Risk and Protective Factors Across Socioecological Levels of Risk for Suicide: An Evidence Map

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VA Evidence Synthesis Program overview

- Established in 2007
- Provides tailored, timely, and accurate evidence syntheses of VA-relevant, Veteran-focused healthcare topics. These reports help:
  - Develop clinical policies informed by evidence;
  - Implement effective services and support VA clinical practice guidelines and performance measures; and
  - Set direction for future research to address gaps in clinical knowledge.
- Three ESP Centers across the US:
  - Directors are VA clinicians, recognized leaders in the field of evidence synthesis, and have close ties to the AHRQ Evidence-based Practice Center Program
- ESP Coordinating Center in Portland:
  - Manages national program operations and interfaces with stakeholders
  - Produces rapid products to inform more urgent policy and program decisions

To ensure responsiveness to decision-maker needs, ESP is governed by a Steering Committee comprised of health system leadership and researchers.

The program solicits nominations for review topics several times a year via the program website.
Risk and Protective Factors Across Socioecological Levels of Risk for Suicide: An Evidence Map

August, 2021

Full-length report available on ESP website: http://www.hsrd.research.va.gov/publications/esp/reports.cfm
• Suicide remains a critical public health issue
  • Suicide rates increased by 33% between 1999 and 2019 in the United States
  • Variation in rates by sex, race, age, and occupation – including military service

• 13.8% of all suicides in the US in 2018 were among Veterans
  • Veterans Comprise 8% of US general population
  • Veterans are 1.5x more likely to commit suicide than general population

• Multiple Agencies have active initiatives to address suicide prevention
  • WHO
  • US Office of the Surgeon General
  • VA

• National Strategy for Preventing Veteran Suicide 2018 – 2028 Goals
  • Increase surveillance
  • Conduct research to identify at-risk individuals & evaluate additional risk & protective factors
• CDC Social-Ecological Model: four tiered framework for organizing risk and protective factors which may then inform prevention strategies
**Background**

- CDC Social-Ecological Model: examples of risk factors categorized into each domain

<table>
<thead>
<tr>
<th>Individual</th>
<th>Relationship</th>
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<tbody>
<tr>
<td>• Previous suicide attempt</td>
<td>• Adverse childhood experiences, such as child abuse and neglect</td>
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<tr>
<td>• Mental illness, such as depression</td>
<td>• Bullying</td>
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<td>• Gender</td>
<td>• Family history of suicide</td>
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<td>• Criminal Problems</td>
<td>• Relationship problems such as a break-up, violence, or loss</td>
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<tr>
<td>• Financial Strain</td>
<td>• Sexual violence</td>
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<tr>
<td>• Impulsive or aggressive tendencies</td>
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<td>• Job problems/unemployment</td>
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<td>• Legal Problems</td>
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<td>• Serious illness</td>
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<td>• Substance use disorder</td>
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<table>
<thead>
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<th>Societal</th>
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<tr>
<td>• Barriers to health care</td>
<td>• Economic downturn/depression</td>
</tr>
<tr>
<td>• Cultural and religious beliefs, such as a belief that suicide is a noble resolution of a personal problem</td>
<td>• Seasonal variation</td>
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<tr>
<td>• Suicide cluster in a community</td>
<td>• Stigma associated with mental illness or help-seeking</td>
</tr>
<tr>
<td></td>
<td>• Easy access to lethal means, such as firearms or medications</td>
</tr>
<tr>
<td></td>
<td>• Unsafe media portrayals of suicide</td>
</tr>
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</table>
What are the risk and protective factors for suicidal behaviors (attempts or death by suicide) across social-ecological levels of risk?
Methods

• Literature Search:
  • Captured literature published between 2011 and January 2021
  • Databases included: MEDLINE, Embase, PsycINFO, and Sociological Abstract

• Identify studies meeting eligibility criteria
  • Primary outcome: suicide death or attempt

• Assess risk of bias, did not analyze high risk of bias

• All studies observational in nature, unable to provide certainty of evidence utilizing GRADE
## Inclusion and Exclusion Criteria

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<th>Inclusion Criteria</th>
<th>Exclusion Criteria</th>
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<td>Population</td>
<td>Community dwelling US Veteran or active military population (18 years of age or older)</td>
<td>&gt;50% known at increased suicide risk due to prior suicide attempts or with specific mental or physical health conditions (e.g. depression, psychoses, PTSD, recent cancer diagnoses, or terminal illness unless results are stratified)</td>
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<td>NA</td>
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<tr>
<td>Comparison</td>
<td>NA</td>
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<tr>
<td>Outcomes</td>
<td>Suicide attempts, suicide deaths</td>
<td>Composite outcome of suicide deaths plus attempts</td>
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<tr>
<td>Timing</td>
<td>Risk factors precedes suicide/suicide attempt</td>
<td>Did not capture suicide/suicide attempt prior to risk factor(s)</td>
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<tr>
<td>Setting</td>
<td>United States</td>
<td>Any</td>
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<tr>
<td>Prognostic or Risk Factors</td>
<td>Any</td>
<td>Physiological, laboratory or imaging studies (must have clinical history or diagnosis; ie, include DM as risk, not A1C).</td>
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Literature Flow Diagram

- MEDLINE N=813
- Embase N=267
- PsychINFO N=252
- Sociological Abstracts N=20

Abstracts/Titles Screened N=1296

Duplicates Removed N=56

- Abstracts/Titles excluded N=1001
  - Ineligible articles N=232
    - Ineligible outcome=102
    - Ineligible population=90
    - Ineligible study design=36
    - Ineligible setting=4

Full text reviewed N=295

Included articles N=63
(Low ROB=14; Moderate ROB=41; High ROB=8)
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## Study Characteristics

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<td>Cognitive or physical decline in functioning</td>
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### Study Characteristics

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<td>Heat Map</td>
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<td><strong>Risk and Protective Factors for Suicides and Attempts</strong></td>
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<tr>
<td>Adverse Childhood Experiences</td>
<td>Yes</td>
</tr>
<tr>
<td>Bullied Within Military Unit</td>
<td>Yes</td>
</tr>
<tr>
<td>Relationship Problems (e.g., Break-Up, Violence, or Loss)</td>
<td>Yes</td>
</tr>
<tr>
<td>Sexual Violence</td>
<td>Yes</td>
</tr>
<tr>
<td>Mental Status</td>
<td>Yes</td>
</tr>
<tr>
<td>Socioeconomic Status/Thwarted Belongingness</td>
<td>Yes</td>
</tr>
<tr>
<td>Death of a Loved One or Pet</td>
<td>Yes</td>
</tr>
<tr>
<td>Monthly IED Rates</td>
<td>Yes</td>
</tr>
<tr>
<td>Military Unit Suicides</td>
<td>Yes</td>
</tr>
<tr>
<td>Military Related Chemical Exposure</td>
<td>Yes</td>
</tr>
</tbody>
</table>
# Direction of Effect (Individual Level)

↑ = increased risk  
↓ = decreased risk  
↔ = no difference or inconsistent  
Blue = Low risk of bias study  
Orange = Moderate risk of bias study

<table>
<thead>
<tr>
<th>Risk/Protective Factor</th>
<th>Prospective Cohort (k=6)</th>
<th>Retrospective Cohort (k=39)</th>
<th>Case-Control (k=7)</th>
<th>Cross-Sectional (k=3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deaths (k=4)</td>
<td>Attempts (k=3)</td>
<td>Deaths (k=28)</td>
<td>Attempts (k=13)</td>
</tr>
<tr>
<td>Previous suicide attempt/ideation</td>
<td></td>
<td></td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>PTSD</td>
<td>↔</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>Other mental illnesses (e.g., depression and anxiety)</td>
<td>↑↑</td>
<td>↔</td>
<td>↑↑↑↑</td>
<td>↑↑↑↑↑↑</td>
</tr>
</tbody>
</table>
### Direction of Effect (Relational Level)

<table>
<thead>
<tr>
<th>Risk/Protective Factor</th>
<th>Prospective Cohort (k=6)</th>
<th>Retrospective Cohort (k=39)</th>
<th>Case-Control (k=7)</th>
<th>Cross-Sectional (k=3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deaths (k=4)</td>
<td>Attempts (k=3)</td>
<td>Deaths (k=28)</td>
<td>Attempts (k=13)</td>
</tr>
</tbody>
</table>

- ↑ = increased risk
- ↓ = decreased risk
- ↔ = no difference or inconsistent

Blue = Low risk of bias study
Orange = Moderate risk of bias study

- **Adverse childhood experiences**
- **Bullied within military unit**
- **Relationship problems (e.g., break-up, violence, or loss)**
- **Sexual Violence**
- **Marital status (unmarried)**
- **Social isolation/perceived burdensomeness/thwarted belongingness**
- **Death of a loved one or pet**
### Direction of Effect (Prospective Cohort Studies)

<table>
<thead>
<tr>
<th>Risk/Protective Factor</th>
<th>Bernecker 2019&lt;sup&gt;a&lt;/sup&gt; Active Military N: 10,000-99,999 STARRS</th>
<th>Bohnert 2014&lt;sup&gt;b&lt;/sup&gt; Veteran N: ≥100,000 VHA</th>
<th>Chu 2026&lt;sup&gt;c&lt;/sup&gt; Active Military N: ≥1,000-9,999 STARRS</th>
<th>LeardMann 2013&lt;sup&gt;d&lt;/sup&gt; Veteran and Active Military N: ≥100,000 Millennium Cohort Study</th>
<th>Naifeh 2017&lt;sup&gt;e&lt;/sup&gt; Active Military N: 10,000-99,999 STARRS</th>
<th>Phillips 2017&lt;sup&gt;f&lt;/sup&gt; Active Military N: ≥100,000 Recruit Assist Program</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SD</td>
<td>SA</td>
<td>SD</td>
<td>SA</td>
<td>SD</td>
<td>SA</td>
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<tr>
<td>PTSD</td>
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<tr>
<td>Other mental illnesses (e.g., anxiety, depression)</td>
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<tr>
<td>Hopelessness</td>
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<tr>
<td>Alcohol, tobacco, or other drug use</td>
<td>↑</td>
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<tr>
<td>Physical illness or pain</td>
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<tr>
<td>Individual</td>
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<tr>
<td>Cognitive or physical decline in functioning</td>
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<tr>
<td>Criminal or legal problems</td>
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<tr>
<td>Life stressors (non-specific)</td>
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<tr>
<td>Military rank (enlisted vs officer)</td>
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<tr>
<td>Service branch (Army/Marine)</td>
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<tr>
<td>Service component (active vs reserves)</td>
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<tr>
<td>Longer time or larger proportion of time deployed</td>
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<tr>
<td>Military former vs current service member</td>
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<tr>
<td>Adverse childhood experiences</td>
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<tr>
<td>Bullied within military unit</td>
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<tr>
<td>Marital status</td>
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<tr>
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</tr>
</tbody>
</table>

6 studies identified as low or moderate risk of bias with a prospective cohort design were summarized separately.

↑ = increased risk
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Low Risk of Bias Studies

• All were cohort studies, predominantly retrospective

• The majority had study populations greater than 100,000 people

• All made use of secondary administrative datasets

• For those that investigated suicide attempts, researchers paid careful attention to temporality of risk factors and outcome

• Variables to control for potential confounders were included in the analyses
|---------------|----------------|---------------|-------------------|-------------------|
| Combat military occupation (yes/no) | • Combat specialist  
• Health care  
• Functional support, service and supply  
• Mechanical or electrical repair  
• Other | • Occupational Grade E01 – E03  
• Occupational Grade E04 – E07 | • Infantry, gun crews, and seamanship specialists  
• Functional support and administration  
• Service and supply handlers  
• Communications and intelligence specialists  
• Electronic equipment repairers  
• Health Care Specialists  
• Other Technical and allied specialists  
• Craftworkers  
• Tactical operations offices  
• Health care officers  
• Groups with < 25 | • Combat arms  
• Special forces  
• Combat Medic  
• Other |
<table>
<thead>
<tr>
<th>Barry, 2018</th>
<th>Barth, 2016</th>
<th>Bishop, 2020</th>
<th>Blow, 2012</th>
<th>Bullman, 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Homelessness</td>
<td>• Race</td>
<td>• Sleep-related breathing disorders</td>
<td>• Age</td>
<td>• Age at entry</td>
</tr>
<tr>
<td>• Sum of 13 med. conditions</td>
<td>• Branch of Service</td>
<td>• Insomnia</td>
<td>• Race</td>
<td>• Race</td>
</tr>
<tr>
<td>• TBI</td>
<td>• Type of unit</td>
<td>• Nightmares</td>
<td>• sex</td>
<td>• sex</td>
</tr>
<tr>
<td>• Any psychiatric disorder</td>
<td>• age</td>
<td>• PTSD</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Depression</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• Anxiety</td>
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<td></td>
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<td></td>
<td></td>
<td>• Schizophrenia</td>
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<td>• Bipolar disorder</td>
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<td>• SUD</td>
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<tr>
<td></td>
<td></td>
<td>• Medical comorbidity</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>• Obesity</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• Number sleep medicine visits 180 days prior to the index date</td>
<td></td>
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</tr>
</tbody>
</table>
Key Findings

• Quality and quantity of information in Veterans and active military is limited

• Greatest amount of information is related to individual risk factors

• Individual-level factors, are consistently predictive of, or associated with suicide and attempts:
  • history of prior suicide ideation or attempts
  • mental illness (other than posttraumatic stress disorder)
  • substance, alcohol or tobacco use

• Community-level, relational-level, and other individual-level factors were reported in only one or two studies
If you have further questions, please feel free to contact:

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Kristen Ullman Kristen.Ullman@va.gov
Timothy Wilt tim.wilt@va.gov

Full-length report and cyberseminar available on ESP website:

http://www.hsrdrresearch.va.gov/publications/esp/