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The Role of Social Determinants of Health in Veteran Suicide: A Systematic Review

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Abstract

Objective: Historically, veteran suicide research has primarily focused on individual-level risk factors, such as mental health; however, recently, there have been calls to take a broader public health approach. Emerging research suggests the importance of considering the contexts in which veterans live through the study of social determinants of health (SDoH). The objective of this systematic review was to address this need by examining the available literature regarding the link between SDoH and suicidality among veterans.

Methods: A keyword search of three online databases was conducted. Articles published between January 2001 and May 2021 examining at least one SDoH (e.g., financial insecurity, trauma, etc.) as a risk factor or correlate for suicidality among the US veterans were eligible for full-text review; data extraction and quality review was completed by two independent reviewers.

Results: Following the keyword search, 1515 articles underwent title/abstract screening. A total of 94 (6.2%) articles were eligible for full-text review and extraction. Results revealed that approximately half of the articles (n = 46, 48.9%) assessed one SDoH, about a quarter (n = 22, 23.4%) assessed two SDoH factors, and the remaining (n = 26, 27.6%) assessed three to five SDoH factors. Trauma was the most assessed SDoH among the articles included in the review (n = 54, 57.7%). The studies were primarily cross-sectional (n = 59; 74.4%).

Conclusion: Although many articles examined SDoH, few included more than one factor, indicating a need for more comprehensive approaches to study suicidality in veterans. The results of this study could serve as a foundation for the future research and could be applied in developing veteran risk screenings and suicide prevention efforts.

Keywords: Social determinants of health; veteran suicide

Introduction

In 2019, 6261 US veterans died from suicide.[1] Compared to non-veterans, veterans experience increased risks for suicide, and thus it is important to understand potential risk factors within this population.[1] Substantial research has examined risk factors for veteran suicide, with a large focus on individual-level risk factors, including personality characteristics (e.g., impulsivity, self-harm) or psychological health issues (e.g., depression).[2–7] These factors have been shown to relate to suicide; for instance, among Veterans Healthcare Administration patients who died by suicide in 2018 59.6% had a diagnosed mental health or substance use disorder.[8] However, a growing body of research has increasingly shown the importance of also examining social and contextual factors in the study of veteran health and suicide. These contextual factors are commonly referred to as social determinants of health (SDoH), defined by the World Health Organization (WHO) as "the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life."[9]

The existing literature illustrates the association between veteran suicide and several known SDoH, including social support and connectedness, financial and housing insecurity, neighborhood and built environment, and trauma exposure.[10–12] Various aspects of social support are particularly salient in relation to veteran suicide. In a longitudinal study, Arenson et al. found that a larger social network size and greater perceived social support were associated with lower chronicity and severity of suicidal ideation (SI) among veterans.[13] Another study of veterans identified a significant relationship between perceived social support from family and a history of suicide attempts.[14] This was expected, as lower perceived support or greater interpersonal challenges indicated increased suicide risk, while higher social support was considered to decrease suicide risk. In a study of veterans, Mavandadi et al. found that a higher frequency

of negative exchanges with social network members was associated with increased odds of reporting the past year suicidal ideation.[15]

Negative interpersonal interactions can coincide with another SDoH, that is, trauma, known to relate to veteran suicide. Research has shown a relationship between suicide and trauma exposure, which can occur at any stage of life.[16,17] A form of trauma experienced by civilians and veterans alike are adverse childhood experiences, or "ACEs."[18,19] ACEs can directly relate to suicide ideation, attempt, and death (collectively referred to as suicidality), but may also exacerbate the psychological impact of subsequent trauma among veterans.[20] In a study conducted by Morgan et al., veterans were more likely to report suicidal thoughts when they had a history of ACEs in conjunction with combat exposure, as opposed to veterans that were not exposed to ACEs and combat exposure.[21] In addition to ACEs, veterans may experience military-related trauma that has been shown to relate to suicidality. Specifically, veterans who have experienced military sexual trauma (MSA) are more likely to attempt or die by suicide.[12,22]

Economic factors, including financial instability and housing insecurity, may also relate to veteran suicidality.[23] A study conducted by Blosnich et al. reported that greater employment/financial issues related to greater risks for suicidality, and noted considerable overlap between experiencing financial issues and housing instability.[5] In a study conducted by Bossarte et al., an association between greater housing instability and increased suicidal ideation was observed among US veterans.[24] In addition, unstably housed veterans are at higher risk for suicide, compared to stably housed veterans.[5] Considering that the current literature suggests that about one-seventh of unhoused adults in the United States have served in the armed forces, this is an important factor in the study of veteran suicide.[25]

The need to consider SDoH in the study of veteran suicide has gained momentum. Duan-Porter et al. published an evidence map that reviewed and summarized the literature regarding risk and protective factors for suicidal behaviors (including both attempts and deaths) among veterans and active duty service members through the lens of the socio-ecological model, classifying risk factors at the individual, relational, community, or societal level.[16] The report was among the first to comprehensively examine contextual factors related to military suicide, and the results highlighted the preponderance of data focused on individual-level factors. While consideration of individual factors, such as psychological health symptoms/diagnoses, are undoubtedly critical to the study and treatment of suicidality among veterans, it is important to examine also broader contextual factors that may impact risk of suicide. However, to date, no systematic reviews establishing the relationship between SDoH and suicide in US military veterans have been published. Thus, the goal of the present study was to add to the existing literature by presenting a more nuanced examination of the existing body of evidence surrounding SDoH and veteran suicide. This PROSPERO (International Prospective Register of Systematic Review)-registered systematic review would fill gaps in knowledge by examining the available literature focusing the relationships between SDoH and suicidality (i.e., suicide ideation, behaviors, and/or death) solely within the veteran population. The results of this study may have numerous important applications that could collectively reduce veteran suicide, including informing the refinement of veteran risk screening instruments, broadening suicide prevention programs, and serving as a foundation for the future research.

Method

The methodology and presentation of results for this study followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.[26] Three researchers trained on PRISMA guidelines searched the peer-reviewed literature published between 2001 and 2021 that examined SDoH-related risk factors in relation to suicidality among US veterans. This review was registered in PROSPERO in March 2021. Full methodology is described herein.

Search selection and criteria

A search of the literature was conducted in April 2021 in three databases: PsycINFO (database of abstracts of literature in the field of psychology), PubMed, and Cumulated Index to Nursing and Allied Health Literature (CINAHL), using the keywords specified in Table 1. In order to be included in the review, full-text studies must have been published in peer-reviewed academic journals between 2001 and 2021 and must be available in English. In addition, the study had to include primary or secondary data collected from the US military veterans who were separated from service, the outcome of interest must be suicidality, and at least one SDoH must have been examined as a correlate or predictor of suicide. Accordingly, articles were excluded if the study population included active duty service members, non-US military service members, or civilians;

Table 1. Search strategy for systematic review.

Database	Search Terms
PubMed, CINAHL, and PsychINFO	("Suicide" or "suicidality") and ("veteran" or "veterans") AND ("social determinants of health" or "economic stability" or "employment" or "unemployment" or "poverty" or "financial insecurity" or "financial instability" or "financial strain" or "income" or "financial security" or "family income" or "homelessness" or "housing instability" or "food insecurity" or "food security" or "hunger" or "public assistance" or "SNAP" or "WIC" or "socioeconomic status" or "education" or "healthcare access" or "insurance" or "healthcare coverage" or "healthcare costs" or "insurance benefits" or "regular source of healthcare" or "primary care provider" or "access to care" or "barriers to care" or "transportation" or "distance to treatment" or "cost of treatment" or "mental health stigma" or "stigma" or "neighborhood and built environment" or "zip code" or "neighborhood type" or "rural" or "urban" or "public transportation" or "environmental exposures" or "neighborhood crime" or "neighborhood safety" or "health literacy" or "social and community context" or "social support" or "loneliness" or "social cohesion" or "civic engagement" or "civic participation" or "volunteerism" or "philanthropy," or "community engagement")

suicidality was not the measured outcome; the study was a literature review, commentary, case study, or clinical intervention; and/or the study population was an inpatient psychiatric population or a population with other documented serious medical conditions (e.g., Parkinson's).

Title/abstract was screened by two reviewers (Ray Cameron Vialu, Emily Schmied) independently, with exclusion requiring consensus of both reviewers. Two reviewers (Ray Cameron Vialu, Eamonn Hartmann) conducted a 100% full-text review of articles deemed eligible after title/abstract screening, and the third reviewer (Emily Schmied) resolved discrepancies. The reviewers recorded title/abstract screening, full-text review, and data abstraction in Covidence (https://www.covidence.org/). The following variables were extracted for all screened articles: research design, instrument/data source, primary outcome and independent variables (including SDoH factors), sample size, participant characteristics, key results, and discussion points. A structured review protocol was followed using PRISMA criteria, as depicted in the flow diagram shown in Figure 1.[26] Articles that met the inclusion criteria were critically appraised using publicly available protocols and were categorized as high, moderate, or low risk for bias.[27] Assessments were appraised independently by two members of the research team.

Results

Figure 1 shows the article review process. The keyword search yielded 1515 articles, of which 547 were duplicates. Initially, the research team screened all 968 original titles/abstracts, marking for removal any article that did not meet the specified inclusion criteria. After the title/abstract review stage, 114 articles remained eligible for full-text review and extraction; of these, 94 (82.4%) were deemed eligible after the full-text review. All included articles were assessed critically, most (60.6%) were rated low risk for bias, 35.1% were rated as moderate, 4.3% could not be determined, and no article was of poor quality.

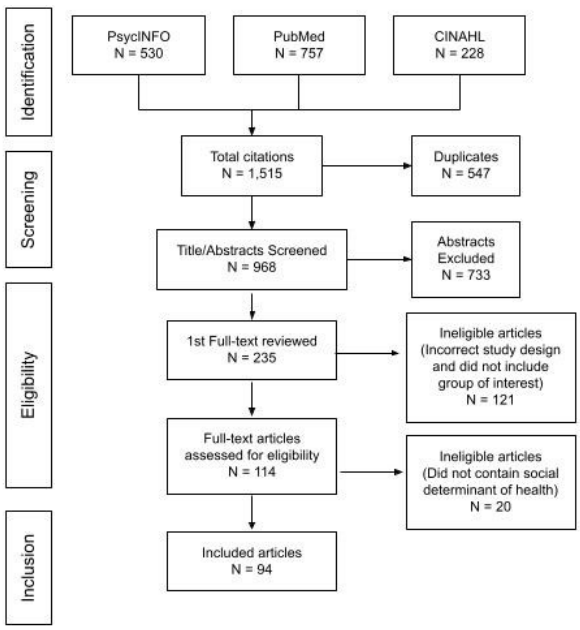

Figure 1. PRISMA flow chart.

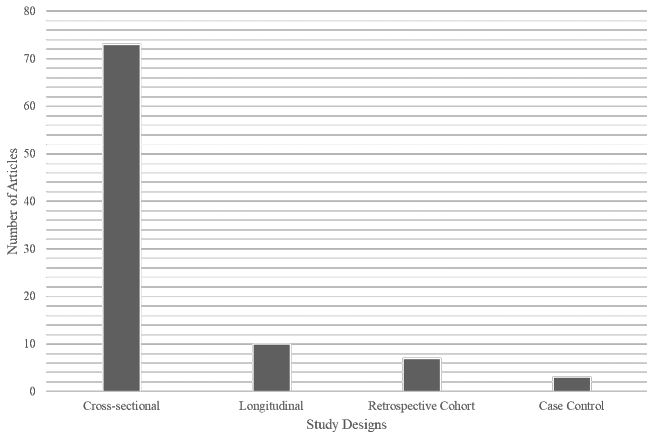

Figure 2. Study designs of reviewed articles (N = 94).

As examined in Figure 2, of the final 94 included articles, the majority used cross-sectional study designs (78.7%) with the remaining consisting of longitudinal, retrospective cohorts, and case control study designs. Sample sizes for over half of the studies (57.4%) were large, with more than 1000 participants. The remaining studies were smaller, comprising 60–999 participants. In terms of data sources, self-report surveys were used predominately (50.0%). The next most common included qualitative one-on-one interviews (19.1%) and medical records were used in about one-sixth of the studies (16.0%).

Among the final 94 articles included, 43.6% (n = 41) only assessed suicide ideation as the indicator of suicidality. Over one-third (n = 36, 38.3%) assessed both suicidal ideation and suicidal behavior, and the remaining (n = 11, 11.7%) assessed suicide death as an outcome. Among the studies using surveys or interviews, the instruments largely included clinically validated screening tools to assess suicidality (Patient Health Questionnaire, Suicide Behavior Questionnaire, and Columbia Suicide Severity Scale).[28,29]

Participant Characteristics

The results revealed that all the branches of service were represented, but half the articles focused on the US army veterans (50%). The majority (81%) of articles included samples with a mean age of 30–60 years. The study sample predominantly consisted of male participants (80.8%). Only four (4.2%) studies reported participant sexual orientation. When examining ethnicity, non-Hispanic white veterans made up approximately two-thirds (67.0%) of the study samples, with minority ethnicities, including black, non-Hispanic, and other/multiple, making up the rest of the population sample.

SDoH

SDoH factors extracted in this review included trauma exposure, income, employment, social support, access to healthcare, education,

housing, and neighborhood/built environment. The review revealed that approximately half of the 94 articles ultimately included in the review (n = 46, 48.9%) assessed only one SDoH, about a quarter (n = 22, 23.4%) assessed two SDOH factors, and the remaining (n = 26, 27.6%) assessed three to five SDoH factors. Many articles (n = 76, 80.9%) discussed at least one SDoH factor in the discussion section when contextualizing the results, and a little over half of the articles (n = 49, 52.5%) mentioned lack of assessment or consideration of an SDoH as a limitation.

Trauma was the most assessed SDoH among the articles included in the review (n = 54, 57.7%). Across the articles, four categories of trauma exposure were assessed: combat (n = 38, 40.4%), sexual assault (n = 29, 30.9%), physical assault (n = 15, 16%), and ACEs (n = 17, 18.1%). Out of 54 articles that assessed any type of trauma exposure, 42 (77.7%) found trauma to be significantly associated with suicidality.

One-third (n = 31, 32.9%) of the articles assessed social context and its association with suicidality. Of the 31 articles, 28 (90.3%) found a significant association between suicidality and social context. When taking a closer look at social context, the most assessed aspect of this construct was social support, which was assessed in various ways. For example, 6.3% of articles (n = 6) used the 12-item Multidimensional Scale of Perceived Social Support (MSPSS), which measures perceived adequacy of social support from family, friends, and significant others. In contrast, some articles measured social isolation/interpersonal problems (n = 4, 12.9%) or unit support/morale (n = 4, 12.9%).[30]

The least frequently assessed SDoH in this review was neighborhood and built environment. Only 12 (12.8%) articles reported assessing this factor, but of these, seven (58.3%) found a significant positive association between neighborhood and built environment and increased risk of suicidality. When taking a closer look at the assessed aspects of neighborhood and built environment, the majority of the studies assessed community type, or whether the veteran resided in an urban or rural area. One study revealed that rural Veterans Affairs (VA) facility users had higher suicide death rates than urban VA facility users (33.3 vs. 29.1 deaths per 100,000 population) between 2003 and 2017.[31] Other measurements for this SDoH included geographical location (n = 2, 16.6%), municipality equality index (n = 6, 50%), and transportation accessibility (n = 2, 16.6%).

Economic stability was frequently assessed throughout the articles (n = 38, 40.4%). The most common measurements included annual household income (n = 4, 10.5%), employment status (n = 10, 26.3%), family income-to-poverty ratio (n = 5, 13.1%), financial stability (n = 5, 13.1%), and homelessness/housing instability (n = 14, 36.8%). Of the articles reporting this construct, about one-third (n = 28, 29.8%) discovered a significant relationship between economic instability/low income and increased suicide risk.

Of the articles that assessed access to health care (n = 18, 19.1%), all of them demonstrated that a lack of access to health care was significantly associated with suicidality. The most assessed measures for health care access were health care coverage or receipt of health services (n = 5, 27.7%), barriers to care-seeking (n = 5, 27.7%), insurance status (n = 1, 8%), distance to nearest VA facility (n = 6, 50%), and mental health service usage (n = 2, 16.6%).

Discussion

As veteran suicide is a complex issue, there is a need to take an expanded approach to studying suicide that considers the contexts in which veterans live and work.[16,32] In fact, a recent statement by the White House about reducing military and veteran suicide identified a need to address upstream risk and protective factors, such as food, housing, financial and employment insecurity, and social connectedness.[32] This systematic review provides an overview of the current evidence surrounding the study of several upstream factors, here referred to as SDoH, in relation to veteran suicidality.

This review showed that of the SDoH factors examined, trauma exposure/history was most frequently assessed as a correlate of suicide. This result complements the existing literature documenting strong associations between traumatic exposures and posttraumatic stress disorder (PTSD) and depression, which have been shown to be positively associated with suicidal behavior.[33–36] Studies have also suggested a dose–response relationship, such that the risk of lifetime suicide attempt increases with number of traumatic events.[37,38] As shown in this review, trauma exposure can take many forms, and thus different approaches are required to address it. For instance, interventions to reduce ACEs may include increasing parental support and expanding access to social services to reduce poverty during childhood;[39] whereas reducing military sexual assault may require changes to reporting practices and disciplinary policies.[40]

The current review also builds upon existing evidence regarding the role of social context in suicidality, as many studies that were reviewed found significant relationships between suicidality and reduced social support, and/or increased loneliness. These results confirm that intervention within the social context could be an essential strategy for understanding and decreasing veteran suicidality, such as engaging in community outreach, where veterans live, encouraging the development of local suicide prevention-focused coalitions, and/or devising peer support systems.[41-42] Ultimately, clinicians, practitioners, public health professionals, and researchers should be attentive to all aspects of the social context when assessing risk for suicide or intervention.

Economic and housing insecurity are other major SDoH factors identified as potential risks for suicidality.[5,43] The relationship between these factors and suicidality, or health in general, may be complex and bidirectional. More specifically, research shows that veterans experiencing homelessness go through many barriers to access social and health services, which could exacerbate existing psychological health issues or cause newly developed conditions to go untreated.[11,43] While about 30% of all veterans access Veterans Health Administration (VHA) services, many homeless veterans do not qualify for VHA services.[44] This is important because veterans experiencing homelessness are known to experience elevated suicide risks and could benefit from greater access to care, and also because nonusers of VHA care have been traditionally understudied and unrepresented in research.[11,44] The present research suggests that this high-risk population needs more suicide-prevention efforts and clinical attention. One study recommended improved policies for linking homeless veterans to social services.[11]

The present study had several limitations in terms of methodology and implications. First, the search was conducted prior to the

White House and Department of Defense's 2021 pledge to focus on SDoH in the prevention of suicides,[32] and thus the review may benefit from including articles that were published more recently. Second, there are many SDoH factors, and not all were extracted for this study; although an effort was made to extract at least one SDoH from each category (i.e., economic stability, education access, healthcare access, built environment, and community context). Third, the design of the review did not allow for examination of risk factors for suicidality by veteran characteristic, such as ethnoracial group, gender, or sexual orientation. As research suggests service members from minoritized racial/ethnic groups, and/or those who identify as women, transgender, or non-binary may face greater risks for suicidality than male veterans or their civilian peers, more research is needed to determine the relationship between racism and discrimination and other adverse SDoH experienced within these groups.[22,45] In addition, researchers and clinicians should make concerted efforts to include veterans from marginalized groups to allow for a more nuanced understanding of how risk factors for suicidality may differ among these unique groups and to ensure they receive necessary resources that could reduce inequities.

Conclusion

We found evidence that SDoH factors are related to suicidality in veterans, although few studies assessed more than one contextual factor. The present work is important because it confirms the importance of examining contextual and multi-level factors in the study and treatment of veteran suicide and because it delineates gaps in the veteran suicide research that need to be addressed. In particular, these findings highlight the need for public health approaches to suicide prevention, such as those that seek to expand access to social services, reduce social isolation and adverse social experiences (e.g., trauma, discrimination, etc.), and combat mental health stigma. In addition, the results support the continued incorporation of social screenings and programs into clinical practices both within and outside VA facility. Finally, researchers should continue to assess contextual factors alongside interpersonal factors, such as psychological symptoms, when studying risk factors for suicidality among veterans. As veteran suicidality is a complex issue, a multifaceted, transdisciplinary approach is required to reduce it.

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