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Suicides in the Military: The Post-Modern Combat Veteran and the Hemingway Effect

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Abstract Suicides in the military have increased over the last ten years. Much effort has been focused on suicide prevention and treatment, as well as understanding the reasons for the sharp increase in military suicides. Despite this effort, the definitive causes of military suicides remain elusive. Further, highly effective suicide prevention and treatment approaches have not yet been developed. The purpose of this article is to present a short review of the current state of suicide prevention interventions within the context of the military. The root causes of suicidal behavior and the role of combat in the military are each discussed. Interpersonal-psychological theory of suicide and the military transition theory are introduced as guiding frameworks for understanding suicides and suicidal behavior amongst active military personnel and military veterans. The article concludes with a set of recommendations for moving forward in understanding and addressing suicides in the military.

Keywords Military · Suicide · Veteran · Combat · Interpersonal-psychological theory of suicide · Military transition theory · Modern veteran · Hemingway effect

Introduction

It is a tragedy when a service member dies by suicide. When someone serves their country, whether in peace time or war, risking their health, personal relationships, and even their lives, they're entitled to live a long and productive life. Sadly, service members are dying by suicide at disturbing rates. Over 8000 military veterans die by suicide every year; that's nearly 22 suicides every day [1]. For those serving on active duty, one service member dies every 36 hours. As a nation, over 30,000 Americans die by suicide every year [2]. Yet, little is known about the causes of suicide; and effective prevention, treatments, and recovery care and management following suicidality remain elusive.

In this article we first present the root causes of suicides in the military, focusing on those hypotheses and explanations that seem the most promising toward assisting us in our understanding of the causes of suicide. We should note here that for the most part we have limited our analyses to Army suicides since suicides represent the greatest problem for this military service. Next, we discuss the role of combat in contributing to the rise of suicide, as this is currently a subject of considerable scientific debate. We then introduce two theories, the interpersonal-psychological theory of suicide and the military transition theory, that are useful in guiding our approach to suicide prevention and care. After that we discuss suicides amongst aging veterans, what we refer to here as "The Hemingway Effect," as well as suicides among "post-modern" veterans. We conclude with a set of recommendations for how the nexus of suicides and military service can be understood and addressed.

Root Causes of Military-related Suicides

From 1990 to 2007, the suicide rates of the military were well below the civilian, demographically-matched suicide rates. The reasons for these lower military suicide rates were poorly understood, and explanations ranged from the "healthy worker" effect, to full and/or to meaningful employment, to

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excellent leadership and high morale [3, 4]. The first indication that suicide rates in the military might be changing occurred in 2003 when an increase in suicides in soldiers deployed to Iraq were reported [5]. The suicide rate for the deployed soldier population in Iraq was 18.3/100,000 compared to 11.9/100,000 for the non-deployed solider population. Similar increases in suicide rates for the deployed population were seen in 2005 (19.9/100,000) and in 2006 (16.1/100,000) [6, 7]. However, little was changed from the preexisting suicide prevention efforts as the meaning of these increases in suicide rates was debated, with many arguing that these changes in suicide rates were spurious and did not reflect an actual increase in the suicide threat (see [3]). The evidence for this argument rested primarily on the fact that the overall Army suicide rate had not significantly increased during 2003-2006, although the trend was clearly upward. Interestingly, only recently was it found that while the rate of suicide attempts among soldiers was lower than the rate of suicide attempts among civilians, the likelihood of dying by suicide when it was attempted was higher in the military—primarily due to the highly lethal means selected by military personnel (i.e., the use of a gun) [8•, 9]. From 2008-2012, things changed. The overall suicide rate for the Army began inexplicably increasing at an astonishing rate, increasing from a low of 9.6/100,000 in 2004 to 19.6/100,000 in 2008, peaking in 2012 at 29.2/100,000, triple the 2004 rate (see Fig. 1; [10]).

Addressing the suicide problem in the Army has been perplexing. Many theories, hypotheses, and explanations have been offered to explain the high suicide rates in the Army (see Table 1) [11–17, 18•, 19–27]. Even policy changes implemented by the military have been implicated as causal factors in the increase in Army suicides. First, it was suggested that the Army's granting of military waivers for new recruits has lowered the overall quality of the recruits and that this lowering of accession standards has led to the increase in deaths by suicide within the Army. A careful analysis of the suicides within the Army, however, has failed to support this explanation [24]. Second, it has been argued that classifying suicide deaths as occurring within the line of duty thereby ensuring beneficiaries receive entitled life insurance policies, has contributed to the increase in Army suicides. Neither of these explanations, however, explains the increase in suicide deaths that occurred in Iraq in 2003, 2005, and 2006, when the military waiver program was not in effect and when deaths by suicide were still considered not within the line of duty. Furthermore, neither of these explanations can account for why the suicide rates in the other services do not mirror those observed in the Army.

The fact of the matter is that we do not know for certain why the Army suicide rates were low in the 1990s and early 2000s, and we don't know why the suicide rates increased in the mid 2000s and continue to remain high (see for example, [28]). Many of the possible explanations identified above are based on correlational studies demonstrating associations, but not causality. Further, many of the explanations are not mutually exclusive; and in fact, co-occur with many other factors. Thus, it becomes difficult, if not impossible, to determine which factor or set of factors are the most important. Although there has been a noticeable increase in civilian suicide rates from 2000 to 2010 (10.4/100,000 compared to 12.1/100,000), this increase is equally puzzling, and has also led to much discussion as to whether this 14 % increase represents a significant increase in suicides [2].

The most parsimonious explanation that can be offered presently is that the increase in deaths by suicide is due to the equally abrupt increase in the poor mental health status of Army personnel, with increases beginning as early as 2004 and continuing up to 2012 [29]. Specifically, beginning in 2004, hospitalizations increased for depression and PTSD, consistent with the early findings showing an increase in suicide rates of Army personnel in Iraq, and well before the observed overall Army increase in suicide rates from 2008 to present. From 2001 to 2012, hospitalization rates increased two-fold for depression, two and half fold for alcohol abuse

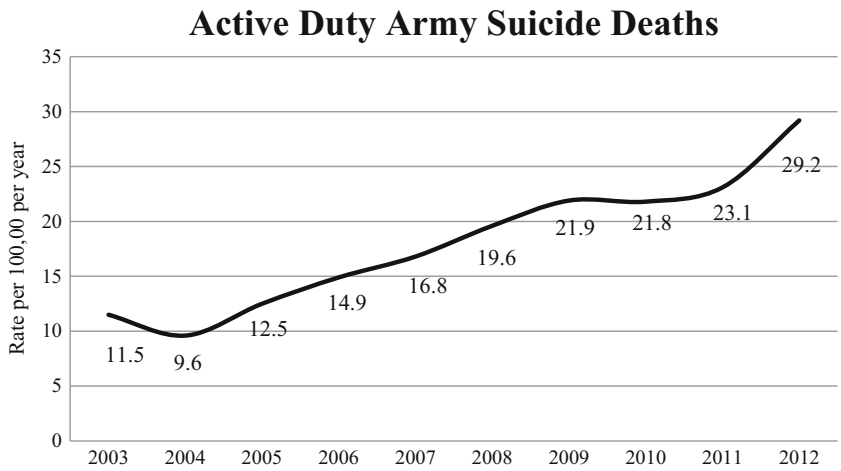

Fig. 1 Source: U.S. Army Health Promotion Risk Division Office

Table 1 Offered hypotheses and explanations for high army suicide rates

Mental health issues (i.e., PTSD, depression, mood disorders, personality disorders)	Risk taking behavior from combat such as high alcohol consumption and drug misuse
Combat and deployment	Experiencing adverse childhood events
Isolation	Inadequate or no social support
Loss of sense of purpose	Chronic pain
Experiencing sexual assault	Legal problems
Mild traumatic brain injury	Financial difficulties
Poor physical health	Failed intimate relationships
Genetic predisposition	Weak moral character
Grief and moral injury	Contagion from suicide exposure
Expertise in weaponry and killing	Desert heat
Constant reminders of suicide through mandatory training	Disruption in natural energy fields surrounding the body
Poor or inadequate nutrition (i.e., low Omega-3 amino acids)	Small or underdeveloped hippocampus and/or neocortex

and dependence, five-fold for substance abuse/dependence, and ten-fold for PTSD. Suicidal ideation hospitalization rates increased ten-fold from 2005 (the first year the data was collected) to 2012. The reasons for these rapid increases in mental health hospitalization rates will be discussed next within the context of combat experiences. However, PTSD and/or depression diagnoses have been shown to be related to suicidality in Army personnel [30].

Role of Combat in Active Duty Suicides

There is considerable debate within the scientific community about the contribution of combat to the observed increase in active duty suicides. On one side there are those who have argued that combat is related to suicidal behavior and suicides [31, 32], while on the other side there are those who have argued that there is no relationship between combat and suicide that cannot be explained by mental health status [18]. It has been clearly established that combat conveys considerable risks to service members' psychological health [33]. In particular, higher rates of both PTSD and depression are seen in service members who have been in combat compared to those who have not been in combat. Further, the greater the exposure to combat the more likely the service member's mental health will be adversely affected (see [34]). It has also been clearly established that poor mental health is related to suicidality and death by suicide [35].

The remaining question then is does combat *directly* lead to suicidality and/or death by suicide that is independent of one's mental health. The answer appears to be no. In a study of active duty service members seeking mental health services in Iraq (see [8]), combat was significantly associated with the presence of PTSD symptoms, which were associated with increased depression symptoms. In turn, increased depression symptoms were related to thwarted belongingness and increased burdensomeness, which was related to increased suicidality. Combat was not found to be directly related to suicidality. Whether combat results directly in death by suicide, or whether death by suicide is mediated through mental health status and other psychosocial variables remains to be determined. The role of combat in death by suicide or for suicidality for National Guardsmen and reservists, as well as for veterans, is also unknown. For now, the scientific evidence indicates that it's best to view the increase in military suicides as a result of an increase in mental health issues of service members, driven in large part, but not entirely, to combat and deployment experiences [33].

Interpersonal-Psychological Theory of Suicide and the Military Transition Theory

Interpersonal-psychology theory of suicide proposes death by suicide occurs when individuals perceive a high sense of burdensomeness, low belongingness/social isolation, and the acquired ability to enact lethal self-harm [36, 37]. Perceived burdensomeness involves strong feelings of being a burden to family, friends, the community, even to the world. Thwarted belongingness is defined by a lack of meaningful personal connections, as well as having strained relationships. Death by suicide, however, will not occur unless perceived burdensomeness and thwarted belongingness is accompanied by the acquired capability to enact self-harm, that is, the ability to complete an act of suicide. Suicide attempts occur when hopelessness stemming from thwarted belongingness and burdensomeness, meets acquired capability. It is important to note that all three components must be present simultaneously for death by suicide to occur.

All military veterans have acquired the capability to die by suicide through military training, meaning this component of the interpersonal-psychological theory of suicide is present in all service members and veterans at all times. Although military training does emphasize gun safety and respect for weapons thereby restricting the possible means from dying by accidental death, the acquired capacity for self-harm is not diminished. So this component of the interpersonal-psychological theory of suicide is not useful in helping us identify when a military service member or veteran might die by suicide. What about the other two components of the theory: Are there times when belongingness and burdensomeness are particularly threatened, which might place the service member or veteran at increased risk for suicide? The military transition theory provides some insight as to when thwarted belongingness and perceived burdensomeness are likely to come together concurrently, along with the ever present acquired ability to inflect lethal self-harm [38].

Military transition theory describes the progression through which service members' transition out of the military. Military transition entails moving from the military culture to the civilian culture, producing changes in relationships, assumptions, work context, and personal and social identity. The theory postulates three interacting and overlapping phases describing individual, interpersonal, community, and military organizational factors that impact the military transition process. The first phase, approaching the military transition, outlines the personal, cultural, and transitional factors that create the base of the transition trajectory. The second phase, managing the transition, refers to individual, community, organizational, and transition factors impacting the individual progression from service member to civilian. The final phase, assessing the transition, describes outcomes associated with transition. The key outcomes include work, family, health, general well-being, and community.

The military transition theory illustrates how certain factors may create susceptibility to negative outcomes, including suicidal behavior. Elder veterans as well as young veterans are particularly vulnerable to acts of self-harm [39]. Despite this, the causes of the development of perceived burdensomeness and thwarted belongingness may be attributed to different factors in each group. What former service members in both vulnerable age groups share is that they are experiencing a period of transition. The specific challenges each group face, as well as the specific transition elements identified in the theory, may create an understanding into the contributing factors associated with the interpersonal-psychology theory of suicide.

Military transition theory provides context into not only how thwarted belongingness and burdensomeness may develop but where interventions can be more effectively identified and targeted.

The Hemingway Effect (Elder Veterans)

Ernest Hemingway, one of America's greatest literary figures, died by suicide when he was 61 years old, only six years removed from having been awarded the Nobel Prize for Literature [40]. In many respects, Hemingway's life and death exemplifies the complexities of suicide in elder veterans. Hemingway saw combat during the Spanish Civil War, World War I, and World War II. Although he never wore the uniform, he served. During the Spanish Civil War he participated in direct combat activities; during World War I, he collected and sorted body parts of blown up soldiers; and during World War II after the Normandy landing he led a group of French fighters, for which he was tried under a military court since "civilians" were prohibited from leading uniformed military, and for which he was subsequently acquitted. For those who subscribe to the combat (or trauma) theory of suicide, Hemingway's suicide can clearly be attributed to his extensive combat experience. Those who favor a genetic-based explanation for Hemingway's suicide can find evidence in the fact that Hemingway's father, brother, and sister also died by suicide. For those who prefer the chronic pain and poor physical health hypotheses, evidence can found in the fact that Hemingway suffered from chronic back pain from two plane crashes and his severe medical conditions associated with cirrhosis of the liver, due to his life-long history of heavy drinking, which is also another possible explanation for his suicide. Hemingway was also an avid hunter and expert in the use of firearms, so support for the weapon use hypothesis can be found here. Strong support for the mental health hypothesis for his suicide is present as Hemingway struggled with severe depression, and possibly PTSD, throughout his life. Finally, Hemingway's social support network was disrupted and weakened, first with the death of his immediate family members (father, sister, brother), and then the loss of many of his close personal friends; and he was estranged from his mother and children.

Viewing Hemingway's death within the interpersonal-psychological theory of suicide, one can easily see the presence of the three hypothesized components necessary for dying by suicide: lack of belongingness, burdensomeness, and acquired capability. Yet, why did Hemingway decide to end his life when he did? In cases of elder veterans like Hemingway, the transition from middle life to later life is fraught with increases in burdensomeness and lack of belongingness. Physical and psychological health tends to deteriorate later in life, especially injuries incurred while serving in the military (see most recently [41]). As we saw, this was certainly true for Hemingway. Family members and close friends, especially friends with combat and military experience, begin dying, significantly disrupting the veterans' social support network and thus their sense of belongingness [42]. Again, as we saw, this was the case for Hemingway.

Being able to identify when elder veterans enter this transition phase of their lives enables initiatives and interventions to be developed and put in place to ensure that unmet physical and psychological health needs are met, as well as feelings of belongingness are maintained. Importantly, providing support to elder veterans need not wait until the veterans enter a transition resulting in crisis. Support structures that anticipate the needs of the elder veteran should already be in place to lighten the veterans' load and ease the veterans' transition into late life. Our elder veterans served us when they were fresh and resilient; our obligation to them is to ensure that their gift does not end in needless suffering and suicide. It is not only our elder veterans who would possibly benefit from such support structures and initiatives. The age group with the highest suicide rates in the U.S. is aged 45-64 (18.6/100,000, with the next highest rate being aged 85 years and older (17.6/100,000). Unfortunately, it is not known to what extent these rates are being driven by the high veteran suicide rates for these age groups.

The Modern Veteran (Veterans of the Great Wars on Terror: Afghanistan and Iraq Veterans)

Veterans of the wars in Afghanistan and Iraq face different challenges and have different needs than veterans of other wars. Most notably, the modern veteran will be rejoining a civilian community that has not served in the Afghanistan or Iraq wars and one that has little direct experience with the military. For example, just 12 % of the U.S. male populations under the age of 35 are veterans of the Afghanistan or Iraq wars, and only 3 % of females under the age of 35 are veterans of the Afghanistan or Iraq wars. In comparison, around 50 % of the U.S. male populations under the age of 35 were World War II veterans, with nearly 15 % of women under the age of 35 being World War II veterans. Hence, unlike previous wars, the modern veteran will be entering a community without a shared military cultural identity. Service members also have a strong sense of accomplishment having served the military during wartime that can lead to a sense of entitlement that is not understood nor reciprocated by civilians.

The military transition theory postulates that the absence of a shared military cultural identity, along with an unrecognized sense of privilege, can interfere with the modern veterans feeling of community belongingness, as well as hinder the modern veterans' establishment of a new effective social support network that includes civilians. And if such conditions are allowed to persist for too long, then thwarted belongingness will ensue. If, however, the modern veteran, including National Guardsmen and reservists, is also able to re-establish a new identity that is not linked so strongly to their military experience then thwarted belongingness may be avoided, making their transition much smoother.

The personal identity of the modern veteran can also be challenged when they leave the military. Nowhere is this more evident than when the modern veteran seeks employment. Believing that life outside of the military was going to be easier than life inside of the military, modern veterans expected to easily find employment that justly compensates them for what they believed their skills merit, and become dismayed and upset when this does not occur. Unlike after World War II when the unemployment rate was between 1-2 %, and less than half the population graduated from high school, the modern veteran is facing an economy with a 7-8 % unemployment rate and competing with a highly educated workforce, with over 88 % of the U.S. population having graduated from high school and with over 30 % having a bachelor's degree. Not being able to find a job can lead to the modern veteran developing a sense of burdensomeness.

Finally, the modern veteran might be dealing with many unresolved mental and physical health issues. Combined, the wars in Afghanistan and Iraq have resulted in over 50,000 service members being wounded in action, and with another 118,000 receiving a diagnosis of PTSD after returning from deployment yet still serving on active duty [43]. At the peak in 2012, over 17,000 active duty combat veterans were being diagnosed with PTSD every year [43]. Of the over 1.4 million combat veterans who have separated from military service since 2002, approximately 54 % have received health care from the Veterans Administration, with over 404,000 combat veterans receiving a mental health diagnosis [44]. Despite these physical and psychological injuries, most service members and veterans are still able to function, and many at a very high level. Often not appreciated by many are that many service members leave the military service not having adequately addressed their physical and psychological health because they are able to function, while they are still operating within the confines of the military structure. This phenomenon has been described as "functioning while suffering" [45]. However, once these injured service members leave the military, their physical injuries and/or psychological injuries can result in significant barriers to occupational and social functioning, resulting in them being unable to get a job, or maintain a job once one is obtained. In addition, these physical and psychological injuries can inhibit their ability to form meaningful relationships. The ability to find employment, combined with an inability to form meaningful relationships, both due to on-going and unresolved physical or psychological issues can result in service members developing a belief that they are a burden to their family, friends, and community.

In summary, loss of belongingness can exist for the modern veteran due to their personal and social identity coming under attack as the service member transitions from the military culture to the civilian community, who might not understand what they have been through or what the military is all about. The modern veterans' social network can also be easily

disrupted, and difficult to re-establish because of a lack of a shared military culture. Burdensomeness can occur due to the inability of the modern veteran to find a meaningful job, having to deal with significant, unresolved mental and/or physical health issues. Most of the significant programs that exist for veterans, such as the Department of Veterans Affairs, along with the GI Bill, and other state, federal and local organizations are targeted at assisting the veteran in meeting their basic needs: food, clothing, shelter, and basic employment. There are very few efforts (if any) aimed at assisting the veteran in developing a sense of community belongingness that recognizes their service and sacrifices.

Confronting the Nexus

We must recognize that military service is hard. Combat and deployment can result in significant psychological and physical injuries that are likely to go untreated for significant periods of time because of the stigma and barriers associated with asking for help. Despite the military's attempt to reduce the barriers associated with accessing care, and to convince the service member that their career will not be harmed for seeking care, the reality is that seeking psychological or physical health care can impact one's career advancement. Someone who seeks psychological care for a mental health problem will likely be treated differently by members of their unit and by their leadership. Further, service members are encouraged to solve their own problems; and in fact, receive resilience training so they do not need to ask for help. It is easy to see how these mixed messages can easily detour a service member from getting the help they need.

Prevention should start from the day service members enter the military. Resilience skills can be trained throughout a service member's military career. Importantly, the military needs to create a culture of respect and understanding. There is nothing admirable about unnecessary suffering. Service members need to believe and see through firsthand experience that receiving care for either a physical or mental health need does not adversely impact their career. For military personnel leaving the military, prevention efforts should be aimed guiding them through the transition process of leaving the military and continuing to assess and monitor their wellbeing two to three years after the transition. Assessing how military personnel transition from active service to civilian life should be a shared responsibility between the Departments of Defense and Veterans Affairs.

In addition to focusing on easing the suffering of veterans as a way of preventing suicide, attempts to prevent the suffering of veterans should be initiated through timely evidence based intervention and monitoring of the veteran's mental health and wellbeing status. By initiating a process that begins during military service, we can begin to address problems as they start and identify potential risk and protective factors. This can be continued during the transition process as veterans are guided and partnered to veteran and community services, which will also help veterans develop new social networks with other veterans who understand them. Much of the current health care efforts provided to veterans is limited, and usually focused on meeting immediate critical needs or chronic health issues. Very little attention is paid to prevention or early intervention, probably because prevention training, for the most part, is redundant, poorly presented, and not evidenced based. Physical and mental health care interventions for military personnel must be structured to meet the health care needs of the veteran throughout their life, thereby preventing the negative outcomes that can result in death by suicide.

We should realize that the military culture is very different than the civilian culture and that many service members struggle in this initial transition. While on active duty, the military provided for all of the service members basic needs, including food, clothing, housing, and employment. Veterans did not have to worry about medical or dental care, as these services were likewise provided. While these are stressors that impact civilians on a daily basis, for many veterans, they are dealing with these issues for the first time.

Veterans will also confront transitions later in life that are equally challenging. The majority of veterans find purpose and meaning in their military service. It can be a struggle to find that same sense of purpose as a civilian which may ultimately lead to feelings of despair. We as communities must work to provide veterans avenues for identifying and developing a meaningful life. One way this may be done is through assisting veterans in finding a renewed sense of purpose and service. Whether this is through meaningful employment, volunteerism, starting a new business, public service or family, new missions lead to new accomplishments, creating pride and passion in post military life. While there are many community organizations that could be leveraged to provide this need, currently none have succeeded in giving the veteran a sense of purpose and community connection.

We need to acknowledge that suicidal behavior is a mental health disorder. Laymen, including military leaders, would find it incredible that suicidal behavior is not considered a mental health disorder, and remains "a condition for further study" [46]. This ambivalence amongst mental health professionals as to whether suicidal behavior is or is not a mental health disorder only serves to increase the confusion among those charged with finding effective preventions and treatments. For example, within the military, the suicide prevention office is led by the human personnel resource director, with most of the suicide prevention training led by the chaplains. Mental health professionals, who reside within the medical department, primarily serve as consultants in the prevention of suicides, yet are held responsible for providing effective treatment for mental health conditions when a service

member is suicidal or when a service member dies by suicide. Furthermore, since suicidal behavior is not considered a mental health disorder per se, only recently, and over much objection, has military medical research funding been devoted to specifically identifying effective suicide-focused treatments and interventions. Suicide prevention efforts, such as suicide prevention training, have been excluded, since the lead for this area still lies within personnel.

To be sure, most of the military's suicide prevention efforts are coordinated, yet coordination is not the problem. In fact, there is probably too much coordination. For many within the military the prevention of suicides is too important to wait for the medical science to provide a solution. So, instead of ensuring what is being done is effective in preventing suicides, the leaders within the military are forced to implement unproven programs and initiatives, often at great time and expense, and then are generally surprised when the suicide rates remain unchanged. What is lacking, yet desperately needed, is unity of command, and unity of effort. One office needs to be solely responsible for the development, establishment, and execution of all programs and initiatives involving suicide prevention training, the identification of service members who are at risk of dying by suicide, the implementation of evidence-based early intervention and treatment programs, and the management of follow-up care. Given that we view suicidal ideation as a mental health condition, it follows that the surgeon general or chief medical officer should lead the suicide prevention and treatment efforts.

Finally, it is essential that we appreciate each generation of veterans for their own accomplishments, and refrain from comparing one generation of veterans to another. Perhaps the biggest social challenge facing today's veteran is living up to the comparison that many make of today's veteran to the veterans of World War II [47]. (As an aside, interestingly and noticeably, comparisons of today's veteran are never made to veterans of the Vietnam War or even to the Korean War; no doubt because our aspirations for the modern veteran are to do better; and why not aspire for our modern veterans to do better than the greatest generation ever!) Such comparisons, no matter how well intended, can lead the modern veteran to view any setbacks as failures, resulting in further alienation, which can lead to perceptions of burdensomeness and feelings of not belonging.

Conclusion

The cause of the increase in military suicides is likely due to a multitude of factors, especially the increases in mental health issues affecting our service members after over a decade of war, although the precise cause of the increase in military suicides remains unknown. More effective monitoring of active military service members and veterans are needed to ensure that their mental health and wellbeing needs are identified before they become suicidal. We recognize that the prevention of suicides represents one of the greatest challenges in mental health. There are no quick fixes to ending suicides of our service members or our veterans, it is our hope though that the few recommendations we have provided will help move us in that direction.

Compliance with Ethics Guidelines

Conflict of Interest Carl Andrew Castro and Sara Kintzle declare that they have no conflict of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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