190:585-98.
101. Masocco M, Pompili M, Vanacore N, Innamorati M, Lester D, Girardi P, et al. Completed suicide and marital status according to the Italian region of origin. Psychiatric Quarterly. 2010;81(1):57-71.
102. Clapperton A, Newstead S, Bugeja L, Pirkis J. Relative risk of suicide following exposure to recent stressors, Victoria, Australia. Aust N Z J Public Health. 2019;43(3):254-60.
103. Hedna K, Andersson Sundell K, Hensing G, Skoog I, Gustavsson S, Waern M. Late-life suicidal behaviours among new users of antidepressants: a prospective population-based study of sociodemographic and gender factors in those aged 75 and above. BMJ Open. 2018;8(10):e022703.
104. O'Neill S, Ennis E, Corry C, Bunting B. Factors Associated with Suicide in Four Age Groups: A Population Based Study. Arch. 2018;22(1):128-38.
105. Puzo Q, Mehlum L, Qin P. Socio-economic status and risk for suicide by immigration background in Norway: A register-based national study. J Psychiatr Res. 2018;100:99-106.
106. Milner A, Maheen H, Currier D, LaMontagne AD. Male suicide among construction workers in Australia: a qualitative analysis of the major stressors precipitating death. BMC Public Health. 2017;17(1):584.
107. Sun BQ, Zhang J. Economic and Sociological Correlates of Suicides: Multilevel Analysis of the Time Series Data in the United Kingdom. J Forensic Sci. 2016;61(2):345-51.

108. Schiff LB, Holland KM, Stone DM, Logan J, Marshall KJ, Martell B, et al. Acute and Chronic Risk Preceding Suicidal Crises Among Middle-Aged Men Without Known Mental Health and/or Substance Abuse Problems: An Exploratory Mixed-Methods Analysis. Crisis. 2015;36(5):304-15.
109. Frisch M, Simonsen J. Marriage, cohabitation and mortality in Denmark: national cohort study of 6.5 million persons followed for up to three decades (1982–2011). International Journal of Epidemiology. 2013;42(2):559-78.
110. Silventoinen K, Moustgaarid H, Peltonen R, Martikainen P. Changing associations between partnership history and risk of accidents, violence and suicides. Journal of Epidemiology and Community Health. 2013;67(3):265-70.
111. Forkmann T, Brahler E, Gauggel S, Glaesmer H. Prevalence of suicidal ideation and related risk factors in the German general population. Journal of Nervous and Mental Disease. 2012;200(5):401-5.
112. Jimenez-Trevino L, Saiz PA, Corcoran P, Garcia-Portilla MP, Buron P, Garrido M, et al. The incidence of hospital-treated attempted suicide in Oviedo, Spain. Crisis. 2012;33(1):46-53.
113. Kolves K, Ide N, De Leo D. Fluctuations of suicidality in the aftermath of a marital separation: 6-month follow-up observations. Journal of Affective Disorders. 2012;142(1-3):256-63.
114. Kuipers P, Appleton J, Pridmore S. Thematic analysis of key factors associated with Indigenous and non-Indigenous suicide in the Northern Territory, Australia. Rural Remote Health. 2012;12(4):2235.
115. Barth A, Sogner L, Gnambs T, Kundi M, Reiner A, Winker R. Socioeconomic factors and suicide: An analysis of 18 industrialized countries for the years 1983 through 2007. Journal of Occupational and Environmental Medicine. 2011;53(3):313-7.
116. Kõlves K, Ide N, De Leo D. Marital breakdown, shame and suicidality in men: a direct link? Suicide & Life-threatening behaviour. 2011;41:149-59.
117. Kovess-Masfety V, Boyd A, Haro J, Bruffaerts R, Villagut G, Lepine JP, et al. High and low suicidality in Europe: A fine-grained comparison of France and Spain within the ESEMeD surveys. Journal of Affective Disorders. 2011;133:247-56.
118. Andres AR, Halicioglu F. Determinants of suicides in Denmark: Evidence from time series data. Health Policy. 2010;98(2-3):263-9.
119. Kolves K, Ide N, De Leo D. Suicidal ideation and behaviour in the aftermath of marital separation: Gender differences. Journal of Affective Disorders. 2010;120(1-3):48-53.
120. Magnusson S, Makinen IH. Sweden: income and suicide. Psychol Rep. 2010;107(1):157-62.
121. Australian Bureau of Statistics. 1351.0.55.062 Psychosocial risk factors as they relate to coroner-referred deaths in Australia, 2017. Canberra; 2019.
122. Beyond blue. Men's experiences with suicidal behavour and depression project: final report.
123. Leske SD, Crompton D, Kolves K. Suicide in Queensland: Annual Report 2019. Brisbane, Queensland, Australia: Griffith University; 2019.
124. Angst J, Hengartner MP, Rogers J, Schnyder U, Steinhausen H-C, Ajdacic-Gross V, et al. Suicidality in the prospective Zurich study: Prevalence, risk factors and gender. European Archives of Psychiatry and Clinical Neuroscience. 2014;264(7):557-65.
125. Tryggvadottir EDV, Sigurdardottir S, Halldorsdottir S. 'The self-destruction force is so strong': male survivors' experience of suicidal thoughts following sexual violence. Scandinavian Journal of Caring Sciences. 2019;33(4):995-1005.
126. Asgeirsdottir HG, Valdimarsdottir UA, orsteinsdottir oK, Lund SH, Tomasson G, Nyberg U, et al. The association between different traumatic life events and suicidality. European Journal of Psychotraumatology Vol 9(1), 2018, ArtID 1510279. 2018;9(1).
127. Choi NG, DiNitto DM, Marti CN, Segal SP. Adverse childhood experiences and suicide attempts among those with mental and substance use disorders. Child Abuse & Neglect. 2017;69:252-62.
128. Turner S, Taillieu T, Cheung K, Afifi TO. The relationship between childhood sexual abuse and mental health outcomes among males: Results from a nationally representative United States sample. Child Abuse & Neglect: the international journal. 2012;66:64-72.
129. Flynn AB, Johnson RM, Bolton S-L, Mojtabai R. Victimization of lesbian, gay, and bisexual people in childhood: Associations with attempted suicide. Suicide and Life-Threatening Behavior. 2016;46(4):457-70.
130. Skerrett DM, Kolves K, De Leo D. Factors related to suicide in LGBT populations: A psychological autopsy case-control study in Australia. Crisis: The Journal of Crisis Intervention and Suicide Prevention. 2016;37(5):361-9.

131. Harford TC, Yi H-y, Grant BF. Associations between childhood abuse and interpersonal aggression and suicide attempt among U.S. adults in a national study. Child Abuse & Neglect. 2014;38(8):1389-98.
132. Rusow JA, Fletcher JB, Le H, Reback CJ. Associations between sexual abuse and negative health consequences among high-risk men who have sex with men. Journal of Gay & Lesbian Social Services: The Quarterly Journal of Community & Clinical Practice. 2014;26(2):244-57.
133. Fergusson DM, McLeod GF, Horwood LJ. Childhood sexual abuse and adult developmental outcomes: findings from a 30-year longitudinal study in New Zealand. Child Abuse & Neglect. 2013;37(9):664-74.
134. Tomasula JL, Anderson LM, Littleton HL, Riley-Tillman TC. The association between sexual assault and suicidal activity in a national sample. School Psychology Quarterly. 2012;27(2):109-19.
135. Cutajar MC, Mullen PE, Ogloff JR, Thomas SD, Wells DL, Spataro J. Suicide and fatal drug overdose in child sexual abuse victims: a historical cohort study. Medical Journal of Australia. 2010;192(4):184-7.
136. Legleye S, Beck F, Peretti-Watel P, Chau N, Firdion JM. Suicidal ideation among young French adults: association with occupation, family, sexual activity, personal background and drug use. Journal of Affective Disorders. 2010;123(1-3):108-15.
137. Foster G, Boyd C, O'Leary O. Improving policy and practice responses for men sexually abused in childhood (ACSSA Wrap No. 14). Melbourne; 2012.
138. Australian Institute of Health and Welfare. Australia's health 2018. Australia's health series no. 16. AUS 221. Canberra; 2018.
139. Commonwealth of Australia. Royal Commission into Institutional Responses to Child Sexual Abuse. Canberra: Commonwealth of Australia; 2017.

Appendices

Table 1—Summary of included studies: risk of suicide for male veterans.

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
Mahar et al. (2019). A retrospective cohort study comparing non-fatal self-harm emergency department visits between Canadian veterans living in Ontario and matched civilians. International Review of Psychiatry, 31[1], 25–33[20]	Canada	Cohort	N=9,514 male veterans N=38,042 age-matched male civilians Provincial administrative healthcare data	2002–15	Non-fatal self-harm presentations at an emergency department, suicide	During the study period, 1.4% of the veteran cohort and 2.5% of the non-veteran cohort died by suicide.52 veterans (0.55%) presented to an emergency department for self-harm, and had 40% lower incidence rate ratio compared to non-veterans (n=308 non-veteran (0.81%) presentations; IRR=0.60, 95% CI 0.41–0.87, p=0.007). Of the veterans who presented at an emergency department for self-harm, 23%	

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
						eventually died by suicide compared to 17% of civilians. There was no significant difference in the rate of emergency department presentations for self-harm between veterans and civilians by age (p=0.48)	
Mahar et al. (2019). Suicide in Canadian veterans living in Ontario: a retrospective cohort study linking routinely collected data. BMJ Open, 9[6], e027343[21]	Canada	Cohort	N=20,397 male veterans living in Ontario N=81,559 age-sex matched civilians	1990–2015	Suicide	Death by suicide accounted for 4.6% (n=39) of deaths in the veteran cohort, and 3.6% (n=189) of deaths in the civilian cohort. Veterans and non-veterans had a similar risk of dying by suicide during the study period (HR=0.86, 95% CI 0.62, 1.22, p=.410)	Highest incidence rates for male veteran sub-groups per 100,000 person-years (not statistically significant patterns): Veterans aged 30–49 years at the time of release, 29.7 (95% CI 17.0, 48.3); Veterans released after the year 2000, 19.7 (95% CI 11.9, 30.8); Service duration of 5–9 years, 32.3 (95% CI

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							15.5, 59.4); Time period following release of 0–5 years, 21.3 (13.5–32.0)
Horwitz et al. (2019). Characteristics of Veteran and Civilian Suicide Decedents: A Sex-Stratified Analysis. American Journal of Preventive Medicine, 56[5], e163–8[22]	US	Case series	N=22,707 men suicide descendants with known military status (mean age 58.8 ± 22.2) N=67,716 men suicide decedents with known civilian status (mean age 43.2 ± 23.4) National Violent Death Reporting System (in 27 states)	2003–15	Suicide	NA	Male veterans were more likely to have a contributing physical health problem (AOR=1.10, 95% CI 1.06, 1.14) and use a firearm for their suicide (AOR=1.41, 95%CI 1.36, 1.47) compared to male civilians. Male veterans were less likely to have alcohol (AOR=0.91, 95% CI 0.87, 0.96) or substance use problems (AOR=0.70, 95% CI 0.66, 0.75), depressed mood (AOR=0.93, 95% CI 0.90, 0.97), or

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							financial problems (AOR=0.91, 95% CI 0.86, 0.97)
Bounoua et al. (2019). Identifying Suicide Typologies Among Trauma-Exposed Veterans. Crisis: Journal of Crisis Intervention & Suicide, Dec 20[23]	US	Case series	N=95 trauma-exposed veterans (age 21-55, mean age 41.5 ± 9.3, 87% men); Recruited through VA Boston Healthcare System	NA	Suicide ideation, suicide attempts and non-suicidal self-injury (NSSI)	Overall, 62% of veterans reported a lifetime history of suicidal ideation, 31% reported a lifetime history of suicide attempts and 55% reported lifetime NSSI	Conditional probability of belonging to the group with presence of both self-injurious thoughts (suicidal ideation) and behaviours (lifetime suicide attempts and NSSI) was strongly associated with trait-impulsivity and past-month risky behaviour (C.Prob=.27, p<.05) and trait disinhibition (C.Prob=.28, p<.01), with motivations for engaging in risky behaviour more strongly associated with motivations for

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							satisfying avoidance (C.Prob =.31, p<.05) Conditional probability of belonging to this group was also strongly associated with general distress (C.Prob=.27, p<.01) and anxious arousal (C.Prob=32, p<.01) Belonging to the group with presence of self-injurious thoughts and behaviours was unrelated to the extent of trauma exposure, depression, or PTSD symptoms
Kerr et al. (2018). Increased risk of attempted suicide in Australian	Australia	Cohort	N=229 veterans with PTSD (mean age 53.3 ± 13.3 years), incl. N=227	2007–14	Past history of suicide attempt	23.6% of veterans had a history of a suicide attempt, i.e. a previous	Veterans who attempted suicide were younger than veterans without

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
veterans is associated with total and permanent incapacitation, unemployment and posttraumatic stress disorder severity. ANZJ Psychiatry. 52[6], 552–60[24]			males; outpatient Military Service Trauma Recovery Day Program, Toowong Private Hospital			attempt on one's own life	suicide attempt (49.4 ± 14.6 and 54.6 ± 12.7 years, respectively; p=0.02) More veterans served in conflicts from East Timor onwards in the suicide attempt group when compared to veterans without suicide attempt (33.3% and 25.1%; p=0.05) PTSD score and employment status of not working/totally and permanently incapacitated related to increased risk of suicide attempts (OR: 1.02, 95% CI 1.00, 1.04; p=0.035, and OR: 3.29, 95%

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							CI 1.34, 8.08; p=0.01, respectively)
Strand et al. (2017). External-cause mortality among 21,609 Norwegian male military peacekeepers deployed to Lebanon between 1978 and 1998. Occupational & Environmental Medicine, 74(8), 573–7[25]	Norway	Cohort	N=21,609 Norwegian male military peacekeepers deployed to Lebanon during 1978 to 1998 (Age at first deployment: 18–59 median 22.8 ± 5.3; Age at end of follow-up: 21–91, median 50.3 ± 10.4) Comparison: National 5-year age-specific and 1-year period-specific rates among all Norwegian men	1978–2013	Suicide	Four suicide deaths occurred in the cohort during deployment (SMR=0.47, 95% CI 0.13, 1.21), and 140 occurred post-deployment (SMR=1.17, 95% CI 0.99, 1.38) with 101 in the high-conflict exposure group (SMR=1.30, 95% CI 1.06, 1.58)	There was an increased risk of suicide during the first 5 years post discharge (SMR=1.48, 95% CI 1.04, 2.04, not significant), and for those in the high-conflict exposure group (RR=1.21, 95% CI 0.81-1.78, not significant). The elevated risk of post-discharge suicide was only observed during the first 5 years post discharge (SMR=1.65, 95% CI 1.06, 2.46) Post-discharge suicide risk in the low-conflict exposure

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							group was similar to national rates
Rasmussen et al. (2017). Concerns of Older Veteran Callers to the Veterans Crisis Line. Suicide & Life-Threatening Behavior, 47[6], 387–97[26]	US	Case series	N=901 calls from discharged? veterans aged 60+ (range 60–101) to the Veterans Crisis Line (83.14% men) (15.43% were repeat callers) Comparison: N=2,707 veteran callers aged younger than 60	Jul–Dec 2013	Suicidal thoughts	Suicidal thoughts were reported by veterans in 28.97% of calls to the Veterans Crisis Line	There was no significant difference between veteran callers aged under 60 and those aged 60 and older in prevalence of suicidal thoughts (χ^2=1.40, p=.237) Veteran callers aged 60 or older who were experiencing suicidal thoughts were more likely to report physical health problems (t=-4.86, p<.001) or loneliness (23.89% vs 17.42%, χ^2 = 5.14, p=.023) compared to those younger than 60 years

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							Veteran callers aged younger than 60 years who were experiencing suicidal thoughts were more likely to report economic concerns (t = 3.65, p<.001), substance use (25.56% vs 15.79%, χ^2 =10.10, p=.002) or relationship problems (31.70% vs 19.43%, χ^2 = 13.85, p<.001) compared to those aged 60 years and older
Gradus et al. (2017). Gender Differences in Machine Learning Models of Trauma and Suicidal Ideation in Veterans of the Iraq and Afghanistan	US	Case series	N=1,062 national sample of men veterans deployed during the Iraq and Afghanistan conflicts	NA	Suicidal ideation	NA	Probable depression, anxiety and somatic symptoms, with a deployment to Iraq or Afghanistan increased the likelihood of suicidal ideation (55.4%)

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
Wars. Journal of Traumatic Stress, 30(4), 362–71[27]							Probable depression alone also increased the likelihood of suicidal ideation (33.3%)
Bohnert et al. (2017). Substance use disorders and the risk of suicide mortality among men and women in the US Veterans Health Administration. Addiction, 112[7], 1193–201[28]	US	Cohort	N=4,863,086 US Veterans Health Administration (VHA) users who received services in 2005 and were alive on Oct 1, 2006 (91.7% men) VHA National Patient Care Database (NPCD) and the VHA Suicide Data Repository	2006–11	Suicide	Out of 4,460,447 male veteran health affairs patients, 8796 died by suicide, resulting in a suicide rate of 36.9 per 100,000 person-years.	Substance use disorders increased the risk of suicide among veterans. More specifically, suicide risk was increased by any current substance use disorder (HR=2.29, 95% CI 2.12, 2.46, p<.001), alcohol use disorder (HR=2.26, 95% CI 2.10, 2.44, p<.001), cocaine use disorder (HR=1.35, 95% CI 1.17, 1.55, p<.001), cannabis use disorder (HR=2.17, 95% CI 1.91, 2.48), opioid use disorder

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							(HR=2.37, 95% CI 1.96, 2.86), amphetamine or other psychostimulant use disorder (HR=2.63, 95% CI = 2.06, 3.35) and sedative, hypnotic or anxiolytic use disorders (HR=4.74, 95% CI=3.64, 6.17). Notably, Hazard Ratios were lower when Cox hazards models controlled for psychiatric diagnoses Firearm was the most common method of suicide amongst men who with or without a current substance use disorder (50.0% vs 74.5%), and

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							amongst all men overall (70.2%). Poisoning was more common amongst men with a current substance use disorder than those without (23.1% vs 11.1%), as was strangulation (16.4% vs 9.4%) and other methods (10.5% vs 5.1%)
Bergman et al. (2017). Suicide in Scottish military veterans: a 30-year retrospective cohort study. Occupational Medicine (Oxford), 67[5], 350–5[29]	Scotland	Cohort	N=56,205 veterans born 1945–85 (90.7% men) Comparison: N=172,741 matched non-veterans (by age/sex/postcode) Scottish Veterans Health Study	1981–2012	Suicide	In the follow-up period, there were 267 veteran suicides (0.48%, mean age 44) compared to 918 non-veteran suicides (0.53%, mean age 41; HR=0.99, 95% CI 0.86, 1.13, not significant). This equates to 7.6% of deaths in veterans, and 8.4% of deaths in non-veterans. Veterans in the 1950-1954 cohort showed a	Early service-leavers were not at a significantly increased risk of suicide. There was no difference in method of suicide between veterans and non-veterans

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
						significantly increased risk of suicide when compared with non-veterans (HR=1.51, 95% CI 1.11, 2.06, p<.001), which remained when the model was adjusted for deprivation (HR=1.44, 95% CI 1.06, 1.97, p<.05)	
Allan et al. (2017). Insomnia and suicidal ideation and behaviors in former and current U.S. service members: Does depression mediate the relations? Psychiatry Research, 252, 296–302[30]	US	Case series	N=405 current and former military service members (mean age 31.6 ± 7.3 years, 90.4% male) with endorsed recent suicidal ideation and/or a history of suicide attempt	12 month follow-up	Suicidal ideation, suicide attempt	NA	Time 1 suicidal ideation was significantly associated with insomnia (r=0.19, B=0.22, p=.001) and cognitive/affective depression symptoms (r=0.27, p<.05). Time 2 suicidal ideation was significantly associated with Time 1 suicidal ideation (r=0.15, p<.05), and Time 2 cognitive/affective

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							depression symptoms (r=0.44, B=0.73, p<.05). Suicidal behaviour between Time 1 and Time 2 was significantly positively correlated with suicidal ideation at Time 1 (r=0.17, B=0.77, p<.05) and Time 2 (r=0.29, p<.05) At Time 1, insomnia was not directly associated with suicidal ideation, but it had a significant indirect effect through cognitive/affective depression (B=0.27, 95% CI 0.14, 0.49). Insomnia significantly predicted suicidal behaviour between

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							Time 1 and Time 2 (B=0.22, p<.05) Time 1 insomnia did not significantly predict Time 2 suicidal ideation (B=0.12, p=.20). Time 2 cognitive/affective depression symptoms mediated Time 1 insomnia and Time 2 suicidal ideation (B=0.25, 95% CI 0.08, 0.45) Somatic depression did not mediate the relationship between Time 1 insomnia and Time 2 suicidal ideation. Cognitive/affective depression symptoms did not mediate the relationship between

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							insomnia and suicidal behaviour
McGlade et al. (2016). Male suspected suicide decedents in Utah: A comparison of Veterans and nonveterans. Comprehensive Psychiatry, 69, 1–10[31]	US	Cohort	N=70 next of kin of male veteran suicide descendants Comparison: N=356 male non-veteran suspected suicide decedents Utah Office of the Medical Examiner	2008–09	Suicide (suspected)	NA	A significant difference in mean age of suicide was found between veterans (mean age=52.1 years) and non-veterans (mean age=36.1, p<.0001). This difference remained significant after non-veteran suicide descendants under the age of 18 years Veteran descendants were found to have significantly more access to firearms than non-veteran descendants (59% vs 49%, p<.004). Veterans were significantly more likely to die by

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							gunshot wound (39% vs 21%) and non-veterans were more likely to die by drug-overdose (62% vs 46%; gunshot vs drug-overdose in veterans OR=0.41, 95% CI 0.23, 0.72, p=.002). Differences in methods did not remain significant after adjusting for age Veterandecedents were more likely to have made a past suicide attempt than non-veterans (33% vs 22%, OR=1.89, 95% CI 1.06, 3.37) however there was no difference found between veterans and non-veterans with a precious

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							suicide attempt in the number of suicide attempts (OR=1.06, 95% CI 0.98, 1.14, p=0.15) There was no association between talking about suicide, disclosure of a suicide plan or ever specifying a suicide method, with veteran status
Blosnich et al. (2016). Population mental health among U.S. military veterans: results of the Veterans Health Module of the Behavioral Risk Factor Surveillance System, 2011–2012. Annals of	US	Case series	N=10,406 veterans who completed the Veterans Health Module of the Behavioral Risk Factor Surveillance System (92.8% men)	2011–12	Past 12-month suicidal ideation, suicide attempt	Among men, 5.1% (n=328) reported to experience suicidal ideation in the past 12 months, and 1% (n=34) reported a suicide attempt over the same time period	Among men, suicidal ideation was positively associated with unemployment (aOR=4.36, 95% CI 1.84, 10.35, p<.05) and inability to work (aOR=3.17, 95% CI 1.43, 7.04, p<.05), as well as a lifetime diagnosis of mental illness (depression, anxiety or PTSD,

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
Epidemiology, 26[8], 592–6[32]							aOR=5.49, 95% CI 2.97, 10.14, p<.05). Receiving mental health treatment in the past 12 months was also positively associated with suicidal ideation (vs no treatment, from a VA facility aOR=2.23, 95% CI 1.12, 4.41, p<.05; from a non-VA facility aOR=3.84, 95% CI 1.46, 10.10, p<.05; from both VA and non-VA facilities aOR=11.89, 95% CI 3.43, 41.16, p<.05) Combat exposure was negatively associated with suicidal ideation in men (aOR=0.54, 95% CI 0.32, 0.90, p<.05)

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							In the overall sample (both men and women), suicide attempt was positively associated with lifetime diagnosis of mental illness (aOR= 02.00, 95% CI 18.38, 566.11, p<.05), and negatively associated with age (aOR=0.94, 95% CI=0.89, 0.98, p<.05) and combat exposure (aOR=0.19, 95% CI 0.06, 0.61, p<.05)
Maguen et al. (2015). Gender differences in suicide and suicide attempts among US Army soldiers. Psychiatry	US	Case series	N=1,496 active veteran men soldiers who died by suicide or attempted suicide in the study period (aged 17–40+); Department of	2008–10	Suicide, suicide attempts	Among men veterans, there were 404 suicides in the study period	The strongest risk factors for suicide among men veterans included having a failed intimate relationship in the 90 days prior to suicide (POR=1.42, 95% CI

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
Research, 225[3], 545–9[33]			Defense Suicide Event Report				1.07, 1.88) and no education beyond high school (POI=1.52, 95% CI 1.08, 2.14) in comparison to those who attempted suicide. Suicide was positively associated with not being married (POR=1.23, 95% CI 1.08, 2.14), history of substance abuse (POR=1.18, 95% CI 0.87, 1.60) and being in separation proceedings (POR=1.11, 95% CI 0.75, 1.64) Among veterans who attempted suicide, having a major psychiatric diagnosis was the most common risk factor

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							for suicide attempt (n=515 vs 128 (suicide), POR (ref. suicide)=0.55, 95% CI 0.41, 0.73) compared to suicide Veterans who suicided were more likely to use a gun (65%) compared to those with an attempt (8%), p<.0001
O'Toole et al. (2015) Suicidality in Australian Vietnam veterans and their partners. J Psychiatr Res. 65:30–6[34]	Australia	Case series	N=448 Vietnam veterans (mean age 60.4, SD 5.2); Australian Army data (wave 2 interviews), and age-sex matched Australian population, Australian National Survey of Mental Health and Wellbeing 1997	Veteran data 2005–06 General population data 1997	Lifetime suicidal ideation, plan, attempt	Prevalence of lifetime suicidality in Vietnam veterans: suicidal ideation (24.0%; RP:7.91, 95% CI 6.61, 30.63); suicide plan (16.7%; RP: 9.73, 95% CI 7.72, 51.20); suicide attempt (7.3%; RP: 13.82, CI 95% 9.28, 138.88). Vietnam veterans were 7.91 times more likely than members of the general population to experience suicidal	Vietnam veterans: more years of schooling associated with lower risk of planning and attempt (p<0.05; ns for ideation). Alcohol abuse/dependence related to ideation, planning (each p<0.05) and attempt, social phobia related to ideation and attempt (each

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
						ideation (95% CI 6.61–30.63), and 9.73 times more likely to have made a suicide plan (95% CI 7.72–51.20). Prevalence of lifetime suicidality in partners of Vietnam veterans: suicidal ideation (15.2%; RP: 6.24, 95% CI 4.36, 8.12); suicide plan (5.1%; RP: 3.54, 95% CI 1.58, 5.48); suicide attempt (2.5%; RP: 5.99, 95% CI 1.26, 10.73) No concordance between veterans and their partners for suicidal ideation or suicide plan; a weak relationship for suicide attempt (p=0.02)	p<0.01); depression related to all aspects of suicidality (p<0.01). PTSD associated with ideation and attempt (p<0.05; ns for planning) Partners of Vietnam veterans: depression associated with suicidal ideation and planning (p < 0.01,), dysthymia associated with suicide planning (p < 0.05,), alcohol disorders and social phobia associated with suicide attempt (p < 0.05)
McCarten et al. (2015). Changes in overall and firearm veteran suicide	US	Case series	N=39,408 veteran suicides (aged	2001–10	Suicide	Among men, the suicide rate increased by 15% across the study period	Among suicides by men veterans, firearms were the most commonly used

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
rates by gender, 2001–2010. American Journal of Preventive Medicine, 48[3], 360, 364[35]			18–70+ years, 94% men) Department of Veterans Affairs suicide mortality database			(43 per 100,000 to 50 per 100,000)	mechanism, accounting for 69% of suicides The percentage of suicides by men with firearms remained stable throughout the study period, however age-adjusted firearm suicide rates for men veterans increased throughout the study period by 16% (95% CI 9.0, 23.3)
Hoffmire et al. (2015). Changes in Suicide Mortality for Veterans and Nonveterans by Gender and History of VHA Service Use, 2000–2010, Psychiatric	US	Cohort	N=173,969 veteran suicide descendants (94.1% men, aged 18–80+) Comparison=non-veteran suicide descendants	2000–10	Suicide	Over the study period, suicide rates increased. Among men veterans, it increased from 28.8 per 100,000 in 2000 to 36.0 per 100,000 in 2010. These rates were also higher than those Among non-veteran men (2000:	NA

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
Services, 66[9], 959–65[36]			U.S. Department of Veterans Affairs suicide data archive			20.1 per 100,000; 2010: 21.4 per 100,000) Overall, veteran suicide rates increased by 25% during the study period, While non-veteran rates increased by 12%. The suicide rate for veterans who accessed VHA support declined over the study period, and was lower than that of non-VHA utilising veterans in 2010 (27.6 per 100,000 vs 38.7 per 100,000) despite being higher from 2000 to 2002	
Bullman et al. (2015). Time dependent gender differences in suicide risk among Operation Enduring Freedom and Operation Iraqi Freedom veterans.	US	Case series	N=1,401,382 active duty, reserve and National Guard veterans who deployed to OEF/OIF and deactivated from	2002–11	Suicide	There were a total of 1,491 suicides among males during the study period	Suicide rates were highest during the first year after deactivating from active duty (36.2 suicides per 100,000 lives) and decreased on average by -6.1% each year over 7

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
Annals of Epidemiology, 25(12), 964–5[37]			active military duty (n=1,237,049 men)				years (7th year rate=20.7 suicides per 100,000 lives)
King et al. (2014). Age-related concerns of male veteran callers to a suicide crisis line. Archives of Suicide Research, 18[4], 445–52[38]	US	Cohort	N=412 male (M=48.6 years; SD=13.32) VA Crisis Line Callers	2008	Age-related concerns		Majority of concerns related to mental health (68.2%), suicide ideation (42.5%), substance abuse (30.3%); also suicide plan (14.3%), suicide attempt (2.4%). Age associated with loneliness (OR=1.05; p<0.01) and mental health concerns (OR=0.98; p<0.05); not associated with themes related to suicidal behaviour
Miller et al. (2013). Veterans and suicide: a re-examination of the National Death	US	Cohort	N=500,822 adult males (aged 18–65+ years) who completed the	1986–2000	Suicide	Over the study period, 482 male veterans died by suicide (26.2 per 100,000), While 835 male non-veteran males died	Suicide risk for veterans was only modestly higher than non-veterans, and this difference was

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
Index-linked National Health Interview Survey. American Journal of Public Health, 102[S1], S154–9[39]			National Health Interview Survey (n=149,133 with self-reported veteran status; n=351,689 non-veterans)			by suicide (18.8 per 100,000 person-years)	not significant when accounting for differences in age, race and survey year (HR=1.11, 95% CI 0.96, 1.29) Firearm was the most common suicide method, used for 76% of veteran suicides and 62% of non-veteran suicides. The rate of firearm use was significantly higher Among veterans compared to non-veterans when accounting for differences in age, race and survey year (HR=1.19, 95% CI 1.01, 1.40)
Katz et al. (2013). Suicide among veterans in 16 states, 2005 to	US	Cohort	N=1,151,260 adult men veterans utilising Veterans Health	2005–08	Suicide	A total of 1,767 suicides in veteran men were reported in the study period, resulting in a	Suicide rates were consistently higher for VHA utilisers than non-utilisers across

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
2008: comparisons between utilizers and non-utilizers of Veterans Health Administration (VHA) services based on data from the National Death Index, the National Violent Death Reporting System, and VHA administrative records. American Journal of Public Health, 102[S1], S105–10[40]			Administration (VHA) support (aged 18-65+) N=5,042,184 adult men veterans not utilising VHA support			suicide rate of 28.53 per 100,000 person-years	all years of the study period (36.45–40.09 vs 23.75–28.75 per 100,000 person-years). This difference in suicide rates also applied across most age-groups except for the 18–29 age-group (this difference is possibly due to the small sample size) A significant interaction between years and between VHA utilisers compared to non-utilisers showed a decrease in suicide rates Among VHA utilisers compared to non-utilisers over time (Wald χ^2=4.949, p<.026). Over the study period, suicide

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							rates increased Among VHA utilisers aged 30 or older, While suicide rates decreased Among VHA utilisers aged 29 or younger
Conner et al. (2013). Mental disorder comorbidity and suicide among 2.96 million men receiving care in the Veterans Health Administration health system. J Abnormal Psychology, 122[1](1), 256–63[41]	US	Cohort	N=2,962,810 men receiving care in the Veterans Health Administration (VHA) Health System	1999–2006	Suicide, mental disorder comorbidity (additive, synergistic, subadditive)		46.5% of men in the cohort who died by suicide had at least one diagnosed mental disorder (30.7% depression, 21.3% SUD, 14.5% anxiety disorder, 11.7% PTSD, 8.9% schizophrenia, 8.6% bipolar disorder). Among those with a diagnosis, most had another comorbid condition. Nearly all combinations of disorders showed subadditive risk i.e. disorders in

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							combination showed lower suicide risk than expected by summing suicide risk associated with each disorder separately
Fanning & Pietrzak (2013). Suicidality among older male veterans in the United States: results from the National Health and Resilience in Veterans Study. J Psychiatric Research, 47[11], 1766–75[42]	US	Cohort	N=1962 male veterans (M=71.0 years, SD=7.1); National Health and Resilience Veterans Survey	Oct–Dec 2011	Current suicidal ideation (SI), past suicide attempt (SA)	6% past 2-week SI (more likely in combat than non-combat veterans; 9.2% vs 4.0%). 2.6% lifetime SA	Sig predictors of current SI included lower education, unmarried/unpartnered status, physical health difficulties, current psychological distress, hostility, and social connectedness ($p<0.05$) Sig predictors of SA included lower education and unmarried/ unpartnered status, lifetime trauma exposure, probable lifetime depression,

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							PTSD, and alcohol use disorder (p<0.05) 42.2% of veterans with current SI ever received mental health treatment (23.9% current treatment); 84.4% of veterans with lifetime SA ever received mental health treatment (46.7% current treatment)
Gradus et al. (2013). Predictors of suicidal ideation in a gender-stratified sample of OEF/OIF veterans. Suicide & Life-Threatening Behavior, 43[5], 574–88[43]	US	Cohort	N=2,321 OEF/OIF veterans, incl. N= 1,139 male veterans M=37 years, SD=10.1)		Deployment stressors, postdeployment suicidal ideation (SI)	19.2% suicide ideation	Associations between deployment stressors and suicide ideation almost fully accounted for by mental health symptoms including PTSD, depression, and alcohol use

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
Kaplan et al. (2012). Suicide risk and precipitating circumstances among young, middle-aged, and older male veterans. American Journal of Public Health, 102[S1], S131–7[44]	US	Cohort	N = 8440 male veteran suicide descendants Comparison: N=21,668 male non-veteran suicide descendants National Violent Death Reporting System	2003–8	Suicide	NA	The risk of suicide was higher Among veterans compared to non-veterans across most age groups including 18–34 years (SMR=1.26, p<.05), 35-44 years (SMR1.12, p<.05) and 45-65 years (SMR=1.04, p=.05). However, this difference was not significant in the 65 years and older age group (SMR=0.98). Suspected depressed mood was the most commonly reported risk factor, experienced 45.3% of veteran suicide descendants overall. This percentage was significantly higher in older age groups,

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							endorsed for 36.1% of veteran descendants aged 18-34, and 48.1% of veterans aged 65 and older (AOR=1.52 (1.29, 1.80, p<.001) Risk factors for suicide varied by age group. Suicide risk in younger veterans (aged 18–34 and 35–44) was associated with intermate partner problems, experienced by 47.3 to 49.7% of suicide descendants in this age group, compared to 25.8% in veterans aged 45-64 (AOR=0.27, 95% CI 0.23, 0.32, p<.001) and 8.6% in veterans aged 65 and older

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							(AOR=0.07, 95% CI 0.06, 0.09, p<.001). Financial, legal and occupational difficulties were also associated with suicide risk Among the youngest two age groups Financial problems were associated with suicide risk for the middle age groups, experienced by 16.7% of suicide descents across both these age groups (35-44 years AOR=1.53, 95% CI 1.16, 2.03, p<.01; 45-64 years AOR=1.48, 95% CI 1.16, 1.88, p<.01). Alcohol abuse was also associated with suicide risk Among

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							these age groups, experienced by 24.0% of suicide descendants aged 35-44 years (AOR=1.61, 95% CI 1.26, 2.06, p<.001) and 24.5% Among those aged 45-64 years (AOR=1.61, 95% CI 1.30, 2.00, p<.001) Among older veterans, suicide risk was associated with health problems, experienced by 66.7% of suicide descendants in this age group (65+ years AOR=36.09, 95% CI 25.92, 50.25, p<.001; 45-64 years AOR=6.43, 95% CI 4.62, 8.95, p<.001) and use of a firearm

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							(83.5% in 65+ age group compared to 61.3% in 18–34 age group, AOR=3.51, 95% CI 2.92, 4.21, p<.001). Older and middle-aged veteran suicide descendants were also less likely to have had a suicide attempt compared with younger veterans (14.6% in 45-64 years and 6.9% in 65+ years, compared to 16.6% in 18-34 years, AOR=0.79, 95% CI 0.63, 0.98, p<.05, and AOR=0.33, 95% CI 0.26, 0.42, p<.001, respectively)
Blow FC et al. (2012). *"Suicide mortality among patients treated by*	US	Case control	Individuals who received veterans health administration	2000–7 fiscal years	Suicide death by veterans	The suicide rate for male service users is reported by year 2000–7. In the latest year (2007) was	

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
the Veterans Health Administration from 2000 to 2007." American Journal of Public Health 102 Suppl 1: S98–104[45]			health care services, N=8,855,655 (males 90.5–91.9% per year) compared to the general population matched by age and gender			37.5 per 100,000 (32.9 for 18–29 year olds, 41.8 for 30–64 year olds, 33.4 for those=>65 years). These rates were higher than the general population in each age group (standardized mortality ratio compared to general population in 2007 was 1.43–1.65 for 18–29, 1.70 for 30-64, 1.17 for 65+). Suicide rates decreased for VHA users between 2000 and 2007 for men aged 30-64 and 65 years and older	
White R et al. (2011). *"History of military service and the risk of suicidal ideation: findings from the 2008 national survey on drug* use and health." Suicide &	US	Cohort	17,641 men who completed the 2008 National Survey on Drug Use and Health. Excluding those on current active duty	2008	History of US military service, past suicidal ideation, plans and attempts, psychological distress,	In all three age groups (18–25, 26–35, 36+) men who had ever served in the armed forces were no more likely than men who had never served to report having seriously considered suicide	Suicide ideation was not associated with military status in age and race adjusted analyses. Military service was also not differentially associated with

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
Life-Threatening Behavior 41[5]: 554–561[46]					psychiatric conditions, socio-demographic characteristics		recent suicide plans or attempts
Mansfield et al. (2011). Suicidal or self-harming ideation in military personnel transitioning to civilian life. Suicide & Life-Threatening Behavior, 41[4], 392–405[47]	US	Case series	N=3,069 male Navy and Marine Corps personnel transitioning from active duty to civilian life	NA	Suicidal/self-harming ideation	Overall, 7% of men (n=203) reported to experience suicidal or self-harming ideation during the previous 30 days (9% of Marine corps, 5.3% of Navy corps).	Across both Navy and Marine corps, suicidal ideation was positively correlated with PTSD (r=.35–.36, p<.01), depression symptoms (r=.39–.45, p<.01), substance abuse (r=.11–.13, p<.01) and negatively correlated with resilience (r=-.16–.29, p<.01). Path analysis models revealed a direct relationship between depression and suicidal ideation

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							(Standardised regression coefficient=0.33–0.41, p<.05) The interaction between substance abuse and PTSD was a moderator for the relationship between depression and suicidal ideation (Standardised regression coefficient=0.09–0.10, p<.05). Substance abuse significantly moderated the relationship between PTSD and suicidal ideation (Navy: standardised regression coefficient=0.097, p=.005; Marines: standardised regression

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							coefficient=.088, p=.009). The direct effects of PTSD and combat exposure on suicidal ideation were not significant. PTSD was found to mediate the relationship between depression and suicidal ideation (p<.0005 for both Navy and Marines). Combat exposure was found to mediate the relationships between depression (Navy standardised regression coefficient=-0.04, p<.05; Marine standardised regression coefficient=-0.08, p<.05) and PTSD (Navy: standardised regression

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							coefficient=0.13, p<.05; Marines: standardised regression coefficient=0.25, p<.05) with suicidal ideation Resilience was found to have a significant and negative direct relationship with suicidal ideation in the Marines only (β=0.16, p=.007; Navy not significant). Resilience also had significant indirect effects on suicidal ideation through depression symptoms (Navy: β=-.067, p<.0005; Marines: β=-.085, p<.0005) and PTSD (Navy: β=-.079, p<.0005; Marines:

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							β=-0.92, p<.0005). Higher resilience was associated with lower depression and PTSD symptoms, and therefore lower suicidal ideation
Lemaire et al. (2011). Factors associated with suicidal ideation in OEF/OIF veterans. Journal of Affective Disorders, 130[1–2], 231–38[48]	US	Case series	N=740 returning OEF/OIF veterans registered with the Houston Veterans' Affairs Medical Centre for routine mental health screening	2004–08	Suicidal ideation	Overall, 6.5% of veterans (n=113) reported active suicidal ideation at the time of the interview	Current suicidal ideation was most strongly positively associated with having a prior suicide attempt (OR=4.71, 95% CI 1.87, 12.16, p=0.001), a depressive disorder diagnosis (OR=3.79, 95% CI 1.87. 7.71, p<0.001), and negatively associated with social support (OR=0.94, 95% CI 0.91, 0.97, p<0.001) Veterans with suicidal ideation

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							reported higher percentages of pre-enlistment physical abuse (10.6% vs 6.0%, p=.010), and sexual abuse (16.2% vs 5.9%, p<.001), prior suicide attempts (32.2% vs 5.8%, p<.001), psychotic disorders (36.4% vs 6.4%, p<.001), depressive disorders (13.5% vs 1.9%, p<.001) and PTSD (12.9% vs 4.0%, p<.001) compared with those without suicidal ideation Current suicidal ideation (SI) was positively associated with deployment factors, including concerns relating to the deployment

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							environment (SI Mean=65.2 (SD=12.6); Non-SI M=60.1 (13.2), p<.001), family concerns (SI M=31.1 (8.6); Non SI M=28.1 (8.5), p=.004) and deployment concerns (SI M=53.6 (12.2); Non SI M=46.9 (12.6), p<.001). Current suicidal ideation was negatively associated with (protective factors) concerns related to deployment training and preparation (SI M=46.0 (10.5); Non SI M=50.0 (10.9), p=.002) and post-deployment support (SI M=46.8 (10.4);

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
							Non SI M=55.4 (10.3), p<.001) Depressive disorders (OR=15.20, 95% CI 7.05, 32.80, p<0.001) and PTSD (OR=10.02, 95% CI 4.02, 24.97, p<0.001) were significantly associated with suicidal ideation, While comorbid depressive disorder and PTSD (OR=18.83, 95% CI 8.85, 40.10, p<0.001) has a much higher odds ratio for risk of suicidal ideation than did either disorder alone
Ilgen et al. (2010). Psychiatric diagnoses and risk of suicide in veterans. Archives	US	Cohort	N=3,291,891 veterans who used Veterans Health Administration services in 1999	1999–2006	Suicide	During the study period, 7684 veterans died by suicide, resulting in a	The presence of a psychiatric diagnosis was associated with a higher risk of suicide (HR=2.60,

Reference	Country	Study design	Study population	Time period	Outcomes/ variables	Results–prevalence	Results–risk factors
of General Psychiatry, 67[11], 1152–8[49]			(fiscal year) and were alive at the start of year 2000 (90% men, age range 18–80+ years)			suicide rate of 37.7 per 100,000 person-years.	95% CI 2.47, 2.74), with 46.8% of veterans who died by suicide having at least one psychiatric diagnosis at baseline Bipolar disorder was the psychiatric diagnosis associated with the highest risk of suicide (HR=3.19, 95% CI 2.94, 3.46) diagnosed in 9% of veteran patients who died by suicide, followed by depression (HR=2.70, 95% CI 2.56, 2.85) and substance abuse (HR=2.47, 95% CI 2.30, 2.64) and alcohol abuse (HR=2.48, 95% CI 2.32, 2.65)

Table 2—Summary of included studies: risk of suicide for male defence force members.

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
Zuromski et al. (2019). Assessment of a Risk Index for Suicide Attempts Among US Army Soldiers With Suicide Ideation: Analysis of Data From the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). JAMA Network Open, 2[3], e190766[50]	US	Cohort	N=3,649 (80.5% male) Regular Army soldiers (age 18–55 yrs) with self-reported lifetime suicidal ideation	2011–14 3 surveys: Core AAS 2011/2012; AAS expansion 2012/2013; STARRS Pre-Post Deployment Survey 2012 Department of Defence Suicide Event Report data 2014	Non-fatal suicide attempts (suicide case excluded)	65 respondents recorded a non-fatal suicide attempt during the study period. Suicide attempt methods (N=77): Poisoning (n=22); Alcohol or drug related (n=16); Blunt or sharp objects (n=12); Firearm related (n=8); Other methods (n=12); Method data missing (n=7)	Risk factors for suicide attempts: recent suicidal ideation (in the past 30 days) (OR=7.2, 95%CI 2.9,18.0); persistence of worst-week suicidal ideation (OR=2.6, 95%CI 1.0, 6.8); lifetime positive screens for 2 or more mental disorders (OR=26.2, 95% CI 6.1, 112.0); Junior enlisted rank compared to Officer rank (OR=30.0, 95% CI 3.3, 272.5); Senior enlisted rank compared to officer rank (OR=6.7, 95% CI 0.08, 54.9)
Sheriff et al. (2019). Childhood	Australia	Case control	N=1,356 ADF males (age 18–60	ADF data 2010	Suicidality (thoughts,	There were significantly higher rates of suicidality	In the ADF population suicidality

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
determinants of suicidality: comparing males in military and civilian employed populations. Psychological Medicine, 49[14], 2421–31[51]			ys); ADF Mental Health Prevalence and Wellbeing Study data N=2,120 civilian men (age 18–60 ys), Australian Bureau of Statistics Australian National Survey of Mental Health and Wellbeing	General population data 2007	plan, attempt)	in the ADF than in general population: Any suicidality: 3.78%; 95% CI 3.70, 3.87 Suicidal thoughts: 3.70%; 95% CI 3.61, 3.78 Suicide plans 1.06%; 95% CI 1.01, 1.11 Suicide attempts 0.40%; 95% CI 0.37, 0.44	associated with the lowest education category and being older (not significant in civilians). In ADF and general populations suicidality associated with being single In the ADF, there was a much higher proportion of those with a high count of childhood trauma, i.e. trauma before the age of 18 (three or more types). Suicidality associated with high counts of childhood trauma types in both populations. Suicidality not associated with childhood non-interpersonal or unclassified trauma; associated with childhood

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							interpersonal trauma in both populations In the ADF suicidality associated with childhood anxiety (not significant in civilians), but not with childhood depression or alcohol use disorders (both sig in civilians). A higher proportion of those in the ADF experienced high counts of adult trauma; suicidality associated with high counts of adult trauma in both populations. Suicidality associated with being in the Navy or Army and with not being an Officer. Suicidality not associated with combat exposure or deployment

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							Childhood anxiety fully mediated the relationship between childhood trauma and suicidality in the ADF, but not in civilians
Willmund et al. (2019). Suicides between 2010 and 2014 in the German Armed Forces-Comparison of Suicide Registry Data and a German Armed Forces Survey. Suicide & Life-Threatening Behavior, 49[5], 1497–1509[52]	Germany	Case control	N=107 (99% Males) suicide cases among active, non-retired German military personnel (age 17–46+ yrs); Archived medical records kept by Bundeswehr Institute of Military Medical Statistics and Data Management Comparison: N=1549 (91% Males) soldiers longitudinal postal survey;	2010–14	Suicide	NA	Suicide cases were significantly over-represented in the following sub-groups: Soldiers who were aged 45+ (OR=4.5, 95%CI 2.5, 8.1, p<.001); Single relationship status (i.e. not in a committed relationship) (OR=6.0, 95% CI 3.7, 9.6, p<.001); Lower Secondary education or less (OR=2.0, 95% CI 1.2, 3.3, p=.011); No or little deployment experience (less than two missions abroad)

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
			Bundeswehr Centre of Military History and Social Sciences				(OR=2.0, 95% CI 1.0, 3.8, p=.040)
Ursano et al. (2018). Nonfatal Suicidal Behaviors in the Administrative Records of Activated U.S. Army National Guard and Army Reserve Soldiers, 2004-2009. Psychiatry, 81[2], 173–92[53]	US	Cohort	N=72,804 person-months (from database of N=1.66 million active duty soldiers) (84.5% men) Army STARRS Historical Administrative Data Study (HADS)	2004–9 (during wars in Iraq and Afghanistan)	Non-fatal suicide event (suicide attempt, suspicious injury, suicide ideation)	During this time of active service, 2937 unique RC soldiers had a definite suicide attempt (n=336) or a probably attempt (n=767), a suspicious injury (n=230), definite suicide ideation (n=213) or probable ideation (n=1,391) Over the study's duration, increases in annual incidence rates of suicide attempt (71–204/100,000 person-years) and suicide ideation (326–425 person-years) were observed	Risk factors positively associated with suicide attempt: Age 21 years of less (Definite attempt OR=2.5, 95% CI 1.8, 3.5; Probable attempt OR=1.6, 95% CI 1.3, 2.0); Never married (Definite attempt OR=1.5, 95% CI 1.2, 1.9; Probable attempt OR=1.7, 95% CI 1.4, 2.0) Risk factors positively associated with Suspicious injury: Age 21 years of less (OR); Never married (OR=2.6, 95% CI 1.9, 3.5)

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							Risk factors positively associated with suicide ideation: Age 21 years of less (Definite ideation OR=1.7, 95% CI 1.1, 2.4; Probable ideation OR=1.6, 95% CI 1.4, 1.9); Never married (Definite ideation OR=1.7, 95% CI 1.3, 2.3; Probable ideation OR=1.3, 95% CI 1.1, 1.4) Completing high school education or higher was negatively associated with non-fatal suicide events (significant across all higher education levels). Rank lower than E4 (E1–3) was positively associated with non-fatal suicide events, while rank higher than E4

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							(E5–8, Office/WO) was negatively associated with non-fatal suicide events
Ursano et al. (2018). Risk Factors Associated with Attempted Suicide Among US Army Soldiers Without a History of Mental Health Diagnosis. JAMA Psychiatry, 75[10], 1022–32[54]	US	Cohort	N=9,650 active-duty with recorded suicide attempt (74.8% men) N=153,528 control person-months (86.3% men) Army STARRS Historical Administrative Data Study	2004–9	Suicide attempt	NA	36.3% of soldiers without a previous mental health diagnosis had a documented suicide attempt. A history of a previous mental health diagnosis was associated with higher odds of suicide attempt (OR=3.2, 95% CI 3.1, 3.3) In both groups (with and without a pervious mental health diagnosis), odds of suicide attempt were higher among soldiers who were younger (No diagnosis χ^2=16.8, p=.005; Previous diagnosis χ^2=61.8,

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							p<.001), non-Hispanic white (No diagnosis χ^2=51.0, p<.001; Previous diagnosis χ^2=88.6, p<.001), less educated (No diagnosis χ^2=307.4, p<.001; Previous diagnosis χ^2=130.0, p<.001), in their first 4 years of service (No diagnosis χ^2=352.7, p<.001; Previous diagnosis χ^2=634.9, p<.001), never or previously deployed (vs currently deployed, No diagnosis χ^2=143.4, p<.001; Previous diagnosis χ^2=458.3, p<.001), and those with a delayed promotion (No diagnosis χ^2=100.8, p<.001; Previous diagnosis χ^2=228.9,

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							p<.001), demotion (No diagnosis χ^2=25.9, p<.001; Previous diagnosis χ^2=45.0, p<.001), combat arms or combat medic occupation (No diagnosis χ^2=39.0, p<.001; Previous diagnosis χ^2=67.7, p<.001), getting married between 2 and 12 months ago (No diagnosis χ^2 = 20.4, p<.001; Previous diagnosis χ^2=42.0, p<.001), previous injury-related health care visit (No diagnosis χ^2=232.3, p<.001; Previous diagnosis χ^2 = 527.8, p<.001) and recency of this visit (Outpatient, No diagnosis χ^2=658.1, p<.001;

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							Previous diagnosis χ^2=836.8, p<.001) Odds of suicide attempt were increased in both groups, and significantly more in soldiers without previous mental health diagnosis, among soldiers who had less than high school education (No diagnosis OR=1.9, 95% CI 1.8, 2.0; Previous diagnosis OR=1.4, 95% CI 1.3, 1.5), delayed promotion (No diagnosis OR=2.1, 95% CI 1.5, 2.0; Previous diagnosis OR=.7, 95% Ci 1.5, 2.0 and past-year demotion (No diagnosis OR=1.6, 95% CI 1.3, 1.8; Previous diagnosis OR=1.4, 95% CI 1.3,

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							1.5). Entering the army aged 21 or younger was associated with higher odds of suicide attempt only in soldiers with no previous mental illness diagnosis (OR=1.2, 95% CI 1.0, 1.3) Subjection to crime, crime perpetration and family violence also increased odds of suicide attempt among soldiers with and without a previous mental health diagnosis
Ursano et al. (2018). Associations of Time-Related Deployment Variables With Risk of Suicide Attempt Among Soldiers:	US	Cohort	N=593 active-duty enlisted soldiers with medically documented suicide attempt during/ after 2nd	2004–9	Suicide attempt	NA	Previous deployment was associated with higher odds of suicide attempt (vs those currently deployed (OR=2.1, 95% CI 1.7, 2.6)

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
Results From the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). JAMA Psychiatry, 75[6], 596–604[55]			deployment (86.5% men) N=19,034 equal probability control person-months (91.2% men weighted sample) Army STARRS Historical Administrative Data Study				Odds of suicide attempt during or after second deployment were increased among soldiers who were in military service for 12 months or less before deployment (OR=2.0, 95% CI 1.6, 2.4), and with 6 months or less between deployments (vs more than 6 months, OR=1.6, 95% CI 1.2, 2.0) Duration of first deployment was not associated with suicide attempt
Reimann et al. (2018). Suicide Rates Among Active Duty Service Members Compared with Civilian	US	Cohort	N=2,091 deceased full-time active service men with manner of death recorded as	2005–14	Suicide	Number of suicides per year in the 19–29 years age group ranged from 106 (in 2005) to 204 (in 2012) and 36 (in 2005) to	Lower rates of suicide among active service military men were significantly associated with being aged 25–49

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
Counterparts, 2005-2014. Military Medicine, 183[S1], 396–402[56]			‘suicide’ (age 17–74) Armed Forces Medical Examiner Tracking System (AFMETS) Civilian comparison (includes reserve and guard service members): Centers for Disease Control and Prevention’s Web-based Injury statistics query and reporting system			93 (in 2012) in the 30–74 years group	years compared with civilians Higher suicide rates were associated with men in the 17–19 age group from 2007 to 2010, and the 20–24 years age group in 2009 and 2012 compared with civilians
Millner et al. (2018). Lifetime Suicidal Behaviors and Career Characteristics Among U.S. Army Soldiers: Results from the Army Study to Assess Risk and Resilience	US	Case series	N=26,927 men active army soldiers not currently deployed to a combat zone Consolidated All Army Survey (AAS) of the Army Study to Assess Risk and	2011–13	Suicidal ideation, non-fatal suicide attempt	The prevalence estimates for lifetime suicidal ideation among soldiers was 12.7%, and 2.5% for suicide attempts	Lifetime prevalence of suicide attempts was higher among soldiers in the Regular army (2.6% vs 1.2% national guard or Reserve army, F(1,210)=26.8, p<.001) and among junior (2.9%) and

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
in Servicemembers (Army STARRS). Suicide & Life-Threatening Behavior, 48[2], 230–50[57]			Resilience in Servicemembers (Army STARRS)				senior enlisted soldiers (2.5% vs 1.2% officers, F(2,209)=7.8, p<.001) but did not differ by military occupational specialty (F(2,209)=0.1, p=.88) Lifetime prevalence of suicide ideation was higher among soldiers in the Regular army (13.2% vs 8.4% national guard or reserve army, F(1,210)=24.8, p<.001) The majority of cases of lifetime suicidal ideation (61.2%) and lifetime attempt (56.7%) had pre-enlistment onset
May et al. (2018). Nonsuicidal self-injury, suicide	US	Case series	N=897 active national guard personnel	NA	Suicidal thoughts and	29.1% (95% CI 25.8, 32.4) of men reported lifetime suicide ideation,	Lifetime suicide ideation was higher among those who

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
ideation and suicide attempts in the National Guard. Comprehensive Psychiatry, 86[10], 115–8[58]			(recruited online on National Center for Veterans Studies website)		behaviours, non-suicidal self-injury	while 3.3% (95% CI 2.0, 4.6) reported a lifetime suicide attempt.	reported lifetime NSSI (79.1%, 95% CI 66.9, 91.3). Lifetime suicide attempt was also higher among those who reported lifetime NSSI (30.2%, 95% CI 16.5, 43.9)
Ursano et al. (2017). Risk of Suicide Attempt Among Soldiers in Army Units with a History of Suicide Attempts. JAMA Psychiatry, 74[9], 924–31[59]	US	Cohort	N=9,650 active-duty, regular US army, enlisted soldiers who attempted suicide in the study period (86.4% men) N=153,528 equal-probability sample of control-person months Army Study to Assess Risk and Resilience in	2004–9	Suicide attempt	NA	Soldiers were more likely to attempt suicide if there had been a suicide attempt in their unit during the past year (ORs, 1.4-2.3, p<.001). The odds of soldiers attempting suicide increased as the number of suicide attempts in the unit increased (χ^2=543.9, p<.001). In units with 5 or more suicide attempts in the past year, the odds of a suicide attempt

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
			Servicemembers (STARRS)				among soldiers was twice that of soldiers who were in a unit with no previous attempts (OR=2.3, 95% CI 2.1, 2.6). This effect was strongest in smaller units (comprising of 1–40 soldiers), where the risk of suicide attempts among soldiers was highest compared to all larger unit sizes (1 attempt OR=2.1 (1.7-2.7), p<.001; 5 + attempts OR=5.9 (3.9-9.1), p<.001) This association did not vary between combat arms and other military operation specialisations
Rogers et al. (2017). Sex Differences in	US	Case series	N=3,374 active military personnel (91.9% male, age	NA	Suicide ideation,	Based on prior medical information, 13 (0.41%) of men participants had a	NA

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
Suicide-Related Symptoms in a Large Military Sample. Military Behavioral Health, 5[1], 73–80[60]			20-57, mean 29.92 ± 4.94)		past suicide attempt	prior suicide attempt and 61 (1.97%) of men had experienced previous episodes of suicide ideation	
Phillips et al. (2017). Risk Factors Associated With Suicide Completions Among US Enlisted Marines. American Journal of Epidemiology, 186[6], 668–78[61]	US	Cohort	N=108,930 active-duty male Marines who voluntarily completed a baseline health survey as part of the Recruit Assessment Program Department of Defense Medical Mortality Registry	2001–10	Suicide	Overall, 123 Marines (0.1%) died by suicide Of the marine deaths that occurred during the study period, 15.6% were suicides	Deployment status: Suicide was less likely among those who were deployed (n=54, 0.08%) compared to those who were never deployed (n=69, 0.16%). Pre-enlistment risk factors positively associated with suicide in the final multivariate model were: Less than high school education (HR=2.17, 95% CI 1.28, 3.68); Being a smoker at the time of enlistment (HR=1.91, 95% CI 1.32, 2.76). Lack of social

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							support at preservice was also positively associated with suicide risk (HR=2.72, 95% CI 1.32, 5.57) During active service, risk factors positively associated with suicide in the final multivariate model were: Traumatic brain injury diagnosis (HR=4.09, 95% CI=2.08, 8.05); Depression diagnosis (HR=2.36, 95% CI 1.22, 4.58); Received relationship counselling (HR=0.53, 95% CI 0.26, 1.05); Adjustment disorder diagnosis (HR=1.64, 95% CI 0.85, 3.14)

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							Deployment alone was not found to be significantly associated with suicide risk (HR=0.53, 95% CI 0.26, 1.05)
Griffith (2017). A Description of Suicides in the Army National Guard During 2007–2014 and Associated Risk Factors. Suicide & Life-Threatening Behavior, 47[3], 266–81[62]	US	Cohort	N=706 Army National Guard suicides (n=668, 94.8% men; active, part-time and non-active) Comparison: N=,000 National Guard non-suicide random sample (n= 8,831, 85.4% men)	2007–14	Suicide	NA	Risk factors found to be positively associated with suicide were: White race (87.9%, χ^2=36.25, p<.001); 17–24 years age group (41.3%, χ^2=19.16, p<.001); Single marital status (χ^2 =12.31, p<.01); Junior enlisted military rank (58.7%, χ^2=6.90, p<.05); Reside in Western USA (27.2%, χ^2=27.87, p<.001); Serve part-time in the military 3–6 years of military experience (34.5%,

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							χ^2 =43.65, p<.001); Currently not in training (92.9%, χ^2=17.01, p<.001); part-time military status (92.3%, χ^2=27.51, p<.001) Little to no association was found with the following factors: educational level,mental category (cognitive ability ranking), prior versus non-prior service, combat arms military occupational specialty, and deployment status The majority of suicides occurred among part-time soldiers outside of military duty (84.5%) compared to having an active-duty status (15.4%, χ^2=336.41,

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							p<.001). The most common method was personal firearm (72.3%) which was followed by hanging (15.4%, χ^2=3,114.96). Most suicides occurred a year or more after returning from deployment (65.9%) compared to 6 months or 12 months after deployment (7.4–19.9%, χ^2=314.95, p<.001) Soldiers who experienced a failed interpersonal relationship in the past 90 days were 13 times more likely to die by suicide, particularly those family-parent problems (27.5%) and divorce/separated (15.3%). Soldiers

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							who experienced substance abuse (27.3%) were 6 times more likely to die by suicide, and soldiers experiencing current or past behavioural health conditions (10.1–20.2%) were 8 times more likely to die by suicide
Allan et al. (2017). Insomnia and suicidal ideation and behaviors in former and current U.S. service members: Does depression mediate the relations? Psychiatry Research, 252, 296–302[30]	US	Case series	N=405 current and former military service members (mean age 31.6 ± 7.3 years, 90.4% male) with endorsed recent suicidal ideation and/or a history of suicide attempt	12 month follow-up	Suicidal ideation, suicide attempt	NA	Time 1 suicidal ideation was significantly associated with insomnia (r=0.19, B=0.22, p=.001) and cognitive/affective depression symptoms (r=0.27, p<.05). Time 2 suicidal ideation was significantly associated with Time 1 suicidal ideation (r=0.15, p<.05), and Time 2 cognitive/affective

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							depression symptoms (r=0.44, B=0.73, p<.05). Suicidal behaviour between Time 1 and Time 2 was significantly positively correlated with suicidal ideation at Time 1 (r=0.17, B=0.77, p<.05) and Time 2 (r=0.29, p<.05) At Time 1, insomnia was not directly associated with suicidal ideation, but it had a significant indirect effect through cognitive/affective depression (B=0.27, 95% CI 0.14, 0.49). Insomnia significantly predicted suicidal behaviour between Time 1 and Time 2 (B=0.22, p<.05). Time 1 insomnia did

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							not significantly predict Time 2 suicidal ideation (B=0.12, p=.20). Time 2 cognitive/affective depression symptoms mediated Time 1 insomnia and Time 2 suicidal ideation (B=0.25, 95% CI 0.08, 0.45) Somatic depression did not mediate the relationship between Time 1 insomnia and Time 2 suicidal ideation. Cognitive/affective depression symptoms did not mediate the relationship between insomnia and suicidal behaviour
Milner et al. (2017). Suicide among emergency and	Australia	Case series	N=56 suicide cases among defence force personnel,	2001–12	Suicide	Elevated suicide rates among defence employees (Adj RR: 3.27,	

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
protective service workers: A retrospective mortality study in Australia, 2001 to 2012. Work; 57[2]: 281–7[63]			incl. 52 males; Australian National Coroners Information System data			95% CI 2.50, 4.28, p<0.001) Suicide per age group: 20–29/51.8%; 30–49/44.6; 50 and over/3.6% 20–29 years Suicide methods: carbon monoxide/other gases: 12.9%; hanging/suffocation: 68.3; firearms: 3.2%; self-poisoning: 4.8%; other: 9.7%	
Ursano et al. (2016). Risk Factors, Methods, and Timing of Suicide Attempts Among US Army Soldiers. JAMA Psychiatry, 73[7], 741–49[64]	US	Cohort	N=9,650 regular army-enlisted soldiers on active duty who attempted suicide (86.3% male, Comparison: N=153,528 person-months, equal	2004–9	Suicide attempt	Out of 163,178 enlisted soldiers included in this study, 9,650 attempted suicide	Non-deployed enlisted soldiers accounted for 61.1% of soldiers who attempted suicide (n=5,894 cases), previously deployed enlisted soldiers accounted for 29.2% of soldiers who attempted suicide (n=2,816 cases), and

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
			probably control sample The Army Study to Assess Risk and Resilience in Service members				currently deployed soldiers accounted for 9.7% (n=940 cases) Odds of a suicide attempt by firearm were higher among currently deployed soldiers (OR=4.0, 95% CI 2.9, 5.6) and previously deployed soldiers (OR=2.7, 95% CI 1.8, 3.9), with odds significantly lower among previously deployed soldiers compared to those currently deployed (OR=0.7, 95% CI 0.5, 0.9). Risk of suicide attempt decreased with deployment time (χ^2=25.6, p<.001), with odds of a suicide attempt higher among

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							soldiers with 1-2 years in service compared to those with 5–10 years History of a mental health diagnosis was significantly associated with suicide attempt in all deployment groups. Soldiers who had a diagnosis in the previous month had the highest odds of a suicide attempt (especially for diagnoses of depression, PTSD and SUD, compared to no diagnosis, and increased further with comorbid diagnoses,), which was highest among those currently deployed (OR=29.8, 95% CI 25.0, 35.5) and previously deployed (OR=22.2,

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							95% CI 20.1, 24.4), with odds decreasing as time increased since the most recent diagnosis Highest monthly risk of suicide attempt varied by deployment status. For never-deployed soldiers, the greatest risk was in the second month of service (103 per 100,000 person-months). For soldiers on their first deployment, the greatest risk of suicide attempt was in the 6th month of deployment (25 per 100,000 person-months). For soldiers who had returned from their first deployment (previously deployed), the greatest risk was

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							around the 5th month after return (40 per 100,000 person-months)
Laukkala et al. (2016). Total and cause-specific mortality of Finnish military personnel following service in international peacekeeping operations 1990–2010: a comprehensive register-based cohort study. BMJ Open, 6[10], e012146[65]	Finland	Cohort	N 4,584 men military peacekeeping personnel in the Finnish Defence Forces (in Africa, Asia, former Yugoslavia)	1990–2013	Suicide	Of the 209 deaths among men personnel during the follow-up period, 53 were suicides. This was lower than the expected number of 74.5 (Suicide death SMR = 0.71, 95% CI 0.53, 0.92) calculated based on the population rate (age-sex matched) Suicide mortality post peacekeeping service was lower among military personnel than general population	NA
Afifi et al. (2016). Association of Child Abuse Exposure With Suicidal Ideation, Suicide Plans, and Suicide Attempts in Military Personnel and the	Canada	Cohort	N=8,161 Canadian Armed Forces personnel; Canadian Forces Mental Health Survey (86.190.6%	2013	Past year suicidal ideation, suicide plan and suicide attempt	NA	All types of child abuse exposures were associated with increased odds of suicidal ideation, suicide plans and suicide attempts in both the general

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
General Population in Canada. JAMA Psychiatry, 73[3], 229–38[66]			men, age 18–60 years) Comparison: N=15,981 age-matched Canadian Community Healthy Survey -Mental Health respondents (49.9% men, age 18–60 years))				population and, with many of these associations being weaker in military personnel compared to the general population Odds of suicidal ideation were increased among personnel who had child abuse exposure without deployment-related trauma (AOR=2.0, 95% CI 1.3, 3.0 $p < .05$) and those who had child abuse exposure and deployment-related trauma together (AOR=2.7, 95% CI 1.8, 4.2, $p<.05$). Odds of suicide plans were also increased among the personnel with child abuse exposure without deployment-related exposure

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							(AOR=2.9, 95% CI 1.4,6.0, *p*<.05) and those who had child abuse exposure and deployment-related trauma together (AOR=4.6, 95% CI 2.3,9.2, *p*<.05). Significant additive effects between deployment-related trauma and child abuse exposure were found for suicide ideation and suicide plans, but interactions were non-significant Suicidal ideation and suicide plans were not associated with deployment related trauma occurring without a history of child abuse exposure
Ursano et al. (2015). Suicide Attempts in the US	US	Cohort	N=9,791 active duty members of the regular army	2004–09	Suicide attempts	Majority of suicide attempts were by enlisted	Among enlisted soldiers, higher odds of suicide attempt

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
Army During the Wars in Afghanistan and Iraq, 2004 to 2009. JAMA Psychiatry, 72[9], 917–926[67]			who attempted suicide (n=7,214 men, 86.3%) Comparison N=183,826 equal-probability sample of control person-months Army Study to Assess Risk and Resilience in Servicemembers (STARRS)			soldiers (vs officers, 98.6%)	were found for those who were currently younger than 30 years (<21 years OR=5.6, 95% CI 5.1, 6.2; 21–24 years OR=2.9, 95% CI 2.6, 3.2; 25–29 years OR=1.6, 95% CI 1.5, 1.8), enlisted at the age of 25 or older (OR=1.6, 95% CI 1.5, 1.8) and has less than high school education (OR=2.0, 95% CI 2.0, 2.1). Shorter length of service was also associated with higher odds of suicide attempt compared to those who had been enlisted for 5 or more years (1–2 years OR=2.4, 95% CI 2.2, 2.6; 3-4 years OR=1.5, 95% CI 1.4, 1.6)

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							Among officers, higher odds of suicide attempt were similarly found for those who and enlisted at the age of 25 or older (OR=2.0, 1.3, 3.1), and lower odds were found for those currently aged 40 years or older (vs 30-34 years, OR=0.5, 95% CI 0.3, 0.8) Higher odds of suicide attempt were found for soldiers who had never been deployed (OR=2.8, 95% CI 2.6, 3.0) and those previously deployed (OR=2.6, 95% CI 2.4, 2.8) compared to soldiers who were currently deployed (controlling for

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							sociodemographic variables) Higher odds of suicide attempt were also found for soldiers and officers with a mental health diagnosis, with the highest odds occurring in the first month since diagnosis (Enlisted soldiers OR=18.2, 95% CI 17.4, 19.1; Officers OR=90.2, 95% CI 59.5, 136.7) with odds decreasing with time (i.e. at 13+ months, Enlisted soldiers OR=1.4, 95% CI 17.4, 19.1, χ^2=15,255.6, p<.05); officers OR=2.3, 95% CI 1.0, 4.9, χ^2=484.4, p<.05) The associations with length of service and deployment with

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							suicide attempts did not remain significant among soldiers ranked as officers, but the same direction applied
Ursano et al. (2015). Nonfatal Suicidal Behaviors in U.S. Army Administrative Records, 2004–2009: Results from the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS)[68]	US	Cohort	N=21,740 regular army soldiers with a documented nonfatal suicide event or suicidal ideation (86% men) Comparison: N=183,826 control-person months from the army Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS) Historical	2004–9	Nonfatal suicide attempt, suicidal ideation	Over the study period, there were increases in annual incidence rates for definite suicide attempt (37.4–126.4 per 100,000 person-years) and definite suicide ideation (89.4–164.9 per 100,000 person-years)	Increased risk of definite suicide attempt was found among those who were non-Hispanic white (χ^2=120.1, p<.05), never married (OR=2.0, 95% CI 1.9, 2.2, p<.05), had less education (χ^2=476.0, p<.05), age younger than 21 years at enlistment (OR=1.9, 95% CI 1.7, 2.2, p<.05) and rank lower than E4 (Rank E1-E2 OR=3.2, 95% CI 3.0, 3.5, p<.05; Rank E3 OR=1.6, 95% CI 1.5, 1.8, p<.05)

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
			Administrative Data Study (HADS)				Risk factors for definite suicidal ideation were similar to those for suicide attempt. Increased risk of definite suicidal ideation was found Among those who were non-Hispanic white (χ^2=42.2, p<.05), never married (OR=1.9, 95% CI 1.7, 2.1, p<.05), had less education (χ^2=476.0, p<.05), age younger than 21 years at enlistment (OR=3.2, 95% CI 2.9, 3.6, p<.05) and rank lower than E4 (Rank E1–E2 OR=3.2, 95% CI 3.0, 3.5, p<.05; Rank E3 OR=1.5, 95% CI 1.3, 1.7, p<.05)
Kessler et al. (2015).	US	Cohort	N=729,337 male enlisted regular	2004–9	Suicide	During the study period there were 496 suicides	Being in an occupation of combat

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
Occupational differences in US Army suicide rates. Psychological Medicine, 45[15], 3293–304[69]			army soldiers on active-duty (officers excluded) Comparison: N=26,694,445 non-suicide person-months (active duty)			(22.4 per 100,000 person-years)	arms was positively associated with significantly higher suicide rates (Infantry men=37.2 per 100000 person-years, OR=1.9, 95% CI 1.1, 2.7; Combat engineers=38.2 per 100000 person-years, OR=1.7, 95% CI 1.1, 2.7). There was a significant interaction between being either an infantryman or combat engineer with deployment status in predicting suicide (χ^2=6.7, p=0.30), with risk highest in combat arms when soldiers had never been deployed (OR=2.9, 95% CI 2.1, 4.1) The suicide rate among soldiers in other occupation

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							categories was lowest among those currently deployed (14.5 per 100,000 person-years, Combat arms vs Other: OR=1.6, 95% CI 1.1, 2.1)
Hoffmire et al. (2015). Changes in Suicide Mortality for Veterans and Nonveterans by Gender and History of VHA Service Use, 2000–2010, Psychiatric Services, 66[9], 959–65[36]	US	Cohort	N=173,969 veteran suicide decedents (94.1% men, aged 18-80+) Comparison=non-veteran suicide decedents US Department of Veterans Affairs suicide data archive	2000–10	Suicide	Over the study period, suicide rates increased. Among men veterans, it increased from 28.8 per 100,000 in 2000 to 36.0 per 100,000 in 2010. These rates were also higher than those among non-veteran men (2000: 20.1 per 100,000; 2010: 21.4 per 100,000) Overall, veteran suicide rates increased by 25% during the study period, While non-veteran rates increased by 12%. The suicide rate for veterans who accessed VHA support declined over the study period, and was	NA

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
						lower than that of non-VHA utilising veterans in 2010 (27.6 per 100,000 vs 38.7 per 100,000) despite being higher from 2000 to 2002	
Cigrang et al. (2015). Predictors of Suicidal Ideation Across Deployment: A Prospective Study. Journal of Clinical Psychology, 71[9], 828–42[70]	US	Case series	N=318 active United States Air Force Security Forces across a 1 year deployment in Iraq (92% male, age range 18–46, mean age=25.0±5.4)	2009–10	Post-deployment suicidal ideation	Of the total sample, 20 airmen reported to experience post-deployment suicidal ideation	Problem drinking before deployment was a significant predictor of suicidal ideation at post-deployment (B=.77, Wald=15.38, p<.01, exp(B)=2.15). Airmen with at least moderate levels of problematic drinking at predeployment were 3.11 times more likely to report suicidal ideation at postdeployment (χ^2=6.75, p<.05) Depressive symptoms and problem drinking at post-deployment were significant

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							predictors of concurrent suicidal ideation (B=.86 (SE=0.31), Wald=15.14, p<.01, exp(B)=2.37; B=1.21 (SE = 0.35), Wald=22.95, p<.01, exp(B)=3.37). Airmen who endorsed at least mild depressive symptoms postdeployment were 2.93 times more likely to report concurrent suicidal ideation compared to those who reported lower depressive symptoms (χ^2=7.09, p<.05). Airmen who endorsed moderate levels of postdeployment problem drinking were 7 times more likely to report concurrent suicidal compared to those

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							who reported lower levels of problem drinking ideation (χ^2=9.01, p<.01) Post-traumatic stress symptoms at post-deployment were related to concurrent suicidal ideation (B=.67 (SE=0.30), Wald=9.22, p<.05, exp(B)=1.95), as was postdeployment reintegration challenges (B=.69 (SE=0.28), Wald=11.00, p<.05, exp(B)=1.99) but neither prospectively predicted suicidal ideation Airmen who endorsed at least moderate postdeployment post-traumatic stress symptoms were 3.35 times more likely to

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							report concurrent suicidal ideation compared to those who endorsed lower levels of post-traumatic stress symptoms (χ^2=8.50, p<.05) Airmen who endorsed at least moderate levels of reintegration challenges were 3.32 times more likely to report concurrent suicidal ideation compared to those who endorsed lower levels of reintegration challenges (χ^2=9.03, p<.05)
Bullman et al. (2015). Time dependent gender differences in suicide risk among Operation Enduring	US	Case series	N=1,401,382 active duty, reserve and National Guard veterans who deployed to OEF/OIF and	2002–11	Suicide	There were a total of 1,491 suicides among males during the study period.	Suicide rates were highest during the first year after deactivating from active duty (36.2 suicides per 100,000

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
Freedom and Operation Iraqi Freedom veterans. Annals of Epidemiology, 25[12], 964–5[37]			deactivated from active military duty (n=1,237,049 men)				lives) and decreased on average by -6.1% each year over 7 years (7th year rate=20.7 suicides per 100,000 lives)
Anestis et al. (2015). Testing the main hypotheses of the interpersonal-psychological theory of suicidal behavior in a large diverse sample of United States military personnel. Comprehensive Psychiatry, 60, 78–85[71]	US	Case series	N=934 military personnel (77.7% male, mean age 27.05)	NA	Suicidal ideation, suicide attempt	In the overall sample, 62 (6.9%) of soldiers endorsed a history of at least one suicide attempt, and 15 (1.7%) endorsed two or more attempts	The interaction between thwarted belongingness and perceived burdensomeness significantly predicted suicidal ideation (t=2.38, p=.1,078, f^2=.02), accounting for an additional 1.3% variance in suicide ideation on top of sociodemographic and variables entered into the model individually The interaction between thwarted belongingness and perceived burdensomeness

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							also significantly predicted suicide attempts (t=-3.92, p<.001). A three-way interaction between these two variables and acquired capability for suicide accounted for an additional 4.3% variance in suicide attempts (t=4.20, p<.001, f^2=.05) on top of sociodemographic and variables entered into the model individually
Gilman et al. (2014). Sociodemographic and career history predictors of suicide mortality in the United States Army 2004–2009. Psychological	US	Cohort	N=77,610 STARRS Historical Administrative Data Study sample	2004–9	Suicide	Standardised suicide rates by time in service and deployment history: first 4 years in service: deployment never (18.4 per 100,000 person-years (PY)), current (25.5), previous (26.2); more than 4 years in service:	Multivariate associations deployment history with suicide: never (OR=5.0, 95% CI 2.8, 8.6; p<0.05), current (OR=1.8, 95% CI 0.9, 3.7), previous (OR=5.0,

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
Medicine, 44[12], 2579–92[72]						never (13.6), current (11.6), previous (20.9)	95% CI 2.8, 8.6; p<0.05)
Bryan et al. (2013). Age and belongingness moderate the effects of combat exposure on suicidal ideation among active duty Air Force personnel. Journal of Affective Disorders, 150[3], 1226–9[73]	US	Case series	N=273 active duty Air Force Security Forces personnel (81.7% male)	NA	Suicidal ideation	Over their lifetimes, 6 (2.2%) airmen reported attempting suicide at least once. Recent suicidal ideation was reported by 39 (14.3%) airmen	The interaction of age and combat interaction was significantly associated with severity of suicidal ideation (*B*=0.014, SE=0.006, p=0.014). The intensity of this interaction increased as age increased, particularly in airmen aged 34 years and older A three-way interaction between age, combat exposure and belongingness, was significantly associated with severity of suicidal ideation (B=0.011, SE=0.005, p=0.042) This indicates that suicidal ideation is

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							most severe among older military personnel with higher levels of combat exposure and lower levels of belongingness
Bryan et al. (2013). Combat exposure and suicide risk in two samples of military personnel. Journal of Clinical Psychology, 69[1], 64–77[74]	US	Case series	N=348 active duty military personnel deployed to Iraq (89.7% male, mean age 24.5)	NA	Suicide risk (including previous suicide attempts, frequency of suicidal ideation, suicidal communication, and likelihood of future attempt)	A low proportion of suicide risk was reported in the overall sample of deployed military personnel (6.6%)	Suicidality was significantly positively correlated with depression (r=.24, p<.001) and PTSD (r=.12, p<.01) symptom severity, and thwarted belongingness (r=.18, p<.001) In regression modelling, suicidality was also found to be directly positively associated with depression symptom severity (β=.190, SE=.059, p<.001) and negatively associated with acquired capability

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							(β=-.101, SE=.053, p=.056). Combat exposure was found to not be significantly associated with suicide risk
Anestis et al. (2013). Means and capacity for suicidal behavior: a comparison of the ratio of suicide attempts and deaths by suicide in the US military and general population. Journal of Affective Disorders, 148[1], 42–47[75]	US	Cohort study	N=1144 Active Duty Service Members and Activated Guard and Reserves who attempted suicide in the study period; Department of Defense Suicide Event Report (total N not reported, 75.7% male) Comparison: N=503,359 suicide attempts in the general population; Web-based Injury Statistics Query and Reporting	2010	Suicide attempts (non-lethal attempts), suicides (lethal attempts)	There were 934 suicide attempts by men in the military. Of these, 281 resulted in suicide. Among men in the military, the non-lethal to lethal attempt ratio was 2.32, which was significantly higher than the ratio among men in the general population of 6.58 (z=19.73, p<.0002)	There was a significantly higher non-lethal to lethal attempt rate among military personal compared to the general population among all age groups (z 4.758–31.17, p<.0002) Among military personnel, there was a higher percentage of suicides from gunshot wounds compared to the general population

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
			System (42.8% male)				(62.3% vs 50.5%, z=3.92, p<.0002) The ratio of non-lethal to lethal suicide attempts related to drugs and alcohol only was not significantly different between military personnel and the general population (40.69 vs 40.34, z=-0.031, p=.975)
Bryan et al. (2013). Reasons for suicide attempts in a clinical sample of active duty soldiers. J Affective Disorders, 144[1–2], 148–52[76]	US	Cohort study	N=72 active duty soldiers (92% male, age M=27.4, SD=6.50) who had attempted suicide	NA	Suicide attempt (SA); suicidal intent, method, lethality, reasons for attempting suicide (AN-R: automatic negative/ reduce aversive		SA for both automatic and social reasons; multiple functions in 95% of attempts. AN-R the most commonly reported function for SA (100%), followed by SN-R (82.4%), SP-R (80.1%), and AP-R (72.8%). Greater proportion of AN-R reasons relative to all

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
					internal experiences, AP-R: automatic positive/generate desired internal experiences, SN-R: social negative/avoid aversive contextual demands, SP-R: social positive/ generate desired environmental contexts)		other functions (p<.001), and smaller proportion of SP-R reasons relative to all other functions (p<.001) with the exception of AP-R. Results unchanged when controlling for effects of gender Suicidal intent weakly correlated with AN-R, AP-R, and SN-R functions (p<0.25); medical lethality correlated with SP-R function (p<0.05)
Hines et al. (2013). Self-harm in the UK military. Occupational	UK	Cohort study	N=9803 (88% male) UK military personnel		Self-harm (SH)	2.3% overall prevalence of SH; lower in reserves (0.7%) than in regulars (2.5%)	SH associated with younger age (OR=0.94), being separated

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
Medicine (Oxford), 63[5], 354–7[77]							(OR=2.02), being in the regular forces (OR=0.28), no longer serving (OR=1.98); not associated with deployment. After adjustment, SH associated with no close family/ friends (OR=2.97), high levels of adversity in family relationships (OR=2.25), local authority care (OR=2.19). SH decreased with increased social activities
Haus-Cheymol et al. (2012). Mortality among active-duty male French Armed Forces, 2006–10. Journal of Public Health, 34[3], 454–61[78]	France	Cohort study	N=1455 male active duty personnel deaths in the French Armed Forces; Surveillance Epidémiologique dans les Armées	2006–10	Suicide	Of the 1439 deaths with known causes among active-duty military personnel during the study period, 301 (20.9%) were suicides. Suicide was the 2nd leading cause of death for military personnel across all age groups (MR=.8,	Male active-duty personnel aged 17–24 years had a greater risk of suicide compared to those of the same age in the general population, however this was not significant

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
						95% CI 18.5, 23.2), behind only transport accidents in veterans aged 17-24 years (MR=18.8, 95% CI 13.8, 23.8), and illness in those aged 25-44 years (MR=20.0, 95% CI 17.1, 22.9) and 45–59 years (MR=26.3, 95% CI 19.8, 32.7)	
Griffith, J. (2012). "*Suicide in the army national guard: an empirical inquiry."* Suicide & Life-Threatening Behavior 42[1]: 104–19[79]	US	Case control	Members of the Army National Guard. Male 96.7%. 294 Suicide decedents compared to 1000 random sample of ARNG members for each year	2007–10	Demographics, suicide death, circumstances surrounding the suicide (family problems, school problems, employment problems, behavioural problems, new life circumstan		Soldier characteristics that showed stronger associations with death by suicide were younger ages, male, white, and not married. African Americans were less likely than other race groups to have died by suicide. Military-related variables - higher ranks and being in training were negatively correlated with suicide death,

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
					ces, health, suicide history)		being in part-time service was positively correlated. In a regression, age, male, white and single accounted for over half (57%) of the explained variance. Military-related variables (prior service, part-time service, in-training, combat specialty, and having been deployed) added 14.3% to the variance. Identified two clusters – 'careerists' – white, married, senior, prior service, more years of service, less likely to be part-time or in training, and to have been deployed. 'First termers' – younger, male, white, single, junior ranking, non-prior service, fewer

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							years of service, more part-time, in-training, and to not have been deployed. Careerists had more prior suicide attempts, interpersonal problems, illnesses, access to fire arms. First-termers had more suicidal thoughts, isolation. Both groups had past behavioural problems, alcohol/substance abuse, loss of significant other, and insufficient income
Bryan & Rudd (2012). "*Life stressors, emotional distress, and trauma-related thoughts occurring in the 24h preceding active*	US	Case series	72 active duty soldiers (91.7% male) who had attempted suicide		Factors involved in nonfatal suicide attempts and intentional self-injury.	Mean number of suicide attempts was 1.85 (range 1–5). Methods included drugs/medication overdose (36.0%), scratching/cutting (20.6%), firearm (18.4%),	97% met the criteria for at least one Axis I diagnosis and 69% met criteria for more than one (major depression 89.3%, PTSD 39.4%, substance

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
duty U.S. soldiers' suicide attempts." Journal of Psychiatric Research 46[7]: 843–8[80]					Mental health diagnoses	hanging (8.8%), transport related (4.4%) and other	dependence (26.2%), alcohol dependence 23.8%, social phobia 10.7%, and others). Contextual factors in the 24 hours before included emotional experiences (feeling depressed upset, miserable or distressed, overwhelmed, lonely, isolated, or abandoned), external events (interpersonal – argument or conflict, receiving anger or criticism, being isolated or alone), traumatic thoughts (less common). Suicidal intent was associated with emotional experiences. None of the factors were

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							associated with attempt lethality
Armed Forces Health Surveillance, C. (2012). "*Deaths by suicide while on active duty, active and reserve components, U.S. Armed Forces, 1998–2011.*" MSMR 19[6]: 7–10[81]	US	Cohort	2990 suicide decedents among all who had served on active duty as a member of the US Army, Navy, Air Force or Marine Corps duing the surveillance period (95% male).	1998–2011	Deaths by suicide of active and reserve members while serving on active duty. Method and number of suicides. Demographics	Suicide deaths were fairly stable from 1998 to 2005, increased sharply from 2005 to 2009 and then declined slightly through 2011.	Most members who died by suicide were males (95%), active component members (89%) of white non-Hispanic race/ethnicity (70%) and in their 20s (58%). Rates were 24% higher among divorced/separated than single, never married members. The Army and Marine Corps had much higher crude suicide rates than the other services. Firearms were the most frequent method
White, R., et al. (2011). "*History of military service and the risk of suicidal*	US	Cohort	17,641 men who completed the 2008 National Survey on Drug Use and	2008	History of US military service, past	In all three age groups (18–25, 26–35, 36+) men who had ever served in the armed forces were no	

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
ideation: findings from the 2008 national survey on drug use and health." Suicide & Life-Threatening Behavior 41[5]: 554–61[46]			Health. Excluding those on current active duty		suicidal ideation, plans and attempts, psychological distress, psychiatric conditions, sociodemographic characteristics	more likely than men who had never served to report having seriously considered suicide. Suicide ideation was not associated with military status in age and race adjusted analyses. Military service was also not differentially associated with recent suicide plans or attempts	
Bell, et al (2010) Prior health care utilization patterns and suicide among U.S. Army soldiers. Suicide & Life-Threatening Behavior, 40[4], 407–15[82]	US	Cohort	1873 active-duty army solider suicides compared with 5613 matched controls (i.e. no suicide, army personnel). 90% of study sample was men	January 1980–December 31 2003	Suicide during service or within 120 days of discharge	Not reported. Controls are selected to be matched.	Risk: Male (v Female: Adj OR=2.73, 95% CI, 2.12–3.55). Hospitalisation up to five years prior to suicide for mental disorder (Adj OR=6.62, 95% CI, 4.77-9.20); alcohol (Adj OR=3.41, 95% CI 2.32–4.99); or injury (Adj OR=2.04, 95% CI 1.64-2.54) Prior hospitalisation for mental disorder

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							and injury more likely than controls to die by suicide (Adj OR with interactions=65.55, 95% CI 15.27-281.45 when Mental disorder is exposure and Adj OR=16.07, 95% CI 3.75–68.77 when injury is exposure) Protective factors: Longer time in service (Adj OR=0.97, 95% CI 0.95-0.99); Black ethnicity (v White: Adj OR=0.64, 95% CI, 0.56–0.74); College education (v non-college: Adj OR=0.69, 95% CI, 0.55–0.87); being married (Adj OR=0.84, 95% CI, 0.72–0.99); being a warrant officer (v Service grade

Reference	Country	Study design	Study population	Time period	Oucomes/ variables	Results – prevalence	Results – risk factors
							E1–E4: Adj OR=0.48, 95% CI, 0.25–0.94) or commissioned officer (v Service grade E1–E4: Adj OR=0.66, 95% CI, 0.47–0.93) Prior hospitalisation for alcohol AND mental disorder AND injury less likely to die by suicide than controls (Adj OR with interactions=0.16, 95% CI 0.15–0.53 when alcohol is exposure variable)

Table 3—NHMRC levels of evidence: risk of suicide for male veterans and defence force personnel.

Reference	Study design
Zuromski et al. (2019)	III-2
Willmund et al. (2019)	III-2
Mahar et al. (2019)	III-2
Mahar et al. (2019)	III-2
Horwitz et al. (2019)	III-3
Bounoua et al. (2019)	III-3
Sheriff et al. (2019)	III-2
Ursano et al. (2018)	III-2
Ursano et al. (2018)	III-2
Ursano et al. (2018)	III-2
Reimann et al. (2018)	III-2
Millner et al. (2018)	IV
May et al. (2018)	III-3
Kerr et al. (2018)	III-2
Ursano et al. (2017)	III-2
Strand et al. (2017)	III-2
Rogers et al. (2017)	III-3
Rasmussen et al. (2017)	III-3
Phillips et al. (2017)	III-2
Griffith (2017)	III-2
Gradus et al. (2017)	III-3
Bohnert et al. (2017)	III-2
Bergman et al. (2017)	III-2
Allan et al. (2017)	III-3
Milner et al. (2017)	III-3
Ursano et al. (2016)	III-2
McGlade et al. (2016)	III-2
Laukkala et al. (2016)	III-2
Blosnich et al. (2016)	III-3
Afifi et al. (2016)	III-2
O'Toole et al. (2015)	IV
Ursano et al. (2015)	III-2
Ursano et al. (2015)	III-2

Reference	Study design
McCarten et al. (2015)	III-3
Maguen et al. (2015)	III-3
Kessler et al. (2015)	III-2
Hoffmire et al. (2015)	III-2
Cigrang et al. (2015)	III-3
Bullman et al. (2015)	III-3
Anestis et al. (2015)	III-3
Gilman et al. (2014)	III-2
King et al. (2014)	III-2
Bryan et al. (2013)	III-3
Bryan et al. (2013)	III-3
Anestis et al. (2013)	III-2
Miller et al. (2013)	III-2
Katz et al. (2013)	III-2
Bryan et al. (2013)	III-2
Conner et al. (2013)	III-2
Fanning & Pietrzak (2013)	III-2
Gradus et al. (2013)	III-2
Hines et al. (2013)	III-2
Kaplan et al. (2012)	III-2
Haus-Cheymol et al. (2012)	III-2
Griffith, J. (2012)	III-2
Bryan & Rudd (2012)	III-3
Blow et al. (2012)	III-2
Armed Forces Health Surveillance. (2012)	III-2
White et al. (2011)	III-2
Mansfield et al. (2011)	III-3
Lemaire et al. (2011)	III-3
Ilgen et al. (2010)	III-2
Bell, et al (2010)	III-2

Table 4—NHMRC matrix to summarise the evidence base: risk of suicide for male veterans and defence force personnel.

Component	Rating
Evidence base	C – Satisfactory
Consistency	C – Satisfactory
Clinical impact	N/A
Generalisability	C – Satisfactory
Applicability	B - Good

Table 5—Summary of included studies: programs or interventions for reducing the risk of suicide for defence for personnel.

Reference	Country	Study design	Study population	Intervention/ Setting	Outcomes/instruments /assessment	Main results
Comtois et al. (2019). Effect of augmenting standard care for military personnel with brief caring text messages for suicide prevention: A Randomized Clinical Trial. JAMA Psychiatry, 76[4]:474–83[88]	US	RCT	N=657. CC: n=329 (mean age 25.6 ys, SD 6.3; 84% male). SC: n=328 (mean age 24.8 ys, SD 5.8; 81% male) Inclusion criteria: on active duty, in the Reserve, or in the National Guard; 18 years or older; English speaking; identified to a behavioural health or medical service with suicidal ideation or a suicide attempt; current suicidal ideation; in possession of a mobile phone/pager that could affordably receive 11 text messages in a year	Caring Contacts (CC)[1] delivered via text message + Standard Care vs Standard Care Military installations	Current suicidal ideation (SSI-Current); suicide risk incident (hospitalisation or medical evacuation); primary outcomes Worst suicidal ideation (SSI-Worst); Treatment History Interview-Military; Suicide attempt (SASI-Count), ED visits; secondary outcomes Baseline, 12-month follow- up	NS effect on likelihood/ severity of current suicidal ideation, likelihood, suicide risk incident or ED visits CC group participants lower odds than SC group participants of any suicidal ideation between baseline and follow-up (OR: 0.56, 95%CI 0.33, 0.95; p=0.03) and fewer suicide attempts since baseline (OR: 0.52, 95%CI 0.29-0.92; p=0.03)

[1] Caring texts at 1 day; 1week; and 1, 2, 3, 4, 6, 8, 10, and 12 months and on their birthdays. Text messages were non-demanding, asking nothing of the recipient and only expressing care and concern.

Reference	Country	Study design	Study population	Intervention/ Setting	Outcomes/instruments /assessment	Main results
Warner et al. (2011). Suicide Prevention in a Deployed Military Unit. Psychiatry, 74[2](2): 127–41[89]	US	Cohort	No. participants or gender not stated. Assumption that the sample is mostly males. Program delivered to personnel and family during 15-month deployment to Iraq	Included education, identification, individual interventions.	Not stated	Lower suicide rate compared to US Army rate (16.0/100,000 vs. 19.2/100,000)
Knox et al. (2010). The US Air Force suicide prevention program: implications for public health policy. The American Journal of Public Health. 100[12]. 2457–64[90]	US	Interru-pted time series	US Air Force members. Gender not stated but the assumption is that the sample is mostly male	11 initiatives: leadership involvement, suicide prevention education and training, training of commanders, individual treatment, referrals for at risk individuals, critical incident stress management, addressing community problems for members, database of suicide	Suicide rates 1981–2007	Reduced suicide rates of Air Force members during the intervention

Table 6—Summary of included studies: programs or interventions for reducing the risk of suicide for male veterans.

Reference	Country	Study design	Study population	Intervention/ Setting	Outcomes/ instruments/ assessment	Main results
Brenner et al. (2018) Window to Hope: A randomized controlled trial of a psychological intervention for the treatment of hopelessness among veterans with moderate to severe traumatic brain injury. J Head Trauma Rehabil; 33[2]:E64–73[91]	US	RCT	Total N=35 . WtoH n=20 (mean age 54.6 ys, SD 8.8; 95% male). Waiting list n=15 (mean age 47.7, SD 12.1; 87%) Inclusion criteria: US military Veterans eligible for VHA care; age 18-65; history of moderate/ severe TBI and at least 1-year post-injury; BHS score 9+, no history of alcohol abuse in the last 7 days or non-alcohol substance abuse in 30 days, no neurological diagnosis other than moderate/ severe TBI.	Windows to Hope (WtoH; 20-hour manualised small group CBT intervention)[2] vs wait list Veterans Affairs Medical Center	Hopelessness (BHS); primary outcome Depression (BDI), Suicidal ideation (BSS), secondary outcomes Baseline, 3-, 6-month follow-up	WtoH group had lower hopelessness at follow up than waiting list group (p=0.03). Ns between group differences for depression and suicidal ideation Participants who were initially allocated to the waitlist group who completed WtoH had decreased hopelessness and depression (p = 0.003 and p = 0.01, respectively). Trend towards reduced suicidal ideation, but was not significant

[2] Therapeutic principles: Relapse prevention: Group formation, Behavioral activation, Socialization to CBT, Cognitive restructuring, Problem solving, Compensatory techniques, Posttraumatic growth.

Reference	Country	Study design	Study population	Intervention/ Setting	Outcomes/ instruments/ assessment	Main results
Stanley et al. (2018) Comparison of the Safety Planning Intervention with follow-up vs usual care of suicidal patients treated in the Emergency Department. JAMA Psychiatry; 75[9]:894–900[92]	US	Cohort	Total N=1,640. SPI+ n=1,186 (mean age 47.2 ys, SD 14.9; 88.5% male). Usual Care n=454 (mean age 49.4 ys SD 14.5; 88.1% male) Inclusion criteria: 18 years+, ED visit for a suicide-related concern, inpatient hospitalisation not clinically indicated, able to read English	Safety Planning Intervention +[3] (SPI+) + structured phone follow up + Usual Care vs Usual Care Veterans Health Administration hospital EDs	Suicidal behaviour (suicide attempts, suicide deaths, and other suicidal behaviours including interrupted attempts) and behavioural health outpatient services extracted from medical records 6-month follow-up	6 month follow up: participants in SPI+ condition less likely to engage in suicidal behaviour than usual care (3.03% vs 5.29%; OR: 0.56; 95%CI, 0.33, 0.95, p = 0.03) and higher attendance of at least 1 outpatient mental health visit (OR: 2.06; 95%CI, 1.57, 2.71; p < 0.001) NNT= 44.43
Bernet (2015). Postdischarge behavioral health treatment and 6-month reattempt rate for veterans hospitalized for suicide attempt. J	US	Cohort	N=690 VISN 9 VA patients (mean age 50.1, IQR 38.1-56.0; 91% male) identified as suicide attempt over Jan 2009, and March 2012 and whose disposition after the attempt was 'hospital admission'		Observation period of 6 months after index discharge or until the next suicide event	Results (short summary): The 6-month reattempt rate was 6%. Timing of first appointment was earlier in the reattempt group versus the no-reattempt

[3] The SPI has 6 key steps: (1) identify personalized warning signs for an impending suicide crisis; (2) determine internal coping strategies that distract from suicidal thoughts and urges; (3) identify family and friends who are able to distract from suicidal thoughts and urges and social places that provide the opportunity for interaction; (4) identify individuals who can help provide support during a suicidal crisis; (5) list mental health professionals and urgent care services to contact during a suicidal crisis; and (6) lethal means counselling for making the environment safer (http://www.suicidesafetyplan.com).

Reference	Country	Study design	Study population	Intervention/ Setting	Outcomes/ instruments/ assessment	Main results
Am Psychiatr Nurses Assoc. 21[3]:212–22[93]			No exclusion criteria based on sex, race, ethnicity, marital status, service or diagnosis			groupAppointment intensity, especially telephone appointments, was greater in the reattempt group. Conclusions: The present study revealed that it is not possible to determine the effect of behavioural health treatment delivery on preventing suicide behaviour by only evaluating the timing and intensity of care
Walser et al. (2015). Effectiveness of Acceptance and Commitment	US	Cohort	N= 981 Veterans (mean age 50.5 ys., SD 12.5; 76% male) Inclusion criteria: diagnosis of depression, not in acute crisis,	Acceptance and Commitment Therapy for depression (ACTD[4]; 12-16 individual	Depression and suicidal ideation (BDI-II), experiential	Depression severity reduced from baseline to final assessment (p<0.001). Participants with

[4] The ACT for Depression treatment protocol was developed specifically for veterans and is intended to be administered in approximately 12e16 individual psychotherapy

sessions. The protocol provides ACT-D specific information including (1) behavioral theory and background (e.g., the role of language in human suffering), (2) implementation of the six core processes (e.g., defusion, acceptance, present moment, self as context, committed action and values; includes metaphors, exercises,

example patient/therapist dialog), (3) specific patient skills (e.g., mindfulness, goals versus values distinction), (4) therapeutic alliance building (e.g., mindfulness rationale, use of compassion), (5) patient homework assignments and (6) useful appendices (e.g., safety planning worksheets, internet and hotline information).

Reference	Country	Study design	Study population	Intervention/ Setting	Outcomes/ instruments/ assessment	Main results
Therapy in treating depression and suicidal ideation in Veterans. Behav Res Ther, 74:25–31[94]			no impairment making it impossible to initiate psychotherapy	psychotherapy sessions VA ACT-D Training Program	acceptance (AAQ-II), mindfulness (FFMQ) Baseline, mid-point (session 7), final session (session 10 or higher).	suicidal ideation at baseline had greater improvement in depression severity relative to participants with no ideation at baseline (p = 0.001) Increases in experiential acceptance associated with lower odds of suicidal ideation (OR: 0.97, 95% CI 0.95, 0.99; p =0.016) and the attenuating effect of experiential acceptance on ideation increased across time (OR: 0.96, 95% CI 0.92, 0.99; p=0.023) Number of participants with no suicidal ideation increased from 44.5%

Reference	Country	Study design	Study population	Intervention/ Setting	Outcomes/ instruments/ assessment	Main results
						at baseline to 65% at follow-up
Knox et al. (2012). Implementation and early utilization of a Suicide Hotline for veterans. Am J Public Health. S 1: S29–32[95]	US	Cohort	National Suicide Hotline for Veterans September 2010: 171,000 calls. 79% of callers were male veterans, age 40-69 years old.	Service that staffed 24/7 by VA clinical staff		2008: Approx. 4000 referrals made to VA's suicide prevention coordinators; 16,000 referrals at the end of September 2010. Other referrals to diverse VA programs, incl. programs for returning veterans from the wars in Afghanistan and Iraq, women, homeless veterans, and substance abuse services. Community referrals made for veterans not eligible for care within the VA

Table 7—NHMRC Levels of evidence: programs or interventions for reducing the risk of suicide for male veterans and defence force personnel.

Reference	Study design
Defence force personnel	
Comtois et al., 2019	II
Warner et al., 2011	III-2
Knox et al., 2010	III-2
Veterans	
Brenner et al., 2018	II
Stanley et al., 2018	III-2
Bernet., 2015	III-2
Walser et al., 2015	III-2
Knox et al., 2012	III-2

Table 8—NHMRC matrix to summarise the evidence base: programs or interventions for reducing the risk of suicide for male veterans and defence force personnel.

Component	Rating
Evidence base	C - Satisfactory
Consistency	C - Satisfactory
Clinical impact	C - Satisfactory
Generalisability	C - Satisfactory
Applicability	C - Satisfactory

Table 9—Summary of included studies: suicide risk for men who are separated.

Reference	Country	Study design	Study population	Time period	Outcomes/variables	Main results
Clapperton et al. (2019). Relative risk of suicide following exposure to recent stressors, Victoria, Australia. ANZ J Public Health 43[3]: 254–260[102]	Australia	Case-control	N=410 male suicide cases, Victorian Suicide Register (VSR) data; N=2,303,526 living male controls, General Social Survey (GSS) data	2013 (VSR data) 2014 (GSS data)	Suicide Divorce/relationship separation	Divorce/relationship separation in 21.5% of male suicide cases and in 12.9% of male control cases Increased suicide risk associated with divorce/relationship separation in males aged 25–44 (suicide rate 41.22/100,000; RR: 3.10 95% CI 2.18, 4.41) The highest suicide risk among males exposed to alcohol and/or other drug problems in combination with divorce/relationship separation (suicide rate 100.01/100,000; RR: 6.21, 95% CI 4.59, 8.42)
Hedna et al. (2018). Late-life suicidal behaviours among new users of antidepressants. BMJ Open 8(10)[103]	Sweden	Cohort	N=185,225 Swedish residents aged ≥75 years who filled at least one antidepressant prescription, incl. 67,539 men; N=199 men died	2007–13	Suicide, suicide attempt Divorce	Being divorced had a significant effect on risk of suicide among men (Adjusted SHR: 1.58, 95% CI 1.06, 2.36) Not significant for suicide attempt

Reference	Country	Study design	Study population	Time period	Outcomes/variables	Main results
			by suicide; N=300 men attempted suicide			
O'Neill et al. (2018). Factors Associated with Suicide in Four Age Groups: A Population Based Study. Archives of Suicide Research 22(1): 128–38[104]	Northern Ireland	Case series	N=1,667 suicide cases, incl. N=1,152 males; NI Coroner's Office data	2005–11	Suicide Relationship difficulties, arguments or breakup	42.6% of male suicide cases had relationship difficulties, arguments or breakup prior; per age group: under 20 (47.9%), 21-40 (55%), 41-60 (33.6%), 60+ (11.2%)
Puzo et al. (2018). Socio-economic status and risk for suicide by immigration background in Norway: A register-based national study. J Psychiatric Research 100: 99–106[105]	Norway	Case-control	N=11,409 suicide cases, incl. N=7,492 native Norwegian males; N = 785 males with an immigration background; The Cause-of-Death Register data; N= 191,785 matched controls	1992–2012	Suicide Separated/divorced/ widowed	Marital status of separated/divorced/ widowed associated with increased suicide risk for suicide in native Norwegian males (adj OR: 3.29; 95% CI 3.07, 3.52; p<0.01), First- and second generation immigrant males (adj OR: 2.74; 95% CI 2.09, 3.58; p<0.01), and males with mixed immigration background (Adj OR: 3.59; 95% CI 2.40, 5.36; p<0.01) compared to married men

Reference	Country	Study design	Study population	Time period	Outcomes/variables	Main results
Milner et al. (2017). Male suicide among construction workers in Australia: a qualitative analysis of the major stressors precipitating death. BMC Public Health 17(1): 584[106]	Australia	Case series; qualitative	N=34 male suicide cases in construction workers in Australia (age 15-69); NCIS data	2010–14	Suicide Relationship breakdown and child custody issues	Relationship breakdown and child custody issues reported in 18 suicide cases Separated or divorced men with young children appeared to have issues negotiating access to their children
Sun et al (2016). Economic and sociological correlates of suicides: Multilevel analysis of the time series data in the United Kingdom. J Forensic Sciences 61(2): 345–51[107]	UK	Time Series with control group	Suicide, British Office for National Statistics, National Records of Scotland, and Northern Ireland Statistics and Research Agency data	1981–2011	Suicide Divorce	Male suicide rates greatly impacted by divorce rates (coefficient 9.94 , T-value 3.18, p=0.004)
Schiff et al. (2015). Acute and chronic risk preceding suicidal crises among middle-aged men without known mental health and/or substance abuse problems: An	US	Case series; qualitative	N=600 male suicides without known mental health or substance abuse problems and with a recent crisis (age 35–64 years);	2005–2010	Suicide Divorce/break up	Divorce/break up recorded in 117 (19.5%) suicide cases. Intimate partner problems precipitated suicide in 58.3% of cases. Of these, 20.6% involved partner violence, 14.9% involved separation

Reference	Country	Study design	Study population	Time period	Outcomes/variables	Main results
exploratory mixed-methods analysis. Crisis, 36(5): 304–315[108]			National Violent Death Reporting System data			
Frisch & Simonsen. (2013). Marriage, cohabitation and mortality in Denmark: national cohort study of 6.5 million persons followed for up to three decades (1982–2011). International Journal of Epidemiology (42):559–78[109]	Denmark	Cohort	N=6,540,000 (18 years or older)(women – 3,290,000, men – 3,250,000) residing in Denmark. Linked national datasets	1982–2011	Suicide mortality Divorced	Divorced men had a higher rate of suicide than married men. (Hazard ratio for divorced men compared to married men 2.73, 95% CI 2.51–2.97)
Silventoinen et al. (2013). Changing associations between partnership history and risk of accidents, violence and suicides. J Epidemiology & Community Health 67(3): 265–70[110]	Finland	Cohort	Representative sample of the Finnish population N=407,814 participants (1990; incl. N=236,532 males) and N=317,929 participants (2000; incl. N=168,502	1987–2007	Suicide, Suicide attempt Divorce	Men currently married or cohabiting had lower suicide incidence rates than those living without a partner (divorced>3 years ago, divorced<3 years ago, never-married) (Hazard ratios: 25.4, 33.6 vs. 77.7, 98.5, 71.7). Previous divorce increased suicide risk in men currently married or cohabiting (HR: 61.8,

Reference	Country	Study design	Study population	Time period	Outcomes/variables	Main results
			males); representative sample of the Finnish population (age 26–59 years); National Institute of Health and Welfare of Finland and the Statistics Finland mortality register			47.3 vs. 25.4, 33.6). In divorced men, the risk was higher in those whose divorce had happened 3 years ago or earlier when compared with men who had experienced the divorce later (HR: 98.5 vs 77.7)
Forkmann et al. (2012). Prevalence of suicidal ideation and related risk factors in the German general population. J Nervous & Mental Disease 200(5): 401–5[111]	Germany	Cohort	N=2,509 German general population, incl. 1109 males (age range 14-94 years). Household interviews	2009	Suicidal ideation Divorce	There was no difference in men's suicidal ideation between those who were suicidal and non-suicidal regarding family status (i.e. married, living together p=0.38, married living apart p=0.91, unmarried p=0.90, divorced p = 0.98, widowed p=0,10)
Jimenez-Trevino et al. (2012). The incidence of hospital-treated attempted suicide in Oviedo, Spain. Crisis, 33(1): 46–53[112]	Spain	Cohort	N=308 suicide attempt presentations to a hospital in Spain, incl. N=119 males (age: 15–64 years). Linked national datasets	2008–09	Suicide attempt Divorced/separated	The highest rate of suicide attempt was for men was among separated/divorced males (approx. 2,400/ 100,000, 100/100,000, and 50/100,000, for separated/divorced, never married, and married, respectively)

Reference	Country	Study design	Study population	Time period	Outcomes/variables	Main results
Kõlves et al. (2012). Fluctuations of suicidality in the aftermath of a marital separation: 6-month follow-up observations. J Affective Disorders 142(1–3): 256–263[113]	Australia	Case-control	N=217 separated persons, incl. N=130 separated males (mean age 44.7 years, SD 9.7); 6-month follow-up survey. Survey data from contacts with relationship counseling services, help-line services, and support and self-help groups	2006–07	Suicide Stressful experiences	Among separated males all levels of suicidality decreased significantly: No change – not suicidal (28.6%), No change – still suicidal (7.9%), Decrease in suicidality (60.3%), Increase in suicidality (3.2%). Males who showed an increase or no stability in suicidality were more affected by other stressful experiences – legal issues, feelings of loss and loneliness, loss of social networks and financial difficulties
Kuipers et al. (2012). Thematic analysis of key factors associated with Indigenous and non-Indigenous suicide in the Northern Territory, Australia. Rural & Remote Health 12(4): 2235[114]	Australia	Case series; qualitative	N=411 coroners' suicide reports in NT, including N=175 Indigenous males (88%) and females (12%) and N=181 non-Indigenous males (85%) and females (15%)	2000–10	Suicide Relationship breakdown	Key factors associated with suicide: alcohol and other drug abuse (89% Indigenous and 77% non-Indigenous), conflict and relationship breakdown (75% Indigenous and 61% non-Indigenous), and mental illness and mental health concerns (34% Indigenous and 67% non-Indigenous). 33% of Indigenous people had had a fight or argument with their spouse or partner prior to their suicide.

Reference	Country	Study design	Study population	Time period	Outcomes/variables	Main results
						Separated from partner mentioned in: 12% Indigenous suicide cases and 30% non-Indigenous cases. Note that analysis was not undertaken by gender but the sample is mostly males
Yip et al. (2012). Towards a reassessment of the role of divorce in suicide outcomes: evidence from five Pacific Rim populations. Social Science & Medicine 75(2): 358–66[98]	Hong Kong, Taiwan, Japan, South Korea, Australia	Cohort	Australian Bureau of Statistics suicide data	2006	Suicide Divorce	Suicide rates higher for divorced males than for married males: Age 15–24: 0.0/100,000 (rate almost negligible); COA[5] 0.0 (ratio almost negligible) Age 25–39: 28.1/100,000; COA: 2.5 (95% CI 1.0, 6.5) Age 40–59: 26.6/100,000; COA: 2.0 (95% CI 1.2, 3.3) Age 60+: 27.0/100,000; COA: 3.6 (95% CI 1.7, 7.7)
Barth et al. (2011). Socioeconomic factors and suicide: An analysis of 18	17 European countries	Cohort	WHO suicide data for 18 countries: 17 European industrialised	1983–2007	Suicide Divorce	Rising divorce rates resulted in significantly higher suicide rates in males (coefficient B=8.02, p=0.02)

[5] COA is calculated by dividing the suicide rate of the divorced by that of the married; therefore, the higher the COA, the greater the suicide risk of the divorced over and above married individuals. If the number is less than 1, marriage is considered to have a detrimental effect.

Reference	Country	Study design	Study population	Time period	Outcomes/variables	Main results
industrialized countries for the years 1983 through 2007. J Occupational and Environmental Medicine 53(3): 313–17[115]	and the US		countries and the US			
Kõlves et al. (2011). Marital breakdown, shame and suicidality in men: a direct link? Suicide & life-threatening behaviour. 41(2): 149–59[116]	Australia	Case-control	N=228 males and 142 males recently separated, 174 married/defacto males. Survey data from contacts with relationship counseling services, help-line services, and support and self-help groups	2006–07	Relationship breakdown, state shame, mental health problems, suicidality (ideation, attempts) during separation	The suicidality score during separation was significantly higher among separated males compared with their female counterpart (2.5 vs. 1.7, t=3.67, p<.001)
Kovess-Masfety et al. (2011). High and low suicidality in Europe: a fine-grained comparison of France and Spain within the ESEMeD surveys. J	France, Spain	Cohort	N=3,349 representative adults (age 18+ years), incl. N=557 men in France and N=781 men in Spain; The European Study of	2001–03	Lifetime suicidal ideation, lifetime suicide attempt Separated/widowed/divorced	Lifetime suicidal ideation in separated/widowed/ divorced men compared to married/ cohabitating men in France (OR: 1.43; 95% CI 0.39, 5.32) and in Spain (OR: 1.68, 95% CI 0.42, 6.66)

Reference	Country	Study design	Study population	Time period	Outcomes/variables	Main results
Affective Disorders, 133(1-2), 247–56[117]			the Epidemiology of Mental Disorders data			Lifetime suicide attempts in separated/widowed/ divorced men compared to married/ cohabitating men in France (OR: 4.46; 95% CI 0.74, 26.78) and in Spain (OR: 8.04, 95% CI 0.17, 387.90)
Andres et al (2010). Determinants of suicides in Denmark: evidence from time series data. Health Policy 98(2–3): 263–9[118]	Denmark	Cohort	Population of Denmark. Denmark Statistical Bank data	1970–2006	Suicide Divorce	Divorce rates are positively correlated with suicide rates (not significant) (coefficient B=0.3282, T-ratio 0.675) ; impact of divorce on suicide is twice as great in males as in females (coefficient B=0.3282 vs. 0.1636)
Corcoran et al. (2010). Suicide and marital status in Northern Ireland. Social Psychiatry & Psychiatric Epidemiology 45(8): 795–800[99]	Northern Ireland	Case-series	N=1,398 suicide deaths (General Register Office for Northern Ireland data); N=1,119 male (80%)	1996–2005	Suicide Divorce	Divorce associated with increase in male suicide rates relative to married males (IRR=2.61, 95% CI 1.39, 4.88, p=0.003) Among young males (20-34 years) the rate increase was doubled (IRR=2.14, 95% CI 0.99–4.61, p=0.053) Suicide rates of divorced young men (20-34 years) were 5.6 times higher than the rates of married

Reference	Country	Study design	Study population	Time period	Outcomes/variables	Main results
						young men (IRR=5.59, 95% CI 3.58–8.67, p=0.001)
Kõlves et al. (2010). Suicidal ideation and behaviour in the aftermath of marital separation: Gender differences. J Affective Disorders 120(1–3): 48–53[119]	Australia	Case-control	N=370 separated persons, incl. N=228 separated males (mean age 43.3, SD 10.0). Survey data from contacts with relationship counseling services, help-line services, and support and self-help groups	2006–07	Suicidality; risk of serious suicidal ideation Separated from married/ de facto partner within the previous 18 months but not yet divorced	Separated males: "*Felt life was not worth living*" (64.6%), "*Wished I was dead*" (48.2%), "*Thought about taking own life, even if would not really do it*" (54.0%), "*Thought seriously about committing suicide*" (28.3%), "*Made plans for committing suicide*" (18.6%), "*Attempted to take own life*" (5.8%), None (29.2%) 47% of separated males with dependent children reported "custody/residency of children" as stressful experience (not significant for the risk of serious suicidal ideation) History of previous suicide attempts (OR: 7.07), substance abuse during the previous year (OR: 2.89), mental health disorders, (OR mood disorder 2.70, OR anxiety disorder 2.91), legal negotiations (OR 3.59) property/ financial issues

Reference	Country	Study design	Study population	Time period	Outcomes/variables	Main results
						perceived as stressful (OR: 5.85), legal issues (OR 1.95) internalised shame (OR: 1.02) and state shame scores (OR: 1.22) and education levels (OR 3.94) are independent predictors associated with serious suicidal ideation among separated males
Magnusson et al (2010). Sweden: Income and suicide. Psychological Reports 107(1): 157–62[120]	Sweden	Cohort	290 municipalities; age 25–64 years; Swedish Centre for National Prevention of Suicide and Mental Ill-Health data	2002–04	Suicide Divorce	A regression analysis of income, low education, unemployment, alcohol consumption and divorce significantly predicted men's suicide. However, income was the only significant predictor when other variables held constant (Divorce b=-1.07, not significant)
Masocco et al. (2010). Completed suicide and marital status according to the Italian region of origin. Psychiatric Quarterly 81(1): 57–71[101]	Italy	Case-control	21 regions in Italy, age 25+ years; Italian Database on Mortality data	2000–02	Suicide Divorced/separated	Divorced men in Italy (total) have a higher suicide rate than married men (13.3 and 9.9/100,000, respectively; RR not significant) Suicide rate for divorced men is the highest in the North-East region (17.9/100,000); the North-East is the only region were the suicide rate among divorced men

Reference	Country	Study design	Study population	Time period	Outcomes/variables	Main results
						is higher than that of married men (RR: 1.49; 95% CI 1.02, 2.17)

IRR = Incidence Rate Ratio; SHR: sub-hazard ratio; COA: Coefficient of aggravatio

Table 10—NHMRC Levels of evidence: suicide risk for men who are separated.

Study	Level of evidence
Clapperton et al. 2019	III-2
Hedna et al. 2018	III-2
O'Neill et al. 2018	IV
Puzo et al. 2018	III-2
Milner et al. 2017	IV
Sun et al. 2016	III-2
Schiff et al. 2015	IV
Frisch & Simonsen. 2013	III-2
Silventoinen et al. 2013	III-2
Forkmann et al. 2012	III-2
Jimenez-Trevino et al. 2012	III-2
Kõlves et al. 2012	III-2
Kuipers et al. 2012	IV
Yip et al. 2012	III-2
Barth et al. 2011	III-2
Kõlves et al. 2011	III-2
Kovess-Masfety et al. 2011	III-2
Andres et al. 2010	III-2
Corcoran et al. 2010	IV
Kolves et al. 2010	III-2
Magnusson et al. 2010	III-2
Masocco et al. 2010	III-2

Table 11—NHMRC matrix to summarise the evidence base: suicide risk for men who are separated.

Component	Rating
Evidence base	B – Good
Consistency	C – Satisfactory
Clinical impact	n/a
Generalisability	A – Excellent
Applicability	B – Good

Table 12—Summary of included studies: risk of suicide for men who are survivors of sexual assault.

Reference	Country	Study design	Study population	Time period	Outcomes/ Variables	Main results
Tryggvadottir et al (2019). 'The self-destruction force is so strong': male survivors' experience of suicidal thoughts following sexual violence. Scand J Caring Sciences, 33(4), 995–1005[125]	Iceland	Qualitative	N=7 male survivors of sexual violence in their forties and sixties		Suicidal ideation Sexual violence	Overall theme: suicidal ideation following sexual violence are based on an experienced 'strong self-destruction force'. Essential structure of the phenomenon: escaping self and inner suffering; shattered self-esteem; shame and guilt; deep sense of loneliness; to quit the plan to commit suicide; emotional silencing; the idea that victims become perpetrators; disclosure; physical manifestation of emotional sufferings; looking for help; professionals' lack of knowledge
Asgeirsdottir et al. (2018). The association between different traumatic life events and suicidality. European J Psychotraumatology 9(1), 2018, 9(1)[126]	Iceland	Cohort study	N=992 participants, incl. N=403 men (mean age 45.6 years); Stress And Gene Analysis (SAGA) cohort study data	2014	Lifetime suicidality, i.e. present suicidal ideation, lifetime ideation/planning and suicide attempt, incl. self-harm with suicidal intent	No prevalence reported for sexual abuse among men. Increased likelihood of lifetime suicidal ideation in men with sexual trauma (RR adj for age: 8.36, 95% CI 3.31, 25.48; RR adj for age and

Reference	Country	Study design	Study population	Time period	Outcomes/ Variables	Main results
					Sexual trauma	demographic factors: 7.66, 95% CI 2.51–23.51)
Choi et al (2017). Adverse childhood experiences and suicide attempts among those with mental and substance use disorders. Child Abuse & Neglect, 69, 252–62[127]	US	Case-control	N=36,309 total sample and N=3,912 matched sample; US National Epidemiologic Survey on Alcohol and Related Conditions data	2012–13	Lifetime suicide attempt Sexual Abuse before age 18	Sexual abuse in men with no history of a suicide attempt (11.90%); with a history of a suicide attempt (22.40%); sexual abuse associated with increased odds of a suicide attempt (OR: 1.62, 95% CI 1.19, 2.21; p<0.01); Adjusted PAF for sexual abuse: 8.56% (95% CI 3.02, 13.80)
Turner et al. (2017). The relationship between childhood sexual abuse and mental health outcomes among males: Results from a nationally representative US sample. Child Abuse Negl, 66, 64–72[128]	US	Cohort study	N=14,564 male respondents (age 20+ years), National Epidemiological Survey on Alcohol and Related Conditions data	2004–05	Lifetime suicide attempt Childhood sexual abuse	Child maltreatment increased the odds of suicide attempt: child maltreatment without sexual abuse (3.1%; AOR: 2.82, 95% CI 1.93, 4.11, p≤0.001); sexual abuse only (7.0%; AOR: 8.57, 95% CI 3.81, 19.26, p≤0.001); sexual abuse with child maltreatment (12.7%, AOR: 9.27, 95% CI 5.73, 15.00, p≤0.001)
Flynn et al. (2016). Victimization of lesbian, gay, and bisexual people in childhood: Associations with	US	Cohort study	N=271 male gay and bisexual (mean age 45.5, SE 0.94) and N=14,109 male	2004–05	Lifetime suicide attempt	The prevalence of sexual abuse among gay or bisexual men was 14.1% vs 2.2% in heterosexual men). Mediation

Reference	Country	Study design	Study population	Time period	Outcomes/ Variables	Main results
attempted suicide. Suicide and Life-Threatening Behavior, 46(4), 457–70[129]			heterosexual (mean age 47.3, SE 0.20), participants; Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions survey data		Childhood sexual abuse	effect significant for childhood sexual abuse ($p < .001$), suggesting experience of childhood abuse plays a significant role in the relationship between attempted suicide and Lesbian, Gay, and Bisexual identity
Skerrett et al (2016). Factors related to suicide in LGBT populations: A psychological autopsy case-control study in Australia. Crisis, 37(5), 361–9[130]	Australia	Case-control	N=27 LGBT person who had died by suicide; N=20 males, N=5 females, N=2 trans-females and matched living LGBT controls		Suicide Sexual assault	LGBT suicide cases more likely than living LGBT controls to have experienced a sexual assault (OR: 3.26, 95% CI 1.04, 0.20; p=0.042)
Angst et al (2014). Suicidality in the prospective Zurich study: Prevalence, risk factors and gender. Eur Archives Psychiatry and Clin Neurosc, 264(7),557–65[124]	Switzerland	Cohort study	N=4,547 subjects, incl. N=2,201 men (age 19 years +); the Zurich study data	1978–2008	Lifetime and 12 months suicide attempt Sexual abuse in childhood	1.8% of men who had no suicidal ideation or attempts reported sexual abuse, compared with 7% with suicidal ideation and 4.2% with a suicide attempt. However, there was no bivariate association between sexual abuse/violence and suicidal ideation and attempt in men. Due to the small number of cases for men, no

Reference	Country	Study design	Study population	Time period	Outcomes/ Variables	Main results
						further analyses were conducted to assess effects of sexual abuse on ideation or attempts
Harford et al (2014). Associations between childhood abuse and interpersonal aggression and suicide attempt among U.S. adults in a national study. Child Abuse Neglect, 38(8), 1389–98[131]	US	Cohort study	N=34,653 participants (age 18+ years), incl. N=14,564 men; National Epidemiologic Survey on Alcohol and Related Conditions Waves 1 and 2 data		Lifetime suicide attempt Sexual abuse	24.64% of men reported sexual abuse (Cf women 75.36%). Childhood sexual abuse in men increased the risk of lifetime suicide attempt (OR**:** 2.26, 95% CI 1.41–3.62; p<0.01) and lifetime suicide attempt with interpersonal aggression (OR: 2.72, 95% CI 1.63, 4.55; p<0.01)
Rusow et al (2014). Associations between sexual abuse and negative health consequences among high-risk men who have sex with men. J Gay & Lesbian Social Services, 26(2), 244–57[132]	US	Cohort study	N=148 men who have sex with men recruited from a community-based, low-intensity, health education/ risk reduction HIV prevention program (mean age 38.2, SD 8.8)	2005–12	Lifetime suicidal ideation Lifetime sexual abuse	51.4% of the sample of gay and bisexual men reported lifetime sexual abuse. A history of lifetime sexual abuse associated with increased risk for lifetime suicidal ideation (AOR: 4.3, 95% CI 2.1, 8.9; p<.001)
Fergusson et al (2013). Childhood sexual abuse and adult developmental outcomes: findings from a 30-year longitudinal study in	New Zealand	Cohort study	N=997 participants born in the Christchurch urban region over a 4-month period in 1977 (current age 30 years);	Since 1977	Suicidal ideation, suicide attempt	Effects of childhood sexual abuse similar for males and females. Frequency of suicidal ideation varied with extent of abuse (20.8%,

Reference	Country	Study design	Study population	Time period	Outcomes/ Variables	Main results
New Zealand. Child Abuse & Neglect, 37(9), 664–74[133]			incl. N=478 males; Christchurch Health and Development Study data Cohort studied at birth, 4 months, 1 year, annually to age 16, then at ages 18, 21, 25, and 30 Effects of different types of abuse analysed: non-contact, contact and sexual penetration.		Child sexual abuse (CSE)	32.1%, 37.3%, 54.8%: no abuse, Non-contact, Contact, Sexual penetration, respectively; p<.001). For suicide attempt (3.8%, 3.6%, 3.9%, 27.4%, no abuse, Non-contact, Contact, Sexual penetration, respectively), sexual penetration was compared with all other types combined, including no abuse, and there was a significant difference in the occurrence of suicide attempt, p<0.001) After adjustment for confounding corelates, extent of exposure to CSA associated with increased rates of suicidal ideation (B= 0.395, SE 0.089, p<.001; Cohen's d=0.40; AR=10.5%) and suicide attempt (B=1.863, SI 0.403, p<.001; Cohen's d=0.24; AR=14.8%)
Tomasula et al. (2012). The association between sexual assault and suicidal activity	US	Cohort	N=14,041 high school students (age 14-18+ years); incl. N=7,091	2007	12-month suicide attempt	3.9% of men reported sexual assault. Increased risk of a 12-month suicide attempt in

Reference	Country	Study design	Study population	Time period	Outcomes/ Variables	Main results
in a national sample. School Psychology Quarterly, 27(2), 109–19[134]			males; Youth Risk Behavior Surveillance System survey data		Sexual assault	male students with history of sexual assault when compared with male students with no history of sexual assault (26.4% and 3.6%, respectively; OR: 9.76; p<0.001). Medically serious attempts reported more frequently among male student with history of sexual assault than female students who have attempted suicide with and without history of sexual assault (p=0. 002). Male students with history of sexual assault were more likely to report a medically serious attempt than male students with no history of sexual assault (59% and 22.4%, respectively; OR: 4.97)

Reference	Country	Study design	Study population	Time period	Outcomes/ Variables	Main results
Cutajar et al (2010). Suicide and fatal drug overdose in child sexual abuse victims: a historical cohort study. MJ Australia,192(4),184–7[135]	Australia	Cohort study	N=2,759 victims of childhood sexual abuse, incl. 558 males (mean age 31.4, SD, 9.3 years); NCIS and Victorian Institute of Forensic Medicine data	Suicide data 1991–2008 Child sexual abuse data 1964–95	Suicide Child sexual abuse	Two of 558 males who had died by suicide had been sexually abused (0.36%). The risk of suicide among men who had been abused was higher than for those who had no abuse (RR: 14.20, 95% CI 4.97,40.61, p=0.01)
Legleye et al (2010). Suicidal ideation among young French adults: association with occupation, family, sexual activity, personal background and drug use. J Affective Disorders, 123(1–3), 108–115[136]	France	Cohort study	n=4,075 general population adults (age 18–30 years), incl. 1,842 men; Health Barometer survey data	2005	12-month suicidal ideation Lifetime sexual abuse/forced sexual intercourse	6% of men had experienced lifetime sexual abuse. Lifetime sexual abuse was not related to suicidal ideation among men

Table 13—NHMRC Levels of evidence: risk of suicide for men who are survivors of sexual assault.

Reference	Level of evidence
Tryggvadottir et al. 2019	IV
Asgeirsdottir et al. 2018	III-2
Choi et al. 2017	III-2
Turner et al. 2017	III-2
Flynn et al. 2016	III-2
Skerrett et al. 2016	III-2
Angst et al. 2014	III-2
Harford et al. 2014	III-2
Rusow et al. 2014	III-2
Fergusson et al. 2103	III-2
Tomasula et al. 2012	III-2
Cutajar et al. 2010	III-2
Legleye et al. 2010	III-2

Table 14—NHMRC matrix to summarise the evidence base: risk of suicide for men who are survivors of sexual assault.

Component	Rating
Evidence base	B – Good
Consistency	B – Good
Clinical impact	N/A
Generalisability	A – Excellent
Applicability	B – Good