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The Effects of Loneliness and Suicidal Ideation on U.S. Veterans

Sean Donnelly
Walden University

Walden University

College of Health Sciences and Public Policy

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Sean Donnelly

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Review Committee
Dr. Srikanta Banerjee, Committee Chairperson, Public Health Faculty
Dr. Julia Leischner, Committee Member, Public Health Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

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Abstract

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Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Public Health

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Abstract

U.S. veterans suffer from a disproportional rate of suicide compared to their civilian counterparts. The purpose of this study was to understand the significance of loneliness and suicidal ideation among the U.S. military veteran population. Another aim was to explain the relationship, if any, between these variables. Three critical research questions related to veteran loneliness, suicidal ideation, and status were examined. The social ecological model was chosen as the theoretical framework because it considers multiple levels of influence (e.g., social belonging, social wellness, and gregarious activity) on an individual's outcome. Data from 6,371 respondents who completed the 2009 National Health and Nutrition Examination Survey (NHANES) were analyzed as part of the study's cross sectional quantitative secondary research design. Logistic regression and descriptive statistics were used to identify the association between the study variables (veteran status, suicidal ideation, loneliness, age, depression, poverty, and gender). The results for all three research questions were not statistically significant. However, the results indicate that depression plays a significant role in suicidal ideation for veterans. Furthermore, the findings demonstrate that loneliness and suicidal ideation are strongly related in the general population. The study may contribute to positive social change by clarifying the connections between depression, loneliness, and suicide among the study population. With this knowledge, stakeholders may be able to craft health policies that save veterans' lives.

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Dedication

My capstone is dedicated to all the U.S. veterans—past, current, and future. Our nation will be forever in debt to you. Your struggles are not ignored. Thank you for your service.

Acknowledgments

I would like to acknowledge my academic committee. Thank you, Dr. Banerjee, my committee chair. Also, thank you to my second committee member, Dr. Leischner, and my university research reviewer, Dr. Sanggon. Your understanding, guidance, and support helped me get through this challenging journey.

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Section 1: Foundation of the Study and Literature Review

The topic of this study was the relationship between loneliness and suicidal ideation among the U.S. veteran community. Few researchers have analyzed the connection between the two variables. The objective of this study was to examine whether loneliness and suicidal ideation are significantly linked to the veteran community and, if so, how much of a driver is loneliness in suicidal ideation among veterans. I also sought to compare the findings to those of nonveterans. This study was needed because of the disparity in suicide between the two studied groups. Understanding veteran suicidal ideation and providing effective treatment are crucial to deterring the act of suicide or parasuicide.

Background

Veteran suicide is an acute and important public health crisis with increasing trends, especially in recent years. Understanding the risk factors associated with veteran suicide remains a challenging feat today ("Reports Outline Suicide Study Findings," 2019). In 2017 the veteran suicide rate in the United States was just over 27 suicides per 100,000, compared to their civilian counterpart at 14 suicides per 100,000 (Friedl, 2020). Some researchers have attributed suicide to loneliness in the general citizen population, especially among men (Shaw et al., 2021). According to Kennedy (2019), despite ongoing research, veteran suicide generally remained the same, as of late 2018 and early 2019. For this reason, research into the discrepancies between veteran and civilian suicidal ideation is imperative. In this study, I addressed the gap in knowledge on veteran loneliness and suicidal ideation.

Problem Statement

Although there are many studies on veteran suicide, research on loneliness, especially how it contributes to suicidal ideation, has been almost nonexistent, especially among veterans. According to Teo (2018, as cited in Richman, 2018), data on loneliness among the veteran population in the private sector is not generally collected by the U.S. Department of Veterans Affairs (VA). As a result, there is a significant gap in the literature regarding the phenomenon of loneliness among U.S. veterans as it pertains to suicidal ideation. Moreover, there is little to no research, according to my review of the literature, on the causal association, if any, between the two variables in the veteran community. A variety of studies have been conducted on veteran suicide in reference to brain injury, social isolation, depression, and other variables, however. According to Ramchand (2022), suicides are highest among veterans diagnosed with opioid use disorder, bipolar disorder, schizophrenia, substance abuse disorder, anxiety, depression, posttraumatic stress disorder, and traumatic brain injury. In addition, researchers have found that social isolation is strongly connected to suicidal outcomes (Calati et al., 2019). However, loneliness has been largely neglected by researchers, according to my review of the literature. This is alarming, especially recognizing the significant impact that suicide and loneliness each have on veterans' quality of life, something that has become a public health crisis (Carroll et al., 2020). This lack of research is reflected by the absence of knowledge on key variables and how they interact in the veteran community. Information from the current study may prove critical to veteran wellness. There is a significant gap in the literature regarding the precise risk factors for suicidal ideation

among U.S. veterans at the national level (Carroll et al., 2020). In the literature review, I highlight this area of concern, while also exposing loneliness as a reoccurring variable in previous studies.

Purpose of the Study

The purpose of this quantitative secondary data analysis study was to (a) explore whether there is a significant association between veteran status and suicidal ideation and between loneliness and suicidal ideation among U.S. veterans after controlling for gender, age, poverty level, and depression and (b) consider whether loneliness moderates the relationship between veteran status and suicidal ideation among U.S. veterans after controlling for age, gender, poverty level, and depression. The independent variable was veteran status. The dependent variable was suicidal ideation, and the moderating variable was loneliness. The covariates were age, gender, poverty level, and depression.

This study is unique in that it included an analysis of the association between veteran loneliness and suicidal ideation. I focused on the "needs more emotional social support" and "thought you would be better off dead" questions in the National Health and Nutrition Examination Survey (NHANES) data sets. The NHANES researchers controlled for age, poverty level, gender, and depression. The knowledge from this investigation may enable practitioners to curb the epidemic of suicidal ideation before it presents itself, by using newly available data that lead to successful preventative measures.

Research Questions and Hypotheses

I explored the following three research questions (RQs) and corresponding hypotheses:

RQ1: Is there a significant association between veteran status and suicidal ideation after controlling for age, gender, poverty level, and depression?

$H_0$1: There is no significant association between suicidal ideation and veteran status after controlling for age, gender, poverty level, and depression.

H_a1: There is a significant association between suicidal ideation and veteran status after controlling for age, gender, poverty level, and depression.

RQ2: Is there a significant association between loneliness and suicidal ideation after controlling for age, gender, poverty level, and depression among U.S. veterans.

$H_0$2: There is no significant association between loneliness and suicidal ideation after controlling for age, gender, poverty level, and depression, among U.S. veterans.

H_a2: There is a significant association between loneliness and suicidal ideation after controlling for age, gender, poverty level, and depression, among U.S. veterans.

RQ3: Does loneliness moderate the relationship between veteran status and suicidal ideation after controlling for age, gender, poverty level, and depression?

$H_0$3: Loneliness does not moderate the relationship between veteran status and suicidal ideation after controlling for age, gender, poverty level, and depression.

H_a3: Loneliness does moderate the relationship between veteran status and suicidal ideation after controlling for age, gender, poverty level, and depression.

Theoretical Framework

I applied the social ecological model (SEM) in this study. The SEM includes multiple systems of influence (McDaniel, 2018). More specifically, the SEM has multiple components and relates well to identifying upstream factors that may affect important mental health indicators like depression, perceived loneliness, and suicidal ideation. Blosnich et al. (2020) identified the impact, as documented in previous studies, that social determinants of health—to include relationships—have on mental health. These categorical determinants can affect a veteran's psychological health. The SEM was applicable to this study because veteran loneliness and suicide were theorized to be connected through the result of inadequate SEM factors, which may cause loneliness and, therefore, suicidal ideation. As a result, the best treatment and deterrent was presumed to be a systems-based approach to veteran wellness.

I used SEM as a foundation to understand how loneliness contributes to adverse effects on military veterans. SEM addresses the relevancy of the social determinants of health. The SEM emphasizes several levels of influence on an individual. These levels include individual, interpersonal, organizational, community, and public policy (Cramer et al., 2017). This is why I chose this model as opposed to other methods. Veterans who identify as lonely because of lack of social support or cohesion fall under SEM. The effects of these levels can be varied for each veteran; however, all stages play a part in mitigating veterans at risk of suicide and suicidal ideation. The feeling of lacking support

can be attributed to levels of community and policy, all the way down to family and friends. As described in previous literature, this result may create a feeling of being lonely and detached from the real world.

To rectify this situation, legislators at the state and federal levels might develop public policy that positively affects veterans, such as health care benefits. Community organizers can bring together programs, people, and ideas to better assimilate veterans into society. Organizational leaders can ensure that proper education and opportunities are presented to veterans. At the interpersonal level, veterans can cultivate better relationships with family and friends. Last, understanding and recognizing certain traits of the individual and how those traits influence decisions is key. Many covariates, including the ones in my research, can affect the individual. In this study, the analysis of all levels of SEM was required to provide knowledge of loneliness or lack of support.

Numerous previous researchers have applied SEM and the social determinants of health to analyze similar underrecognized health issues in general society. In one study, Marquez et al. (2023) concluded that social and local levels of community were related to loneliness and vulnerabilities. In addition, Cramer et al. (2017) found that SEM community level engagement is critical for reducing suicide, specifically for military transition. Furthermore, the World Health Organization (2021) reported that multiple levels of SEM, to include individual, community, and societal methods of intervention, are critical to reducing loneliness.

Veterans who feel lonely or disassociated with other individuals may be at more risk for suicidal ideation. In addition, perceived loneliness or neglect from institutional

agencies can increase the feeling of detachment and decrease the feeling of social support. In this cross-sectional study, I quantitatively examined the relationship between this perception and disassociation. Veterans may leave service and feel that they are unable to assimilate with their civilian counterparts due to cultural differences and transient lifestyles, which can increase adverse psychological affects and thoughts of suicide (Krause-Parello et al., 2019). In contrast, going to college, staying in the same community, and being with the same group of friends for much of one's life are strong predictors of positive health as these long-lasting relationships create stronger well-being (World Health Organization, 2019).

Loneliness, which is a factor included in SEM, can affect veterans from a societal standpoint. In addition, it illustrated the quantifiable impact on suicidal ideation from loneliness. This research examined if veterans (independent variable) that are self-identified to be lonely (modifier variable) have higher or lower suicidal ideation (dependent variable) than non-lonely veterans. Furthermore, it analyzed if veterans have higher or lower chances of suicidal ideation compared to their civilian counterparts. The social support aspect of SEM covers self-perceived thoughts of loneliness or engagement a veteran feels with society, friends, and family.

Social support can also display how well a veteran relates to social groups and connections, therefore, setting a foundation for psychological conditions. Ultimately, SEM will reinforce the theory that peer support and social cohesion in the community is critical for psychological health. Moreover, the RQs answered the theory that veterans who identify as lonely, may or may not have higher suicidal ideation. The

covariate/confounding variables that were considered are gender, age, poverty level, and depression status. The extensive data that exists in the NHANES data set, coupled with the framework of the study allow new findings and can build new practices that can better predict and mitigate veteran suicide.

Nature of the Study

To address the RQs in this quantitative study, the specific research design included is a quantitative analysis of cross-sectional secondary data. Quantitative research is defined as a process that describes variables and tests the relationships between them (Bloomfield et al., 2019). Multivariant logistic regression will be used to analyze and determine the relationship between the independent (veteran and nonveteran) and dependent (suicide Ideation) variables. Loneliness is a moderator variable that will be designated as a yes/no binary outcome. Quantitative research delivers numerical data that is the result of hypothesis testing through data processing tools. To analyze the data as part of the research design, I used Statistical Package for the Social Sciences (SPSS) software to compute descriptive statistics for the study variables.

I used a multivariable binary regression logistic model to test the hypothesis and multiple covariate/confounding variables (age, poverty level, gender, and depression). The critical points of the data output focus on the confidence interval, *p* value, and odds ratio. The significance level was determined by a *p* value of < 0.05, with a confidence interval of 95%. If the *p* value was less than 0.05, then it will be considered significant. The null hypothesis was validated if the *p* value was not significant, and the alternative

hypothesis was valid if the *p* value was significant. The covariates/confounders of age, gender, depression, and poverty were measured and adjusted for in SPSS.

I centered the research design around the NHANES data set. To collect the data, NHANES researchers gave participants the option of a questionnaire, audio-assisted questionnaire, or computer-assisted questionnaire. Researchers collected data either in person at participants' homes or in mobile examination centers, or via telephone. Consent forms were obtained for individuals who participated.

Literature Search Strategy

The secondary data sources that were used for this study were from the NHANES, Veterans Health Administration, Google Scholar, and databases in the Walden University Library. The literature review for this study includes works published from 2017 and afterward. I focused on literature concerning veterans, loneliness, and suicidal ideation. There were limited studies on the significance of loneliness with suicide in the civilian world—and even less research in relation to veteran suicide. For this literature review, I aggregated the studies of related variables, strong theories, and limited associations of loneliness on suicide. After a deep dive into surveys covering the variables that I needed, I found one (NHANES) that included a veteran-specific category. The information analyzed was from a published 2009 data set that included all required variables for the study. Even though this is an older survey, it is still important to analyze. I chose this data set I could find because no other data set containing the required variables that was developed after 2009. The lack of a more recent data set illustrates the importance and need for this research.

Veteran suicide was as compelling a research topic more than a decade ago as it is today. Thus, analysis of this data set may yield findings that have yet to be recorded and, in doing so, may inspire more modern studies in the field. I used the demographic variable titled "served in the U.S. Armed Forces" to indicate veteran status. In social support data, the subcategory labeled "needed more support" was used for loneliness, and under the mental health depression screener data, the subcategory labeled "thought you would be better off dead" was used for suicidal ideation.

Literature Review Related to Key Variables and/or Concepts

I describe selected articles related to veteran suicide and loneliness in this review. The review includes current and relevant research on the topic of veteran suicide and how it relates to loneliness. The summaries in this section describe the authors' findings and conclusions about the variables and modifiers of loneliness and suicide in the veteran community. Much of the research includes analysis of the correlation and strength between these or similar variables. However, as described in the comparative analysis and critique, there were shortfalls or poor sampling (non-stratified) in each of these studies. A more comprehensive investigation that eliminates these gaps is required for an accurate analysis. The keywords used in the Walden Library databases and the Google Scholar search engine were *veterans*, *suicide*, *loneliness*, *depression*, and *suicidal ideation*. These keywords were most successful in returning results that applied to this study. This review provides an overview of the research originating from these keywords. The literature used in this review was published between 2017 and 2020.

Summary

1. Horowitz et al. (2019) described how the veteran suicide rate was higher than its civilian counterpart. In addition, the authors identified how male veterans were more likely to have contributing health problems than male civilians. Furthermore, veterans were less likely to have a depressed mood or financial problems. They also found that female veterans had nearly double the suicide rate as female civilians. Horowitz et al. recommended further research to understand the discrepancy between veterans and civilians.
2. Peitrzak et al. (2017) confirmed that veterans have higher suicide ideation when reported lonely—moreover, loneliness plays a part in suicidal ideation. They noted research that showed that less suicidal ideation was associated with more social support. They also observed that veteran suicide was an increasing public health concern. The findings bring to light the importance of social support in resolving suicidal ideation.
3. Mavandadi et al. (2019) examined social support and suicidal ideation. Their research findings reinforced that social support reduces suicidal ideation. The areas of social support studied were perceived support, frequency of negative social exchange, and degree of social interaction. Mavandadi et al. concluded that it is essential for future health assessments to include multiple levels of support research.
4. Teo et al. (2018) contended that loneliness may be the most critical determinant of suicidal ideation. Moreover, it is the only factor that leads to

depression and healthy behaviors. In addition, the research showed that lack of social connectedness was associated with suicidal ideation and depression. The authors noted the need for further research on the social network of veterans.

5. Wilson et al. (2018) concluded that loneliness is also a significant contributor to suicidal ideation. Wilson et al. examined four areas of social isolation and loneliness: prevalence of social isolation or loneliness, experience of the military impacting loneliness, the relationship between mental health and social isolation or loneliness, and interventions to combat social isolation or loneliness. The conclusion reached was that veterans, especially older ones, require special attention to be given to these needs. Future research will need to be tailored to the veteran community, with a focus on older veterans.
6. Blosnich et al. (2020) concluded that the social determinants of health are significantly associated with suicidal ideation. They focused on how social disruptions, such as relationships, are strongly linked to suicidal ideation. The authors suggested that medical clinics should incorporate behavior and social data into the records of veterans because of the important link between social determinants.

Analysis

I aggregated the literature review from the Walden University Library and Google Scholar. I reviewed multiple sources within library databases and Google Scholar, including the following publications: *The American Journal of Preventative Medicine*,

Journal of General Internal Medicine, *Journal of Affective Disorders, World Psychiatry*, *Psychiatric Services*, and *Occupational Medicine*. Consequently, the relevant literature illustrated that suicidal ideation has been largely associated with many mental health determinants for veterans. The result from the review reflects the importance of the topic and association between loneliness and suicidal ideation.

According to a study by Teo et al. (2018), loneliness has been linked to depression and suicide maybe more than any other psychiatric complication. They pointed out that depression is one of the most pressing psychological diseases in the world. Moreover, significant research is centered on medical treatment, instead of the social connectivity aspect. This means that the focus has been aimed at treatment versus prevention methods for individuals with psychological issues. In contrast, upstream solutions are arguably more critical to combat negative and self-destructive thinking.

Depression and perceived loneliness are closely linked and can develop in parallel or act in sequence. In many cases, a social determinant of depression is loneliness (Teo et al., 2018). Teo et al. (2018) found that loneliness was the only mechanism that was linked to both clinical depression and adverse health behaviors. The authors also found that loneliness may contribute to other adverse effects, such as early mortality. This finding implies that the link between suicide and loneliness must be further studied. It is important to recognize that this study was conducted only at the Veterans Health Administration hospital and mostly centered on White men. In addition, the research was centered on veterans of lower socioeconomic status who screened positive for depression.

Horwitz et al. (2019) found that veteran suicide was higher than that for civilians. Horwitz and his team analyzed many variables to assess suicide comparison; however, loneliness was not one of them. They reviewed depression, which could be an indicator of loneliness, and did a comparative analysis of veteran and civilian suicidal intent. A shortfall to this study is that the data from the National Violent Death Reporting System did not differentiate between active duty and veterans. Consequently, the article's researchers expressed how critical it is to reach out to non-VA care facilities for better veteran data. Horwitz et al. collected information from mainly medical providers and coroners and law enforcement, which makes data sourcing from NHANES even more valuable.

A strong theory prevails that veteran loneliness plays a part in suicidal ideation and that veteran suicide surpasses civilian suicide. A report by Pietrzak et al. (2017) supports the conclusion that veterans have a greater number of suicidal ideation thoughts when they have reported being lonely. The authors indicated that very limited research had been done on modifiable variables of suicide. In addition, they argued that early identifiers can be critical in deterring suicide. Their research implies that variables such as loneliness may be a good predictor of suicidal ideation. This possible association supports the theory that loneliness plays a major part in suicidal ideation. Unfortunately, a restriction to this study is that it may not be representative of a sufficient group of younger veterans, minorities, women, and combat veterans.

Another study by Mavandadi et al. (2019) illustrated how social ties or connectedness significantly applies to thoughts of suicidal ideation in veterans. Veterans

who reported more social relationships were less likely to report suicidal thoughts. Likewise, the authors stated that a lack of belongingness and living alone increased the chances of suicidal ideation. Mavandadi and fellow researchers indicated that loneliness can be a critical predictor variable in maladaptive thinking, leading to possible suicide. Adversely, a significant gap in this study is that it highlighted mostly men and had nominal women participation. This is a critical limitation because women veterans make up a large part of suicides in the veteran community. However, in their conclusion, researchers pointed out that a deeper study of perceived loneliness needs to be attained. This call for further study reinforces the criticality of the research into the covariate of loneliness and suicidal ideation.

Loneliness is another profound factor that contributes to suicide according to Wilson et al. (2018). Wilson et al. conducted a systematic review of the literature. The authors concluded that suicide and loneliness were strongly associated with each other. Wilson and his colleagues determined that the disruption occurs because of loneliness and the feeling of disconnection when veterans leave military service. This finding reinforces the significance of SEM theory and how it applies to veteran well-being.

Wilson et al. (2018) found that loneliness is a variable associated with the thought or attempt of suicide. Moreover, loneliness was found to be the trigger behind most calls to suicide hotlines specifically among older veterans, who appeared to be more at risk from loneliness. Peer support and focused social programs were theorized to be essential modes for veteran loneliness. Finally, the authors noted that veterans find it hard to relate to civilians, therefore contributing to increased loneliness.

Although this may be a strong factor, detachment or distrust can be remedied with SEM practices, Wilson et al. (2018) contended. However, there are a few constraints to this study that should be addressed. The researchers juxtaposed veterans from different countries. However, the challenges that veterans face in other countries may be different than those faced by U.S. veterans. In addition, according to researchers civilian and veteran loneliness differ; as such, more comparative research is needed. Last, the research was focused only on prior peer-reviewed research.

Blosnich et al. (2020) expressed how crucial social determinants such as relationships are to personal health. Loneliness is an integral part of a veteran's health. Positive relationships can offer major support for veterans transitioning or going through difficult moments that can make them feel lonely. The authors found that 8.3% of the veterans sampled reported relationship failure or family issues. They concluded that social determinants of health are equally as important as medical factors such as mental illness in treating and preventing suicide or parasuicide. However, Blosnich et al. acknowledged that their study was not exhaustive and did not include consideration of variables such as income, other providers, limited locations, and environment.

Definitions

The following definitions of key terms are provided to clarify the meaning of popular or significant words/terms applied in this study:

Loneliness: A distressing feeling that accompanies the perception that one's social needs are not being met by the quantity or especially the quality of one's social

relationships (Hawkley & Cacioppo, 2010). In the NHANES data set used in this study, loneliness meant needing more emotional support.

Parasuicide: An apparent attempt at suicide, commonly called "suicidal gesture," in which the aim is not death (Sampoornam, 2020).

Suicidal ideation: A broad term, often called "suicidal thoughts or ideas," that is used to describe a range of contemplations, wishes, and preoccupations with death and suicide (Harmer et al., 2022).

Suicide: Death caused by injuring oneself with the intent to die (Centers for Disease Control and Prevention [CDC], n.d.).

Assumptions

Based on the previous literature, I assumed that loneliness is a strong covariate of veteran suicidal ideation. Additionally, the literature review supports that loneliness may play a major part in suicide. I had no reason to believe that the secondary data were inaccurate and that the participants were not forthcoming in their responses. Furthermore, I presumed that previous data collection was done diligently and to the best ability of scientific researchers. I believe that I reviewed all relevant literature on this topic to illustrate the gap in this area at the onset of this study.

Scope and Delimitations

Loneliness as a direct effect of suicidal ideation has been mostly ignored in veteran research, according to my review of the literature. However, U.S. veterans have reported coming out of service feeling lonely and detached from society. This finding supported the hypothesis that loneliness may contribute to suicidal ideation. This gap of

research was the catalyst to this study. I investigated the significance of the variable loneliness in this study. Therefore, I selected SEM as the theoretical framework because loneliness is a product of SEM. This study included secondary data from NHANES and, thus, is limited to the sample size and group of participants. The sample consisted of 6,371 respondents, of whom 767 were veterans, and it included five U.S. service branches: Marines, Army, Navy, Air Force, and Coast Guard. The Space Force was not included as it was relatively new at the time of data collection. This sample included the main branches of service, which creates a more robust study for accurate results. Loneliness affects people from all branches, so it is important to include as many departments as possible.

Significance

This study is significant because it involved analysis of a large sample of veterans from the NHANES data sets to answer the RQs, while using new covariates/confounding variables. Furthermore, it opened a new underrecognized at-risk variable, such as loneliness, for examination. According to Teo (2018), a psychiatrist at the VA, there has not been extensive research on veteran loneliness, which is also not on the mind of medical professionals. In addition, Saha, who is another psychiatrist agrees with Teo's assessment (as cited in Richman, 2018).

The limited existing literature focuses on loneliness as a side effect of other primary variables with suicidal ideation. The studies left out one or more covariates in this study, and inferred a possible link to suicide, with no direct investigation. These studies can be found in the full literature review. Generally, sizable research on similar

issues has been used from the VA database, which provides data on only a nominal number of veterans in the health care system. The study results from Teo et al. (2018) were similar, and only sampled 301 veterans. By analyzing NHANES data sets researchers can be made aware of the extensive information that will address the potential relationship between veteran suicide and loneliness. In doing so, practitioners can implement successful programs to meet the needs of veterans that suffer from the increasing threat of loneliness and suicidal ideation. By reviewing the data in NHANES, researchers can identify untouched information from a large sample size of veterans in the health care community and outside of the VA. Moreover, health care professionals would be able to examine evidence-based results. These outcomes could be recommended for policy implementations to achieve positive social change for the veteran. This can lead to social change implications that may result in the reduction of veteran self-harm and psychological issues.

Summary and Conclusions

The literature points to a strong theory that loneliness may be attributed to suicidal ideation, as it relates to suicide and nonveteran research. In addition, it is essential to underscore that social determinants of health are just as crucial to consider in the totality of a veteran's health status as medical factors from mental illness or invisible wounds. However, understanding the strength of that association, covariates, and confounding variables are key to resolving the problem. Veterans are a unique group and have undergone many different challenges than their civilian peers. To address those issues more research needs to be done according to the authors in the literature review.

This study allows health practitioners to better understand how loneliness contributes to veteran suicide. A lot of research has gone into other variables involved in suicide, but research is lacking in loneliness, and suicidal ideation—which could be the premeditated steps to parasuicide and suicide.

To collect the correct data and examine the effects of loneliness, I used the 2009 NHANES data set as a source for my research design and methods. This data set allowed me to scrutinize the variables required in this study. Questions were asked to veterans and nonveterans about loneliness and suicidal ideation. Participants responded through surveys and provided quantitative results. These results were transferred into SPSS and processed for statistical analysis to answer the RQs. In the next chapter, the research design and data collection are explained in greater detail.

Section 2: Research Design and Data Collection

Introduction

The aim of this quantitative study was to investigate the association between veterans, loneliness, and suicidal ideation. In this examination, I analyzed (a) whether there was a significant association between veteran status and suicidal ideation and between loneliness and suicidal ideation after controlling for age, gender, poverty level, and depression and (b) whether loneliness moderated the relationship between veteran status and suicidal ideation after controlling for age, gender, poverty level, and depression. In the following sections, I discuss the research design and rationale, methodology for the study, and threats to validity.

Research Design and Rationale

I conducted a correlational, cross-sectional quantitative study. I analyzed a secondary quantitative data set from the NHANES repository. NHANES staff have collected health data for decades to support U.S. policy decisions. I conducted a correlational, cross-sectional study because it was the best method for analyzing the correlation between the study variables. Analysis of secondary data was appropriate for this design because it allowed me to examine all required data. The variables included in this study were the independent variable (veterans), dependent variable (suicidal ideation), covariates (age, depression, poverty level, gender), and moderating variable (loneliness).

By using a correlational, cross-sectional design, I was able to look at the association between each RQ using a bivariate and multivariate analysis to determine the

strength of each connection, while adjusting for confounders. The reason for choosing the NHANES data set was that it provided the required survey questions to answer the RQs for this study, unlike any other data sets that I explored. Furthermore, the fact that the NHANES data set is from 2009 highlights the neglect in research into this area and importance of a follow up study. In addition, NHANES aggregated information from outside veteran clinics, meaning there was more data on an array of veterans. The inclusion of this information was important because most veterans use private practice instead of VA clinics (Cohen & Boersma, 2023).

A correlational, cross-sectional research design was applicable to my study because it yielded clear data to answer the RQs. I sought to confirm or test a theory (i.e., to present a result that requires further examination). I based the study on previous data in the hope that it would add to future research in the field. The information obtained through quantitative research designs has been invaluable for the study of suicide. The use of quantitative methods to predict suicide rates may support a more rapid approach to suicide prevention by identifying risk factors earlier (Mobley & Taasoobshirazi, 2022).

Methodology

Population

The original data collected through NHANES provided me with the information needed for my research. The NHANES sampling design is conducted through a complex probability sampling method that considers participants representative of the civilian, noninstitutionalized population (National Center for Health Statistics, n.d.). In addition, NHANES staff use a sample weight and oversample subgroups. The target population in

this study were randomized men and women. The inclusion criteria were the variables and covariates stated in the Research Design and Rationale section. The study population consisted of 10,149 participants with 6,371 respondents (CDC, 2009). Data were collected over two 6-month periods in 2009; one period was from November 1 through April 30, and the other period was from May 1 through October 1 (CDC, 2009).

Sampling and Sampling Strategy

There were 387 participants who were only interviewed at home, whereas there were 9,762 participants who were interviewed at home and at the mobile examination center (CDC, 2009). Persons above the age of 16 and emancipated minors were interviewed directly. A proxy was provided if the individual could not answer the question themselves. The household interview was conducted in person with an interviewer. The survey participants selected the language to interview or requested a translator. Computer-assisted personal interview methods were used for the interviews. Several questions required the use of printed hand cards (English or Spanish) that listed the response choices or provided information that survey participants needed to answer the questions. In addition, the interviewer directed the respondent to the appropriate hand card during the interview. When needed, the interviewers assisted by reading the questions.

The computer-assisted personal interview software that was used to collect the data had built-in data editing and consistency checks. This alerted the interviewer when erroneous data values were recorded or when recorded data were inconsistent with previous entries or characteristics. Questionnaire skip patterns were preprogrammed to

reduce respondent burden. In addition, online information screens gave the interviewers standardized descriptions of the terminology and concepts that were used in the questionnaires. Following data collection, interview records were reviewed by the NHANES staff for accuracy. A few of the interviews were verified by recontacting the households. Interviewers were obligated to record multiple interviews, which were reviewed by the staff.

To gain access to the data set, I used the open source NHANES website. This is a site under the CDC. The site is broken down into subcategories of demographic information and survey questionnaires. I clicked on the time frame that I was interested in (2007–2008), which is the last year to cover my three RQs, and which was published in 2009. To conduct the statistical analysis, I merged the relevant variables into one data set for analysis in SPSS). I complied with the correct procedures and permissions to obtain the information required.

This data set represents the best data for my study because it is the only data set that I found to contain all the information I needed to answer my three RQs. Even though this data set is an older set, it is meaningful to analyze. Furthermore, it underscores the importance of new research to investigate the study topic. Furthermore, NHANES contains a large amount of veteran data that have not been analyzed to study loneliness and suicidal ideation among veterans. As such, the study may yield valuable insight and findings.

Power Analysis

The NHANES data set included 10,149 participants that signed up for the study, of whom 6,371 responded. I performed a power analysis by following the G*Power statistical software guidelines for a logistic regression *z* test, priori type of power analysis (Teodorovici, 2014). Furthermore, I assumed a two-tailed test with 80% power, alpha of 0.05, odds ratio of 1.2, and an *x*-distribution binomial option. I chose this effect size to meet the desired sample size of 1,484 participants for the greatest precision. In addition, I chose the alpha of 0.05 because it is statistically significant. A power level of .080 was chosen because it gave an 80% strength in determining the true effect or difference.

Operationalization of Variables

In this section, I describe the variables and how they are presented in the study. The variables included were the predictor or independent variable (veteran status), dependent variable (suicidal ideation), moderating variable (loneliness), and covariates (age, depression, poverty, and gender).

Predictor/Independent Variable

The independent variable for RQs 1, 2, and 3 was the NAHANES categorical variable of "Served in the US Armed Forces" (veteran status) or the variable name of DMQMILIT. It is coded as "Served in the US Armed Forces" in frequencies testing or output and coded as 1 for yes or 2 for no. For "missing" data it is coded as 7. For logistic regression output or data, the predictor variable is recoded as "ServedinMilitary." This is recoded as 0 for no or 1 for yes under logistic regression testing or output.

Dependent Variable

The dependent variable for RQs 1, 2, and 3 was the NHANES categorical variable suicidal ideation ("thought you would be better off dead"), with the variable name DPQ080. In the NHANES survey, it was coded as 0 (not at all), 1 (several days), 2 (more than half the days), and 3 (nearly every day). I recoded this dependent variable, which I renamed suicide, as 1 for yes or 0 for no for logistic regression testing.

Moderating Variable

The moderating variable is the NHANES categorical variable of "Needed more support in past year" (loneliness), or the variable name SSQ031. This variable is coded in frequencies testing or output as "missing" or 9, yes or 1, no or 2. This moderator variable was recoded as Loneliness, and 0 for no or 1 for yes under logistic regression testing or output.

Age

The NHANES age variable for the subject is labeled as "Age at screening adjudicated" or RIDAGEYR. This covariate is coded as 0 to 79 years of age (range of values), or 80 years of age and older (>=80 years of age).

Depression

The NHANES depression variable for the subject is labeled as "feeling down, depressed, or hopeless" or the variable name DPQ020. For testing or output this covariate is coded as "not at all" or 0, "several days" or 1, "more than half the days" or 2, and "nearly every day" or 3. "missing" data is coded as 9.

Poverty

The NHANES poverty variable for the subject is labeled as 'ratio of family income to poverty," or the variable name INDFMPIR. Under testing or output, the covariate is coded as 0 to 4.99 (range of values) or 5 (value greater than or equal to 5.00). Poverty level guidelines from the Department of Health and Human Services (CDC, n.d.) were used to measure poverty levels. A 0 means no income or below federal poverty threshold, while higher numbers indicate how many times a family is above the threshold of poverty. This was calculated by dividing family income by the poverty guidelines specific to family size, as well as the appropriate year and date.

Gender

The NHANES gender variable for the subject is labeled as gender, or the variable name RIAGENDR. For frequencies testing or output this will be a binary outcome of male/1 or female/2. This covariate was recoded as Gender, and 0 for 'female' and 1 for 'male' under logistic regression testing or output.

Data Analysis Plan

For the analysis work I used IBM SPSS version 28.0.1.0. (142). I reviewed the proper data files published from NHANES in 2009 and then merged them together into one data set. I ensured the variables that I needed matched the variables in the NHANES study. 'Missing numeric value' is coded as 'period,' 'missing character value' is coded as 'blank' and 'refused to answer,' and 'don't know' is coded as 7 or 9 numbers. SPSS computation adjusted for the left-out data. In addition, unrelated variables from the study are left out.

Data Cleaning and Screening

Because I was not the original researcher, I screened the available secondary data for inconsistencies while using SPSS to obtain a more accurate output. I used SPSS to conduct a bivariate correlation multicollinearity test under spearman correlation coefficient for my variables. Multicollinearity occurs when two or more independent variables are presented, this can lead to inaccurate or biased errors (Vatcheva et al., 2016). The standard correlation coefficient of .8 was used to determine strength of relationship. The results were =>.8, which indicates there are no multicollinearity issues.

The last data cleaning test that was performed was a multivariate outlier test through the Mahalanobis Distance formula. The results of this test exposed less than .001% of outliers. As a result, these outliers were removed from SPSS. Lastly, the Hosmer-Lemeshow test showed that the logistic regression model was a good fit for my data (.264).

Research Questions and Hypotheses

The RQs and hypotheses are as follows:

RQ1: Is there a significant association between veteran status and suicidal ideation after controlling for age, gender, poverty level, and depression?

$H_0$1: There is no significant association between veteran status and suicidal ideation after controlling for age, gender, poverty level, and depression.

H_a1: There is a significant association between veteran status and suicidal ideation after controlling for age, gender, poverty level, and depression.

RQ2: Is there a significant association between loneliness and suicidal ideation after controlling for age, gender, poverty level, and depression among U.S. veterans?

$H_0$2: There is no significant association between loneliness and suicidal ideation after controlling for age, gender, poverty level, and depression among U.S. veterans.

H_a2: There is a significant association between loneliness and suicidal ideation after controlling for age, gender, poverty level, and depression among U.S. veterans.

RQ3: Does loneliness moderate the relationship between veteran status and suicidal ideation after controlling for age, gender, poverty level, and depression?

$H_0$3: Loneliness does not moderate the relationship between veteran status and suicidal ideation after controlling for age, gender, poverty level, and depression.

H_a3: Loneliness does moderate the relationship between veteran status and suicidal ideation after controlling for age, gender, poverty level, and depression.

Statistical Tests

Logistic regression was chosen because the dependent variable was coded as binary. The reason for including the select covariates in this study is that the prior literature indicates that these variables are important to the relationship of suicidal ideation. To answer the RQs, I conducted binary logistic regression in SPSS. Furthermore, assumptions were met through data cleaning and screening techniques. The significance of the RQs was determined by a p value of < 0.05, with a confidence interval of 95%. If the p value was less than 0.05, then it was considered significant. The null

hypothesis is validated if the *p* value is not significant, however, the alternative hypothesis is valid if the *p* value is significant.

Threats to Validity

Steps to mitigate the threats to validity were taken along the process of this manuscript. Internal validity means conducting the design without bias, while external validity means getting the same results in a different environment, or simply replicated (Andrade, 2018). Certain types of internal and external validity apply to cross sectional studies. It is important to examine internal validity by considering selection bias, confounding variables, and correct measurement tools. Furthermore, external validity can be analyzed by proper sample representation and ensuring that the findings apply to the real world. To overcome these issues participants were selected at random and proper statistical tests such as Hosmer-Lemeshow were applied, in addition, a multivariate logistic regression controlled for possible confounders. This study may be vulnerable to a certain degree because this is a secondary quantitative analysis, and not a primary study--therefore it relies on the data from prior research. In addition, another processing system, not SPSS, could display different results. My study took into consideration the main covariates but not all influencers. Additional covariates could include other mental health issues, time-in-service, combat exposure, and rank. Furthermore, my data set is from 2009 therefore the results may be different today. The data I sampled was thoroughly scrutinized and methodically aggregated through NHANES. Even with the challenges of validity, NHANES has a robust method to validate and ensure data integrity throughout its research. NHANES was chosen at random because it met the requirements for my

study. To ensure the integrity of this research design, I conducted data screening and cleaning techniques. Furthermore, I used the most updated version of SPSS to measure results.

Ethical Procedures

I collected the survey data from an open-source website (NHANES); no permission from NAHNES was needed to obtain the information. The makers of the original study obtained approval from the CDC review board for the research. I did not have access to or collect private information from the primary study. NHANES staff used quality assurance methods to maintain standards and protocols. Anonymity and informed consent were obtained for individuals in the original study. I obtained approval for this study from Walden University's Institutional Review Board (approval no. 06-09-23-0722143.)

Summary

Choosing the correct research design is paramount for reliable testing. The selected research model is the framework of the study that supports the analysis against scrutiny. The cross sectional quantitative secondary data set selected was the preferred method for my study. The information and variables from the original data set fit appropriately with my study's requirements. Furthermore, the data analysis plan provided the expected examination for this study's analysis. Having the correct blueprint for my study maintains accuracy for the next phase in the manuscript—the results and findings.

Section 3: Presentation of the Results and Findings

Introduction

The purpose of this study was to explore (a) whether there was a significant association between veteran status and suicidal ideation and between loneliness and suicidal ideation after controlling for age, gender, poverty level, and depression and (b) whether loneliness moderated the relationship between veteran status and suicidal ideation after controlling for age, gender, poverty level, and depression. The null hypothesis represented no significant association between the independent and dependent variables whereas the alternative hypothesis represented a significant association between variables for each question. In Section 3, I present the results of this study. This section includes information on the acquisition of secondary data for analysis, the data analysis, the results, and a summary of key findings. The results are presented with tables using descriptive statistics and frequencies.

Accessing the Data Set for Secondary Data Analysis

I obtained the secondary data used in this study from NHANES. I pulled the data from the NHANES study published in 2009 and conducted between 2007 and 2008. The data was used because it encapsulated all the variables needed to answer the three RQs for this study. The original study included an adequate sample size of 6,371 respondent participants, with one of those participants refusing to identify themselves as a veteran or not. Therefore, it exceeded the desired sample size of 1,484. The missing data or non-respondents of 3,778 were considered for SPSS testing. RQ2 only required veteran analysis, leaving out the nonveteran sample. There were no discrepancies in the data

analysis that were not accounted for. Missing data for each variable was accounted for by SPSS.

Results

This study's purpose was to examine the relationship between the independent variable of veteran status and the dependent variable of suicidal ideation, with loneliness as a moderating variable. The examination considered multiple possible confounder variables such as gender, poverty level, age, and depression. In this section, I outline the logistic regression test results and descriptive statistics.

Descriptive Statistics

Table 1 reflects the baseline sample population characteristics/demographics: veteran status, gender, loneliness, suicidal ideation, depression, poverty, and age. There were 5, 570 nonveterans and 760 veterans after the data output. Women accounted for 49.8% (n = 5,030) and men, 50.2% (n = 5,079) for all who signed up for the study. The results for the moderating variable of loneliness showed 80.2% identified as not being lonely, while 19.8% identified as being lonely. The covariate results for suicidal were as follows: no (n = 5,162; 96.8%) or yes (n = 169; 3.2%). The covariate results for depressed were as follows: not at all (n = 4,039; 74%), several days (n = 970; 17.9%), more than half the days (n = 222; 4.1%), or nearly every day (n = 173; 3.2%). I computed descriptive statistics for age (M = 32.87; SD = 25.45) and poverty (M = 2.28; SD = 1.58). I used mean and standard deviation as measurements because both variables are continuous/scale variables. The statistics for poverty offer a measure of the ratio of family income to poverty.

Most participants were above the poverty threshold level as 0 represented no income or below the federal poverty level. Above 0 would indicate how many times a family was above the federal poverty level. This measurement seemed more appropriate and relevant for my study. Before and after testing showed a slight variance for both veterans (760 vs. 767) and nonveterans (5,570 vs. 5,603), most likely due to respondents failing to fully answer all questions. However, this is not enough of a discrepancy to invalidate the study. The total population came out to 6,330 for veterans and nonveterans due to missing data and one respondent refusing to answer the question. Missing data were present in multiple variables such as loneliness (n = 6,537 or 64.7%), suicide (n = 4,478 or 47.3%), depression (n = 4,705 or 46.5%), and poverty (n = 894); the lack of complete data may have led to less accurate results.

Table 1

*Sample Population Characteristics and Results After Testing (*N = *6,330)*

Variable	*N*	%
Veteran status		
No	5,570	88.0
Yes	760	12.0
Missing	3,779	37.4
Gender		
Female	5,030	49.8
Male	5,079	50.2
Loneliness		
No	2,863	80.2
Yes	709	19.8
Missing	6,537	64.7
Suicide (ideation)		
No	5,162	96.8
Yes	169	3.2
Missing	4,778	47.3
Depression		
Not at all	4,039	74
Several days	970	17.9
More than half the days	222	4.1
Nearly every day	173	3.2
Missing	4,705	46.5

Variable	*M*	*SD*
Poverty [a]	2.28	1.58
Age	32.87	25.45

[a] Data were missing for 894 respondents.

Table 2 presents the correlation coefficient and significance level for Spearman's rho test. This table demonstrates that serving in the military is not strongly correlated with suicidal ideation ($r = .018$, $p = .200$). Furthermore, loneliness is negatively correlated with veteran status ($r = -.068$, $p < .001$). Lastly, the table points out that loneliness is negatively correlated with suicidal ideation ($r = -.135$, $p < .001$). The following results

shows gender ($r = .333$, $p<.001$), depression ($r = .060$, $p<.001$), poverty ($r = -.114$, $p<.001$), and age ($r = -.288$, $p<.001$).

Table 2

Correlation Coefficient for Veteran Status, Gender, Suicide, Depression, Loneliness, Poverty, and Age

			Veteran Status	Gender	Suicide	Depression	Loneliness	Poverty	Age
Spearman's rho	Veteran Status	Correlation Coefficient	1.000	.333**	.018	.060**	-.068**	-.114**	-.288**
		Sig.	.	<.001	.200	<.001	<.001	<.001	<.001
	Gender	Correlation Coefficient	.333**	1.000	.001	.121**	-.063**	-.035**	.028**
		Sig.	<.001	.	.963	<.001	<.001	<.001	.005
	Suicide	Correlation Coefficient	.018	.001	1.000	.293**	-.135**	-.098**	.003
		Sig.	.200	.963	.	<.001	<.001	<.001	.854
	Depression	Correlation Coefficient	.060**	.121**	.293**	1.000	-.277**	-.196**	-.047**
		Sig.	<.001	<.001	<.001	.	<.001	<.001	<.001
	Loneliness	Correlation Coefficient	-.068**	-.063**	-.135**	-.277**	1.000	.118**	.139**
		Sig.	<.001	<.001	<.001	<.001	.	<.001	<.001
	Poverty	Correlation Coefficient	-.114**	-.035**	-.098**	-.196**	.118**	1.000	.180**
		Sig.	<.001	<.001	<.001	<.001	<.001	.	<.001
	Age	Correlation Coefficient	-.288**	.028**	.003	-.047**	.139**	.180**	1.000
		Sig.	<.001	.005	.854	<.001	<.001	<.001	.

Table 3 shows the Spearman's rho correlation coefficient and significance level for RQ2, or for veterans' inclusion only. The results display a *r* equal to .076 and *p* equal to .072. This means that there is a weak positive correlation and no significant *p* value. This implies that there is no significant association between loneliness and suicidal ideation among veterans, while controlling for the proper variables. The following result for loneliness shows age ($r = -.157$, $p < .001$), gender ($r = -.032$, $p = .429$), depression ($r = .294$, $p < .001$)**,** and poverty ($r = -.100$, $p = .016$).

Table 3

Correlation Coefficient for Veteran Status, Depression, Loneliness, Age, Gender, Poverty, and Suicide

			Loneliness	Age	Gender	Depression	Poverty	Suicide
Spearman's rho	Loneliness	Correlation Coefficient	1.000	-.157**	-.032	.294**	.076	-.100*
		Sig.	.	<.001	.429	<.001	.072	.016
	Age	Correlation Coefficient	-.157**	1.000	.158**	-.147**	-.007	-.099**
		Sig.	<.001	.	<.001	<.001	.848	.009
	Gender	Correlation Coefficient	-.032	.158**	1.000	-.050	.037	-.023
		Sig.	.429	<.001	.	.195	.331	.538
	Depression	Correlation Coefficient	.294**	-.147**	-.050	1.000	.266**	-.149**
		Sig.	<.001	<.001	.195	.	<.001	<.001
	Suicide	Correlation Coefficient	.076	-.007	.037	.266**	1.000	-.095*
		Sig.	.072	.848	.331	<.001	.	.017
	Poverty	Correlation Coefficient	-.100*	-.099**	-.023	-.149**	-.095*	1.000
		Sig.	.016	.009	.538	<.001	.017	.

**. Correlation is significant at the 0.01 level (2-tailed). r=correlation strength (further from 0 the stronger the correlation).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4 shows the results of the binary logistic regression model for RQs 1 and 3. This was combined because Table 4 provides the comparison for veterans and

nonveterans, as a result answers the relevant questions. In addition, it also reveals the interaction term (loneliness and veteran status) with a *p* value of .321 and odds ratio (OR) of .501. The interaction term refers to the moderating effects or impact loneliness has on veterans or nonveterans with suicidal ideation. The results show that serving in the military is not a significant predictor of having suicidal thoughts, *odds ratio*= .891, *p* = .758). However, the variables (except for gender and age) can be significant predictors of suicidal ideation, with a *p* value of less than .05 and a positive odds ratio, showing that loneliness can generally be a significant predictor of suicidal ideation. The odds ratios for the covariates were as follows: loneliness OR=1.74 (positive association), and increased chances of suicidal ideation, age OR=1.07 (positive association), and increased chance of suicidal ideation, poverty OR=.813 (negative association), and less chance of suicidal ideation, gender OR=1.51 (positive association), and increased chance of suicidal ideation. A result that is above 1 is considered a positive association, unlike a result that is below 1. An odds ratio above 1 indicated a higher likelihood of suicidal ideation. In contrast, a negative association meant less likelihood.

Table 4

Binary Logistic Regression Model for Veteran Status, Loneliness, Age, Depression, Gender, Poverty, and Suicide

					95% C.I.for EXP(B)	
	B	S.E.	Sig.	Exp(B)	Lower	Upper
Served in the U.S. Armed Forces (1) (veteran status)	-.115	.373	.758	.891	.430	1.850
Needed more emotional support in past year (1) (loneliness)	.559	.233	.017	1.748	1.107	2.760
Age at screening adjudicated	.075	.100	.455	1.078	.886	1.311
Feeling down, depressed, or hopeless (not at all during the week)			<.001			
Feeling down, depressed, or hopeless (1) (several days)	3.832	.478	<.001	46.157	18.103	117.689
Feeling down, depressed, or hopeless (2) (more than half the days)	4.379	.525	<.001	79.741	28.485	223.230
Feeling down, depressed, or hopeless (3) (nearly every day)	4.607	.560	<.001	100.211	33.447	300.242
Ratio of family income to poverty	-.207	.088	.018	.813	.685	.965
Gender (1)	.418	.252	.098	1.519	.926	2.490
Loneliness and veteran status	-.692	.697	.321	.501	.128	1.96

OR=odds ratio (determined by the measurement based off the value of 1)

Sig=p-value

Table 5 illustrates the binary logistic regression model results for RQ2. This data set and question are focused only on the specific veteran sample from my study. The results show that there is no significance (p = .711) with an odds ratio of 1.31 between loneliness and suicidal ideation among U.S. veterans. However, most categories of depression except for Category 2 show significant results at p equal to or less than .001 with an odds ratio of either 24.89 or 146.15. All other covariates were not significant.

Table 5

Binary Logistic Regression Model for Veteran, Loneliness, Age, Depression, Gender, Poverty, and Suicide

					95% C.I.for EXP(B)	
	B	S.E.	Sig.	Exp(B)	Lower	Upper
Needed more emotional support in past year (loneliness) (1)	.275	.742	.711	1.316	.307	5.641
Age at Screening Adjudicated	.001	.029	.978	1.001	.946	1.059
Gender (1)	17.524	6606.864	.998	40800538.981	.000	.
Feeling down, depressed, or hopeless (not at all during the week)			<.001			
Feeling down, depressed, or hopeless (1) (several days)	3.215	.827	<.001	24.892	4.923	125.860
Feeling down, depressed, or hopeless (2) (more than half the days)	-16.054	12347.979	.999	.000	.000	.
Feeling down, depressed, or hopeless (3) (nearly every day)	4.985	1.168	<.001	146.155	14.80 0	1443.320
Ratio of family income to poverty	-.324	.235	.167	.723	.456	1.146
Constant	-22.060	6606.865	.997	.000		

OR=odds ratio (determined by the measurement based off the value of 1)

Sig=p-value

For Table 6, I also ran a binary logistic test for association between veteran status and suicidal ideation without loneliness. The *p* value (.402) was nonsignificant, and the odds ratio was .771. The odds ratio and *p* value were similar even without loneliness being a factor. Depression across all categories showed a significant *p* value of less than .001 and strong odds ratios (28.15, 47.30, 70.33). Gender also resulted in a significant *p* value of .003 and positive odds ratio of 1.75. Age was found to be significant at *p* equal to .029 and the odds ratio a positive 1.01. The ratio of family income to poverty was significant at *p* equal to .003 with a negative odds ratio of .816.

Table 6

Binary Logistic Regression Model for Veteran Status, Loneliness, Age, Depression, Gender, Poverty, and Suicide

					95% C.I.for EXP(B)	
	B	S.E.	Sig.	Exp(B)	Lower	Upper
Gender (1)	.560	.186	.003	1.751	1.217	2.519
Age at Screening Adjudicated	.011	.005	.029	1.011	1.001	1.022
Served in the U.S. Armed Forces (1) (veteran status)	-.260	.311	.402	.771	.419	1.417
Feeling down, depressed, or hopeless (not at all during the week)			<.001			
Feeling down, depressed, or hopeless (1) (several days)	3.338	.294	<.001	28.157	15.811	50.141
Feeling down, depressed, or hopeless (2) (more than half the days)	3.857	.340	<.001	47.301	24.303	92.063
Feeling down, depressed, or hopeless (3) (nearly every day)	4.253	.358	<.001	70.336	34.866	141.890
Ratio of family income to poverty	-.204	.068	.003	.816	.714	.932
Constant	-5.946	.421	<.001	.003		

Summary

Research Question 1 Results

RQ1: Is there a significant association between veteran status and suicidal ideation after controlling for age, gender, poverty level, and depression?

$H_0$1: There is no significant association between suicidal ideation and veteran status after controlling for age, gender, poverty level, and depression.

These findings show that being a veteran did not have a significant impact on suicidal ideation, with a *p* value of .122. In addition, the odds ratio results displayed an association of .891. The null hypothesis was accepted.

Research Question 2 Results

RQ2: Is there a significant association between loneliness and suicidal ideation after controlling for age, gender, poverty level, and depression, among U.S. veterans?

$H_0$2: There is no significant association between suicidal ideation and loneliness after controlling for age, gender, poverty level, and depression, among U.S. veterans.

Because the *p* value was .711 and the odds ratio was 1.31, the null hypothesis was confirmed. This finding shows that there was a nonsignificant association between loneliness and suicidal ideation among U.S. veterans.

Research Question 3 Results

RQ3: Does loneliness moderate the relationship between veteran status and suicidal ideation after controlling for age, gender, poverty level, depression?

$H_0$3: Loneliness does not moderate the relationship between veteran status and suicidal ideation after controlling for age, gender, poverty level, depression.

The interaction term results show a *p* value of .321 and an odds ratio of .501, as illustrated in Table 4, which indicates a nonsignificant outcome. As a result, the null hypothesis was not rejected.

The findings of RQs 1, 2, and 3 show that there is no significant association in the results of the RQs. Even though I accept the null hypothesis, these findings are still important. They allow researchers to analyze other aspects of the study and understand what further questions need to be asked. Loneliness and depression are two independent variables that have significant results for this general population sample or veterans' sample. The results of this study beg the question of how loneliness plays a part with depression, and how depression should be included in veteran suicide research. Furthermore, it reinforces the influence loneliness has on the general population. Therefore, after identifying these issues, initiatives need to be launched to confront and address loneliness and depression. To do this, practitioners need a plan that will be engineered based on these results.

Section 4: Application to Professional Practice and Implications for Social Change

Introduction

I conducted this study to examine how loneliness affects veterans. During this analysis, I tested three RQs that yielded no significant results. However, missing covariate respondents may have made the results less accurate. I found that loneliness was generally a significant predictor in suicidal ideation. Moreover, depression had a significant impact on suicidal ideation among veterans. The aim of this study was to investigate the important role that loneliness plays in the veteran community. Loneliness has been an increasing issue in society, and, therefore, it was essential to study its association within the veteran community. By understanding the results of this study, stakeholders may be able to advance veteran health care policy and drive positive social change for the community.

Interpretations of Findings

The results for RQ1 show that there was no significant association between veteran status and suicidal ideation, $p = .758$; $OR = .891$. However, the results indicate that loneliness was a clear predictor of suicidal ideation among the general population sample with a p value of .017 and an odds ratio of 1.74. This meant that a lonely individual had 1.74 times the odds of having suicidal ideation than someone who did not identify as lonely. This finding is important to consider because previous research states that veterans have high rates of loneliness (see Straus et al., 2022).

This study also showed that age and gender were not significantly associated with suicidal ideation among veterans. However, this does not answer the question as to why

some veterans suffer from increasing suicide more than others when researchers examine age and gender. This is another critical area to analyze in future studies. Furthermore, the results for loneliness in RQ2, $p = .711$; $OR = 1.31$, show no significant association with suicidal ideation among veterans and are in contradiction to some of the literature that I discussed in Section 2. Wilson et al. (2018) found that loneliness is a profound factor in suicide for the general population, but these newly founded results show that loneliness and suicide strength depend on the group being studied. There was no significant outcome for veterans in my study. This lack of a statistically significant finding means that more exploration of the subject is needed. Even with an insignificant *p* value, a positive result (the odds ratio for RQ2) and the previous data may trigger more questions that encourage researchers to use larger samples and a more recent study sample to further investigate the study topic.

Although loneliness was found to be a clear predictor of suicidal ideation among the general population in RQ1, the results for RQ3, $p = .321$; $OR = .501$, showed that loneliness did not significantly moderate the relationship between veteran status and suicidal ideation. However, this finding contradicts that of Straus et al. (2022), who found loneliness to be highly prevalent in military veterans, with most reporting being lonely, unlike this study. In addition, Straus et al. found that a lonely veteran has a significantly greater likelihood of suicidal ideation than a non-lonely veteran. This finding demonstrates the magnitude of the relationship between loneliness and veterans. The Straus et al. study may indicate that the idea of loneliness has changed or may be defined differently than this manuscript's sample. As a result, this connection calls for further

analysis and investigation into loneliness, specifically in the veteran community. Furthermore, researchers need to investigate larger sample sizes of veterans, resulting in more power for their analyses. Loneliness has been linked to many personal health issues and risk factors. Some of these issues include heart disease, stroke, diabetes, depression, anxiety, addiction, suicide, dementia, and early death (CDC, 2023). In addition, it creates a higher at-risk environment for veterans' health and has been shown to be an indicator of suicidal ideation, in general.

At minimum, these findings support the idea that loneliness and suicidal ideation are strongly linked in the general community. Because loneliness has been found to be a statistically significant factor in the general population, and depression is a known significant factor in the veteran population, this suggests that healthy levels of SEM are not being met or supported in these groups. This can be a symptom of insufficient relationships between friends, family, or community initiatives that bring together veterans or community members. In addition, policy and societal influences play a part in social well-being; moreover, therapy or health care costs may be a challenge for some individuals. Furthermore, being literate on all the resources available can be overwhelming and difficult; navigating the path to treatment is not always easy. Depression is a major factor in suicidal ideation among veterans. The odds ratio of 146.15 for depression, with p less than .< 001, is a strong and troublesome result for veterans. Loneliness may be one catalyst for depression; this link has been suggested in previous literature by Teo et al. (2018). This association suggests that additional scrutiny and intervention is needed in the effects of depression among veterans. Furthermore, even

with accepting the null hypothesis, the data reinforce theories in prior literature on loneliness affecting suicidal ideation. Researchers can now better understand the connection between loneliness and suicidal ideation among veterans. In addition, this research can also show how depression is associated with loneliness and suicidal ideation.

Consequently, health practitioners can identify loneliness and depression as a critical predictor for suicide and in turn screen for these covariates, either independently or combined, through questionnaires and surveys before, during, or after suicidal ideation has been identified. Policy makers can develop strategies that prioritize loneliness and depression interventions through the SEM. These can include mandated screening questions related to loneliness and depression by health clinics for veterans. Specifically, veterans with risk factors and with other psychological conditions or alcohol addiction should be targeted because these factors may contribute to suicidal ideation. Furthermore, local communities can offer veteran community activities, sponsored events, and launch programs to bring in veteran social wellness. By including the SEM, stakeholders may be able to address the problem of loneliness and depression, which in turn will reduce suicidal ideation and even parasuicide and suicide. According to Nichter et al. (2021), 25.9% of U.S. veterans reported suicidal ideation; of these veterans, 7.3% had a suicide plan or action. Nichter's et al. study sample was from over 4,000 veterans, which suggests that many veterans have suicidal ideation that may be linked to loneliness and depression.

Limitations of the Study

There were certain limitations to this study. Suicidal ideation is usually part of a screener questionnaire for depression. Therefore, it is difficult to control depression as a separate covariate. I did not differentiate between veterans that experienced combat with those that did not. In addition, posttraumatic stress disorder was not included in this data. The wars in Afghanistan and Iraq have launched new challenges for the health care field since the collection of this data set--this means that there were a mix of possible combat exposed veterans and deployed veterans with nonexposed or deployed veterans; this study did not differentiate between these veterans. In addition, only the covariates of depression, gender, age, and poverty were analyzed in this study. Furthermore, the Space Force was not considered for this survey—it was not established at the time of the data collection. There was missing data and nonresponsive participants that adjusted the sample size and could have affected the precision of the outcome. Lastly, the definition used for loneliness could be subjective and different for other studies and participants.

Recommendations

Even though RQs 1, 2, and 3 did not have significant results, this study demonstrated the need for general loneliness prevention and more research into the field of depression prevention among veterans. Loneliness can be a result of socio-economic reasons, as defined in the survey (lacking emotional social support), in addition previous research from Teo et al. (2018) shows a link between loneliness and depression. Further research should examine a larger sample size of veterans and have a distinction between more covariates that include combat-exposed versus non-combat-exposed veterans.

Furthermore, future researchers should include more respondents to the same covariates mentioned in this study. In addition, a targeted approach to examine gender and age differences is important to consider because male and female veterans may have different risk factors for suicidal ideation. A study by Rand (2022) found that veterans between 55 and 74 are the largest number of veterans dying by suicide and the difference in suicide rates between veterans and nonveterans are highest among women (Ramchand, 2022). Moreover, future researchers should examine previously enlisted service members and officer veterans to provide more information on specific groups and their resulting suicidal ideation and suicide outcomes. Veteran homelessness is another situation that can increase veteran loneliness. Additional studies should review the veteran homeless population and its impact on veteran suicidal ideation. Lastly, I would recommend a deeper investigation into the connection between depression and loneliness.

Public Health Practice and Field-Based Products

This study reinforces the association between loneliness and suicidal ideation among the general population. Furthermore, it specifically highlights the impact depression has on veterans. As shown, veterans require unique peer and family support legislation in their communities—this means veteran focused events, opportunities, and benefits to assist veterans and their families that are newly transitioned. New veterans need to have resources explained to them, such as their benefits and health care choices. Local health care policies should be drafted to manage some of the unique issues faced by veterans, and therefore prevent mental health care issues, such as loneliness and depression. Additionally, transitioning programs for military members need to increase

their relationship with civilian organizations and local government. By doing this, veterans will be better prepared for employment, social well-being, and positive mental health.

Transitional programs are a bifurcation point that can lead veterans to success or failure. The military branches facilitate a basic program that attempts to prepare service members for the civilian world just prior to release. However, it is considered inadequate and ill-equipped by many veterans (Lawrence, 2022). Expanding these initiatives and setting up local community programs to receive veterans would be a guaranteed advantage. Setting veterans up for success starts with these military programs. Simultaneously, more skills in the military need to be recognized or reciprocated with civilian programs to maintain that bridge to employment after service. Undoubtedly, health care needs to be better explained, extended, or covered for veterans after they leave service, and until they can sign up for the VA system. Some veterans may not be able to go to a VA hospital easily due to disabilities, distance, or they may be confused as to when their benefits run out. There are also some veterans who do not qualify for health care benefits. Therefore, it's critical to address these health care disparities without delay.

Loneliness and depression can stem from a lack of meaning or being alone, which can be products of limited social activity or engagement Teo et al. (2018). Loneliness can impede a veteran's focus and production, thus reducing their contributions to themselves and community. In understanding how these variables play a part in suicidal ideation, researchers can manufacture procedures to resolve or mitigate suicidal ideation. This is critical for the benefit of current and future veterans. As a result, veterans will have

practice-in-place to help them transition or return from active duty. In addition to benefiting the veteran, this will have a positive impact on the economy and image of the government, which affects the future of recruitment and stability.

Conclusion

Veterans make up less than 10% of the population and the number of people serving is declining (Schaeffer, 2021). This distinction is important to know because when the veteran and nonveteran divide becomes too great, we forget about the critical responsibility needed for a select few. Depression and loneliness are key contributors to suicidal ideation that need to be recognized and treated. Undoubtedly, it benefits everyone to invest in our veterans. The result of this would mean a more economically engaged and well-off veteran. In addition, veterans that are treated early with upstream methods will be at a lower health care cost to taxpayers in the future. The reputation of how the United States treats its veterans is critical to military recruitment and sustainment, which impacts public health and national security. Service members not only deploy overseas but also conduct stateside operations during national disasters or public health emergencies. Adverse mental health and insecurity for veterans create financial issues and compound problems for society. Veterans often become part of the vulnerable populations and are at a greater risk for homelessness than the general population (Tsai et al., 2021). Full spectrum support for veterans is essential for a healthy and secure nation. This means extensive Department of Defense transition programs and civilian receiving programs. Moreover, veterans need to feel comfortable to speak about their depression, loneliness, and suicidal thoughts. Alternatively, communities need to be

proactive in creating opportunities for veterans to engage with others. Reducing suicide starts with treating the root cause. Therefore, additional funding and resources will be required to meet the expectations of future veteran health care, not only from the civilian side, but also the Department of Defense.

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