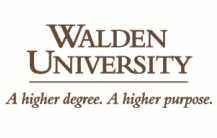

2018

Gender, Social Support, and Resiliency in Suicidal Ideation among U.S. Army Soldiers

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This is to certify that the doctoral dissertation by

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has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
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Walden University
2018

Abstract

Gender, Social Support, and Resiliency in Suicidal Ideation among U.S. Army Soldiers

by

John F. Ambrose

MPH, Drexel University, 2004

BS, Virginia Tech, 2001

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

August 2018

Abstract

Suicidal behaviors have continued to increase in the United States (U.S.) Army population since the beginning of the wars in Iraq and Afghanistan. Suicide rates are higher in men compared to women; yet, the rate of suicidal ideation is higher in women than men. The purpose of this study was to determine if there is a correlation between suicidal ideation and protective factors, if social support and resiliency are different for men and women within the U.S. Army population, and if gender acts as a moderating variable between suicidal ideation and protective factors. The interpersonal-psychological theory of suicidal behavior was used as the foundation for this study. Secondary data were collected from the U.S. Army Public Health Center. After removing missing responses, the total sample size for this study was $N = 3{,}446$. Chi-square, independent samples *t* test, and multiple logistic regressions were used to determine the relationship between gender, suicidal ideation, resiliency, and social support in the U.S. Army active duty population. The percentage who reported suicidal ideation was 3.6% versus 4.9% for males and females, respectively. Social support was statistically significantly correlated with suicidal ideation ($p = 0.002$) while resiliency was not statistically significantly correlated with suicidal ideation ($p = 0.68$). Neither scale was effective in detecting differences among gender groups. Refined instruments are needed for evaluation of small changes in regard to protective factors. To promote social change, this study can be used to enhance knowledge about protective factors and gender in the context of the suicidal process, thus furthering the knowledge about how to prevent suicide in the U.S. Army population.

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Dedication

This is dedicated to my family who have made all of this possible. I especially want to acknowledge my wife who has supported me this entire endeavor. If not for her, I would not have made it to completion of this study as she was always there to provide support. Furthermore, I would like to dedicate this to my mom and dad who have pushed me at every step of my life to be the best person I can be, have taught me to never quit.

Acknowledgments

I would like to acknowledge my committee for all their support in helping me reach conclusion of this study. In addition, I want to acknowledge the support I received from my colleagues and leadership within the Army Public Health Center and Defense Health Agency. Without the support of all the individuals in both Army Public Health Center and the Defense Health Agency, I would not have been able to complete this monumental task.

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Chapter 1: Introduction to the Study

Introduction

Numerous researchers have attempted to identify causative variables and mitigating factors to explain the prevalence rates for suicide in the United States (Chang, Stuckler, Yip, & Gunnell, 2013; Tøllefsen, Hem, & Ekeberg, 2012; Värnik, 2012). Black, Gallaway, Bell, and Ritchie (2011) remarked that the proportion of U.S. Army soldiers with suicidal risk factors (ie., alcohol and drug abuse) and suicidal behaviors (ie., ideation, plans, and attempts) have been increasing since 2004. Furthermore, in the civilian population and the military population, the social construct of gender plays a role in suicidal behavior. Although much of the focus of previous research has been aimed at understanding suicide in soldiers, scholars have not described the protective factors that may help to prevent death by suicide. As a result of this increase in suicidal behavior in the Army population, as well as the gap in literature regarding protective factors and gender, the purpose of this study was to (a) demonstrate if there is a correlation between suicidal ideation and protective factors, (b) demonstrate if social support and resiliency are different for men and women within the Army population, and (c) determine if gender acts as a moderating variable between suicidal ideation and protective factors. I focused on the protective factors of social support and resiliency with the dependent variable of suicidal ideation in the U.S. Army (hereafter Army) active duty population.

Background

Globally, suicide is the 15th leading cause of death, resulting in an estimated 870,000 deaths per year and a global mortality rate of 16 deaths per 100,000 persons

(World Health Organization [WHO], 2017). Twenty million people attempt suicide each year, with the majority between the ages of 15-29 years (WHO, 2017). The global suicide rate exceeds individual rates of homicides, war, and terrorist activities (WHO, 2017). In the United States, suicide is now the 10th leading cause of death with more than 33,000 suicide deaths each year (Kaplan, McFarland, Huguet, & Valenstein, 2012), and the rate of suicides has increased from 10.5 per 100,000 in 1999 to 13.0 per 100,000 in 2014 (Curtin, Warner, & Hedegaard. 2016).

Suicide rates within the Army have increased since the beginning of combat operations in 2001 (Kessler et al., 2014). Specifically, the Department of Defense Task Force on the Prevention of Suicide by Members of the Armed Forces (DOD TFPS, 2010) reported the overall Army suicide rate was fewer than 10 deaths per 100,000 U.S. personnel in 2001. This suicide rate surpassed the corresponding civilian rate in 2008, 19 suicides per 100,000 persons, with an Army-specific suicide rate of 20 deaths per 100,000 persons (Trofimovich, Reger, Luxton, & Oetjen-Gerdes, 2013). The high rate of suicide deaths, most recently reported as 24.4 per 100,000 person-years in the calendar year 2015 for the Army, has prompted study and evaluation by the Department of Defense (DoD) to curtail the problem (Army Public Health Center [APHC], 2016; DOD TFPS, 2010; DoD, 2015a). In addition, the leadership within the Army Medical Command tasked the creation of the Behavioral and Social Health Outcomes Program (BSHOP) within the APHC. The role of the BSHOP program is to provide scientific expertise, primarily in epidemiology, social work, and psychology, to Army personnel

(Ritchie, 2014). As a part of this expertise, the BSHOP program routinely conducts behavioral health epidemiology consultations, or field investigation, within Army units.

Due to the high suicide rate within the Army and the timeline in which suicides increased, risk factors such as deployment, age, gender, sexual trauma, enlistment standards, and length of deployments have been tested as predictors of suicide cases in the Army (Black et al., 2011; Gradus, Street, Suvak, & Resick, 2013; Leardmann et al., 2013 Schoenbaum et al., 2014; Street et al., 2015). However, less research has been dedicated to understanding the role of protective factors and the role of gender. Although suicide is among the leading causes of death globally, in the United States, and in the Army population, other suicidal behaviors, such as suicidal ideation, are also elevated (Nock et al., 2008; Ursano et al., 2015a). The Army Study to Assess Risk and Resilience in Servicemembers (STARRS) found that suicidal ideation was higher in the Army population (14.1%; as cited in Ursano et al., 2015a) than their corresponding civilian counterparts (11.7%; as cited in Gadermann et al., 2012). Suicidal ideation is defined as thoughts related to killing one's self and is a precursor to suicide (Nock et al., 2008; Ursano et al., 2015a). However, the prevalence decreases with severity of suicidal behaviors. For instance, suicidal ideation is more prevalent than suicidal attempts, which is more prevalent than suicide (Nock et al., 2008; Ursano et al., 2015a). Most cases of suicidal ideation never die by suicide (Nock et al., 2008). Given that suicide cannot occur without first contemplating suicide (Nock et al., 2008) and given the high rate of suicidal ideation as compared to the civilian population and identified by the Army

STARRS program (Ursano et al., 2015a), in this study, I focused on suicidal ideation as the dependent variable in the Army population.

Lemaire and Graham (2011) noted that further investigation of protective factors may bolster interventions in the suicidal process. One such protective factor is resilience. Resilience is defined as a psychological construct that allows a person to adjust to and/or recover from stressful life events (Johnson, Gooding, Wood, & Tarrier, 2010; Smith, Tooley, Christopher, & Kay, 2010). This psychological construct relates to a person's optimism about adapting to a current situation (Johnson et al., 2010; Smith et al., 2010). Another protective factor is social support. As Lieberman, Solomon, and Ginzburg (2005) noted, social support may act as a buffer against suicidal ideation. To help address suicide, it is important that protective factors be studied in the Army population as they are not currently well evaluated.

As of 2009, the Army-specific suicide rate in men was 23.77 per 100,000, while the suicide rate in women was at 5.24 per 100,000 (Black et al., 2011). Gradus et al. (2013) noted that the reverse was true for suicidal ideation in that more women (21.1%) reported suicidal ideation as opposed to men (19.2%). Because more men progress further along the suicidal process to suicide than women, it is appropriate to consider if protective factors among genders differ as an explanation for the differences in the suicidal process (Joiner, 2005). Therefore, in this study, I provided analysis into the role of gender and protective factors as potential approaches for regulating the rate of suicidal ideation within the active duty Army population.

Problem Statement

Rates of suicide in the Army, from 1977–2003, averaged a rate of 12.2 deaths per 100,000 person-years (Armed Forces Health Surveillance Center [AFHSC], 2012),). The rates increased from 10.1 deaths per 100,000 person-years in 2002 to 19.7 deaths per 100,000 person-years in 2008 (AFHSC, 2012), which now surpass rates of suicide in the parallel nonmilitary population (Kessler et al., 2014; Schoenbaum et al., 2014). Figure 1 details the change in suicide rate beginning in 1977. However, the method for determining suicide rate was changed in March 2014 (DoD, 2014). Thus, comparisons to rates produced in subsequent years are limited.

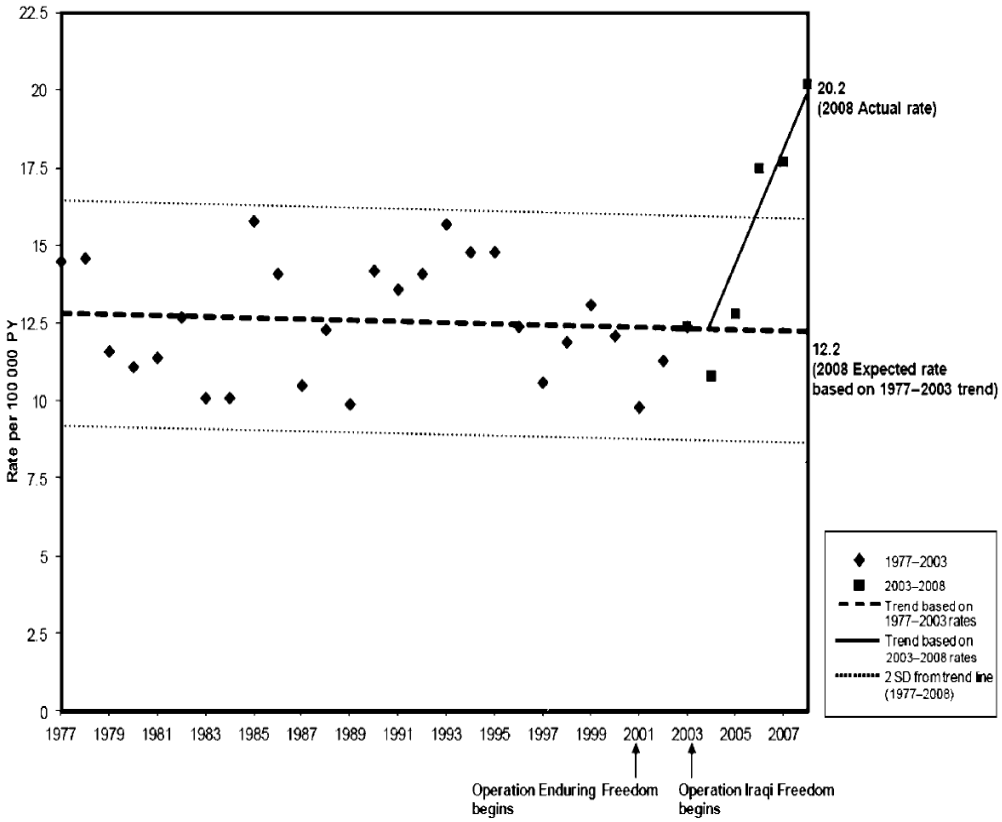


Figure 1. Active duty U.S. Army suicide rates, 1977-2008. Adapted from "Mental health risk factors for suicides in the US Army, 2007–8." by Bachynski et al., 2012, *Injury Prevention, 18*(6), p. 3. Copyright [2012] by BMJ Publishing Group Ltd. Reprinted with permission.

Several scholars have attempted to explore the reasons for the increase in the suicide rate for the Army population. Some researchers have attributed the increase in suicide rates to combat exposures and high operational tempo in the military (Kessler et al., 2014; Leardmann et al., 2013; Lemaire & Graham, 2011; Maguen et al., 2008; Nock et al., 2014). Other researchers have reported differences in regards to suicidal behaviors, such as suicidal ideation (Benda, 2005; Street et al., 2015; Ursano et al., 2014). Although the incidence of suicidal ideation has not been measured in recent years for the active duty population, scholars in 2005 (48.7% for women versus 44.4% for men) and 2013 (21.1% for women versus 19.2% for men) demonstrated that the rates of suicidal ideation were statistically significantly higher among women than men ($p < 0.05$) for military veterans (Benda, 2005; Gradus et al., 2013). Similarly, in the U.S. civilian population, Lee et al. (2010) reported that women were more likely than men ($p < .05$) to experience suicidal ideation over the course of their lifetime (28% for women versus 26% for men). Likewise, Nock et al. (2008) reported that women are 1.4 times more likely than men to have suicidal ideation. In addition, women are more likely to have depressive symptoms than men (t=20.40, p<0.01), which results in higher rates of suicidal ideation ($x^2 = 20.08$, p<0.01; Allison, Roeger, Martin, & Keeves, 2001). The increased risk of suicidal ideation in women, established by Benda (2005) and Gradus et al. (2013), is similar to risk for women in the civilian population (Nock et al., 2008; Ursano et al., 2014).

Ideation is a precursor and risk factor for suicide attempt and death by suicide (Bryan, Ray-Sannerud, Morrow, & Etienne, 2013; Nock et al., 2008). Bryan et al. (2013) stated that a reason for hope and optimism during periods of suicidal ideation lessens the

likelihood of suicide attempt, which is why resilience was considered in this study. Resilience is defined as a psychological construct that allows a person to adjust to and/or recover from stressful life events (Johnson et al., 2010; Smith et al., 2010). Resiliency directly addresses a person's ability to have optimism and hope and is distinguished by Bryan et al. (2013) as needed for overcoming suicidal ideation. Moreover, Joiner (2005) stated that resiliency limits a person's ability to overcome the biological self-preservation mentality noted as the psychological construct of the interpersonal-psychological theory of suicidal behavior

Social support has also been noted to be a protective factor against suicidal ideation (Kleiman & Liu, 2013). Social support is defined as the encouragement an individual receives by others within his or her respective environment (Kleiman & Liu, 2013). Tsai, Harpaz-Rotem, Pietrzak, and Southwick (2012) found that posttraumatic stress disorder (PTSD) and social support were inversely proportional among military veterans who had returned from operations in Iraq and Afghanistan. Those same veterans reported low social support among their spouses, family, and colleagues (Tsai et al., 2012). As a result, the ability of the soldiers to function in social settings was poor, and increased suicidal ideation was observed in the veteran population (Tsai et al., 2012). Joiner et al. (2009) outlined the importance of social support in relation to the interpersonal-psychological theory of suicidal behavior through the construct of burdensomeness. Joiner (2005) stated that burdensomeness was developed through a lack of engagement with others.

High resiliency and the ability to overcome difficulties is a protective factor for suicidality (Johnson et al., 2010). A gap in the current knowledge base exists in discernment of the difference between known protective factors, such as resiliency and social support, among men and women in the Army population. As a result, it is important for researchers to examine the relationship between resiliency, social support, and suicidal ideation in the Army population. In this study, I attempted to fill the gap in knowledge regarding the role of protective factors, notably resiliency and social support, in suicidal ideation and how gender moderates that relationship in the active duty Army population.

The continued increase in suicide rates among the Army population provides the larger context for the problem that was addressed in this study. However, to address the gap in knowledge related to this problem, suicidal ideation was used as the suicidal behavior that was measured, due to the limitations of surveying suicide attempters and those who die by suicide. Resiliency and social support were variables that could provide insight into why people do not descend along the path of suicidal behavior from ideation to attempt, as described by the interpersonal psychological theory of suicidal behavior. Each of the aforementioned protective factors was studied to determine if the gender differences noted above could be explained by social support and resiliency.

Nature of the Study

I used the quantitative paradigm of a cross-sectional study design using secondary data collected from the APHC–BSHOP behavioral health Epidemiological Consultation (EPICON) studies. EPICONS are conducted as field investigations by APHC in response

to requests from Army commanders (Ritchie, 2014). Employing a cross-sectional design allowed for the assessment of resiliency, using the Brief Resilience Scale (BRS; Smith et al., 2008), social support, using the Social Connectedness Scale –Revised (SCS-R; Lee, Draper, & Lee, 2001), and the assessment of recent suicidal ideation, using the Columbia-Suicide Severity Rating Scale (C-SSRS; Richie, 2014). Moreover, a correlational assessment allowed for measuring the strength and direction of the relationship between the dependent (suicidal ideation as measured using the C-SSRS) and independent variables (social support and resiliency as measured by the SCS-R and BRS respectively) with gender acting as a moderating variable.

Research Questions and Hypotheses

There were seven research questions for this study. The questions and corresponding hypotheses are as follows:

1. Is there a difference in suicidal ideation, as measured using the C-SSRS (Military Screener Version), between men and women among Army soldiers?

$H_0$1: There is no difference in suicidal ideation between men and women among Army soldiers.

$H_1$1: There is a difference in suicidal ideation between men and women among Army soldiers.

2. Is there a correlation between suicidal ideation, as measured using the C-SSRS (Military Screener Version), and level of social support, as measured using the SCS-R, among Army soldiers?

$H_0$2: There is no correlation between suicidal ideation and social support among Army soldiers.

$H_1$2: There is a correlation between suicidal ideation and social support among Army soldiers.

3. Is there a correlation between suicidal ideation, as measured using the C-SSRS (Military Screener Version), and level of resiliency, as measured by BRS, among Army soldiers?

$H_0$3: There is no correlation between suicidal ideation and resiliency among Army soldiers.

$H_1$3: There is a correlation between suicidal ideation and resiliency among Army soldiers.

4. Is there a difference in the level of social support, as measured using the SCS-R, between men and women among Army soldiers?

$H_0$4: There is no difference in the level of social support between men and women among Army soldiers.

$H_1$4: There is a difference in the level of social support between men and women among Army soldiers.

5. Is there a difference in the level of resiliency, as measured by BRS, between men and women among Army soldiers?

$H_0$5: There is no difference in the level of resiliency between men and women among Army soldiers.

$H_1$5: There is a difference in the level of resiliency between men and women among Army soldiers.

6. Does gender moderate the relationship between suicidal ideation, as measured using the C-SSRS (Military Screener Version), and level of social support, as measured using the C-SSRS, among Army soldiers?

$H_0$6: Gender does not moderate the relationship between suicidal ideation and social support among Army soldiers.

$H_1$6: Gender does moderate the relationship between suicidal ideation and social support among Army soldiers.

7. Does gender moderate the relationship between suicidal ideation, as measured using the C-SSRS (Military Screener Version), and level of resiliency, as measured by BRS, among Army soldiers?

$H_0$7: Gender does not moderate the relationship between suicidal ideation and level of resiliency among Army soldiers.

$H_1$7: Gender does moderate the relationship between suicidal ideation and level of resiliency among Army soldiers.

Purpose of the Study

The purpose of this study was to understand the gap in knowledge about the relationship between suicidal ideation and gender, social support, and resiliency among the active duty Army population. Depression, poor social support, alcohol abuse, and drug abuse have all been identified as risk factors for suicidal ideation and are well researched in the Army population (Kessler et al., 2014; Panagioti, Gooding, & Tarrier,

2012; Pfeiffer et al., 2014). However, scholars have not researched protective factors, specifically resiliency and positive social support, and how gender might moderate the relationship between protective factors and suicidal ideation (Lemaire & Graham, 2011; Schoenbaum et al., 2014). To comprehend how the aforementioned protective factors and gender relate to suicidal ideation among soldiers, I used a quantitative paradigm, using secondary data with a cross-sectional study design, to address the gap in knowledge. The data for each of the independent variables (social support and resiliency) and the dependent variable (suicidal ideation) were analyzed using secondary data collected from behavioral health EPICONS. I attempted to (a) demonstrate if there was a difference in the level of suicidal ideation between men and women, (b) establish if there was a correlation between suicidal ideation and protective factors, (c) reveal if social support and resiliency were different for men and women within the Army population, and (d) determine if gender acted as a moderating variable between suicidal ideation and protective factors.

Theoretical Base

The theoretical framework for this study was based on the interpersonal psychological theory of suicidal behavior, which was first proposed by Joiner (2005). The interpersonal psychological theory of suicidal behavior contains three central constructs. The first construct of the interpersonal psychological theory of suicidal behavior states that a person must have the capability to die by suicide, which is known as the psychological construct (Joiner, 2005). The second and third construct, noted as the interpersonal constructs, states that a person with suicidal ideation must lack a sense

of belongingness and perceive oneself as a burden (Joiner, 2005). A person does not feel that he or she has a social support system (known as connectedness) and that the individual is an encumbrance on others encompassed in his or her worldview (Joiner, 2005). Although this theory does not detail why a soldier in the Army died by suicide, it does infer that the reasons for suicidal ideation are based on risk factors and protective factors that emphasize each construct. Furthermore, Bryan, Morrow, Anestis, and Joiner (2010) found that soldiers in the U.S. military had a higher acquired capability for suicide as opposed to civilian personal, which is harmonious with the psychological construct of the interpersonal psychological theory of suicidal behavior in that ability to die by suicide is developed through habitable exposures to stressors, such as death. In the interpersonal psychological theory of suicidal behavior, there are risk factors and protective factors associated with suicidal ideation (Joiner et al., 2009). Specifically, the variable of social support, used in this study, has been correlated to the construct of thwarted burdensomeness (r = .34, p < 01; Joiner et al., 2009). Kleiman and Beaver (2013) noted that resiliency moderates the psychological construct of the interpersonal psychological theory of suicidal behavior (b=.34, 95% CI=.17 to .54, p<.01). A more detailed explanation of the interpersonal-psychological theory of suicidal behavior can be found in Chapter 2.

Another construct to this research is the metatheory of resilience and resiliency, often shortened to just metatheory or resilience. Richardson (2002) first described the metatheory of resilience and resiliency as the personal qualities that enamor a person in preventing self-destructive behaviors. Scholars have identified resiliency as a protective

factor in preventing suicides (Connor & Davidson, 2003; Schoenbaum et al., 2014; Tsai et al., 2012). In the civilian population, scholars have had mixed results in describing resiliency differences among men and women. For instance, Hjemdal, Vogel, Solem, Hagen, and Stiles (2011) found higher resilience levels in women, as opposed to men, resulting in protection from some psychiatric symptoms. However, Hjemdal et al. also stated that no significant differences were assessed for overall resiliency.

List of Definitions

Resiliency: A psychological construct that allows a person to adjust to and/or recover from stressful life events.

Social support: The encouragement one receives to help feel appreciated and cared for by other people and part of some grouping or network.

Suicide: The act of intentionally ending a person's own life.

Suicidal ideation: The thoughts a person develops to end his/her life.

Suicidal intent: Evidence that a person attempted suicide and understood the consequences of his or her respective actions.

Suicide attempt: The act of trying to willfully end a person's own life but survives.

Suicide plan: The development of an organized method that can be used to die by suicide.

Assumptions

- I assumed that the respondents provided honest and unbiased information to EPICON surveys

- I assumed that the measures and scales used in this study are valid and reliable.
- I assumed that previous research referred to in this study was conducted without bias.
- I assumed that data will be provided by the requesting agency in accordance with procedures outlined in the methodology section (Chapter 3) and that the data were reflective of the respondents' opinion at the time of data collection.

Limitations

- The cross-sectional study design only showed association not causality.
- In addition, cross-sectional study design only allowed for a snap shot of the health experience in the Army population at a given time as opposed to a longitudinal study that would allow for change in the dependent and independent variables over time. As a result, temporal sequence was unclear in this study.
- Risk cannot be calculated in this study given that a cross-sectional study was being used.
- In this study, identification of suicidal ideation can only be determined based on survey responses by study participants. Although the initial entries were validated using electronic medical records by the BSHOP at APHC, this information cannot be further validated using medical encounter data given that access to medical records would constitute a breach of the data sharing agreement

with the APHC. However, Nock et al. (2008) discerned that suicidal ideation may be underreported in studies that use medical encounter data.

- Given the low number of women as compared to men in the Army population, there was potential for selection bias in the study.
- Survival bias could be introduced in the study as those who are enrolled in the initial EPICON studies may have based responses on previous experiences involving suicidal behavior or protective factors as opposed to recent perceptions.
- I did not account for the effects of location on suicidal ideation. Army installations are in multiple locations throughout the world, and many locations encompass soldiers with different job responsibilities and various potential exposures to suicidal behavior risk factors (Chapman et al., 2012). Potential stressors do not necessarily overlap across all installations and job responsibilities.
- I used data collected from EPICON surveys by APHC. Given that surveys were self-administered, data may be incomplete. In addition, EPICON study sites were selected by Army Command and, therefore, the data collection may not be representative of the entire Army population. Finally, data were collected between years 2015–2017. As a result, the data may not reflect the current beliefs of the Army population.
- As part of the agreement with APHC to use data related to suicidal ideation, social support, and resiliency, no unit information was cited or released as a part of this study. Furthermore, EPICON technical reports could not be cited

in this study as each report includes identifying unit information and are deemed sensitive by Army Public Affairs Office.

Scope and Delimitations

In this study, I evaluated the existence of any statistically significant relationships between resiliency and social support, with suicidal ideation among active duty Army soldiers using gender as a moderating variable. Only soldiers in active service were considered in this study, and their responses were treated with high ethical standards. National Guard and Reserve soldiers were not considered in this study due to the differences from the active duty population in training, operating environments, and recruiting strategies performed by APHC. The National Guard and Reserve soldiers were not evaluated as part of the APHC EPICON studies for the data being used in this research. The research protocol was implemented with the approval and oversight of the Walden University Institutional Review Board and the APHC Public Health Review Board.

Strengths

I used secondary data that were collected as part of the APHC EPICON studies from the years 2015–2017. A larger sample could be used, as opposed to primary data collection, making is possible to more easily show statistical significance. In addition, because primary data collection was not needed as a part of this study, analysis could be performed quickly and did not require any financial resources. Finally, I had the full support of the APHC as analysis of the research questions further enhanced evaluation of suicidal ideation in the Army population that have not been previously evaluated by

APHC. Furthermore, this study has the potential to add to the medical literature regarding the measurement of protective factors, specifically resiliency and social support, to suicidal ideation and how gender moderates that relationship within the active duty military.

Significance of the Study

The most recent suicide rate (2015) in the Army has been documented to be 24.4 deaths per 100,000 person-years (APHC, 2016). Street et al. (2015) reported that the number of males dying by suicide is higher than that of females in the Army active duty population. Conversely, suicidal ideation, a preliminary step to suicide, is higher in women as opposed to men in the military population. Snarr, Heyman, and Slep (2010) reported that women are 5.5 times as likely as men to experience suicidal ideation (95% *CI*: 1.2, 1.3). This trend is similar in the civilian population, as Nock et al. (2008) noted that women were at 1.4 times as likely as men to experience suicidal ideation (95% *CI*: 1.3, 1.4). There may be protective factors that prevent women from making the step from ideation to plan then to attempt. Protective factors, such as optimism, are developed into resiliency to suicide (Bryan et al., 2013; Johnson et al., 2010). Smith et al. (2010) described resiliency as the coping resources resulting from stable personal characteristics. Social support has also been identified as a protective factor for suicide (Pietrzak et al., 2010b; Wilcox, 2010). Although little information is available with regard to this discrepancy between men and women in the form of suicidal ideation, I endeavored to ascertain the role of the aforementioned protective factors in the state of gender variation with regard to the soldiers who experience suicidal ideation within the Army.

Summary and Transitions

The issues of suicidal ideations, attempts, and suicides have been a focus in the current century in the armed forces, though civilian suicide rates are considerably higher than previous years as well (Chang et al., 2013; Tøllefsen et al., 2012; Värnik, 2012). Suicide is estimated to result in 870,000 deaths per year around the world, with researchers indicating that it is the 10th leading cause of death in the United States (Kaplan et al., 2012; WHO, 2017). The suicide-related deaths in the United States have been rising, increasing 24% from 1999 to 2014 (Curtin et al., 2016).

Researchers who have studied military suicides have demonstrated a disparity between men and women. As of 2009, women have a reported suicide rate of 5.24 / 100,000 persons, while men have a reported suicide rate of 23.77 / 100,000 persons (Black et al., 2011). However, Nock et al. (2008) reported that women were 1.4 times more likely than men to have suicidal ideation. Men are the major victims of suicide, while more women experience suicidal ideation. A lack of sufficient protective factors, such as social support, could be the reason for the high death levels, especially within the Army (Joiner, 2005; Street et al, 2015). However, little information is available on protective factors and suicidal behaviors, such as suicidal ideation. Information is lacking on the correlation of protective factors and suicidal ideation between men and women in the active duty Army population. To determine the correlation between protective factors and gender, analysis was conducted using suicidal ideation as the outcome rather than suicide because protective factors are difficult to measure in the completed suicide population.

The protective factors that were measured in this study were those of social support and resilience. Each of these protective factors helps to determine a person's optimism and level of hopelessness related to suicidal behavior (Johnson et al., 2010). Resilience is the act of a person increasing his/her level of focus and commitment, while social support refers to the encouragement a person receives to help feel appreciated (Johnson et al., 2010; Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009). In this study, I focused on accessing the correlation between the strength of suicidal ideation and protective factors, such as resilience as social support. Gender was also evaluated to determine if it moderates the relationship between the aforementioned protective factors and suicidal ideation.

The research was conducted in a defined population while allowing the respondents to remain anonymous due to the use of a secondary data set with no corresponding personal identifiable information. However, a limitation with self-reported data is that respondents can choose not to participate in the survey, which decreases the power of the study. However, because APHC has collected EPICON data since 2015, a large sample size does exist, although missing data may limit analysis. The results of the study could be used to support positive social change given that results may contribute to the medical literature about the role of gender and protective factors in the active duty Army population.

In Chapter 1, I introduced an overview of the study and definitions that were used throughout the research. In addition, the interpersonal psychological theory of suicidal behavior was presented as the framework for study development (Joiner et al., 2009). In

Chapter 2, I will provide a comprehensive assessment of the medical literature regarding suicidal behaviors, theory, roles of gender, and protective factors of social support and resiliency. In Chapter 3, I present the quantitative methods that were used for the study that include the sampling procedure, operationalization of the variables, data analysis plan, and ethical considerations. In Chapter 4, I outline the results of the methodology described in Chapter 3. Chapter 5 provides an interpretation of the results.

Chapter 2: Literature Review

Introduction

The purpose of this quantitative, cross-sectional study was to fill the gap in knowledge about the relationship between suicidal ideation, social support, and resiliency among the active duty Army population and to evaluate the role of gender in the aforementioned associations. In this chapter, I will summarize the medical literature regarding protective factors for suicidal behavior that have been studied in both the civilian and military populations. To understand how these factors relate to the suicidal process, a critical review of literature associated with suicidal theory will be presented. In addition, I will impart information obtained from the medical literature regarding the suicidal process and the epidemiology of suicide in both the civilian and military populations. Prior to the conclusion of this chapter, I will describe abbreviated research summaries on validated measuring tools used for the assessment of suicidal ideation, resiliency, and social support.

Literature Review Strategy

I used Google Scholar to identify quantitative studies regarding suicidal ideation, with a focus on correlational and cross-sectional studies in military populations. Both risk factors and protective factors were emphasized, using search terms such as *protective factors for suicide, risk factors for suicide, epidemiology of suicide, suicide U.S. Army, suicide military, resiliency for suicide, social support for suicide, suicidal ideation, suicidal process, resiliency, social support,* and *suicide theory*. In addition, research was conducted to understand the suicidal process to appreciate how suicidal ideation can

envelop each suicidal behavior. Articles were only selected if they occurred after 2011, with exceptions made for when articles were needed for primary sourcing material or for understanding the historical context of changes in suicidal behavior research. Over 150 articles were sorted, categorized, and reviewed for incorporation into this study.

Epidemiology of Suicidal Behavior

As of 2014, the suicide rate in the United States was 13.0 per 100,000 (Curtin et al., 2016). From 1999 to 2014, there was a 24% increase in the national suicide rate (Curtin et al., 2016). Beginning in 1999, 10.5 deaths per 100,000 were reported (Curtin et al., 2016), cumulating with the 2015 suicide rate of 13.8 per 100,000 (Drapeau & McIntosh, 2016). Men have the highest rate of suicide at 21.5 per 100,000 as compared to women with a rate of 6.3 per 100,000 (Drapeau & McIntosh, 2016). The American Association of Suicidology indicated that there was a minimal increase in the rate of fatal outcomes resulting from suicides from 2014 Theto 2015 (as cited in Drapeau & McIntosh, 2016). Although not all suicide attempts are fatal, the American Association of Suicidology estimated that there were 1,104,825 attempts in 2015, which translated into an attempt every 29 seconds and one death in every 25 attempts (as cited in Drapeau & McIntosh, 2016).

Age is a factor in suicide, with the 65 years and older population accounting for 17.9% of the suicides in 2015, despite making up only 14.9% of the U.S. population (Drapeau & McIntosh, 2016). The age group with the highest suicide rate in the civilian population is that of 45- to 54-year-olds at 20.3 per 100,000 (see Figure 2). The young, less than 24-years-old, accounted for 12.4% of the suicide attempts, while the middle

aged, 25 –64-years-old, accounted for 37.3% of all suicides in 2015 (Drapeau & McIntosh, 2016). Among the youth captured in the 2013 CDC's Youth Risk Behavior Surveillance System, specifically those in ninth to 12th grade, Kann et al. (2014) found that suicidal ideation was reported in 17% (95% *CI* 15.8, 18.2) of students.

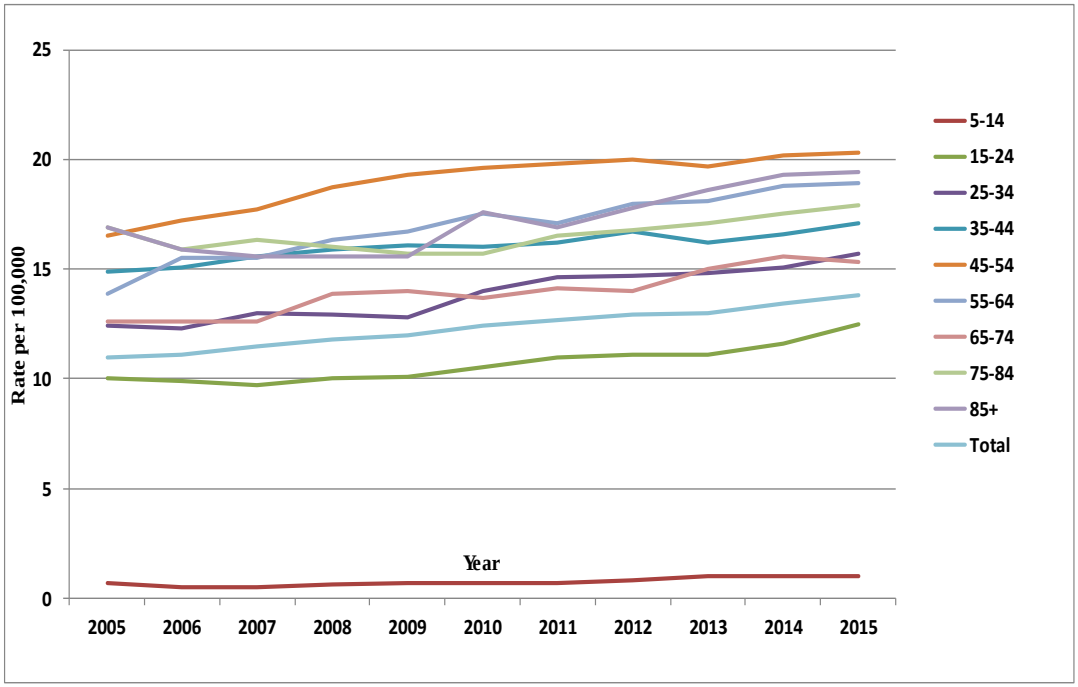


Figure 2. United States suicide rates by age group for years 2005-2015. Adapted from "U.S.A Suicide: 2015 Official Final Data" by Drapeau & McIntosh (2016) (Copyright [2016] by American Association of Suicidology).

The suicide rates also vary with other factors, such as gender and ethnicity. According to Drapeau and McIntosh (2016), the suicide rate in 2015 was 24.6 per 100,000 among White males, 7.2 per 100,000 among White women, 10.0 per 100,000 among non-White males, and 2.9 per 100,000 among non-White women. During that same timespan, American Indian/Alaska Natives (18.37 per 100,000) and White non-Hispanic (16.71 per 100,000) had the highest rate of suicide (Ivey-Stephenson, Crosby, Jack, Haileyesus, & Kresnow-Sedacca, 2017).

The percentages of suicides by gender are at 78.8% for men and 21.2% for women (Lineberry & O'Connor, 2012). The Centers for Disease Control and Prevention noted that male deaths from suicide (22.34 per 100,000) were consistently higher than corresponding female deaths (5.68 per 100,000) from the years 2001–2015 (as cited in Ivey-Stephenson et al., 2017). See Figure 3 for more information on suicide rates by race/ethnicity and gender.

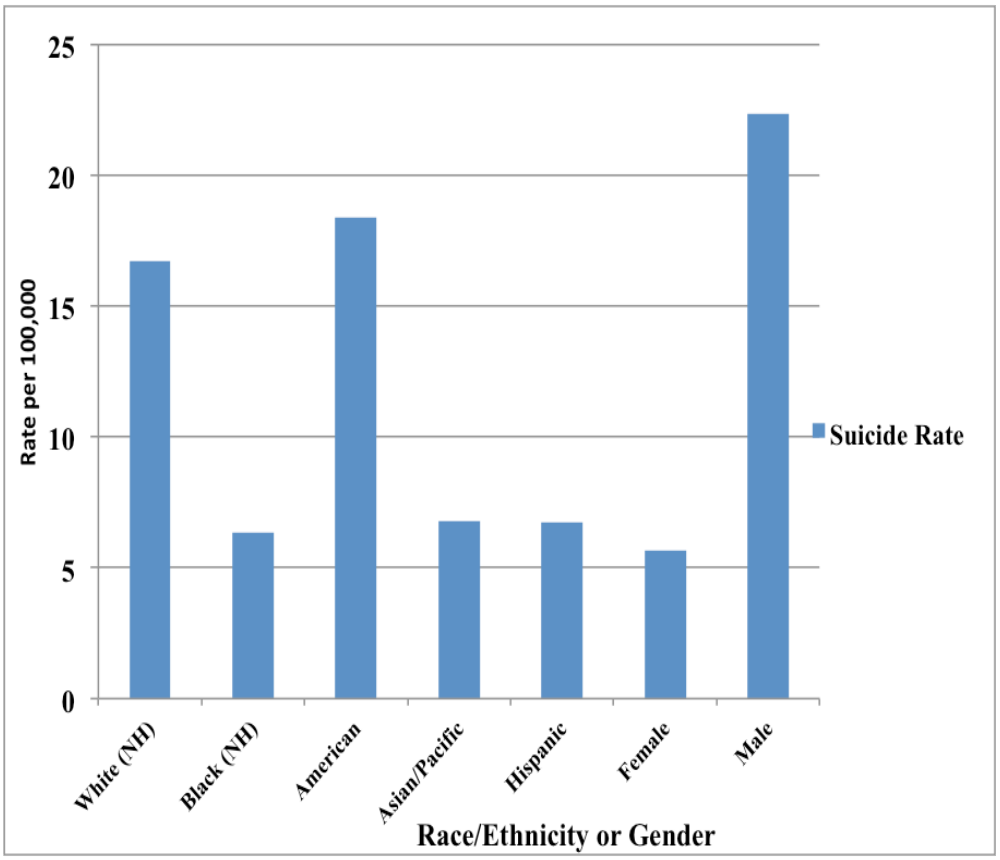


Figure 3. United States suicide rate per 100,000 by race/ethnicity or gender. Adapted from "Suicide Trends Among and Within Urbanization Levels by Sex, Race/Ethnicity, Age Group, and Mechanism of Death" by Ivey-Stephenson et al. (2017). *MMWR Surveillance; 66*(No. SS-18):1–16.). Copyright [2016] by U.S. Department of Health and Human Services.

Epidemiology in U.S. Army

Historically, the suicide rate among Army soldiers has been reported to be 20% lower than the general population (Lineberry & O'Connor, 2012). Lineberry and O'Connor (2012) attributed this lower rate to the healthy soldier effect, which is a term

used to describe how soldiers are less likely to die by any “all-cause mortality” when compared to the civilian population. The healthy soldier effect is often attributed to screening standards for entry into the military, a healthier lifestyle while in the military, and medical retirements from the military. Despite this, the Army STARRS revealed that in the past 15 years, there had been a substantial increase in the rate of suicide among Army service members (as cited in Nock et al., 2014). The Army STARRS disclosed that 13.9% of Army service members had suicidal thoughts, 5.3% had suicide plans, and 2.4% had attempted suicide (as cited in Nock et al., 2014). Prevalence estimates for suicidal ideation were also higher among women as compared to men (*OR* = 2.1 [95% *CI*: 1.4, 3.1]; Nock et al., 2014). According to Lineberry and O'Connor, the suicide rate in the Army between 2004 and 2008 increased 80% above what was recorded during the stable suicide rate period between 1977 and 2003. Much of this increase was hypothesized to be the result of the wars in Iraq (beginning March 20, 2003) and Afghanistan (beginning October 7, 2001; Nock et al., 2014; Ursano et al., 2015b).

Ursano et al. (2015b) revealed that enlisted soldiers, as opposed to commissioned officers, made up 98.6% of the suicide attempts in the Army from 2004 to 2009. Like Nock et al. (2014), Ursano et al. indicated that suicide in the Army is the result of the interaction of various factors, such as length of deployment, age at enlistment, combat and deployment effects, psychiatric diagnosis, active service, and risk factors; therefore, suicide rates vary accordingly.

For suicidal ideation, the Army reported 1,171 cases in 2015, which was an increase of 255 cases reported in 2013 (APHC, 2016). Additionally, the APHC (2016)

reported a suicidal ideation incidence rate of 207.6 per 100,000 persons (95% *CI*: 194.9, 220.4), which was the highest rate since tracking began in 2007. Furthermore, the incidence of cases in females (307.0 per 100,000) were higher than that of males (11.2 per 100,000), which is in line with the trend in the civilian population (ARPH, 2016). Suicidal ideation was highest in the age group 17-to 24-years-olds (304.8 per 100,000), as opposed to the 45-to 54-years-old group in the civilian population (ARPH, 2016). In addition, 58% of the suicidal ideation cases reported in the Army for 2015 had never deployed, which is a significant increase ($\chi^2 = 17.1$, $p < 0.002$) over the 2013 numbers (52%; ARPH, 2016).

Risk Factors Associated with Suicidal Behaviors

In the U.S. population, scholars have examined the risk factors of suicidal behaviors in an attempt to predict suicidal attempts (Easton, Renner, & O'Leary, 2013; Kumar & George, 2013; Nock et al., 2010; Tiihonen et al., 2006). Risk factors that are most associated with suicidal behavior are depression ($\chi^2 = 8.67$, $p < .05$) and previous suicide attempt ($t(59) = 2.84$, $p < .05$; Nock et al., 2010). However, it is important to note how a risk factor associates with a stage of suicidal behavior. For instance, the variable depression is associated with suicidal ideation, plan, and attempt, while the variable previous suicidal attempt is only associated with plan and attempt (Nock et al., 2010; Tiihonen et al., 2006). However, the aforementioned risk factors do not fully explain suicidal intent, as there are numerous people with depression who never develop suicidal ideation or suicidal plans and those with previous suicide attempts who never make another attempt (Nock et al., 2010). Other risk factors found to be associated with

suicidal behavior include personality traits, such as aggressiveness and antisocial behaviors (*OR* = .50, *p* < .001) and hopelessness (*OR* = 2.62, *p* < .001; Joiner, 2005; Neeleman, de Graaf, & Vollebergh, 2004). Environmental factors, poor social support (*t*=5.650, *p* < .01), alcohol dependence (*OR* = 1.59, *p* < .001), family history of suicide (*OR* =2.02, *P* < .001), and physical and sexual abuse (*OR* = 1.74, *p* < .05) are also associated with suicidal behaviors (Easton et al., 2013; Kleiman & Liu, 2013; Kumar & George, 2013). Likewise, age is a risk factor for suicide. In the civilian population, suicide rates increase with age (Drapeau & McIntosh, 2016).

In the military population, many of the same risk factors still apply for suicidal ideation and attempts, such as depression (*OR* = 1.23, *p* < .01), alcohol abuse (*OR* = 1.03, *p* < .05), and mental disorders (*OR* = 15.33, *p* < .01; Nock et al., 2014). However, additional risk factors include combat deployment, matriculation into the military, and PTSD (Nock et al., 2014; Nock et al., 2015; Ursano et al. 2016). Ursano et al. (2016) reported that 61.1% of enlisted soldiers who attempted suicide had never deployed (to a combat operation) and that the risk of suicide was highest in their second month of service. Among those soldiers who had deployed, risk was highest at the 6th month of deployment, while those who had previously been deployed were at highest risk of suicide at 5 months postdeployment (Ursano et al., 2016). PTSD was reported as a significant risk factor for both suicidal ideation (*OR* = 2.9, *p* < .05) and suicidal attempt (*OR* = 5.4, *p* < .05; Nock et al., 2015). Despite each of the aforementioned risk factors, clinical prediction of suicidal behaviors has been limited due to human judgment of medical providers that must accompany any such evaluation (Nock et al., 2008).

Understanding risk factors for suicidal behaviors ensures the applicability of Joiner's (2005) theory. However, given the amount of research on these risk factors for suicide, suicide attempt, and suicidal ideation, I focused on protective factors, specifically social support and resiliency, because less research has been applied to these areas (Black et al., 2011; DoD, 2015a, 2015b; Nock et al., 2014; Nock et al., 2015; Ursano et al., 2016). It is important to understand protective factors that are associated with suicidal behavior as public health interventions targeting communities or populations could be more valuable.

Interpersonal-Psychological Theory of Suicide

Suicidal theory dates back to the 19th century beginning with Durkheim (1897/1951) and continues to evolve throughout the 21st century, including those developed in the last decade by Joiner (2005), the interpersonal psychological theory of suicide, and Klonsky and May's (2015), three-step theory. The theory that supported this research was the interpersonal psychological theory of suicide first proposed by Joiner in 2005. This theory by Joiner is a combination of three constructs. The first construct, known as the psychological construct, is the ability of a person to die by suicide (Joiner, 2005). The second and third constructs of the theory, known as the interpersonal constructs, are described as thwarted belongingness and perceived burdensomeness (Joiner, 2005). However, each of these constructs were based on previous suicidal theories that prevailed throughout the 20th century (Joiner, 2005). Durkheim introduced the theory of suicide in 1897, and it translated into English in 1951 (Durkheim, 1897/1951). Durkheim argued that suicide is not derived from individual factors, but

rather from the collective social forces placed upon an individual or population. Durkheim argued a U-shaped relationship between the individual and the degree of social integration between the individual and society as the reasoning for suicide. Social integration was defined as the ability of a person to belong and be included into society. On one side of the U-shaped relationship, high integration meant that an individual was too engrained in society, thus committing himself or herself to a larger goal (Durkheim, 1897/1951). Durkheim termed this as altruistic suicide. The other side of the U-shaped relationship was considered low integration. Low integration is Durkheim's (1897/1951) explanation of egoistic suicide where a person does not belong or is socially isolated from society. Between the two extremes, Durkheim also hypothesized about anomic suicide and fatalistic suicide. Anomic suicide occurs when there is a sudden change, regardless of the direction of the change, in social position, whereas fatalistic suicide occurs among those with overregulation of their lives by society.

Durkheim's (1897/1951) theory of suicide did not consider the impact of outside forces on an individual, such as mental illness, alcohol, and genetics (Joiner, 2005). Despite this, Durkheim was the first to hypothesize that social isolation or social support may play a role in suicidal behaviors. Moreover, the definition of altruistic suicide, over integration into society by an individual, was used in the third construct by Joiner (2005) in the interpersonal psychological theory of suicide in that perceived burdensomeness is needed for an individual to experience suicidal behaviors. However, Shneidman (1987) influenced Joiner in the development of the second interpersonal construct of the theory known as failed belongingness.

Shneidman (1987) introduced the term psychache, which described an accumulation of deformed psychological essentials that eventually reaches an insufferable strength. Shneidman (1987) argued that suicide is not committed as an act of termination of the psychological pain, but rather a departure from the suffering. Shneidman (1998) also provided a description of thwarted needs that included "abasement, achievement, affiliation, aggression, autonomy, counteraction, defendance, deference, dominance, exhibition, harm, avoidance, inviolacy, nurturance, order, play, rejection, sentience, shame-avoidance, succorance, and understanding" (p. 179). Holden, Mehta, Cunningham, and McLeod (2001) later validated the psychache theory with a Cronbach α of 0.73. As both Shneidman (1998) and Joiner (2005) pointed out, although each of the aforementioned thwarted needs are required to develop psychache, it does not explain why some people die by suicide and others do not. However, Joiner's (2005) theory was informed by the psychache theory, which was used for this study. Joiner (2005) stated that psychache is needed to describe why people die by suicide and termed it "perceived burdensomeness" and "failed belongingness,"; without a means to die by suicide, a person would not be able to overcome his or her natural defense against death, which is noted as self-preservation (p. 37).

According to Joiner's (2005) first construct of the interpersonal psychological theory of suicide, a person must have the ability to die by suicide, which means that a person must have the ability to overcome biological self-preservation. The ability to overcome biological self-preservation can be done by people who are manipulated by pain and provocation (Joiner, 2005). Exposure to pain and provocation can come through

a number of means, including attempted suicide, exposure to death, or exposure to environments causing fear (Bryan, Sinclair, & Heron, 2016). Bryan et al. (2016) indicated that combat exposure was correlated with acquired capability for suicide (M = 0.19 [95% CI: 0.04, 0.33], p = 0.011). However, that result did not persist after the soldier was removed from combat exposures (M = -0.20 [95% CI: -0.03, -0.38], p = 0.022; Bryan et al., 2016). Anyone with repeated exposures to pain and provocation can have a reduction in the fear of injury or self-injury, resulting in the degradation of the biological value of self-preservation (Joiner, 2005).

Interpersonal Psychological Theory of Suicide Constructs in Research

Few scholars have conducted research into the interpersonal psychological theory of suicide in the military population (Anestis, Khazem, Mohn, & Green, 2015; Bryan, 2011; Bryan, Clemans, & Hernandez, 2012). Bryan et al. (2012) perceived that burdensomeness could predict suicidal desire (β = -0.67, SE = 0.33, p=0.045) among a sample of 133 Army soldiers at a combat support hospital in Iraq. However, in this same study, the construct of acquired capability and thwarted belongingness were more difficult to predict (Bryan et al., 2012). Bryan (2011) used a sample of 219 service members treated at a military installation in Iraq and found both perceived burdensomeness (t[12.801] = 3.919, p < 0.001, d = 1.26, M = 2.18, SD = 0.85) and thwarted belongingness (t[14.167] = 5.473, p< 0.001, d = 1.47, M = 4.65, SD = 1.30) were positively correlated with suicidal ideation. Neither construct was correlated with age, gender, nor rank, which indicates that the two constructs were independently associated with suicidality. as suggested in the interpersonal psychological theory of

suicide (Bryan, 2011). Bryan et al. (2011) did include gender as a moderating variable because there was insufficient evidence regarding gender as a moderating variable for protective factors and suicidal ideation.

Since the inception of the interpersonal psychological theory of suicide, other research has been conducted in the civilian populations to validate the constructs defined by Joiner (Hill & Pettit, 2014; Van Orden, Witte, Gordon, Bender, & Joiner, 2008). Hill and Pettit (2014) found that the perceived burdensomeness construct of the interpersonal psychological theory of suicide acts as a mediator between protective factors and suicidality. Van Orden et al. (2008) found that both thwarted belongingness and perceived burdensomeness could predict suicidal ideation (F [5, 303] = 21.47, $p < 0.001$). Van Orden et al. also tested the first construct of a person having the ability to die by suicide and found that those with provocative experiences, defined as experiences with negative outcomes, were more likely to experience suicidal ideation (F [2, 225] = 3.59, $p = .029$).

Interpersonal Psychological Theory of Suicide, Social Support, and Resiliency

Joiner et al. (2009) described the construct of belongingness as the perceived experience a person senses as a result of disaffection from others, which is otherwise known as a lack of social support. Joiner et al. tested the Suicide Probability Scale's social support constructs with the Interpersonal Needs Questionnaire for burdensome and found that they were correlated at $r = .88$, $p < .001$. For this reason, social support was included in this study as a predictor of suicidal ideation. Joiner et al. conducted a study

of 815 individuals ranging from ages 19- to 26-years-old and found that social support was the strongest predictor of suicidal ideation (F [2, 810] = 17.31, $p < .05$).

Because 15% of the U.S. population contemplates suicide while only 1.4% actually die by suicide, something prevents a person from overcoming his or her biological self-preservation, known as the psychological construct of the interpersonal psychological theory of suicide (Selby et al., 2010). Joiner et al. (2009) suggested that the fear of death can be overcome by repeated exposures to death or painful events. However, resiliency is the psychological construct that allows a person to adjust to and/or recover from stressful life events. To test the ability of resiliency in the interpersonal psychological theory of suicide, Kleiman and Beaver (2013) conducted an analysis of resiliency and interpersonal constructs of the interpersonal psychological theory of suicide and found intercorrelations of $r = -.54$, $p < .05$ with perceived burdensomeness and $r = -.62$, $p < .05$ with thwarted belongingness.

Metatheory of Resilience and Resiliency

Another scheme that was used as a guideline for this research was that of the metatheory of resilience and resiliency first developed by Richardson in 2002. The metatheory of resilience and resiliency was developed through phenomenological identification of survivor characteristics (Richardson, 2002). The theory is grounded in three waves, the first of which is defined as resilient qualities. Resilient qualities are termed as the qualities of an individual that can be used to predict success (Richardson, 2002). Some of these qualities are listed as self-esteem, self-efficacy, and support systems. The second wave of the metatheory of resilience and resiliency is the resiliency

process. This is the process of how an individual deals with stress or adversity and is the process in which a person reintegrates back into a comfort zone (Richardson, 2002). The final wave of the metatheory of resilience and resiliency is the innate resilience. Richardson defined the innate resilience phase as the motivational forces within an individual to foster activation of the process in Wave 2.

Other Theories Used for Suicidality Research

As part of the cognitive therapy of depression, proposed by Beck (1979), suicide was suggested as an extreme outcome of depression. Beck stated that individuals with existing memory representations of negative outcomes would focus on environmental stress related to the schema, similar to the psychological construct in the interpersonal psychological theory of suicide. Individuals with a depressed reaction to environmental stimuli would result in stressors to the person. Beck proposed that the cognitive theory of depression was made by a circular relationship between negative views about the environment, negative views about the future, and negative views about the self. As a possible outcome or exit from this cycle, Beck proposed that individuals may die by suicide in extreme cases. However, research on Beck's cognitive theory of depression has been inconclusive. Haaga, Dyck, and Ernst (1991) indicated that the supporting evidence is illogical and weak. Despite this, Abela and D'Alessandro (2002) did find that the cognitive theory of depression was significantly correlated with negative views of the future, as suggested by Beck ($r = 0.287$, $p < 0.05$).

Klonsky and May (2015) developed the three-step theory, which was used to define the relationship from suicidal ideation to suicidal action. The first step of this

theory is the advent of pain, which can be defined as either psychological or emotional pain. Similar to Beck's cognitive therapy of depression, Klonsky and May argued that environmental stressors could impact an individual's pain. In addition to pain, an individual must also have a negative outlook on the future, defined as hopelessness. Without this negative outlook, suicidal ideation may not develop. The second step to the three-step theory is defined by connectedness. Klonsky and May described connectedness as the attachment of a person to other individuals or to a role in a person's life, such as a job, project, interest, or anything else that keeps a person devoted to livelihood. Connectedness is similar to the burdensomeness construct defined by Joiner (2005). However, in the three-step theory, connectedness protects against the transition from moderate to strong suicidal ideation, while Joiner argued that burdensomeness is needed for the development of pain and provocation. The third step of the three-step theory is the ability of a person to move from ideation to attempts. Joiner defined this as a person's acquired ability for suicide; however, Klonsky and May stated that progression from ideation to attempts is defined by three variables: dispositional, acquired, and practical. Dispositional refers to genetics that could lead a person to suicide attempts, acquired refers to habituation of pain, while practical refers to a person's access to means for suicide. Although the three-step theory is similar to Joiner's interpersonal psychological theory of suicide, it lacks sufficient research to validate its usage in a military population.

Suicidal Process

Theories such as the interpersonal psychological theory of suicide use suicide or suicidality as the encompassing terms for the suicidal process (Van Heeringen, Hawton, & Williams, 2000). However, it is important to differentiate between select behaviors within the suicidal process. This process includes varying degrees of the following: suicidal ideation, suicidal planning, and suicidal attempt (Neeleman et al., 2004; Van Heeringen et al., 2000). By definition, the term suicidal process is described as a person's reaction to his or her respective environment (Van Heeringen et al., 2000). After a person has begun the suicidal process (i.e., suicidal ideation), the person is more susceptible to future suicidal behaviors (Neeleman et al., 2004). Suicidal ideation, defined as thoughts of engaging in suicide-related behavior, is the first step of the suicidal process (Crosby, Ortega, & Melanson, 2011a). The second phase of the suicidal process is termed as suicidal plan (Crosby et al., 2011a, Van Heeringen et al., 2000). Suicidal plan is described as the development of an organized method of dying by suicide (Crosby et al., 2011a). This step is followed by the phase known as any of the following: suicidal intent, suicidal attempt, or suicide. Suicidal intent is defined as evidence that a person attempted suicide and the individual understood the consequences of his or her respective actions (Crosby et al., 2011a). Although there is overlap between each of the behaviors within the suicidal process, there may be differences between risk factors and protective factors for each phase. For instance, individuals who have attempted suicide are at risk for attempting suicide again ($x^2 = 35.36$, $p < 0.001$; Miranda, Ortin, Scott, & Shaffer, 2014). However, suicidal ideation is less of a predictor of suicidal attempt ($x^2 = 1.97$, $p =$

.16; Miranda et al., 2014). In addition, although men are more likely to die by suicide (χ^2 = 3.01, $p < .05$), women are more likely to experience suicidal ideation ($x^2 = 20.08$, $p <$ .01; Allison et al., 2001; Nock et al., 2008; Werbeloff et al., 2016). Gender is not the only demographic risk factor associated with the suicidal process, as age of onset is associated with risk of developing suicidal plans and attempts (Nock et al., 2008). The lifetime prevalence of suicidal ideation, as compared to attempt, is 12.1% to 4.1 % respectively (Miranda et al., 2014). Having a suicide plan is significantly associated with risk of attempt (*OR*=3.5, 95% *CI* 1.7, 7.2; Miranda et al, 2014). In addition, 60% of transitions from suicidal ideation to suicidal attempt occur within 12 months after beginning the suicidal process (*OR*=117.4 - 123.1; Nock et al., 2008). After that 12-month time period, the risk of suicidal attempt decreases substantially (*OR*=1.5 - 4.4; Nock et al., 2008). Another difference among risk factors for phases of the suicidal process is that of affective disorders, psychiatric disease also is a known as mood disorder. Lethality of suicidal intent is higher among those with affective disorders than those without in the general population (Undurraga, Baldessarini, Valenti, Pacchiarotti, & Vieta, (2012). As a result of the outlined differences among the suicidal process, it is critical to differentiate between those with suicidal ideation, planning, and attempt (Klonsky & Alexis, 2014).

Measuring Suicidal Ideation in Behavioral Health Epidemiological Consultations

APHC is responsible for conducting all behavioral health epidemiological field investigations within the Army population, which are known as EPICONs (Ritchie, 2014). Behavioral health EPICONS originate at the behest of a military installation or

unit commander who perceives an increase in behavioral health concerns. Past behavioral health EPICONS have been conducted as a result of suicides, homicides, and sexual assaults. Upon activation of an EPICON response, a multidisciplinary team consisting of psychologists, epidemiologists, environmental health officers, and soldier support will travel to an installation or unit and conduct an investigation (Ritchie, 2014). The EPICON team collects data using the following methods: personal interviews, focus groups, surveys, and assessment of existing data sources (Ritchie, 2004). Personal interviews are conducted in one-on-one settings with Army leaders, family members, soldiers, and relevant personnel to the investigation. Focus groups, using standardized questions, are conducted to generate a hypothesis prior to quantitative data collection. Survey collection is performed by using validated questions, and all data collected from this process are captured in a database prior to being transferred to SAS. In addition, suicidal behaviors, such as suicidal ideation, are measured using the C-SSRS and validated using medical chart reviews, which are referred to as assessment of existing data sources (Ritchie, 2014). Upon completion of the data collection, all data are analyzed and interpreted by the BSHOP at APHC. A final report is generated and sent to the installation; however, these reports are typically deemed sensitive and not available for public release, which is why the EPICON field investigation reports were not cited as a part of this study.

Defining boundaries between phases in the suicidal process can be difficult. Therefore, Posner et al. (2008) and Posner et al. (2011) developed a tool to not only measure suicidal ideation and suicidal behaviors, but to also measure intensity of the

ideation. Specifically, the C-SSRS was developed to distinguish between suicidal ideation and suicidal behavior (Posner et al., 2011). The suicidal process is not a continuum, but rather overlapping behaviors that begin and end at different times. Moreover, suicidal ideation is present during other forms of behaviors noted in the suicidal process (Van Heeringen et al., 2000). To effectively elicit the display of overlapping behaviors within the suicidal process, the C-SSRS is divided into four constructs. The first construct is noted as severity of suicidal ideation. The severity subscale is measured on a 5-point ordinal scale and is used to identify the presence or absence of suicidal ideation. The second construct is referred to as the intensity subscale, which consists of five questions rated on a 5-point ordinal scale and is used to identify the strength of suicidal ideation. This is followed by the third construct, noted as the behavioral subscale, used to identify suicidal behaviors, which is rated on a nominal scale; the lethality subscale is rated on a 6-point ordinal scale (Posner et al., 2011). The reliability of the C-SSRS has been tested in the general population and authors have reported excellent internal consistency with Cronbach alpha ranging from .88 to .95 (Kerr, Gibson, Leve, & Degarmo, 2014; Madan et al., 2016). The C-SSRS has also been used to support a number of military-specific studies including the Army STARRS studies (Harvey et al., 2014, Legarreta et al., 2015, Nock et al., 2014). For example, using the C-SSRS, Nock et al. (2014) identified lifetime prevalence estimates for suicidal ideation (13.9%), suicide plans (5.3%), and suicide attempt (2.4%). Because the C-SSRS can be used to stipulate various retrospective time periods, Nock et al. also showed that

47.0%–58.2% of Army soldiers experience onsets of the suicidal process prior to enlistment in the military.

Other suicidal ideation scales have been developed and used for specialized populations, such as the Army, including the Suicide Attitudes and Attribution Scale, Suicide Ideation Questionnaire, and the Beck Scale for Suicide Ideation (Ghasemi, Shaghaghi, & Allahverdipour, 2015). However, because the C-SSRS is able to identify suicidal ideation and severity of ideation throughout the suicidal process, it is now considered the gold standard for suicidal ideation and quantitative measuring tools (Madan et al., 2016). The BSHOP team responsible for EPICON assessment used the first construct of the C-SSRS to identify suicidal ideation. This variable was provided in the dataset for this project to assess the dependent variable of this study.

Protective Factors Associated with Suicidal Behaviors

Social support means that there is a presence of others, and this presence can act as a positive reinforcer for individuals with suicidal behaviors. Kleiman and Liu (2013) stated that social support can help individuals coping with stressful difficulties and events linked to psychopathology. Kleiman and Liu (2013) revealed that increased social support also enhances the development of help-seeking behaviors, such as being hospitalized and joining self-help groups, thus reducing the risk to attempt suicide. One of the mechanisms that can explain how social support helps reduce suicide risk is through friends and family being available to act as a distraction during stressful times (Tabaac, Perrin, & Rabinovitch, 2015). Additionally, social support means that a person

is likely to be present during the suicide attempt and, therefore, provide support in removing burdens that lead to suicidal behaviors.

Increased social support decreases lifetime suicide attempts (Kleiman & Liu, 2013). Among individuals who have access to positive social support, thereby enjoying the feeling of belongingness, Kleiman and Liu (2013) indicated that such feelings reduces the risk of suicide, as described in Joiner's interpersonal psychological theory of suicide. Kleiman and Liu also demonstrated that higher social support was linked to an over 30% reduction in the risk of a lifetime suicide attempt, as compared to those with lesser social support, when controlling for all other risks and protective factors. Increased social support creates the feeling of being cared for, esteemed and loved, and being a part of a system of mutual responsibilities (Kleiman & Liu, 2013). In a study among African American women, Tabaac et al. (2015) found that social support was responsible for 12.3% of the variance of a previous suicidal ideation and 10.7% of the variance in lifetime suicide attempts. Tabaac et al. claimed that social support from significant others and family were inversely associated with suicidal ideation in the past, while social support by family was inversely associated with lifetime suicide attempts. Tabaac et al. argued that social support provides safe, social opportunities through which the individuals can process their experiences, and this may prevent suicidal ideation. Social support had been found to reduce suicide indirectly by enhancing other protective factors like self-esteem. Additionally, Tabaac et al. reported that increased social support correlated with greater wellbeing and fewer mental health problems like depression among non-Caucasian populations.

Increased social support leads to enhanced resilience to suicide (Kleiman & Liu, 2013). According to Min, Lee, and Chae (2015), resilience is an internal psychological construct that helps protect from stress while still fostering adaptation. Resilience and other associated psychological factors like hope, coping strategies, and optimism have been linked to suicide risk reduction (Min et al., 2015). This effect was present even after controlling for history of childhood trauma or events of combat exposure. Furthermore, increasing resilience in individuals helps to reduce suicidal ideation and reduce the risk of dying by suicide (Kamble, 2015).

Resilience was correlated with suicidal ideation among adolescents (Kamble, 2015). Students with low resiliency had a high risk of suicidal ideation and suicide, thus substantiating the need to increase resilience ability in such individuals (Kamble, 2015). In the same study, there were no notable differences by gender (Kamble, 2015). Similarly, Min et al. (2015) studied the role of social support and resilience in predicting suicidal ideation and suicide attempt among patients suffering from anxiety disorders and/or depression and found that a high level of resilience was protective against suicidal ideation.

Social support and resilience have a role in tempering suicidal ideation (Kamble, 2015). Perceived social support or greater social support has been found to be related to reduced levels of suicidal ideation, as well as attempts. Resilience and social support are protective factors for suicidal behaviors (Min et al., 2015). Kleiman and Liu (2013) indicated that the effect of social support in reducing suicidal ideation is generalizable; therefore, it is important to increase social support for affected individuals to help reduce

the risk of suicide attempts. With enhanced social support, Min et al. (2015) found that the resilience ability of depressed individuals increases, and the resilience acts as a barrier to suicidal thoughts.

Role of Gender and Suicidal Behaviors

According to the CDC, men die by suicide at a rate four times that as compared to women and account for 77.9% of all suicides (as cited in Parks, Johnson, McDaniel, & Gladden, 2014). Women are less likely to die due by suicidal acts as compared to men despite the fact that suicidal ideation and planning are reported more in women (Kaess et al., 2011). Suicide is considered to be the seventh leading cause of death among men and fourteenth among women (Kaess et al, 2011). In 2014, the age-adjusted rate of suicide among men (20.7 per 100,000) was over three times that of women (5.8 per 100,000; Curtin et al., 2016). The increase in the percentage of the age-adjusted suicide rate was considerably greater in women (a 45% increase) compared to men (a 16% increase) for the time period of 1999 through 2014 (Curtin et al., 2016). Similar findings were reported by Kaess et al. (2011), whom indicated that suicides occurred about 2-4 times more in adolescent males than females. Gender differences also exist in ways in which men and women die by suicide. According to Curtin et al. (2016), 55.4% of men died by firearm while 34.1% of women died by poisoning.

Despite the increased rate of suicide in men versus women, women are three times more likely to plan and attempt suicide as compared to men (Drapeau & McIntosh, 2016). In 2008 through 2009, 1 million adults in the United States had attempted suicide in the past year (Crosby et al., 2011b). Among those who attempted suicide, 442,000

were men while 616,000 were women (Crosby et al., 2011b). The same trend was observed by Kaess et al. (2011), where suicide attempts were 10.83% among adolescent girls and 4.88% among adolescent boys. According to CDC data, in 2013, 8% of students attempted suicide on one or more occasions, 17% of the students (22.4% of girls and 11.6% of boys) seriously considered attempting suicide, and more girls as compared to boys had suicide plans (as cited in Parks et al., 2014).

Similar to the trends in suicide attempts and plans, suicidal ideation is more common among women as compared to men in the U.S. population (Crosby et al., 2011b). Approximately 3.9% of the adult women in the United States reported suicidal thoughts, and among adolescents, Kaess et al. (2011) reported that suicidal ideation rates were considerably higher among women (19.80%) as compared to men (9.28%). Similar findings were observed among adolescents with Rhodes (2014) reporting that suicidal ideation was a reliable predictor of a suicide attempt, but this related more to women as compared to men.

When considering populations such as active duty Army soldiers, suicidal ideation was considerably elevated among female soldiers as compared to male soldiers (*OR* = 2.1[95%*CI*,1.4-3.1]; Ursano et al., 2015b), and more women than men soldiers reported of having suicide plans in the past. Similar findings were observed with women soldiers recording higher odds of having a suicide attempt (*OR* = 2.4; 95% *CI*: 2.26, 2.48; Ursano et al., 2015b). Ursano et al. (2015b) indicated that gender was a consistent predictor of suicide attempt; therefore, it is important to consider examining suicide risk of men and women separately.

Role of Gender and Social Support in Suicidal Behaviors

Social support has been determined to be a significant protective factor against suicide as it has been associated with a reduction of lifetime attempts and suicidal behavior to about 30% *Kleiman & Liu, 2013). Social support helps to attenuate the impact of traumatic or stressful experiences for both male and female service members. Although such an impact is significant, few scholars have explored the impact of gender difference on the influence of social support on suicidal ideation. Instead, most of the researchers have described the impact of social support on suicidal ideation as a whole without considering gender differences, probably because of lack of any statistical significance. Gradus, Smith, and Vogt (2015) showed no meaningful differences when studying the impact of social support on suicidal ideation among a sample of veterans from the Operation Enduring Freedom and Operation Iraqi Freedom.

Sources of social support may include family, friends, and significant others. Kleiman and Liu (2013) stated that providing social support to someone, whether it is to civilian or service members, creates a feeling of being cared for, loved, and esteemed as well as being part of a caring system where mutual responsibilities are shared. Additionally, social support creates the feeling of belongingness, and this correlates to increased wellbeing, which translates to fewer mental health problems such as depression and PTSD. Social support ensures that others are present during the hard times, and they can assist in helping the individual cope with stressful months due to mental problems (Kleiman & Liu, 2013). By acting as a distraction during stressful events, people can help others refrain from suicidal ideation or remove self-harming weapons from them

(Kleiman & Liu, 2013). Additionally, social support acts as a catalyst to individuals at risk of suicide, in aiding the person to seek help for suicidal ideation. Furthermore, Kleiman and Liu indicated that increased social support had been determined to enhance resilience, thereby increasing the protective capacity and ability to resist suicidal ideation and consequently reducing suicide attempts or events.

In a study of college students, Lamis and Lester (2013) found that the levels of perceived social support were lower in men as compared to women. Lamis and Lester suggested that women are increasingly likely to believe they belong to valued groups or connected to others as compared to men. Lamis and Lester concluded that men perceive themselves to have less and weaker social support networks as compared to women. Having social support from family was a suicidal ideation predictor in men, and social support from significant others and friends had no association to suicidal ideation in both genders (Lamis & Lester, 2013). With social support being considered as a key protective factor against suicide as described by Pietrzak, Russo, Ling, and Southwick (2011), the Lamis and Lester findings were unexpected. Perceived social support may not be available when the students feel suicidal or depressed, or the support may create fears of disappointing the parents, which increase suicidal ideation (Lamis & Lester, 2013).

Studies regarding the effect of social support in relation to suicidal ideation among the Army personnel, such as Gradus et al. (2015) study, found social support as well as unit cohesion to be significantly linked to wellbeing and reduced psychopathology. According to Mota, Medved, Whitney, Hiebert-Murphy, and Sareen

(2013), postdeployment social support can also differentiate resilient veterans from those who have PTSD. Mota et al. indicated that social support reduces the likelihood of suicidal ideation, as well as psychopathology, in female veterans and service members. Conversely, a lack of support has the opposite effect. However, evidence that social support may be more psychologically helpful for women in the military as compared to men is limited. Mota et al. indicated that most men share some associations, for instance, companionship, spouse, and relationship with other service members, with women service members, but did not find any gender differences in social support levels. Spiritual support enhanced some social support measures in women, but no similar links were found in men (Mota et al., 2013). Nevertheless, Mota et al. did not find any sex differences in social support levels. Despite the contrasting findings regarding gender differences on the effect of social support on suicidal ideation, there is a consensus of its beneficial role in preventing suicidal ideation (Keiman & Liu, 2013; Lamis & Lester, 2013; Pietrzak et al., 2011).

Measuring Social Support

As part of the survey data collection process within a behavioral health EPICON, social support is collected using one of two scales: the Adult Attachment Scale or the Social Connectedness Scale - Revised. Prior to 2017, the Adult Attachment Scale was used for EPICON response. However, during the 2017 calendar year, BSHOP recommended the change to the SCS-R (Ritchie, 2014).

The Adult Attachment Scale, developed in 1994 by Collins and Read, is designed to test a person’s ability to feel close to others, his or her dependency on others, and his

or her level of anxiety related to others. The Adult Attachment Scale is an 18-question scale with responses ranging from 1=*not at all characteristic of me* to 5=*very characteristic of me*. Within the scale, there are three subscales for closeness, anxiety, and dependency. The close subscale measures the degree to which a person is comfortable with closeness and intimacy. The depend subscale measures if a person can depend of others in time of stress. Finally, the anxiety subscale measures if a person is worried about abandonment of burdensomeness (Collins & Read, 1994). Using a Cronbach's coefficient alpha, Kruse, Hagerty, Byers, Gatien, and Williams (2014) conducted a reliability assessment for the Adult Attachment Scale and reported a Cronbach $\alpha = 0.89$. Similarly, Grady, Banford-Witting, Kim, and Davis (2016) published a Cronback $\alpha = 0.88$ for the Adult Attachment Scales and Cronback $\alpha = 0.87$ for the close subscale, $\alpha = 0.86$ for the depend subscale, and $\alpha = 0.81$ for the anxiety subscale.

The other scale that has been used as part of the behavioral health EPICONs is that of the SCS-R. The SCS-R is comprised of 20 statements. Using a Likert scale ranging from 1 to 6, respondents will choose their respective concurrence with each of the 20 statements (Lee & Robbins, 1995). The SCS-R was developed to measure belongingness or social support, using three constructs including companionship, affiliation, and connectedness. Lee and Robbins (1995) described a person who does not feel belongingness as at risk of distancing him or herself from others, leading to possible self-harm. In addition to the SCS-R being used for behavioral health EPICON studies in the Army population, Pietrzak, Tsai, Kirwin, and Soutwick (2012) tested the validity of

the scale in a population of military veterans. Pietrzak et al. reported a Cronback α = 0.86.

Role of Gender and Resilience in Suicidal Behaviors

Resilience is a protective factor against suicidal ideation and suicide attempt in the military and the larger civilian populations (Harrison et al., 2017; Kleiman & Liu, 2013; Rice & Liu, 2016). Resilience is considered as an internal psychological construct that helps in protecting a person from stress while still reinforcing adaptation (Min et al., 2015). Although the effect of resilience as a protective factor against suicide has only been recently studied, few scholars have focused on the gender effect of resilience on suicidal ideation. Just as Kamble (2015) and Rice and Liu (2016) indicated, the gender effect on resilience varies among studies, with some indicating a significant difference and others having showing no significant difference in suicidal ideation and behaviors.

Kamble (2015) found that resilience differs on the basis of gender among adolescents. In this study, the average resilience score for males was 101.7 (*SD*, 11.59) while that of females was 108.8 (*SD*, 13.45), and such findings were in line with those of some previous studies (Kamble, 2015; Minn et al., 2015; Rice & Liu, 2016). Although there was no significant gender difference regarding suicidal ideation and depression, Kamble also found a difference between resilience and depression. Individuals who had depressive symptoms had lower resilience (Kamble, 2015). On the contrary, optimism and self-confidence were linked to depression negatively; therefore, resilience was a factor in reducing depressive levels (Kamble, 2015). Resilience, as well as its associated positive psychological factors such as hope, coping strategies, and optimism, have been

linked to suicide risk reduction (Min et al., 2015). With adolescents experiencing different situations and both males and females handling the associated depression differently, Kamble (2015) indicated that this could explain why resilience levels differ with gender.

Resilience is more protective against suicidal ideation in men as compared to women. You and Park (2017) used the Connor-Davidson Resilience Scale (CD-RISC) and found that, after all other risk factors were accounted for, resilience was negatively associated with suicidal ideation and behavior. After conducting hierarchical multiple regressions and controlling for other relevant factors such as age, the effect of gender was determined to be significant (You & Park, 2017). However, this effect applied only to men. Lower resilience coupled with being male increased the suicidal behavior scores using the Suicidal Behaviors Questionnaire-Revised (SBQ-R; You & Park, 2017). It was also determined that there was a statistically significant inverse relationship between the CD-RISC and the SBQ-R (You & Park, 2017). When explaining the identified gender difference, You and Park argued that the instrument used (CD-RISC) mostly measures personal strengths, as well as resource, and these could relate more to men as compared to women.

Researchers who have studied the effect of resilience on suicidal behaviors in the military have continued to focus on how to improve the resilience of servicemen and understand the effect of gender (Harrison et al., 2017). Rice and Liu (2016) explored the relationship between resilience and coping among U.S. military personnel, which is a test of Wave 2 and Wave 3 of Richardson's metatheory of resilience and resiliency (2002).

Although resilience scores differed among servicemen and veterans based on education levels and time in service, Rice and Liu indicated that gender did not show any significant difference in resilience scores ($p > 0.05$). Carter-Visscher et al. (2010) found similarities between men and women troops in relation to resilience factors and psychosocial risks. In this study, gender had no moderating effect on the association between resilience factors and mental health (Carter-Visscher et al., 2010). However, the only difference between men and women was that concerns regarding family functioning and life during deployment were increasingly linked to PTSD and depression among women than men (Carter-Visscher et al., 2010). According to Harrison et al. (2017), such conditions have been determined to be a risk of suicidal ideation or attempts.

The findings of the gender impact on resilience against suicidal ideation and behaviors have clinical implications in that it has led to the need for preventive intervention strategies to be designed in a gender-specific manner. It has become equally important to measure psychological resilience in military personnel and other populations who are at risk of suicide (Harrison et al., 2017). However, with few studies regarding gender influence on resilience being conducted so far, there is a need for continued research on this topic.

Measuring Resilience

A number of scales have been developed to measure resilience including the Dispositional Resilience Scale, the ER 89, the Resilience Scale for Adults, the Resiliency Attitudes and Skills Profile, Adolescent Resilience and the Psychological Resilience, and Ego Resiliency (Windle, Bennett, & Noyes, 2011). However, the BRS has demonstrated

the adequate reliability and validity as compared to the aforementioned scales (Windle et al., 2011). The BRS is a 6-question scale with a response for each question ranging from 1 to 5. The BRS was developed based on the premise that a person is able to bounce back from stress (Smith et al., 2008). Joiner (2005) described the effect of stress on an individual as leading to the ability to commit suicide, and this is known as the psychological construct of the interpersonal psychological theory of suicide. Individuals who are able to mitigate stress in their lives are inclined to have higher resiliency than those who are not able to manage stress. Studies in the civilian population have demonstrated good reliability with a Cronbach α between 0.86 and 0.88 (Smith et al., 2010). Similarly, in the military population, Tenhula et al. (2014) demonstrated a Cronback $\alpha = 0.89$

Summary and Transition

Much of the literature regarding the differences that protective factors, resiliency and social support have on the suicidal process is inconclusive, especially in the military population. In addition, there is no clear evidence that gender may moderate the risk of transition from ideation to plan based on the strength of the aforementioned protective factors. As a result, in this study, I attempted to understand the gap in knowledge about the relationship between suicidal ideation and gender, social support, and resiliency among the active duty Army population. Chapter 3 provides information on the methods that were used to investigate the research questions outlined in Chapter 1.

Chapter 3: Research Method

Introduction

The purpose of this study was to understand the relationship between suicidal ideation and gender, social support, and resiliency among a sample of active duty Army soldiers. In this chapter, I will describe the research design, study hypotheses, methodology, and data analysis plan for this project. Threats to the validity of the study and ethical considerations are also discussed in detail. The subsequent methodology in Chapter 3 was devised to (a) demonstrate if there is a correlation between suicidal ideation and protective factors, (b) demonstrate if social support and resiliency are different for men and women within the Army population, and (c) determine if gender acts as a moderating variable between suicidal ideation and protective factors.

Research Design and Rational

I used a cross-sectional study design and employed a nonexperimental, quantitative, correlational research design to identify the relationship between protective factors of social support and resiliency (independent variables) and suicidal ideation (dependent variable). Chi-square, independent samples *t* test, and multiple logistic regressions were used to determine the relationship between gender, suicidal ideation, resiliency, and social support in the Army active duty population. Restraints on time, governmental resources, and budget limited this study to a cross-sectional methodology as opposed to the preferred longitudinal study. As outlined in Chapter 2, correlational researchers using a cross-sectional study design are consistent with methodology used for suicidal behavior research.

Given the testing of the interpersonal psychological theory of suicide, I took a positivist approach in regards to the validation that has been previously used to justify the testing of the theory with the selected dependent and independent variable. This approach is consistent with prior medical literature on the topic of suicidal ideation and protective factors as noted by the scales including the C-SSRS (Military Screener Version), the SCS-R, and the BRS. Although the Adult Attachment Scale was included as another measure of social support in the data from APHC, low number of responses to the scale prevented it from being analyzed as a part of a research question for this study. Therefore, the research questions for this study did not include the Adult Attachment Scale; however, exploratory analysis was performed to the degree possible using the scale.

Research Hypotheses

There were seven research questions for this study. The questions and corresponding hypotheses are as follows:

1. Is there a difference in suicidal ideation, as measured using the C-SSRS (Military Screener Version), between men and women among Army soldiers?

$H_0$1: There is no difference in suicidal ideation between men and women among Army soldiers.

$H_1$1: There is a difference in suicidal ideation between men and women among Army soldiers.

2. Is there a correlation between suicidal ideation, as measured using the C-SSRS (Military Screener Version), and level of social support, as measured using the SCS-R, among Army soldiers?

$H_0$2: There is no correlation between suicidal ideation and social support among Army soldiers.

$H_1$2: There is a correlation between suicidal ideation and social support among Army soldiers.

3. Is there a correlation between suicidal ideation, as measured using the C-SSRS (Military Screener Version), and level of resiliency, as measured by BRS, among Army soldiers?

$H_0$3: There is no correlation between suicidal ideation and resiliency among Army soldiers.

$H_1$3: There is a correlation between suicidal ideation and resiliency among Army soldiers.

4. Is there a difference in the level of social support, as measured using the SCS-R, between men and women among Army soldiers?

$H_0$4: There is no difference in the level of social support between men and women among Army soldiers.

$H_1$4: There is a difference in the level of social support between men and women among Army soldiers.

5. Is there a difference in the level of resiliency, as measured by BRS, between men and women among Army soldiers?

$H_0$5: There is no difference in the level of resiliency between men and women among Army soldiers.

$H_1$5: There is a difference in the level of resiliency between men and women among Army soldiers.

6. Does gender moderate the relationship between suicidal ideation, as measured using the C-SSRS (Military Screener Version), and level of social support, as measured using the C-SSRS, among Army soldiers?

$H_0$6: Gender does not moderate the relationship between suicidal ideation and social support among Army soldiers.

$H_1$6: Gender does moderate the relationship between suicidal ideation and social support among Army soldiers.

7. Does gender moderate the relationship between suicidal ideation, as measured using the C-SSRS (Military Screener Version), and level of resiliency, as measured by BRS, among Army soldiers?

$H_0$7: Gender does not moderate the relationship between suicidal ideation and level of resiliency among Army soldiers.

$H_1$7: Gender does moderate the relationship between suicidal ideation and level of resiliency among Army soldiers.

Methodology

Procedures for Recruitment, Participation, and Data Collection

The data for this study were collected as a part of survey used in four separate behavioral health EPICONs ranging from 2015 to 2017. Only Army active duty personnel were selected to participate in the survey, and all participation in the survey was voluntary. BSHOP epidemiologists validated the suicidal ideation questions of the C-SSRS through the use of electronic medical records. Only nominal questions pertaining to suicidal ideation were used for this study to determine suicidal ideation. The measuring tool for the EPICONS was developed at the APHC using Verint in accordance with Army Medical Command protocols established by the APHC Memorandum 070-1 Scientific Review of Research with Human Subjects (Department of the Army, 2012). The survey was administered on-site using secure computer terminals. Soldiers were allowed to ask for support in reading or understanding questions, but they were otherwise given privacy to answer all survey questions. Additionally, Army medical personal and psychologist were on stand-by should any soldier need support during response to the survey.

In this study, I accessed resiliency, social support, and suicidal ideation through the use of secondary data provided by the APHC. Data on the aforementioned variables were collected as a part of routine behavioral health EPICON studies. The data were stored on a database within the APHC server using SAS. Prior to receiving the data, all protected health information and identifying information were stripped from the dataset. In addition, unit information was removed from the dataset, as per the agreement with

APHC. The data file used for this study only contained the following variables and scales: gender, rank, suicidal ideation question collected using the C-SSRS (Military Screening Version), BRS, SCS-R, and Adult Attachment Scale. However, due to low numbers, the Adult Attachment Scale was only evaluated to the degree possible.

Population

The target population for this study included active duty Army soldiers, which had a total population of 417,959 as of 2015 (DoD, 2015b). Most of the active duty Army are enlisted soldiers and there is a 5.2:1 ratio of enlisted soldiers to officers in the Army (DoD, 2015b). Most enlisted personnel (43.7%) are junior enlisted (E1-E4; DoD, 2015b). Women are underrepresented in the Army population as compared to the civilian population as only 17% (*n*= 69,407) of the active duty Army soldiers list their gender as female (DoD, 2015b). Forty-six percent of women in the active duty Army are junior enlisted, and 24% are officers (W1-O10; DoD, 2015b). The active duty Army is a dynamic population where soldiers often move from one location to another. However, as of 2015, 89.9% of the active duty Army population was located within the United States (DoD, 2015b), 6% of soldiers were located in Europe, and 3.9% in East Asia. The aforementioned location statistics do not include deployments to areas of operations, as the aforementioned reported locations are considered home of record or assigned duty station for the soldiers.

Sampling and Sampling Procedures

The power calculations were performed using the G*Power Version 3.1.9.2 software (Faul, Erdfelder, Lang, & Buchner, 2007; Faul, Erdfelder, Buchner, & Lang,

2009). Among the 4,947 subjects in the original database, a total of 1,501 failed to complete the SCS-R questionnaire, and they were omitted from the analysis. Thus, the sample size for this study was n = 3,446. Hypotheses 1 was tested using a chi-square test. Figure 4 depicts the results of the G*power analysis. The following G*power settings were used for this analysis: test family X^2 tests; statistical test goodness of fit tests; type of power analysis A priori; effect size 0.0477; alpha error probability 0.05; power 0.80; DF = 1. I found that a sample size of 3,446 achieved 80% power at the 0.05 level of significance to detect an effect size of W = 0.048, which is a small effect size according to Cohen (1988).

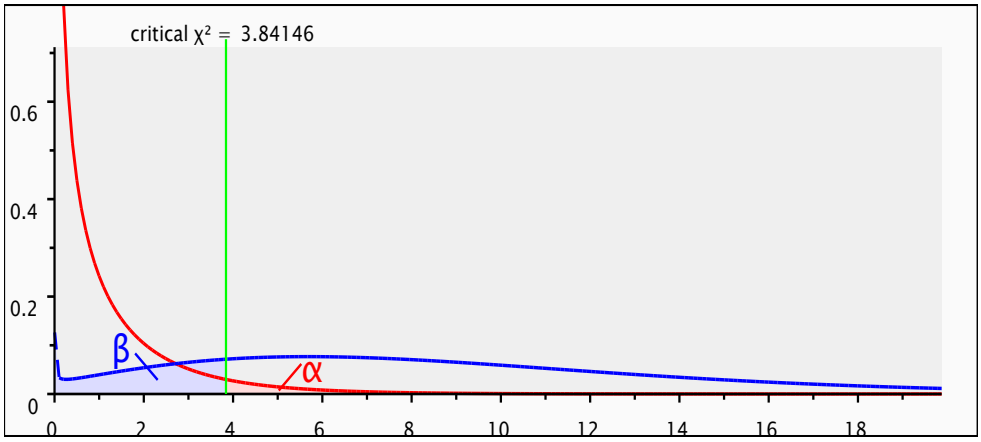


Figure 4. G*power analysis for Hypothesis 1.

Hypotheses 2 and 3 were tested using simple logistic regression analysis. A logistic regression analysis of a binary dependent variable (e.g., suicidal ideation status) on a continuous independent variable (e.g., social support or resiliency) with a sample size of 3,446, and an estimated number of cases (i.e., those with suicidal ideation) of approximately 100 (around 3%), achieved 80% power at a 0.05 significance level to

detect an odds ratio of 0.76. Figure 5 depicts the results of the G*power analysis. The following G*power settings were used for this analysis: test family *z* tests; statistical test logistic regression; type of power analysis A priori; odds ratio 0.76; alpha error probability 0.05; power 0.80; R^2 other X = 0 (Faul et al., 2007; Faul et al., 2009). I found that a sample size of 3,446 achieved 80% power at the 0.05 level of significance to detect an odds ratio of 0.76. This study would have an 80% chance of detecting a 24% reduction in the odds of suicidal ideation for every 1-standard deviation increase above the average for the independent variable, which can be considered a small effect size (Cohen, 1988).

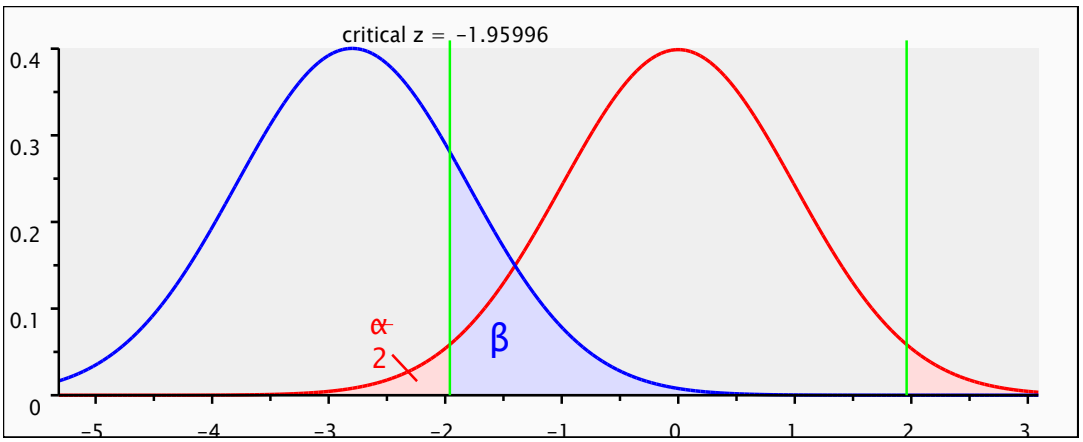


Figure 5. G*power analysis for Hypothesis 2 and 3.

Hypotheses 4 and 5 were tested using independent samples *t* tests. Figure 6 depicts the results of the G*power analysis. The following G*power settings were used for this analysis: test family *t* tests; statistical test means: difference between two independent means; type of power analysis a priori; tails(s) two; alpha error probability 0.05; power 0.80; allocation ration N2/N1 0.20 (Faul et al., 2007; Faul et al., 2009. I found that a sample size of 3,446 achieved 80% power at the 0.05 level of significance to

detect an effect size of 0.13 (a small effect size) with a significance level (alpha) of 0.05 using a two-tailed independent samples *t* test.

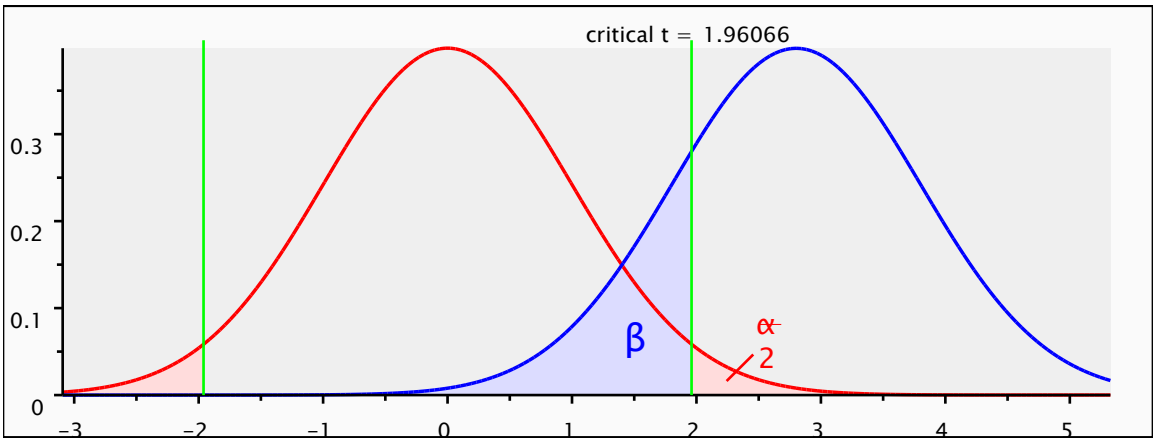


Figure 6. G*power analysis for Hypothesis 4 and 5.

Hypotheses 6 and 7 were tested using multiple logistic regression analysis with a single binary dependent variable (e.g., suicidal ideation status) and three independent variables (e.g., gender, social support, and the interaction between gender and social support). Assuming no correlation between the independent variables and gender (as expected by virtue of centering the variables), the power analysis was the same as discussed for Hypotheses 2 and 3 above. I found that the sample size of 3,446 obtained for this study was adequate for detecting small or larger effect sizes for Hypotheses 1 through 7.

Operationalization of Variables

Resiliency was considered using the BRS (Smith et al., 2008). This scale has been previously used in the military population and has demonstrated adequate reliability and validity (Cronbach $\alpha = 0.89$; Tenhula et al., 2014). This variable was measured on a continuous measurement scale with a range of 1 to 5 using the BRS. The score was computed as the average of responses to Statements 1 through 5 from the BRS. Response choices to Statements 1 through 6 were coded as 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neutral*, 4 = *Agree*, and 5 = *Strongly Agree*. Questions 2, 4, and 6 were negatively worded in the BRS, and as a result, need to be reverse coded prior to calculating the mean score. Resulting smaller scores indicated less resiliency while larger scores indicated more resiliency.

Social support was collected in the EPICON studies using both the Adult Attachment Scale and the SCS-R. Only the SCS-R was used as an independent variable in this study due to the poor response rate with the Adult Attachment Scale. This SCS-R

was computed as the sum total of responses to Statements 1 through 20 from the SCS-R questionnaire. Response choices to Statements 1 through 20 were coded as 1 = *Strongly Disagree*, *Disagree*, 2 = *Disagree*, 3 = *Mildly Disagree*, 4 = *Mildly Agree*, 5 = *Agree*, and 6 = *Strongly Agree*. Questions 1, 2, 4, 5, 8, 10, 12, 14, 16, and 19 were phrased in such a way that a higher level of agreement indicated more social support. Questions 3, 6, 7, 9, 11, 13, 15, 17, 18, and 20 were phrased in such a way that a higher level of agreement indicated less social support. Prior to computing this variable, Questions 3, 6, 7, 9, 11, 13, 15, 17, 18, and 20 were reverse coded so that 1 = *Strongly Agree*, 2 = *Agree*, 3 = *Mildly Agree*, 4 = *Mildly Disagree*, 5 = *Disagree*, and 6 = *Strongly Disagree*. Consequently, smaller scores indicated less social support, while larger scores indicated more social support. This scale was used to assess the impact of perceived social support on suicidal ideation. Pietrzak, Tsai, Kirwin, and Soutwick (2012) tested the validity of the scale in a population of military veterans and reported a Cronbach $\alpha = 0.86$. There are no subscales incorporated in the SCS-R.

The Adult Attachment Scale was assessed to the degree possible. Grady et al. (2016) demonstrated the Cronbach $\alpha = 0.88$ for the Adult Attachment Scale. The Adult Attachment Scale uses 18 questions to measure perceived social support. A 5-point Likert scale, ranging from 1–5, was used to measure responses to the individual survey questions. The question responses are averaged to produce the mean measure of social support, which ranges from 1 to 90. Higher scores indicate a higher level of positive social support. Prior to totaling the final score for the Adult Attachment Scale, Questions 2, 7, 8, 13, 16, 17, and 18 must be reverse coded given that each is asked in a negative

connotation. In addition, subclassification of social support was derived for subscales titled close, depend, and anxiety by averaging results for each subscale.

Gender and rank were collected as part of the behavioral health EPICON studies as self-identified measures. All respondents selected male or female for gender. Rank was requested in the dataset to characterize the study population. However, in order to protect participant confidentiality, rank was grouped and presented in aggregate by APHC. Rank was grouped as follows: junior enlisted (E1-E4), enlisted leaders (E5-E6), senior enlisted leaders (E7-E9), and officers (WO1-CW5/O1-O6).

The independent variables, moderating variable, and demographic variables for the study are further described in Tables 1-4.

Table 1

Data Elements for Demographic Variables

Variable	Description	Level of Measurement	Response or Variable Recode
Demographic Variables			
Rank	What is your grade/rank?	Ordinal	• E1-E4 = 1 • E5-E6=2 • E7-E9 = 3 • WO1-CW5/O1-O6 = 4
Gender	What is your gender?	Nominal	• Male = 1 • Female = 2

Note. *Indicates that reverse coding should be applied to the scoring

Table 2

Data Elements for Independent Variables Calculated from Social Connectedness Scale – Revised

Social Connectedness Scale	Description	Level of Measurement	Response or Variable Recode (if applicable)
soc_con_1_	I feel comfortable in the presence of strangers	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)
soc_con_2_	I am in tune with the world.	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)
*soc_con_3_	Even among friends, there is no sense of brother/sisterhood.	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)
soc_con_4_	I fit in well in new situations.	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)
soc_con_5_	I feel close to people.	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)
*soc_con_6_	I feel disconnected from the world around me.	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)
*soc_con_7_	Even around people I know, I don’t feel that I really belong.	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)
soc_con_8_	I see people as friendly and approachable.	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)

*soc_con_9_	I feel like an outsider	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)
soc_con_10_	I feel understood by the people I know.	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)
*soc_con_11_	I feel distant from people.	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)
soc_con_12_	I am able to related to my peers.	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)
*soc_con_13_	I have little sense of togetherness with my peers	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)
soc_con_14_	I find myself actively involved in people's lives.	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)
*soc_con_15_	I catch myself losing a sense of connectedness with society.	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)
soc_con_16_	I am able to connect with other people.	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)
*soc_con_17_	I see myself as a loner	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)
*soc_con_18_	I don't feel related to most people.	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)

soc_con_19_	My friends feel like family.	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)
*soc_con_20_	I don't feel I participate with anyone or any group	Interval	Likert Scale: 1 (Strongly Disagree) – 6 (Strongly Agree)
soc_con_Score	Sum of SCS-R questions 1 – 20	Interval	• Cumulative Sum Range: 20 (Low social support) – 120 (High social support)

Note. *Indicates that reverse coding should be applied to the scoring

Table 3

Data Elements for Independent Variables Calculated from Adult Attachment Scale

Adult Attachment Scale	Description	Level of measurement	• Response or Variable Recode (if applicable)
relation_1_	I find it relatively easy to get close to people.	Interval	• Likert Scale: 1 (Not at all characteristic of me) – 5 (Very characteristic of me)
*relation_2_	I find it difficult to allow myself to depend on others.	Interval	• Likert Scale: 1 (Not at all characteristic of me) – 5 (Very characteristic of me)
relation_3_	I often worry that romantic partners don't really love me.	Interval	• Likert Scale: 1 (Not at all characteristic of me) – 5 (Very characteristic of me)
relation_4_	I find that others are reluctant to get as close as I would like.	Interval	• Likert Scale: 1 (Not at all characteristic of me) – 5 (Very characteristic of me)
relation_5_	I am comfortable depending on others.	Interval	• Likert Scale: 1 (Not at all characteristic of me) – 5 (Very characteristic of me)
relation_6_	I don't worry about people getting too close to me.	Interval	• Likert Scale: 1 (Not at all characteristic of me) – 5 (Very characteristic of me)
*relation_7_	I find that people are never there when you need them.	Interval	• Likert Scale: 1 (Not at all characteristic of me) – 5 (Very characteristic of me)
*relation_8_	I am somewhat uncomfortable being close to others.	Interval	• Likert Scale: 1 (Not at all characteristic of me) – 5 (Very characteristic of me)
relation_9_	I often worry that romantic partners won't want to stay with me.	Interval	• Likert Scale: 1 (Not at all characteristic of me) – 5 (Very characteristic of me)
relation_10_	When I show my feelings for others, I'm afraid they will not feel the same about me.	Interval	• Likert Scale: 1 (Not at all characteristic of me) – 5 (Very characteristic of me)
relation_11_	I often wonder whether romantic partners really care about me.	Interval	• Likert Scale: 1 (Not at all characteristic of me) – 5 (Very characteristic of me)
relation_12_	I am comfortable developing close relationships with others.	Interval	• Likert Scale: 1 (Not at all characteristic of me) – 5 (Very characteristic of me)
*relation_13_	I am uncomfortable when anyone gets too emotionally close to me.	Interval	• Likert Scale: 1 (Not at all characteristic of me) – 5 (Very characteristic of me)
relation_14_	I know that people will be there when I need them.	Interval	• Likert Scale: 1 (Not at all characteristic of me) – 5 (Very characteristic of me)
relation_15_	I want to get close to people, but I worry about being hurt.	Interval	• Likert Scale: 1 (Not at all characteristic of me) – 5 (Very characteristic of me)
*relation_16_	I find it difficult to trust others completely.	Interval	• Likert Scale: 1 (Not at all characteristic of me) – 5 (Very characteristic of me)
*relation_17_	Romantic partners often want me to be emotionally closer than I feel comfortable being.	Interval	• Likert Scale: 1 (Not at all characteristic of me) – 5 (Very characteristic of me)
*relation_18_	I am not sure that I can always depend on people to be there when I need them.	Interval	• Likert Scale: 1 (Not at all characteristic of me) – 5 (Very characteristic of me)
relation_Score	Average of questions 1 - 186	Interval	• Mean Range: 0 (Low social support) – • 5 (High social support)

Note. *Indicates that reverse coding should be applied to the scoring

Table 4

Data Elements for Brief Resiliency Scale

Brief Resiliency Scale	Description	Level of measurement	Response or Variable Recode (if applicable)
BRS_1_	I tend to bounce back quickly after hard times.	Interval	• Likert Scale: 1 (Strongly Disagree) – 5 (Strongly Agree)
*BRS_2_	I have a hard time making it through stressful events.	Interval	• Likert Scale: 1 (Strongly Disagree) – 5 (Strongly Agree)
BRS_3_	It does not take me long to recover from a stressful event.	Interval	• Likert Scale: 1 (Strongly Disagree) – 5 (Strongly Agree)
*BRS_4_	It is hard for me to snap back when something bad happens.	Interval	• Likert Scale: 1 (Strongly Disagree) – 5 (Strongly Agree)
BRS_5_	I usually come through difficult times with little trouble.	Interval	• Likert Scale: 1 (Strongly Disagree) – 5 (Strongly Agree)
*BRS_6_	I tend to take a long time to get over set-backs in my life.	Interval	• Likert Scale: 1 (Strongly Disagree) – 5 (Strongly Agree)
BRS_Score	Sum of BRS questions 1 - 6	Interval	• Cumulative Sum Range: 0 (Low Resiliency) – • 30 (High Resiliency)

Note. *Indicates that reverse coding should be applied to the scoring

The surveys used by the behavioral health EPICON included the C-SSRS to identify suicidal behaviors. Two of the questions reflect suicidal ideation. The first question asked about suicidal ideation in the previous 4 weeks, while the second question asked about thoughts of suicide at the time of survey administration. Given that both questions were validated with a Cronbach α ranging from 0.88 to 0.95 (Kerr et al., 2014; Madan et al., 2016), a single suicidal ideation variable was created as the dependent variable for this study. If a respondent answered yes to either question, then suicidal ideation was present for the respondent; otherwise, the respondent was considered to not have suicidal ideation. Data elements for the dependent variable can be seen in Table 5.

Table 5

Data Elements for Dependent Variables and Columbia-Suicide Severity Rating Scale

Variable	Description	Level of Measurement	Response or Variable Recode (if applicable)
Suicide_2_	In the previous four weeks, have you had thoughts of killing yourself?	Nominal	• Yes = 1 • No = 0
Suicide_3_	Are you currently having thoughts of suicide?	Nominal	• Yes = 1 • No = 0
Suicide_Final_	Final identification of suicidal ideation using variables suicide 2 and suicide 3.	Nominal	• Yes = 1 • No = 0

Data Analysis Plan

All statistical analyses were performed using the professional version of the SPSS (v.24) software. Demographic variables were summarized using the mean, standard deviation, and range for continuous scaled variables and frequency and percent for

categorical scaled variables. All of the hypothesis tests were two-sided with a 5% alpha level.

Hypothesis 1 was tested using a chi-square test if all of the expected cell counts were five or greater. If any expected cell count was less than five, then the Fisher's exact test would have been used instead. If the chi-square test was statistically significant, then the null hypothesis would be rejected and it would be concluded that there is a difference in suicidal ideation between males and females. The number (and percentage) of males and females with suicidal ideation were reported and interpreted.

Hypotheses 2 and 3 were tested using simple logistic regression analysis if the assumptions were satisfied. The assumption of independence of cases is supported by the fact that no single study participant appeared in the database more than once, multicollinearity is of no concern because there was only one independent variable for Hypotheses 2 and 3, and categorical independent variables have mutually exclusive categories is of no concern because there was no categorical variables for Hypotheses 2 and 3. If the regression coefficient for the independent variable is statistically significant, then the null hypothesis would be rejected and it would be concluded there is a relationship between the independent and dependent variables. If the null hypothesis is rejected, the model would be reported and interpreted.

Hypotheses 4 and 5 were tested using independent samples *t* tests if the assumptions were satisfied. The first assumption was that there are no outliers in the continuous variable (e.g., social support for Hypothesis 4 or resiliency for Hypothesis 5) for either level of the categorical variable (i.e., males and females). This assumption was

tested by inspection of box plots of the continuous variable, separately for males and females. The second assumption was that the continuous variable has a normal distribution for both groups. This assumption was evaluated by inspection of histograms of the continuous variable, separately for males and females. The third assumption, homogeneity of variance, was that the variance in the continuous variable is the same for both groups (i.e., males and females). This assumption was tested using Levene's test. If any assumptions for the independent samples *t* test were severely violated, then the Mann-Whitney test was used instead. If the *p*-value was less than .05, the null hypothesis was rejected, and it would be concluded that there is a difference in the continuous variable between males and females. The average (and standard deviation) continuous variable was reported separately for males and females.

Hypotheses 6 and 7 were tested using multiple logistic regression analysis if the assumptions were satisfied. The assumptions were tested as described for Hypotheses 2 and 3 above. In addition, the assumption that the categorical independent variables (e.g., the moderating variable, gender) have mutually exclusive categories was of no concern because there was only one categorical variable, gender, and participants could only claim to be male or female. The absence of multicollinearity was evaluated by the variance inflation factor (VIF); a VIF greater than 10 was considered as presence of multicollinearity. Independent variables with a VIF greater than 10 were eliminated from the analysis.

As is common practice in a moderated regression analysis, the independent variables (e.g., gender and social support or resiliency) should be *centered* prior to

conducting the analysis. Gender was centered by subtracting the average gender from gender. Recall that gender was coded as 0 = female and 1 = male, so the average gender has a meaningful interpretation because it measures the fraction of the sample that was male. The other independent variables (e.g., social support) was centered by subtracting their average from the original score (e.g., social support minus the average social support score). The interaction between gender and the independent variable (e.g., social support) was computed by multiplying the centered gender variable by the centered independent variable.

If the regression coefficient for the interaction between gender and the independent variable was statistically significant, then the null hypothesis was rejected and it was concluded that gender moderates the relationship between independent and dependent variable. If the null hypothesis were rejected, the model would be reported and interpreted.

Threats to Validity

Given the cross-sectional study design, the results can only be used for illustrating the association between the independent and dependent variables at a single point and time. As with all observational epidemiologic studies, association does not mean causation. Therefore, causality cannot be determined. Furthermore, I used active duty Army soldiers as the population, which minimizes the external validity (generalizability) of the study to other populations. Finally, given the demographic makeup of the Army, it is possible that women and officers were underrepresented in the study.

Because soldiers were asked questions about suicidal behavior, which can invoke negative feelings among individuals, there was a potential that soldiers could have selectively answered questions due to the stigma associated with reporting those behaviors. Active duty soldiers believed that the stigma associated with suicide would harm their respective careers ($r = 0.07$, $p < 0.01$; VanSickle et al., 2016). Additionally, Pietrzak et al. (2010a) reported that active duty veterans with suicidal ideation were 2.9 (95% *CI*: 2.7, 3.1) times as likely as those without suicidal ideation to report a perceived stigma. Although it is impossible to say what percentage of those felt compelled to not answer the survey, there is a risk that suicidal ideations could be underreported in the study.

Ethical Considerations

Given the aforementioned stigmatization of suicidal behaviors, the data collection for this study occurred using a web-based survey (Houston, Haw, Townsend, & Hawton, 2003; Pietrzak et al., 2010a). Identifying information was originally collected as part of the survey; however, anonymity may have encouraged soldiers to respond more freely without fear of repercussions for their responses. Protected health information or identifying information was not requested as part of this study, so that confidentiality is maintained. Moreover, data collected from this survey will continue to be stored on a secure server at the APHC. Any rank group with fewer than five responses were not be reported in order to further reduce the likelihood of being able to identify study participants. In addition to identifying information, APHC requested that no unit

identifying information be used as a part of this study. This request further reduced the likelihood that patient information could be disclosed.

Summary and Transition

This study was conducted to demonstrate if there is a correlation between suicidal ideation and protective factors, demonstrate if social support and resiliency are different for men and women within the Army population, and determine if gender acts as a moderating variable between suicidal ideation and protective factors. I focused on the protective factors of social support and resiliency with the dependent variable of suicidal ideation in the Army active duty population. Secondary data from APHC behavioral health EPICONs were used to assess the aforementioned research questions. Results for this study were used to inform the strength of protective factors as it relates to suicidal ideation among active duty Army soldiers. Final results are reported in Chapter 4.

Chapter 4: Results

Introduction

The purpose of this study was to assess the relationship between suicidal ideation and gender, social support, and resiliency among a sample of active duty Army soldiers. I focused on (a) demonstrating if there is a correlation between suicidal ideation and protective factors, (b) demonstrating if social support and resiliency are different for men and women within the Army population, and (c) determining if gender acts as a moderating variable between suicidal ideation and protective factors. In Chapter 4, I present the results of the statistical analysis.

Data Analysis Preparation

I used secondary data, so it was not necessary to code the data or enter the data manually. The data were received from APHC in Microsoft Excel format. The Excel file was opened in the software used to perform the analysis, SPSS v.24. Once the data were in SPSS format, variable labels and value labels were typed into the SPSS software. The resiliency score and social support score were computed within the SPSS software according to the instructions provided by the authors of the instruments and as described in Chapter 3. For example, certain questions on each survey were reverse coded prior to computing the scores. Frequency tables and descriptive statistics were computed for all study variables to ensure that all of the values were within range and to determine if there were any missing values. All of the data were within their expected range, so it was not necessary to remove or modify the data on account of out of range values. However, of the 4,947 rows in the original Excel file, 1,501 were missing data for all of the SCS-R

survey questions. Those 1,501 rows were removed from the SPSS data file, leaving a sample size of 3,446 for the data analysis.

Descriptive Statistics

The statistical analyses for this study were based upon a data set consisting of 3,446 active duty Army soldiers. There was a total of 2,998 (87.0%) males and 448 (13.0%) females. The grade/rank distribution was 1,942 (56.4%) E1-E4; 948 (27.5%) E5-E6; 213 (6.2%) E7-E9, and 343 (10.0%) WO1-CW4/O1-O6. A total of 3,317 (96.3%) reported that they did not have thoughts of killing themselves in the past 4 weeks, and 129 (3.7%) reported they did have thoughts of killing themselves in the past 4 weeks. The average (and standard deviation) resiliency score was 2.98 (0.37), and the range was 1.00 to 5.00. The average (and standard deviation) social support score was 67.93 (8.41), and the range was 20 to 120.

Inferential Analysis

Research Question 1

Is there a difference in suicidal ideation, as measured using the C-SSRS (Military Screener Version), between men and women among Army soldiers?

$H_0$1: There is no difference in suicidal ideation between men and women among Army soldiers.

$H_1$1: There is a difference in suicidal ideation between men and women among Army soldiers.

Table 6 shows the number (and percentage) of Army soldiers who reported having thoughts of suicide in the past 4 weeks, separately for males and females. All of

the expected cell counts were greater than 5 (the minimum expected cell count was 16.77), so the chi-square test was used to test the hypotheses as originally planned. I found that there was not a statistically significant difference in suicidal ideation between males and females. The number (and percentage) who reported suicidal ideation was 107 (3.6%) versus 22 (4.9%) for males and females, respectively, X^2 (1) = 1.95; p = 0.16; w = 0.024. The null hypothesis was not rejected, and it was concluded there was no difference in suicidal ideation between men and women among Army soldiers.

Table 6

Cross-Classification of Suicidal Ideation Versus Gender a,b.

Gender						
				No	Yes	Total
Male	Count	2891	107	2998		
	% within What is your gender?	96.4%	3.6%	100.0 %		
Female	Count	426	22	448		
	% within What is your gender?	95.1%	4.9%	100.0 %		
Total	Count			3317	129	3446
	% within What is your gender?			96.3%	3.7%	100.0%

Note. a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 16.77.
b. X^2 (1) = 1.95; p = 0.16; w = 0.024.

Research Question 2

Is there a correlation between suicidal ideation, as measured using the C-SSRS (Military Screener Version), and level of social support, as measured using the SCS-R, among Army soldiers?

$H_0$2: There is no correlation between suicidal ideation and social support among Army soldiers.

$H_1$2: There is a correlation between suicidal ideation and social support among Army soldiers.

A simple logistic regression analysis was performed to test the hypotheses. As discussed in Chapter 3, the assumptions for simple logistic regression were satisfied by virtue of the study design. No single study participant appeared in the database more than once, absence of multicollinearity was established because there was only one independent variable, and categorical independent variables having mutually exclusive categories was of no concern because there were no categorical independent variables. Table 7 shows the level of social support (SS) was statistically significantly correlated with suicidal ideation ($p = 0.002$). The null hypothesis was rejected, and it was concluded that social support was a statistically significant predictor of suicidal ideation. The Nagelkerke R Square statistic was 0.010, which means that the SS explains only 1.0% of the total variance in suicidal ideation. The equation of the model was SI = -5.40 + 0.032*SS, where SI = log odds of having suicidal ideation and SS = social support score. The odds an Army soldier will have suicidal ideation increased by 3.2% for every 1-point increase in the social support score.

Table 7

Simple Logistic Regression Analysis of Suicidal Ideation Versus Level of Social Support

		B	S.E.	Wald	df	*p*-value	*OR*[c]
Model [a]	Social Support Score [b]	0.031	0.010	9.634	1	0.002	1.032
	Constant	-5.399	0.710	57.897	1	0.000	0.005

Note. a. Dependent Variable: In the previous four weeks, have you had thoughts of killing yourself? (0 = No; 1 = Yes).

b. Range of 20 to 120, larger scores indicate more social support

c. Odds Ratio

Research Question 3

Is there a correlation between suicidal ideation, as measured using the C-SSRS (Military Screener Version), and level of resiliency, as measured by BRS, among Army soldiers?

$H_0$3: There is no correlation between suicidal ideation and resiliency among Army soldiers.

$H_1$3: There is a correlation between suicidal ideation and resiliency among Army soldiers.

A simple logistic regression analysis was performed to test the hypotheses. As discussed for Hypothesis 2, the assumptions for simple logistic regression were satisfied by virtue of the study design. Table 8 shows the level of resiliency was not statistically significantly correlated with suicidal ideation ($p = 0.68$). The null hypothesis was not rejected, and it was concluded that resiliency was not a statistically significant predictor of suicidal ideation. Because the independent variable was not statistically significant,

there is no model to report. Nagelkerke's R Square statistic was statistically indistinguishable from 0, and the odds ratio was statistically indistinguishable from 1.

Table 8

Simple Logistic Regression Analysis of Suicidal Ideation Versus Level of Resiliency

		B	S.E.	Wald	df	*p*-value	*OR* [c]
Model [a]	Resiliency Score [b]	0.102	0.245	0.173	1	0.678	1.107
	Constant	-3.551	0.739	23.112	1	0.000	0.029

Note. a. Dependent Variable: In the previous four weeks, have you had thoughts of killing yourself? (0 = No Yes).

b. Range of 1 to 5, larger scores indicate more resiliency

c. Odds Ratio

Research Question 4

Is there a difference in the level of social support, as measured using the C-SSRS, between men and women among Army soldiers?

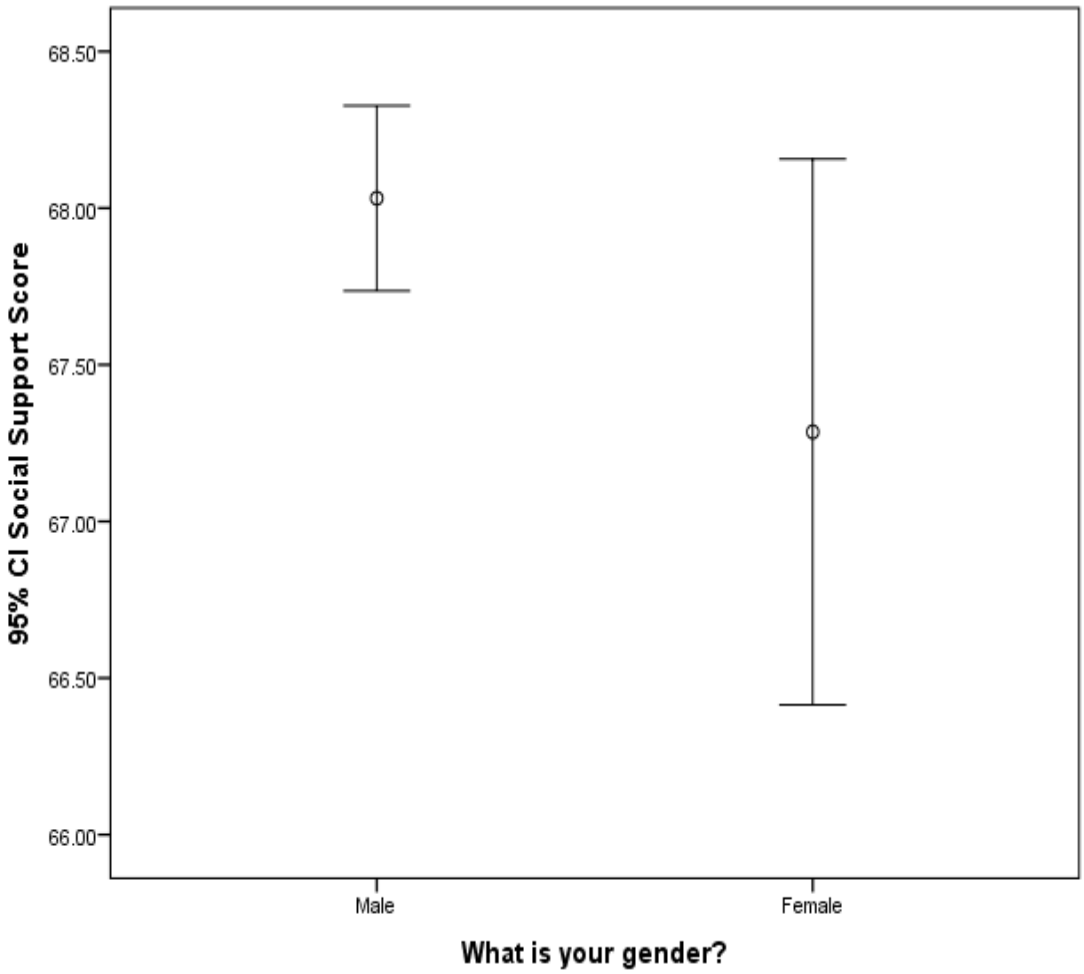
$H_0$4: There is no difference in the level of social support between men and women among Army soldiers.

$H_1$4: There is a difference in the level of social support between men and women among Army soldiers.

The assumptions for the independent samples *t* test were evaluated prior to conducting the analysis. The first assumption was that there were no outliers in the continuous variable (e.g., social support) for either level of the categorical variable (i.e., males and females). This assumption was tested by inspection of box plots of the social support score, separately for males and females. The second assumption was that the continuous variable had a normal distribution for both groups. This assumption was

evaluated by inspection of histograms of the social support score variable, separately for males and females. The third assumption, homogeneity of variance, was tested using Levene's test. There was insufficient evidence to suggest the assumptions of the independent samples *t* test were violated; therefore, the independent samples *t* test was used to test the hypotheses.

Figure 7 is an error bar chart that shows the average, and 95% confidence interval, for the average social support score separately for males and females. The figure shows some evidence to suggest that on average females have less social support than males. However, the difference in means between males and females was small and not statistically significant. I found that the average (and standard deviation) social support score was 68.03 (8.24) versus 67.29 (9.38) for males and females, respectively, $t(3444) = 1.75$; $p = 0.080$; $d = 0.088$. The null hypothesis was not rejected, and it was concluded there is no difference in the level of social support between males and females among Army soldiers.



[1] Two-tailed Independent Samples *t*-test: $t(3444) = 1.75$; $p = 0.080$; $d = 0.088$.

Figure 7. Error bar chart of the social support score separately for males and females. [1]

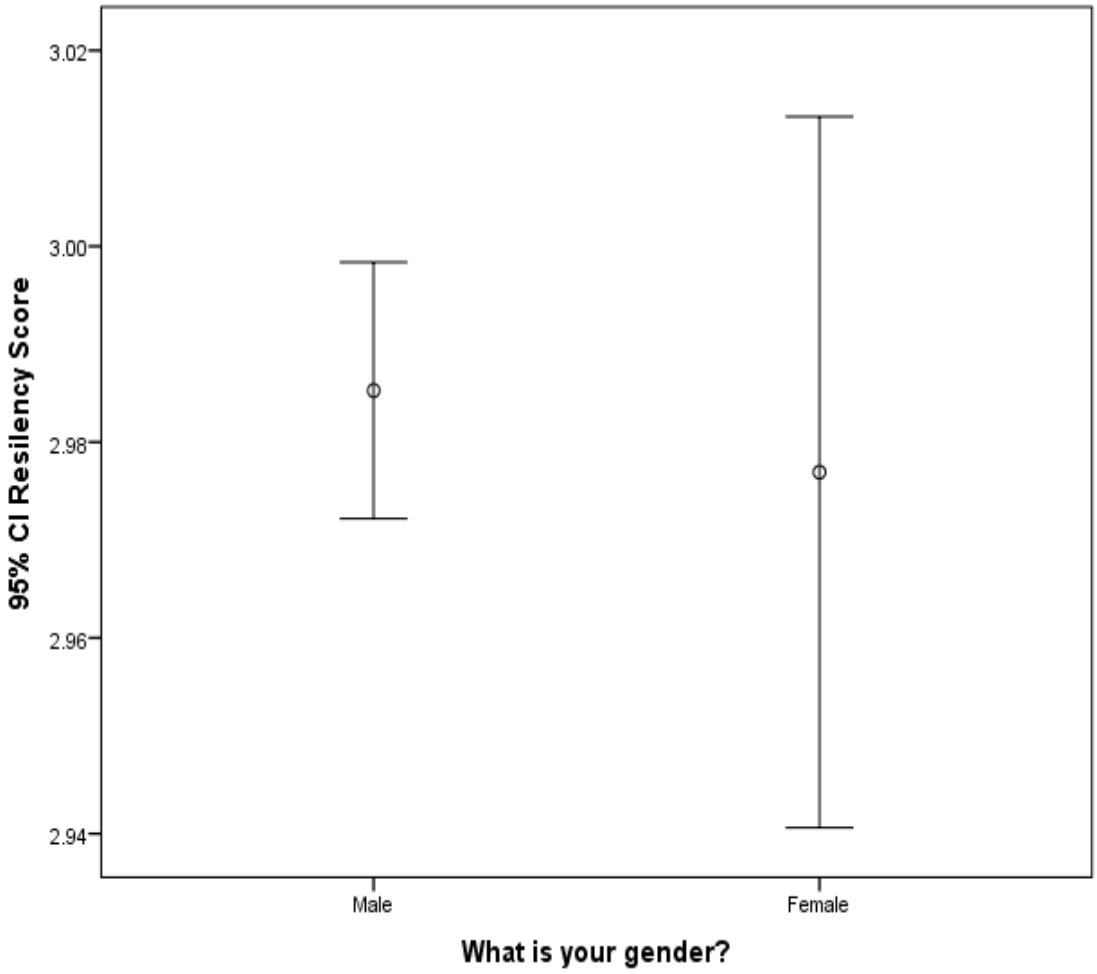
Research Question 5

Is there a difference in the level of resiliency, as measured by BRS, between men and women among Army soldiers?

$H_0$5: There is no difference in the level of resiliency between men and women among Army soldiers.

$H_1$5: There is a difference in the level of resiliency between men and women among Army soldiers.

The assumptions for the independent samples *t* test were evaluated prior to conducting the analysis as discussed above for Hypothesis 4. Because there was insufficient evidence to suggest the assumptions of the independent samples *t* test were violated, the independent samples *t* test was used to test the hypotheses. Figure 8 is an error bar chart that shows the average and 95% confidence interval for the average resiliency score separately for males and females. The figure shows little evidence to suggest that there is a difference in the average resiliency score between males and females. The independent samples *t* test results show that there was not a statistically significant difference in the average resiliency score between males and females. The average (and standard deviation) resiliency score was 2.99 (0.37) versus 2.98 (0.39) for males and females, respectively, $t(3444) = 0.45$; $p = 0.66$; $d = 0.027$. The null hypothesis was not rejected, and it was concluded there was no difference in the level of resiliency between males and females among Army soldiers.



[1] Two-tailed Independent Samples $t(3444) = 0.45$; $p = 0.66$; $d = 0.027$.

Figure 8. Error bar chart of the resiliency score separately for males and females. 1

Research Question 6

Does gender moderate the relationship between suicidal ideation, as measured using the C-SSRS (Military Screener Version), and level of social support, as measured using the SCS–R, among Army soldiers?

$H_0$6: Gender does not moderate the relationship between suicidal ideation and social support among Army soldiers.

$H_1$6: Gender does moderate the relationship between suicidal ideation and social support among Army soldiers.

As discussed for Hypotheses 2 and 3 above, the assumptions for multiple logistic regression were satisfied by virtue of the study design. In addition, the assumption that there is no multicollinearity was verified by inspection of the VIF, all of which were less than 10. The VIFs ranged from 1.004 to 1.011. Therefore, multiple logistic regression analysis was used to test the hypotheses. Recall the primary variable of interest is the interaction between gender and the social support score. It is the interaction term that determines whether or not gender moderates the relationship between suicidal ideation and social support. Table 9 shows the results of the multiple logistic regression analysis. The interaction term was not statistically significant, $p = 0.44$. The null hypothesis was not rejected, and it was concluded that gender does not moderate the relationship between suicidal ideation and social support among Army soldiers. Because the interaction variable was not statistically significant, there was no model to report. Nagelkerke's R Square statistic was statistically indistinguishable from 0, and the odds ratio was statistically indistinguishable from 1.

Table 9

Multiple Logistic Regression Analysis to Test if Gender Moderates the Relationship Between Suicidal Ideation and Social Support

		B	S.E.	Wald	*df*	*p*-value	*OR* [e]
Model [a]	Gender_C [b]	0.378	0.242	2.444	1	0.118	1.459
	Social_C [c]	0.032	0.010	10.463	1	0.001	1.033
	Gender_CXsocial_C [d]	-0.021	0.027	0.601	1	0.438	0.979
	Constant	-3.339	0.102	1072.009	1	0.000	0.035

Note. a. Dependent Variable: In the previous four weeks, have you had thoughts of killing yourself? (0 = No; 1 = Yes).

b. Gender: 0 = Male; 1 = Female (centered to have a mean of 0).

c. Social Support (centered to have a mean of 0): Range of -47.93 to 52.07, larger scores indicate more social support.

d. The interaction between gender and social support (i.e. Gender_C multiplied by Social_C).

e. Odds Ratio

Research Question 7

Does gender moderate the relationship between suicidal ideation, as measured using the C-SSRS (Military Screener Version), and level of resiliency, as measured by BRS, among Army soldiers?

$H_0$7: Gender does not moderate the relationship between suicidal ideation and level of resiliency among Army soldiers.

$H_1$7: Gender does moderate the relationship between suicidal ideation and level of resiliency among Army soldiers.

As discussed for Hypotheses 2 and 3 above, the assumptions for multiple logistic regression were satisfied by virtue of the study design. In addition, the assumption that

there was no multicollinearity was verified by inspection of the VIF, all of which were less than 10. The VIFs ranged from 1.00 to 1.002. Therefore, multiple logistic regression analysis was used to test the hypotheses. Recall the primary variable of interest is the interaction between gender and the resiliency score. It is the interaction term that determines whether or not gender moderates the relationship between suicidal ideation and resiliency. Table 10 shows the results of the multiple logistic regression analysis. The interaction term was not statistically significant, $p = 0.21$. The null hypothesis was not rejected, and it was concluded that gender does not moderate the relationship between suicidal ideation and resiliency among Army soldiers. Because the interaction variable was not statistically significant, there was no model to report. Nagelkerke's R Square statistic was statistically indistinguishable from 0, and the odds ratio was statistically indistinguishable from 1.

Table 10

Multiple Logistic Regression Analysis to Test if Gender Moderates the Relationship Between Suicidal Ideation and Resiliency

		B	S.E.	Wald	df	*p*-value	*OR* [e]
Model [a]	Gender_C [b]	0.319	0.243	1.720	1	0.190	1.375
	Resiliency_C [c]	0.157	0.243	0.418	1	0.518	1.170
	Gender_CXResiliency_C [d]	-0.702	0.556	1.593	1	0.207	0.496
	Constant	-3.301	0.099	1115.340	1	0.000	0.037

Note. a. Dependent Variable: In the previous four weeks, have you had thoughts of killing yourself? (0 = No; 1 = Yes).

b. Gender: 0 = Male; 1 = Female (centered to have a mean of 0).

c. Resiliency Score (centered to have a mean of 0): Range of -1.98 to 2.02, larger scores indicate more resiliency.

d. The interaction between gender and resiliency (i.e. Gender_C multiplied by Resiliency_C).

e. Odds Ratio

Summary

I did not find any evidence that there was a difference in the levels of suicidal ideation between men and women in the Army active duty population. There was a statistically significant result for Research Question 2 in that social support was a significant predictor of suicidal ideation. However, no statistically significant results were found for the independent variable of resiliency with suicidal ideation. Furthermore, no gender differences were found for either protective factor of resiliency or social support in regards to suicidal ideation. Interpretation of the aforementioned results will be outlined in Chapter 5, along with conclusions for the study, generalizability of the results, and an elaboration on the findings within the context of the theoretical framework used for this study.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

In Chapter 5, I will provide an interpretation of the findings. In addition, I will provide information on the contributions to the discipline, limitations to generalizability for the study, and information regarding positive social change as a result of the study.

Summary of Findings

Prior to understanding the impact of the protective factors of resiliency and social support, in Research Question 1, I first attempted to understand if there is a difference between men and women in regards to suicidal ideation in the U.S. Army population. Differences between genders have been noted in regards to suicidal behaviors in previous studies (ARPH, 2016; Ursano et al., 2015b). However, in this study, no difference among genders could be detected. There are a number of explanations for this result, the first of which is that it is possible that there is no difference among genders in regards to suicidal ideation. Although Snarr et al. (2010) noted a difference among men versus women for suicidal ideation, the difference was relatively small, albeit still significant X^2 (1) = 19.4; p = 0.05), 5.5% for women versus 3% for men. A second possible explanation for the nonstatistically significant result in Research Question 1 is that the secondary data obtained from the ARPH were not reflective of the overall Army active duty population. As described in Chapter 3, the data for this study were obtained from EPICON studies conducted between the years 2015 and 2017. Given that the sample was not random, but rather a convenience sample of active duty soldiers within those specified units, it is possible that the study is not generalizable to the Army population.

Additionally, survival bias could have also affected the sampled population in that between the times of the original incident(s) prompting an EPICON study, surviving Army soldiers could have made adjustments to their respective behaviors to better protect against suicidal ideation. A final reason that suicidal ideation differences may not have been detected between men and women is that the scale used for suicidal ideation was not sensitive enough to see modest changes among the individuals within the sampled population. This point will be discussed in later details after summarizing the remainder of the results.

After testing for suicidal ideation difference among genders, the next research question was to test the level of social support, using the SCS-R, with suicidal ideation. In the results of the logistic regression, I indicated that there was a statistically significant correlation among suicidal ideation and social support. This was an unexpected result, as the relationship indicated an increased social support trend with suicidal ideation. As with the results from Research Question 1, the scales used for the EPICON data could not have been refined enough to detect small differences. Another possible explanation for this result is that survival bias affected the study. It seems counterintuitive that more social support would be associated with an increased level of suicidal ideation. However, with correlational study designs, a researcher cannot show cause and effect. So, one possible explanation for the observed results could be that those with greater suicidal ideation are more likely to seek social support, so they have both greater suicidal ideation and greater social support. Those with little or no suicidal ideation may be less likely to seek out social support. This effect has been noted in some previous medical literature

articles, including research by Barlow and Coleman (2003). Barlow and Coleman noted that families tend to find "allies in grief" after suicide and, as a result, the social and emotional support is increased in the family. Similarly, in a study of Air Force personnel, social support programs were implemented in postsuicide communities, and family violence, suicide, and homicide were reduced (Knox, Litts, Talcott, Feig, & Caine, 2003). Another interpretation to take away from the results of Research Question 2 is that the odds an Army soldier will have suicidal ideation increased by only 3.2% for every 1-point increase in social support, meaning that although there was an increase, the slope of the linear pathway was not large. The results could be attributed to a lack of specificity in the scales that were used by the EPICON team.

Research Question 3 was used to test the correlation between resiliency and suicidal ideation. Results for the test were not statistically significant. This result was not surprising because resiliency is not always able to be detected. Pietrzak et al. (2011) noted that resilience testing and resiliency interventions are in their infancy. Resiliency is an intrinsic construct, and a researcher is unable to verify resiliency through any other means than survey. Even among various measuring tools for resilience, key factors considered necessary to resilience are debated. For instance, the BRS assesses the key components of the "return to normal" and "adaptation to new situations" whereas the CD-RISC considers resiliency to contain the key factors of "confidence, tolerance, and belief in fate" (Pietrzak et al., 2011; Smith et al., 2008).

In Research Questions 4 and 5, I tested the difference in the level of social support and resiliency, respectably, between gender groups. For both research questions, a

statistically significant result was not obtained. The difference between men and women for each test was almost even. This may indicate that gender does not determine the level of protective factors for men and women of the U.S. Army population. Smith et al. (2010) noted similar results in which gender alone was not predictive of suicidal behavior; however, when both resilience, social support, and optimism were added to the model, gender was a statistically significant predictor of suicide ($p < .05$). Given that men and women of the Army population serve in units together and that unit training for resiliency occurs together, this may explain why social support and resiliency did not differ.

Given the results of Research Questions 4 and 5, the not statistically significant results for Questions 6 and 7 were expected. With both questions, gender was used as a moderating variable between the protective factor and suicidal ideation. I found that gender did not act as a moderating variable.

I considered how much of a role survivor bias played in the study. Recalling that the data collected for this study were secondary data used from an EPICON field investigation, there was a time lapse from when the suicides in the unit occurred to when the field investigation was conducted. However, there was no way to determine what that time gap was. As a result, it was possible that unit morale and social support increased as part of the allies in grief process, as noted by Barlow and Coleman (2003).

Measuring Tool Assessment

Prior to instituting a study using secondary data analysis, this study was originally proposed using primary data collection. The C-SSRS would have been used to capture

the dependent variable of suicidal ideation. The protective factors of resiliency and social support would have used the Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003) and the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988) respectively. However, due to Army restrictions, a primary data collection study could not be instituted; therefore, the resulting secondary data analysis was performed using data collected as a part of a separate investigation. Although I did ultimately use the C-SSRS to assess the independent variable of suicidal ideation, the original study planned would have used Section 2 of the C-SSRS, which creates a scale for strength of suicidal ideation intensity. The data collected as a part of the EPICON investigation, and used for this study, did not collect the intensity information for the C-SSRS. In resulting analysis, therefore, I cannot determine if the suicidal thoughts reported from soldiers in this study are to the degree that may lead to suicide. Or as detailed by Silverman (2011), it is not clear if the suicidal ideations reported in the study population are of those that have developed plans for suicide. For the purposes of understanding the suicidal process, this is important because risk factors and protective factors may be more pronounced in those who are said to have suicidal ideation with plan formulation. Those without plan formulation may not be any different than the general population, as many researchers do not even consider suicidal thoughts without intent to be defined as suicidal ideation (Silverman, 2011). However, the secondary dataset collected by the EPICON study does not differentiate between those with intent and those without intent. If the researchers would have collected the information in the second section of the C-SSRS, this scale would have defined the

intensity of suicidal ideation, or those with/without intent, and the study may have been more accurate in determination of the protective factors for suicidal ideation.

It is important to differentiate that the goals of this secondary data analysis were different than the original goals of the EPICON researchers. First, the goal of this study was to determine the role gender played in moderating the relationship between suicidal ideation and the protective factors of resiliency and social support. However, the goal of the EPICON team was to understand the burden of suicidal behavior in the respective population and to attempt to prevent additional suicides in that population. As a result, the data used in this study were not the best source for answering the outlined research questions, but rather the best sources that was available to me.

In addition to the aforementioned study concerns, I also used the BRS in place of the more robust resiliency scale of the CD-RISC and the SCS-R instead of the MSPSS. In terms of resiliency, the CD-RISC has often outperformed the BRS in measuring resiliency. For instance, Windle et al. (2011) used an intraclass correlation statistic, which is used to measure reproducibility, and reported 0.62 for the BRS and 0.87 for the CD-RISC. Although Windle et al. reported that the CD-RISC and BRS received the highest overall ratings for resiliency tools, the goal of each tool differs. The goal of the BRS is to measure "bounce back" from a stressful event, while the goal of the CD-RISC is to measure a person's ability to overcome negative situations (Connor & Davidson, 2003; Smith et al., 2008; Windle et al., 2011). Given this information, the six-question BRS was chosen for an EPICON analysis for measuring suicidal behaviors after a suicide event in a military unit. Again, although the BRS was adequate for such a goal, it may

not be the best tool to use in a study, such as this research, where a more refined measure of resiliency is needed to understand differences in a population.

Finally, I also used the SCS-R for secondary data analysis instead of the originally proposed MSPSS. Similar to the comparison of the BRS and CD-RISC, the SCS-R and the MSPSS were designed with difference goals in mind, which may explain the difficulty in detecting statistically significant differences among groups in this study. The SCS-R was developed to measure belongingness or social support in the clinical setting, using three constructs including companionship, affiliation, and connectedness (Lee & Robbins, 1995). The MSPSS, on the other hand, was designed for research studies in an attempt to merge competing hypothesis for social support. The first hypothesis was that social support created a buffer by enhancing self-esteem or a sense of control, and the second hypothesis stated that social support lessened the effect of stressful situations (Zimet et al., 1988). Therefore, Zimet et al. (1988) created a scale that would quantify the subjective nature of social support and ensure that social support was measured from three sources: family, friends, and significant others.

At present, it is impossible to state inconclusively that using the CD-RISC instead of the BRS or using the MSPSS instead of the SCS-R would have detected differences in the sample population. However, using two nominal questions regarding suicidal ideation instead of the more refined scale for suicidal ideation probably did play a role in not detecting statistically significant differences among groups in this study. In addition, survival bias may have had an effect on the results given that suicide interventions were put in place immediately following a suicide in each of the surveyed units.

Contributions to the Discipline

Despite not finding statistical significantly differences among gender groups for this study, there is still important information that is relevant to future researchers in this area. First, more studies still need to occur to determine if there is a difference among men and women of the U.S. Army in terms of suicidal ideation. Surveillance of suicidal behavers in both the military and civilian population indicates that there are gender differences (APHC, 2016; Drapeau & Macintosh, 2016). However, any differences among genders should be evaluated in the context of normal day-to-day operations and again after a suicide event has occurred. Suicide intervention programs that were enacted after a suicide event in the survey units may have increased resiliency and social support among both genders. As a result, the effectiveness of these programs should be questioned, and lessons can be learned and implemented during normal operations as a primary intervention. Another contribution this study made was the first evaluation of the BRS and SCS-R in the context of group differences. Neither scale was effective in detecting differences among gender groups; as a result, future researchers should work with more refined instruments for evaluation of small changes in regards to protective factors. Finally, using only nominal questions to evaluation suicidal ideation is not an effective means for determination of suicidal behaviors. Suicidal ideation with intent and without intent may represent two different stages of the suicidal process. As a result, future studies measuring suicidal ideation should consider using refined scales, such as the C-SSRS Section 2, in which the strength of the ideation is measured.

Limitations to Generalizability

Given that the data for this study were collected as a part of an investigation into suicide burden in specific units, the results are not generalizable to the overall Army. It is impossible to determine what role survival bias played in this study. Had the soldiers who were surveyed not been closely associated with suicide from members within their own units, would they have answered the survey questions differently? Secondly, because I used secondary data collected as a part of the aforementioned EPICON studies, would the results have been different had the survey been administered randomly to Army soldiers? For both questions, it is impossible to determine the answer with the current results; this limits the generalizability of the results.

Positive Social Change

This study represents an attempt to further understand the impact of protective factors of social support and resiliency. In addition, little research has been implemented to understand if gender plays a significant role in the suicidal process. Although results of this study will not directly impact current Army policy on suicides and mental health, this study does support the need for additional research on these topics. Combat operations in the Army have slowed in recent years, but mental health and suicide continue to be a problem in the Army population (APHC, 2016). As a result, this study can be used to build future studies that may enhance knowledge about protective factors and gender in the context of the suicidal process, thus furthering the knowledge about how to eventually prevent suicide in the Army population.

Recommendations for Future Research

The next step in this research would be to continue evaluating resiliency, social support, and gender in the Army population. However, future research should be conducted using primary data collection and a random sample of Army soldiers. Furthermore, refined measures for suicidal ideation, resiliency, and social support should be implemented.

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