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Suicide Throughout Military Personnel and Veterans: A Literature Review

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Suicide throughout Military Personnel and Veterans: A Literature Review

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Abstract

Background: Suicide among uniformed servicemembers and veterans is hauntingly common, with numbers increasing despite growing efforts to address potential problem sources. Numerous programs, strategies, research studies and system-wide efforts continue to attempt to stifle the losses. The purpose of this systematic literature review is to evaluate the gravity of the multifactorial situation, and potentially offer insight into future plans to stop these very preventable tragedies.

Methods: A database search was conducted for studies from January 2010 or more recent using PubMed, Elsevier, ScienceDirect, and UpToDate. The search terms/keywords used were "veterans, suicide, prevention, reduction, treatment, strategies, therapy, medications, antidepressant, selective serotonin reuptake inhibitors, Prozac, exercise, and military". Inclusion criteria lists studies from 57 journal articles ranging from psychiatry to neuroscience.

Results: In considering the articles reviewed, servicemembers, their friends, co-servicemembers and families continue to battle with direct and indirect consequences of suicide stemming from a multifaceted spectrum of physical, mental and even spiritual health factors. Organizations and research teams collect vast amounts of statistics adding to the list of potential origins of uniformed suicide; despite this data collection, the number of deaths continue rising.

Conclusion: Throughout the literature around servicemember suicide, there exists large amounts of subtopics that show potential for successful intervention. Continuing to pursue and implement effective treatments in compliment to providing meaningful resources can create an additive effect, with each component lessoning the servicemember's risk of suicide.

Introduction

Suicide remains a battle in and of itself for those who chose to serve. Statistics recently published show that an alarming 22 veterans commit suicide every day[24]. The number of preventable deaths would still be considered too many if it were 1 per day, or 1 per year. Those estimates are not including those that end their lives while still fulfilling their duty contracts. Dedicating themselves to causes greater than themselves, higher quality support and attention needs to be developed and adapted at a rate faster than the caskets being unnecessarily filled. A funeral is difficult enough to go to without having to subconsciously barrage oneself with questions that will never be answered. The emptiness left behind each time it occurs accumulates within a person's spirit. A multitude of people are affected by it and are passionately motivated to be involved with whatever means may help to fill that void. Many of the studies simply compile data of the effectiveness of intervention strategies attempted[13]. Several simply discuss emotional and behavioral diagnoses such as Post-Traumatic Stress Disorder, anger and internal hostility as reasons for the high suicide rates[17]. Witnessing another human being's life end, whether in a war-like fashion or even by suicide itself, will of course cause an emotional change; therefore, correlating mental health problems to suicide is not so much a scientific conclusion as it is common human sense. These emotional changes are natural; occurring just the same as when a person loses a grandparent to natural old age. With the included literature showing that veteran suicide is a multifactorial epidemic, the tools and plans used to help address it should be multi-staged, multi-faceted, multi-departmental and multi-organizational in nature.

One might instinctively make the assumption that the rates of suicide in uniformed individuals are higher due to the increased number returning from combat deployments; but this is not the case. The number of deployments has been showed to be a poor indicator for being a

cause of the servicemember suicide increases. According to a study published in 2017, several collections of data showed chaotic and non-confirming results when looking at the relationship between combat deployments and suicide[23]. Many studies are able to tabulate data showing that servicemembers are aware of various programs or tools aimed at suicide prevention, yet an unnerving percentage report that their mental healthcare needs are not met[24]. Systems and sources do not intend to create difficulties; they are created secondary to the notion that understanding one's options and how to use them in seeking care become just as complicated as the mental health diagnoses themselves. Servicemembers should not need to experience added stress and mental anguish because of the system. "Overwhelming" becomes a commonly stated adjective by those who are handed pamphlet after pamphlet; calling number after number to find the right person or department that will fulfill their needs. Just as many who serve don't hesitate to take on a challenge; the literature identifies that neither can those aimed at fixing the trend. The system can be remade to refocus priorities on listening to servicemembers and veterans' feedback, adapting to its population base for which it was originally created.

With such high percentages of servicemembers and veterans demonstrating signs and symptoms that correlate with suicide, improvement on how the aid is made available and utilized remains an opportunity not yet seized. An article published in 2014 stated that upwards of 60-70% of servicemembers that have a mental health diagnosis do not receive adequate treatment. It looked to examine the relationship of stigma to the utilization of care[30]. The slow to adapt culture of the armed forces could hold some of this fault. Imagine being afraid to go talk your supervisor due to a problem with your paycheck; you have worked for that financial compensation and should not have any hesitation or thoughts of repercussions against you. The notion that a blade can't function properly if there is a weakness to it is an attitude that has negatively impacted far

too many in uniform. These individuals are not asking for their hands to be held step by step, they are asking for their team to back them up. A wide-range of reasons are apparent as to why those who serve or who have served chose not to seek care; including but not limited to: perceived weakness, lack of trust both from leadership or the system itself, limitation on responsibility, potential loss of benefits, negative career impact, and community judgement[4]. It is intimidating the first time a lower-enlisted soldier has to step into the commander's office. No matter the reason for the interaction, it is comparable to telling a strict father you crashed his classic car. A small, trivial, one lined question may not even feel as though it is worth asking for fear of the commander taking offense. The concept of the "open door policy" may not seem to apply as freely when it comes to servicemembers ability to get the care they need before the option of suicide is the only one perceived available. This is not to make the leap that only others that currently or previously wore the uniform can solve this problem. Open, welcoming and non-biased conversations between various ranks, as well as between civilians and servicemembers should be common and easy.

When adding the reluctancy of seeking care in military and veteran individuals to the high rate of suicide, those wanting to help may begin to feel disheartened. Just as pediatrics or nephrology is a part of training curriculum, studies argue that uniformed individuals represent a unique population of patients that should be added as well[26]. This cohort is different and may need to be cared for in a different manner. This could perhaps better prepare the caretakers of servicemembers for their specific needs, leading to a decrease in the number of suicides. There then remains the barrier of servicemembers not disclosing, trusting, or communicating with providers of care. It is difficult to feel understood when the person across the exam room has never worn a uniform. A mental anchor that it is impossible to explain internal needs to someone

that never served is a frequent block. A wall remains when individuals are held back by a stigma. Not meeting the mental healthcare needs of those who need it is associated with a potential four-fold increase in suicidal ideation (AOR 4.11) (Table 1)[24]. In a systemic review article as part of a book published in 2015, 77% of those completing suicide had interaction with a primary care provider within the past year. This number suggests that something is falling short; whether it be in communication or the system itself, more can be done. It went on to note that the *US Preventative Services Task Force,* which is frequently used by primary care providers as a screening guidelines list stated "Suicide risk screening" as an "I" or "Uncertain"[27]. "Uncertain" does not seem a positive designation when it comes to the preventable deaths of those in uniform. Instead, healthcare should be "certain" that suicide death reduction is as important as death reduction from any other health reason. Giving primary care providers the information required to more uniquely and effectively treat this population while still in school in combination with advocating for adaptation of the commonly used guidelines to those in uniform could yield positive results in the form of reduced suicide completions. Teaching those that have opportunities to aid in the reversal of this trend that talking about suicide and its risks does not need to be a difficult task; more over it should be a task or topic of conversation that is confidently discussed with all, with any risk.

Background

One in five suicides in the United States is a veteran of the armed forces and shockingly that number may be conservatively low. Those who defend our country also have a higher suicide rate compared with any civilian demographic[27]. These numbers should ignite an attitude of unacceptability in the public eye. While the civilian suicide rate should also be considered unacceptable; the armed force's loss of life, however, comprises a greater percentage of its

overall population. Within the last 15 years, the death rate among US Army soldiers has been higher than the death rate due to combat related illness[55]. This concerning statement points out that modern war is not as deadly as the aftermath. Signing a contract of service is often done with the knowledge that death is a possibility; however, suicide is never thought of as the means by which it will occur. While these numbers are reported with regard to the involvement with recent major conflicts such as the Iraq and Afghanistan war initiatives; suicide and mental health precursors have been present and documented in uniformed individuals since World War I[33]. In other words, we have had decades to address this issue, with little progress to show for it. Being exposed to stressors not present in other aspects of life can open a person to the potential for developing a psychiatric disorder with a much lower threshold than civilians. These people still have financial obligations, children, relationships, car problems, deadlines, etc.; but combining these with the mental toll and time away from support systems such as family, the addition of a deployment can make suicide a detrimental nemesis in need of more detailed attention. The doesn't even necessarily have to come from a deployment as well. For example, having to digest the mental stress that a utility bill or car payment is late because one forgot and is training out in the middle of nowhere with no access to telephone or internet connectivity can be the final pressure that breaks one mentally.

In servicemembers, both current and veteran status, exposed to traumatic situations, the diagnosis of PTSD is talked about as commonly as the flu during the winter months. In a study published in 2018 examining technology and it's uses in PTSD, it reported that in 2016 over 600,000 veterans have been diagnosed and treated for post-traumatic stress disorder; and those numbers are only within the Veteran's Health Administration system[5]. It is difficult to understand how these statistics would be changed if including servicemember diagnoses of

PTSD at a non-VA health system as those individuals may or may not be as comfortable seeking health care in these "civilian" institutions for previously mentioned stigma-related reasons. A journal article from 2017 stated that "PTSD may be a more salient predictor of suicide attempt than depression which is itself, more predictive of ideation". In other words, depression is more capable of getting one thinking about suicide, but PTSD will cause actual suicide-related actions. It went on to discuss the relationships between PTSD, co-morbid conditions such as substance use, anger, and suicide as inappropriate responses to the experienced loss of control of emotion during specific situations[17]. Again, it may be difficult to ascertain whether or not the anger comes from frustration with getting care, lack of understanding, navigating systems themselves, or believing that civilian providers are even qualified to help. Experiencing a "loss of control of emotion" may occur simply due to being unable to be scheduled for an appointment for mental health needs at a time of the day more in line with an individual's work schedule. Without a doubt PTSD contributes negatively to the servicemember suicide epidemic, warranting continued public attention and research efforts.

With the culture of order and structure a commonplace in the armed forces, experiencing loss of control, even when it comes an individual's outward emotions can often be beyond full comprehension for those who serve. As a result, these individuals attempt to bring this distasteful mental chaos into internalized order by using substances. A study released in 2017 looking at the association between substance abuse disorders and the risk of suicide in a cohort of more than 4.8 million people in care at a Veteran's Health Administration facility found significant increased risk of mortality due to suicide with the presence of a substance use disorder[15]. When small mental issues begin to pile up within a person, eventually the pile becomes noticeable enough to want to act on it; servicemembers are surrounded by culture that educates them well

on the mentally "altering" effects of several substances. A "work hard, play hard" attitude is one that is often used to foster team camaraderie and cohesiveness. It's when that person is battling mental health challenges that they return to what they know. For example, if one is reliving a specific traumatic experience every night in the form of nightmares instead of getting needed sleep; alcohol and other chemicals are used in an attempt to prevent the nightmares from happening at all. Increased concentration on reducing these negatively impactful coping mechanisms with those concurrently battling PTSD could positively impact the number of mortalities in servicemembers by suicide. Civilian programs like Alcoholics Anonymous and drug-addiction facilities are not well adapted to welcoming servicemembers. Not only is the stigma of getting involved with them a greater gap for them, these programs may not understand that the substance abuse is only one piece of the puzzle.

There is a long-standing association and perhaps a military cultural stereotype between the words "mental health" and "therapy". Cognitive Behavior Therapy (CBT) has been shown to be effective for reducing suicide risk in those with PTSD and depressive symptoms[44]. There remains a deficit, however, with the literature only showing a reduction in risk data for a period of 6 months to 2 years. Servicemembers and veteran's may not show their symptoms or express need for care within this time window. Too often do family and friends describe someone they know that may have served in previous theaters of war such as Vietnam or Operation Desert Storm Desert Shield; and they describe a relationship in which "we just don't talk about it". Cognitive Behavior Therapy has been shown to help to do just that, "talk about it"; often with great results. This suggests that just as positive progress after discontinuing a medication may wane, so too do the positive effects of CBT. Many times veterans will state that it is easier to talk about their experiences with other veterans, almost establishing an "in-house" group therapy

environment; however, this effective outlet for discussing and reducing PTSD and depressive symptoms is too often hindered by the battle-harden culture of the military which continue to reveal the notion of verbalizing things of a mental nature equates with weakness[4]. Is it harder to be comfortable letting the public know one has mental health needs, or one's own close friends? Fear of letting those close to you inside the mentally locked "vault" becomes a daunting endeavor; often feeling like a blind gamble on how the relationship will be altered after they are allowed in. Having local, welcoming places that servicemembers can meet may help to reduce many of the stressors contributing to risk. Helping each other maintains that camaraderie that stabilizes ultimate meaning for many that serve, resulting in a protective effect from mental health symptoms. Being able to be confident in the knowledge that others similar to oneself are experiencing the same things opens the door to a team approach to improvement; also removing vast amounts of stigma in the process. For perspective, if the entire class has the same pimple on their nose, it is far less likely that one person will feel discouraged and self-conscious. Just as many tasks within the service require the use of teamwork in order to be completed, Cognitive Behavior Therapy in an all-servicemember group capacity could be further developed and adapted which in turn would more effectively meet the needs of those that both desire and are not confident enough to find the solutions to them.

Suicide in those who serve or have served is not a new thing. According to an article published in the *Journal of Psychiatric Research* in 2015, comorbidities such as substance use disorders, depression and PTSD that correlate to suicide in studies relating to those serving in Operation Iraqi Freedom, Operation Enduring Freedom and Operation New Dawn are "mirror" to older studies done involving those that served in the Vietnam War[28]. This connection could indicate a couple different points: either this problem is decades old in the making and we are

struggling to find solutions, or suicide is an aftermath byproduct of war itself. This study would also suggest further knowledge is needed to determine whether the mental health needs are due to the same root causes that have not changed over time, or if the suicides are as a result of evolving symptoms. This multi-generational issue needs to be handled with devoted detail to each of the individualized servicemember's needs, especially those identified to have an underlying mental illness in order to avoid stigmatization of those who have already sacrifice so much.

With the emptiness that is created by suicide, more can be done to enhance the acceptance and portrayed strength in seeking treatment prior to such an event. Servicemember's feel the weight of social stigma and stereotypes surrounding "asking for help" and this is leading to nonresponse and dropout rates as high as 50%[56]. This harkens back to the concept that a more "welcoming" environment is needed. Something as subtle as a sly look while sitting in the waiting room of the facility itself could be enough to deter a return visit. Similar to having a bad experience at a specific restaurant and not wanting to go back; servicemembers are prideful, and if leaving an appointment creates negativity in their mind, that may be the only treatment they ever get. This further exacerbates the problem, not only with the increased perceived barriers to treatment; but in increased intensity of common psychiatric symptoms related to PTSD and depression as well, the two most correlated conditions with servicemember suicide.

In situations in which the servicemember feels confident in seeking care and/or the community facilities do a competent job of de-stigmatization; there still remains obstacles that contribute to the suicide statistics. If a servicemember can't get to a facility such as a Veteran's Affairs healthcare facility, they simply won't receive the necessary help. Transportation and logistics therein have been shown to be a problem for those who have served[4]. These clinics and

hospitals don't exist in every town, and rural servicemembers are inherently at a higher risk due to the distance from care. There is truth to the saying "word travels fast" in a rural community, which makes the public stigma for those needing mental health care in non-metropolitan areas even greater. Public awareness campaigns may hold the ability to spread positive propaganda in these underpopulated communities that seeking care is not weakness, but strength. Technology could also be implemented effectively in these situations to help to fill the void for those having a greater commute or trouble with transportation to and from a care facility[5]. Just as city councils discuss how they are to allocate funds for street care, or a police and firefighting force; they could also dedicate funds towards serving their local servicemembers by instituting shuttles, or public computer access for the previously mentioned deficiencies.

Even if the servicemember has zero concern about stigma and has little to no transportation issues; an intangible barrier to care is the confusion and lack of understanding surrounding what benefits a person is even entitled to. Servicemembers are eligible for a wide array of benefits, with the health care being among the most difficult to understand. Certain situations make one fall into specific "tiers" of care, with little explanation as to how various life events change where one stands. The short, concise lectures that are given when coming home from a deployment are not enough to give an individual confidence on their benefits either. The piles of forms that are required to be filled out in a specific manner place hindrance on accessing care as well. Even if one fills out the correct forms, with having gone to one-on-one therapy sessions for mental illness related reasons such as PTSD, claims and benefits are still denied simply due to the servicemember having little to no knowledge of medical terminology that is looked for on these forms. The cloudiness of knowing what care is taken care of versus what might not be covered, combined with the potential for ramifications in the form of a possible

insurmountable financial burden becomes a hurdle to seeking care as well[4]. For example, only after a servicemember was told to attend physical therapy for a knee injury, which was ten sessions; did he learn that each session that was ordered by the VA healthcare providers cost $50 dollars each. Situations like this in turn not only place added financial stress and anxiety on servicemembers and their families; it detracts from their trust in the systems themselves that are telling them they are here to help. Simplification and streamlining of the processes in applying for, as well as monitoring where a servicemember stands when it comes to their benefits would positively impact those afraid of seeking care due to being afraid of the financial burden that may or may not come with it.

Methods

In order to obtain articles relevant to this compositions purpose, multiple database searches were conducted. The search was aimed for published studies dated from January 2010 through current using PubMed, Elsevier, ScienceDirect, and UpToDate. The search terms/keywords used were "veterans, suicide, prevention, reduction, treatment, strategies, therapy, medications, antidepressant, selective serotonin reuptake inhibitors, Prozac, exercise, and military". The search terms used were combined in 18 different combinations and priorities in order to yield broader results. Inclusion criteria lists studies from 57 journal articles ranging from psychiatry to neuroscience and one review book. Reference sections of eight studies were also utilized to obtain additionally relevant material. An attempt was made to reject duplicate articles as well as include studies most closely resembling a meta-analysis, literature review, or guideline-like manuscript. The focus of this paper is centered on suicide reduction regardless of any human category other than being of current or former armed forces involvement. As such, there are statistics stated throughout many of the articles used that refer more to specific groups

of people more than others. Many review articles compiled their data using assessments and surveys, requiring voluntary participation to obtain statistics. Lastly, this composition recognizes that several articles consulted contained smaller sample sizes; however, with a goal of adding to the continued reduction of a specific population, study sample size will hopefully shrink (i.e. less suicides leading to less need for this research). The intent of this work is to purposefully and positively affect other's lives by examining an area of care personally connected to the author; as such, occasional personal experiences are intertwined in a supportive nature of the research in an attempt to offer direction to those as passionate about the topic discussed.

Discussion

Servicemembers are some of the hardiest and resilient individuals on the planet. When those who serve spend countless hours training in order to increase and maintain that toughness, overtime it begins to form an engrained image of dislike or even fear of thoughts or things that take away from this "toughness". Armor looks better without any dents in it, and the culture of the military perpetuates this mindset. A study conducted in 2013 examined the effects of shame as it correlated to suicidal ideation, showing that individuals with higher levels of shame experience more severe levels of suicidal episodes (Table 2 & Figure 1)[38]. Changing the known definition throughout the military and veterans of toughness itself in a way that does not create shame at the first sign of anything less than just that holds potential for reducing the aforementioned correlation. This change could be more effectively implemented when all levels of leadership embrace training methods beyond sitting through a simple yearly slideshow presentation too. When shame rises in these individuals' minds, quickly thoughts and actions yield to a stigma. As previously mentioned, stigma then becomes an obstacle for both receiving and delivering the care necessary. The shame is often two-sided; one being fear of being viewed

and treated differently by peers and leaders, the other is a tendency to equate shame with functional self-disappointment. This self-disappointment festers in the individual as they wrestle with thoughts that their mental struggles are causing themselves to let others down. Internal ideas are created that the team is suffering because of one's own suffering. This cultural barrier is at partial fault for unnecessary lives lost. The literature has shown that two common care-seeking hesitation thoughts in those who need it are "My unit leadership might treat me differently" and "I would be seen as weak", 44.2% and 42.8% respectively[30]. Toughness needs to be added to the description of those individuals and leaders whom oppose the idea that seeking care is weakness. Commanders and leaders at various levels need to be indoctrinated with how the "open door" policy functions. Being able to find a better blend of the "scary parent" figure and the "caring parent" may help to reshape how shame effects those in uniform. The "suck it up" mentality when it comes to servicemembers and veteran's mental healthcare is an outdated way of thinking; policy needs to be adopted to show those that need the help the stigma is being dismantled[4]. When comparing this to things one learns throughout life, help is needed in order to accomplish tasks that would not have been possible prior to asking for it. For example, knowing how to change the oil on a vehicle is something one learns by asking for help in learning to do so; the difference is that you don't feel shameful in presenting the question at all. Asking for help in regard to mental health should be seen as completely normal from day one.

Just as in the civilian employment arena, the military is not immune to interpersonal issues such as sexual harassment and the negative sequelae that result. Sadly, many servicemembers experience what is called "Military Sexual Trauma" during their tenure in uniform[62]. This presents an added risk for developing PTSD not related to deployments, combat exposure, or many other of the risk factors for suicide; although remaining capable for creating

additive risk, especially in female servicemembers[63]. The culture of the military often fosters personality characteristics that flirt with the line between confidence and pompous audaciousness. While campaigns and efforts to reduce these problems within ranks are present, further review and improvement could result in reduced amounts of PTSD, thus further reducing servicemember suicide. These individuals already have to contend with a long list of risk factors, they should not need to withstand one from within their own team.

Attempting to break the barriers between veterans and the stigma of seeking care, technology is something that holds some positive potential in delivering mental health and PTSD-related care. As devices become more and more mobile, servicemembers may have the ability to see a reduction in symptoms or experience better control of those symptoms simply by use of their mobile phone or tablet. With portable devices becoming a more and more common part of everyday life, use of these trends and the devices' data sharing capabilities to an advantage by those addressing the problem of servicemember suicide could yield positive returns. Many of these applications (apps) are available on several different platforms and are being developed with expanding functionality. For example, apps are available for the purpose of digital interactive behavior control techniques or even "coaching" apps that give those that need it the training to help them learn how to better cope and modify negative thought processes[5]. These options hold potential beyond the obvious; servicemembers and veterans whom would otherwise experience shame or guilt in seeking treatment can do so while maintaining their own measure of privacy. These applications can also be self-paced and renew a sense of self-pride and ultimate meaning by letting the individual empower themselves. Supportive policies would also be pertinent in maintaining zero-cost app options as well. When preventing the unnecessary loss of life in those who serve, we should look for any option or tool possible that can be used,

adapting technology as it becomes a more integral part of delivering care. Social media platforms can also be involved with the reduction of servicemember suicide, with their wide-reaching ability to spread information quickly; these companies could be consulted to create public information campaigns about the importance of being aware of signs and symptoms of suicide, as well as spreading information about the normality of seeking care for mental health. Understanding the generational barriers regarding the use of digital mental health care delivery will also need to be attended to in order to prevent older generations of veterans from being forgotten. Technology is continuing to be integrated into more corners of daily life and it may be utilized as a tool in the preservation of it in the process.

Numerous medications are commonly used in the treatment of several mental health conditions, many with effective results. These substances may not only hold positive benefit for civilians but for servicemembers and veteran's as well. A study manuscript published in 2012 described data regarding the reduction in suicide when a veteran patient was prescribed selective serotonin reuptake inhibitors (SSRI's) such as sertraline or fluoxetine. Noted in the same article is a figure showing an upward trending in the risk for completed suicide post 270 days, leading to the thought that reducing suicide is not as simple as pharmacotherapeutics (Figure 2)[41]. Helping veterans to understand the importance of medication compliance presents another opportunity for suicide prevention, as these medications need to be taken consistently. Another point to consider in the use of medications is cost. This also intertwines with helping servicemembers to fully understand what benefits, specifically health benefits, they are entitled to. Several of these medications can be on their own expensive to purchase, which in turn could affect medication compliance. Antidepressants are not the only pharmacologic tools that can reduce suicide occurrences. Another study from 2012 was conducted using data from 5 different

VA hospital systems revealing that the combination of lithium and divalproex (two commonly used mood stabilizing medications) held the potential for a suicide protective effect for patients with an established mental health diagnosis. The authors went on to note the return of suicide risk due to significant lapses in medication adherence; an area of medicine that is constantly trying to be improved upon whether the patient is military/former military or not[40]. Most would agree that when debating between taking a medication and increased suicide risk, a pill or two is not a big deal; however, another implication is the potential for long-term organ and even systemic side effects from both anti-depressant and anti-psychotic medications. Pharmacologic therapy is only one tool in the drawer to solving servicemember suicide.

Some servicemembers choose non-pharmacologic therapy simply in order to sleep. These habits don't always result in a diagnosed substance use disorder. Choosing to ingest substances that alter function to the extreme levels in order to facilitate sleep is a common one among servicemembers and veterans. When those who have experienced trauma struggle with insomnia in parallel with other developed psychiatric disorders; the inability to sleep properly not only impedes progress, it has been shown to indirectly increase the risk for suicide due to exacerbation of other diagnosis[1]. Having to relive a memory of a negative magnitude few endure every night does not pose well for preventing suicide. That individual begins to feel that they have to choose the lesser of two evils; on one hand they begin to fear sleep as they will be thrown back into a negative experience and on the other they have a cheap, over-the-counter "medication" that they can purchase without going to a doctor or being subjected to stigma in the public eye. There needs to be more effort made to ensure more than two options are presented. A study published in 2011 found that cognitive behavior therapy, CBT, was able to help those with persistent sleep problems; however, these problems began to return after 6 months[45]. In order to

keep the insomnia symptoms from continuing as a chronic additive to the proverbial suicide risk fire; periodic maintenance of CBT could save lives. Interestingly, individuals needing care for PTSD and depressive symptoms, both risk factors for suicide attempts and/or completions, were more apt to seeking care when that care was more focused on treating insomnia. Insomnia sounds like something a "normal" person would seek care for, thus again avoiding the outward stigma and inward shame. Even those with PTSD and depression that were not experiencing insomnia were more likely to seek treatment so as the treatment was framed for insomnia instead[8]. A vast majority of servicemembers are not opposed to improved sleep, thus if facilities adapt the way the care is referred to, those that need it may be more likely to make and attend appointments. Those at risk for suicide don't want to be viewed publicly as "crazy"; presenting treatment options in a manner that reduces even self-judgement could in turn reduce the number of self-deaths.

Not many people would view sleep as a positive daily activity when each attempt results in visually having to relive traumatic experiences. Having to try and get rest while one's mind continues visualizing people you once knew and cared about violently lose their lives puts a sour taste on sleep. Recent research has attempted to examine the effectiveness of eye movement desensitization and reprocessing (EMDR) therapy in those suffering from PTSD with or without co-occurring insomnia. EMDR is a developing treatment in which a licensed therapist verbally works with a person in systematically recalling the traumatic experiences of an individual while also physically guiding them through methodic eye and hand movements. A comparison study compiled in 2018 demonstrated the effectiveness of EMDR therapy when used in several varying regimens, and that the positive treatment effects were still present at the one-year follow-up[50]. Additionally, a position paper authored in 2018 stated that the American Academy of Sleep

Medicine (AASM) supported the use of EMDR for PTSD associated nightmare disorders[51]. Vietnam veterans showed a reduction in nightmares post-treatment with EMDR, lending positive evidence that this developing treatment option can have a lasting impact on those experiencing nightmare related PTSD even with many years since exposure. EMDR as an early intervention shows promise in reducing the number of suicides of those who serve with little to no reported side effects and should be researched and honed further.

Suicide may on the surface be seen as a solo act; however, for servicemembers it is a mentally infiltrative plague infecting each person around the lost left behind. Bereavement is needed by many who experience loss yet those who serve can take on more than what they intend to. With each funeral service of a former friend and fellow servicemember attended, an added amount of guilt, depression and shame build internally. An article in 2017 stated that 47% of veterans had a lifetime exposure to suicide and associated increased rates of anxiety, depression, PTSD, and prolonged grief. These were people that trained alongside us, went through the things we went through, could understand our thoughts better than any therapist. The feeling of guilt becomes overwhelming as those left behind attempt to understand what could have been done to prevent the loss. The same article also noted that 51% of veterans who had lost a friend to suicide were also associated with suicidal thoughts and behaviors[7]. This statement lends credibility as to just how heavy the weight of guilt can be. The level of complicated grief that these individuals are involved in greatly interferes with their ability to function to their self-standards both mentally and physically[42]. The increased chronicity of the complicated grief presents greater risk for developing permanent psychiatric conditions such as depression and insomnia, thus leading to an increased risk for suicidal ideations and attempts themselves. Things such as certain foods or songs become sources of pain as individuals associate them with the lost.

Pictures are now difficult to look at as they lead to depressive symptoms rather than nostalgic laughter. Another study conducted in 2017 even found that the more suicides an individual had been exposed to, the greater the risk of suicidal ideation. This would suggest an additive effect, with the sting of death causing more and deeper damage with each occurrence. Utilization of a "postvention" process may be needed to help those being exposed with the sequelae[19]. Suicide exposure needs to be triaged higher in servicemembers due to exposure behaving in a manner similar to a communicable disease. This author has been exposed to three servicemember suicides to date and can attest to the aforementioned.

Often disease processes are referred to as being genetic in nature, posing varying amounts of hereditary manifestations in future generations. Suicide has been examined in literature for many years now as to its potential for heritability; however, when it comes to those who have served in the military, suicide seems as though it holds the potential for being a generationally acquired condition as well. Correlation studies have shown that children and teens of parents with PTSD are more prone to develop mental and behavioral disorders than those of parents without PTSD[53]. It then becomes difficult to place fault in the child when their lives were altered at such crucial times. This life changing event becomes an emotional snowball, generating an avalanche of sequelae as years pass. These acquired psychiatric conditions place the next generation at a greater risk for suicide as well. Preventing a suicide in someone who served could not only save one life, but also their child's life as well. Exposure to suicide may soon need to be added to screening questionnaires for well-child checks and visits, especially for those with military family members, if we don't make progress on servicemember suicide.

Death can damage a person's spiritual outlook, whether from a deployment or the suicide of someone close. The gruesome mortality that members of the armed forces are exposed to can

cause detrimental damage to their spiritual health, adding to the risk factors for suicide. Coming to terms with an individual's deity on the reasons for the death turn into a lifelong internal discussion. "Why them and not me?" Having to do things, as well as having to comprehend things the average civilian would perceive as inhuman generates complicated questions regarding personal morality, the divine, one's ultimate meaning, interpersonal abilities, and self-doubt. The "kill or be killed" moment that occurs in the situations of battle are pivotal for many. For thousands of years, combat has existed in the presence of religious differences, yet the occurrence of just one action performed within combat can deter one from involvement with anything worship related. Grappling with the knowledge that one's actions ended the life of another human can punch holes in the soul that are present forever. Internal spiritual devotion quickly transforms into anger and loss of ultimate meaning. A study composed in 2018 found that the absence of ultimate meaning with regards to spiritual health was of the most prognostic value of suicide risk[12]. In other words, being involved with the violence of war arises questions such as "what's really the point?" or "Is this it?". Others begin to detach emotionally and assume they remain alive by pure luck. A traumatic life experience shows individuals just how quickly and bluntly life can end. It happens faster than a person can ever be ready for, and the imagery is more permanent than a bone-deep tattoo. According to survey data compiled in a 2014 study aiming to evaluate the differences between veteran's suicidal ideation with spiritual health and those with suicidal ideation with poor spiritual health showed potential for novel means of suicide prevention by maintaining religion and spiritual health[34]. From the perspective of stopping the loss of ultimate meaning leading to possible suicide, providing therapy and direction for the "soul" in the form of spiritual health also is received better by veterans than "mental health". Learning to pray again may be a more agreeable option to some rather than therapy

sessions. This also points out that it does not take a healthcare providers title or degree to save a life, with religious leaders and community members also able to lower the suicide statistics. Servicemembers are susceptible to stigma that not only affects their "soul", but also their physical health as well[30].

With the loss of ultimate meaning in too many uniformed people, what follows can turn into physical neglect. This can manifest in many ways such as finding comfort in certain foods or abnormally high cortisol levels. Something as chronically stressing as military duty can surface as metabolic syndrome, leading to an increased body mass index (BMI). "Why should I take care of myself physically when it can end like that anyways?" When a servicemembers self-image begins to decline in combination with the loss of ultimate meaning, suicide is a lurking hazard. A study conducted in 2016 in a cohort of Iraq and Afghanistan veterans found that as an individual's BMI increased, so did their Beck Suicidal Ideation scale scores (Figure 3). As BMI increases and Metabolic Syndrome develops, physiologic changes become evident. The authors went on to note that not only does BMI concurrently increase risk for suicide when combined with PTSD, but health-promoting behaviors can even stave the connection between PTSD and suicidal ideation[25]. Having weight-lifting, running, or competitive physical fitness goals also aids in maintaining not only self-pride; it also upholds the internal feeling of ultimate meaning as well. Helping these individuals maintain involvement in physical activity can not only prevent the adverse sequelae of metabolic syndrome, it has been documented in literature as reducing depressive symptoms, increasing cognitive function, and even maintaining optimal performance of the immune system[32]. Physical therapy my not only have the ability to post-operatively or post-injury rehabilitate; it may also be able to reduce the number of servicemember suicide when structured correctly. Exercise in general holds a wide range of potential positive impacts on those

with PTSD, as well as sleep-related problems. In turn, these benefits can also reduce the risk for developing substance abuse disorders, as sleep is occurring more naturally. It has also been recently looked at for having the ability to create a "desensitization of internal arousal cues", funneling the internally withheld aggression into positive physical output[54]. It would be interesting to see studies involving the combination of EMDR therapy with physical therapy programs since both are shown for increasing desensitization capabilities in individuals with symptoms and diagnoses related to PTSD. With physical fitness being a daily task for those who serve, finding adaptive ways to incorporate exercise into treatment may help reduce the suicide rate.

Many individuals see the military as a positive life option post high school, whether to help pay for college, learn valuable skills, or become a part of a team when they otherwise have never had the chance to be a part of one before. This author can attest to all three. Reminiscing on just how many opportunities have been presented as a result of the decision to enlist swells an intense sense of pride. A person enlisting in the military at such a young age may be at an increased risk for suicide simply based on the notion that their rank is lower than others. Someone 18 years old has potentially not been exposed to stressors of even bill-paying, law-abiding civilian life yet; let alone a life in the military. Executive decision-making skills are still being developed and understood. In a composition from 2014, enlisted soldiers with less than 4 years of service were at a much greater risk for suicide than those enlisted personnel with greater than 4 years[46]. This would pose several follow-up questions which warrants investigation. Is this trend due to financial hardship and its potential during time in the lower ranks? At these ranks, the compensation is not impressive, and individuals will not expect to be owning a Ferrari anytime soon. Is this data a result of the amount of newly experienced stress during the early

career years? Lower ranking individuals are constantly being tasked, trained, and berated by those above them. Are the number of suicides higher due to a lack of education? A high school curriculum does not contain the materials that would arm graduates with knowledge pertaining to the stressors of the military. Recruiters are all too aware of this and are well equipped to present "cool" and "enticing" videos of warriors doing uncommon action involved tasks like jumping out of airplanes, firing large artillery weapons and figures of how much money they will get as a bonus if they sign up. As eluded to many times within this manuscript; any questions around the loss of life that have the potential to be answered should pursued.

While many individuals remain in the military as a career choice, others either do their best to continue with their civilian employment while serving part-time, or they look for employment shortly after completion of their term agreement. Employment may be another underexamined subject in the textbook that is servicemember suicide. Intuitively, if a serving individual is unable to retain his or her job, this not only negatively effects their pocketbook; it is another link in the chain of risks for the worsening of mental health condition symptoms involved with diagnosis like PTSD and depression. According to a study compiled in 2019, those battling things such as PTSD, depression or traumatic brain injury experienced a significant increase in unemployment[57]. Whether or not this relationship exists due to employers containing systemic barriers to working with individuals with military-related mental health problems; the stigma for individuals is too much to bear is a question worth asking. For servicemembers, having a job is not just a means by which the groceries are obtained; it is a palpable source of ultimate meaning. Assuming the servicemember was able to obtain a restful night's sleep as discussed earlier in this composition, their employment may be the remaining piece of their life

that gets them out of bed in the mornings and prevents them from succumbing to sequelae like depression and even suicide.

Many civilian employment opportunities come with specific benefits packages that are offered to an incoming employee. For servicemembers, these benefits, more specifically health benefits post deployment and/or contract completion, represent an added incentive when joining the armed forces. The health benefits, however, can be contingent on the discharge status that is filed or listed on an individual's service paperwork. Approximately 16% of servicemembers do not receive an "Honorable" discharge status, directly affecting their eligibility to receive benefits related to mental health and substance misuse[58]. In other words, a minor incident of misconduct which could have represented an indication for needing help in and of itself, holds the potential to bar that individual from benefits that may have stifled follow-on actions and prevented their suicide. Civilian employees have an advantage in this way as typically they are able to choose a health benefits package early on in their employment. Imagine that the minor infraction that led to a "non-honorable" discharge was an alcohol related incident like a DUI; an individual in this situation already may be dealing with a substance use problem and now they won't have access to the help and care necessary to keep them from self-harm. Another example of a situation posing improvement potential; leadership can aid in the reduction of servicemember suicide by more intricately reviewing the reason for the minor misconduct and being very hesitant to stamp a label on someone's service that will negate benefits.

Money is an object of life that is a constant source of stress no matter if a person is a civilian or servicemember. That being said, when the highest number of armed forces suicides are occurring in the 18 to 34-year-old demographic, which is also a time when financial stability is at its most vulnerable. According to the publicly available 2019 military pay charts, an enlisted

soldier at the rank of "private/E2" earns just $1,884.00 dollars per month; that equates to a prior-tax income of only $22,608.00 per year. To put that in perspective, the 2019 United States poverty line for a 3-person household, say a spouse and one child family, is $21,330.00. As honorable as the choice is to serve one's country, it is not a financially lucrative career choice; especially when enduring the early years. A 19-year-old who enlisted only a year ago is already at an increased risk for suicide as previously noted; adding the stressor of keeping a bank account in the black can add fuel to the suicide fire. To this end, one simple post-deployment lecture may not be enough for a young adult to learn about financial maturity. A randomized controlled trial conducted in 2016, presenting differences in veterans when subjected to a money management program stated that "$AFE intervention was associated with significant increases in money-saving behavior, employment, and perceived empowerment as well as significant decreases in debt, psychiatric symptoms, and homelessness"[52]. Meeting the health care needs of those in uniform must extend beyond just physical health when it comes to preventing unnecessary loss of life. If we can aid those with psychiatric risks in achieving financial stability, we can place another brick on the wall of suicide prevention.

With military service in any branch comes the possibility of deployment, sometimes to an area in which violent combat is a commonplace. Those who are subsequently deployed and exposed to the gruesome reality of the results of war can be subject to higher suicide rates than other servicemembers, but most definitely civilians. Civilians of course can be exposed to a traumatic death, like a car accident for example; however, this author would argue that these instances remain still easier to cope with because they were just that, an accident. Situations in which humans are intentionally and methodically killing other humans can elevate the mental trauma to another level. An article published in 2018 reviewing several concepts around the

relationships between deployments, combat experience, and suicide found mixed results when it came to the number of deployments and suicide; however, the activities and actions during the deployment served as better indicators. For example, drone operators and those occupying positions executing death causing actions had a higher suicide rate than civilians, and those involved in more direct, face-to-face firefight-like experiences had even higher rates yet[47]. Being able to clearly describe the scene of blood and viscera shredded and scattered from a roadside explosive device is as haunting with each day as it was the moment it happened. The higher instances were associated with feelings of deep moral injury, guilt and shame related to witnessed or completed actions within the combat experience. The knowledge that one remains alive simply due to timing, in mere seconds, implants a pellet of guilt that can never be removed. As previously mentioned in this work, yearly slideshow presentations with zero human emotion attached to them hardly suffices as suicide training. Servicemember suicide trends may be more effectively reversed if sustained, integrated and even interactive programs were implemented for those returning from a combat-related deployment. This research, while difficult to execute and compile, could shed light on intervention options when it comes to preventing servicemember suicide post-deployment. Screening tools and discussions between providers and servicemembers should be catered in a fluid, adaptable tier-like fashion; more specifically and effectively meeting the needs of those with closer involvement with and in combat.

Combat exposure and the future of risk of suicide also carries the possibility to be predicted simply by the servicemembers job selection or military occupation specialty (MOS) at the time of joining the armed forces. This is also true in the civilian employment realm as certain career selections have been shown in research to hold a higher potential for the development of suicidal ideation than others. An individual choosing to serve in a support role may not have as

high of a risk of suicide as those fulfilling combat job functions, thus creating differences in how care should be weighted and rendered to those serving. It is also noted that recruiters are routinely given data on specific positions that are experiences shortages, thus biasing how positions of various nature and risk are presented to younger individuals. To be clear, this is not to say that support roles can't battle with suicide precursor symptoms; as previously mentioned, exposure to suicide itself can increase the risk of one's own suicide. A study from 2015 found a connection between position title within the Army and suicide regardless of deployment history. It presented data that the positions of *Infantryman* and *Combat Engineer* posed greater risk of suicide than any of the examined "support" or "service-support" positions[48]. While these indicated positions could be at a higher risk simply due to a higher utilization in recent conflict, the point remains that servicemember suicide continues to be unacceptably high. The authors went on to discuss the lack of confirmed connection between number of deployments and suicide; their data was confounding in showing that those in the above described MOS positions had just as high a risk of suicide having never deployed as to those with a deployment. Another article, this one published in 2017, showed statistics pointing to an overall increased risk of suicide in combat arms in comparison to all other positions as a group. Within combat arms, it was noted that special forces (SF) individuals were shown to have a considerably lower rate than other positions. Despite having multiple, stress-intense deployments, SF soldiers lower suicide rate was possibly explained due to having a more rigorous selection process, significantly stronger unit-cohesion rates, and psychological differences both in education level and training development[49]. Research further into the correlation between shame, guilt, loss, complicated grief and depressive symptoms is needed to help distinguish these data variates and investigate ideas for improvement. This also indicates a possible route for the reduction of servicemember

suicide rates. If more MOS titles modeled their training after the effective strategies of special forces units, cohesiveness and psychological differences would begin to be present in other positions; standing to reason that preventable deaths among those in uniform would be reduced.

Another facet to complicated subject of servicemember suicide is the loss of limbs due to amputation. Deployments to combat areas, especially for MOS positions like *Infantryman* and *Combat Engineer* hold the risk of major injury. The hazards of the more recent conflicts in the Middle East regions involved the use of "improvised explosive devices" or IEDs. These homemade yet cleverly designed bombs often inflicted injuries that would cause a servicemember to lose a limb. Psychological sequelae have been shown to develop beyond even what the conflict itself can cause[59]. As mentioned, servicemembers are indoctrinated with an elevated sense of pride, and uniform standards, patches, awards, ribbons and medals intensify this. Self-image is permanently altered forever when an individual loses an extremity; this leads to high rates of anxiety and depression. In the instances of amputation, a heightened awareness for these symptoms is essential in preventing suicide. Independence is threatened and a newfound physical challenge requires learning to adapt countless corners of life that were previously subconscious tasks[60]. Fortunately, research is beginning to show the positive results of the technological advance in prosthetics. These amazing pieces of metal, plastic and carbon fiber not only allow those who serve to more closely continue to live life unaltered, they also have been shown to help prevent the psychological after effects of losing a limb; especially when combined with targeted Cognitive Behavior Therapy[61]. Often, these extremity replacements are expensive, and servicemembers must rely on in place benefits in order to obtain them. Improvement in the processes by which amputees receive the latest prosthetics along with CBT may help to reduce the trend of servicemember suicide.

Injuries sustained while part of the military are not always outwardly visible. IED's cause another problem in the form of "mild traumatic brain injuries" or mTBIs. A study published in 2017 stated that as many as 23% of US veterans who served in either Iraq or Afghanistan reported at least one mTBI episode. It went on to discuss the close connection between PTSD and depression symptoms with the occurrence of an mTBI; concluding that this specific type of injury showed increased the risk of future suicide attempts[64]. Servicemembers with documented injuries of this nature need to have care available to them that provides close follow-up due to its correlation with suicide risk. With nearly one in four of these individuals sustaining this mechanism of injury, this, therefore represents increased risk for future attempted suicide for nearly one in four as well.

Regardless of job description, military personnel are commonly trained in the realm of firearms and other basic munitions before being specialized. When referencing the MOS titles above, greater exposure to and increased confidence with firearms, often times of large caliber and capacity, is built into the repertoire of that individual's capabilities. As this relates to suicide, these servicemembers come to have an increase of three to four-fold risk[55]. Individuals with a history of intimate involvement with weapons therefore need to receive additional attention when signs and symptoms of mental conditions surface. These individuals have a trained desensitization as to the permanence of the function of firearms, with the culture of the military often fostering a positive motivation in the use of them. What are often referred to as "Range days" are commonly viewed as positive and fun; the results of these specific trainings even hold the weight of potential promotion ability. In other words, the more confident and comfortable a person is with their firearm, the higher the potential for greater rank and pay. Servicemembers of this specific demographic have an engrained level of comfortability and even numbness as to the

result when a firearm is used; which become a more common method of suicide completion, presenting a need for intervention strategies that preserve life while also maintaining individual's rights. Just as firearm safety is discussed with families at a "well-child" visit, providers charged with the care of servicemembers must have confidence in conversing about ways to remain safe with them.

As has been adamantly mentioned several times throughout this work, the necessity to professionally entertain all options for the reduction in servicemember suicide is paramount. To this point, the literature has shown potential for dogs to have the ability to lessen the impact of mental health symptoms; in this instance, namely PTSD and depressive symptoms. While the research examined focused on canines, servicemembers could benefit in a similar manner with many types of non-human companions. Having a furry friend follow one around, dependent on another for their food and water, training and exercise, as well as simple love and attention maintains a stronger sense of ultimate meaning; which is shown to be connected with spiritual health and reducing suicide ideation. While shown to not be fully capable of dissolving an entire diagnosis, addition of adjunct animal therapy or a service canine has been credited with further lessening the mental burdens of PTSD and depression (Table 3)[56]. These service animals could be considered to be an interactive, available beyond the healthcare facility, treatment that hold the potential to reduce suicide numbers. The barriers that remain include the application process in order to receive a certified service animal, as well as the high price tag. This author would argue that the psychological benefits of these companions can be available at a much lower cost simply by adopting through a local "rescue" organization. Frequently, the animals are being helped themselves, with their new owner quickly understanding their ability to create a healing partnership. More can be done to streamline the process and reduce the cost by which a service

animal can be obtained for those who could stand to benefit from a four-legged friend. Simply having a pair of non-judgmental eyes staring at one can not only induce an emotional blanket of calm; but also instill a renewed sense of task-oriented purpose as most dogs require work and training.

Conclusion

The large amount of literature and range of subjects surrounding the reasons for servicemember suicide numbers being unacceptably high would, on the surface at least, make it seem as though the problem is in the process of being fixed. Reiterating the purpose of this review; it is not to discredit any of those cited herein for the work accomplished yet state in a variety of ways that the solutions are seemingly reactive and not proactive. As mentioned previously, servicemember suicide is not a new phenomenon, and this author would argue that ample time has passed without a solution. The vast majority of the included studies begin by describing the very subject matter of interest written in this composition. In other words, many are aware of the problem, and attempt to offer their unique niche of research with the hopes of contributing to a positive movement collaboration. The respect all the authors have garnered from their care and motivation to end the continued rise in a heartbreaking trend is unmatched.

With each subtopic discussed, another opportunity for improvement presents itself. Each facet with the ability to contribute to, or even prevent the loss of a servicemembers life. It is possible that any one of the areas above could represent the deciding element for an individual with suicidal ideation and intent; tipping the scale in a positive way. Furthermore, none of the discussed avenues of research should be considered less valuable than another; each equally worth pursuing in the eyes of those left behind. Organizing the areas examined into a tier-like fashion, with some categories demanding more research attention than others would deem the

suicides of those enduring the less talked about factors of less importance than others. It is crucial that any concern or concept involved with servicemember suicide be delved into even if only one obituary can be prevented. Also, collaboration on a much greater scale is arguably necessary, with contributors to the research understanding that while they may prefer one variable at a time; these topics are interconnected in an omnidirectional manner. In other words, a servicemember of a lower rank with a combat deployment could experience financial stress leading to many mental health symptoms like depression and insomnia; in turn decreasing one's ultimate meaning enough that suicide becomes the result. As previously noted, preventing just one of these deaths could ultimately mean preventing several.

Each individual that develops even one string in the web that is suicide deserves equally individualistic attention. While one servicemember may benefit from an antidepressant, another may need assistance with maintaining financial stability. These options for preventing suicide in those who serve should be offered in a stigma-free comprehensive and fluid manner that engages them with others, maintaining the camaraderie and task-oriented purpose they originally signed up for. To phrase it differently, this epidemic needs to be approached passionately by many, as many may be positively rewarded from their efforts. The research shows we have the ability to do something; therefore, we have the responsibility. Servicemembers should not have to exchange the opportunity to learn many life skills for the possibility of being condemned to a prematurely shortened life. Those who choose to serve already stand the potential to give the ultimate sacrifice by someone else's hand, they shouldn't need to accept the additional risk of suicide by taking an oath to their country.

An overarching thought has been present throughout the construction of this work; that many of the studies, articles, assessments, trials and research appear to be focused on small

components of the servicemember suicide problem. Whether this notion be due to the vast, seemingly overwhelming amount of parts to the puzzle, or simply in keeping within the set guidelines as to how scientific/medical questions are answered; the wordy, time-consuming, bureaucratically slow-progressing rate of solution discovery and implementation is not keeping up. The long and drawn out process in itself holds some of the responsibility for servicemember suicide. To the ones left behind, it is comparable to a firetruck only going ten miles per hour on the way to the fire; the capabilities seem to be present but getting there is taking too long. Instead of the literature being focused on replacing one broken part at a time, the communities showing interest in saving these lives need to get together and invest their ideas into an all-encompassing new model.

This composition does not only want to draw attention to the efforts being put forth in a way that presents them as failures. The servicemember suicide rate is too high, and the various reasons suggested here hint that improvement is still needed. Instead of addressing and treating mental health for a single diagnosis listed on the servicemembers problem list in a reactive manner; we need to, for lack of a better phrase, have a "hair-trigger" for initiating care and intervention when even just one of the components or preceding signs of suicide surface. Instead of treating things as they surface, active efforts need to be made before it gets to that point. For example, literature-based guidelines exist as to the optimal timeframes in which a child should be vaccinated; we know this before the child even reaches that designated age. This same concept can be applied to servicemembers. In other words, if an individual enlists at the age of 18 with little education into combat arms; assertive, comprehensive "anti-suicide" measures should be initiated for that person as soon as possible. The research has commonly shown that one area that can increase the risk of suicide rarely remains as one. Far more often mental health

in those who served does a single mental health challenge represent the "seed" that can quickly root into multiple branches of symptoms and diagnoses, each adding to the foothold of suicide ideations and actions. Those devoting themselves to reversing the trends may only get a glimpse of the "stem". Mental health in this group of people should be as comfortable and easy to talk about as what one had for breakfast. Getting over the hurdle that is stigma is but one in the race towards saving these lives. Attention to this area of medicine needs to receive just as high a priority, if not higher as others like orthopedics or infectious disease.

When contemplating how and where to place priority in order to possibly more effectively curb the number of suicides, a good and obvious strategy is to invest into those areas that statistically are most commonly associated with the suicide attempts and completions. For example, knowing that the three most common medical diagnosis linked to suicide risk are PTSD, depression and substance abuse disorders; we can do more to combat these issues. Legislation and policy must be urgently adopted in order to broaden the benefits structure for servicemembers, so as to ensure that care is present and ready whenever needed throughout life. Also knowing learning that specific age ranges and time frames of life and service (ages 18-35 and 1-4 years of service) are at greater risk, systems and personnel should be trained to be more wary of signs and symptoms. Since this age range of individuals will also have an inherently greater affiliation with technology, we can better meet these individuals needs whether they be urban or rural using telehealth strategies; not only mending the stigma and transportation voids but making care seeking behavior a common and positive experience no matter their current location. Having an easy to understand, holistic program beyond a simple briefing or class that "checks the box" in place for those returning from service that ensures that other life stressors such as housing, employment and/or financial things do not contribute to suicide risk as well. If

people don't come together and take this problem head on, the rising trend of servicemember suicide will continue to get worse.

The true intent of this work of reducing the number of servicemember suicides would not seem as thorough if it solely focused on what has and is currently being attempted; it also must offer hope and positivity. Just as in news media, a large portion of the material discusses data of a negative nature. Relatively little work has been documented on what are called "protective factors" or component differences within individuals that increase one's resilience; in this case to suicide. A journal article published in 2017, taking interest in novel options, stated "protective factors are not the absence of risk, but rather they buffer against risk to reduce the likelihood of potential negative consequences"[65]. Their goal was to show how fostering "curiosity" as character trait in military individuals held potential as a protective factor against suicidal ideation and behaviors by improving on comfortability with anxiety, increase learning and renew a desire for challenges and adversity. This study used common assessments such as the *Patient Health Questionaire-9* (PHQ-9), the *Perceived Stress Scale* (PSS4), the *Generalized Anxiety Disorder-7* (GAD-7), the *Insomnia Severity Index* (IHI) and the *Curiosity and Exploration Inventory-II* (CEI-II) in order to show how this unexplored area can help servicemembers. Adapting and expanding on studies similar to this one may not only be able to further help servicemembers with self-coping skills but also reduce the instances of suicidal ideation (Figure 4)[65]. Giving those that need it the tools to grow their curiosity will prospectively aid in restoring an individual's ultimate meaning; therefore, helping lessen preventable loss of life.

Just as many topics herein can coexist and compound the servicemembers risk for suicide, with each additional digging the mental hole deeper; so too can the positive interventions. More plainly, the options that are both established and developing can work

together to out maneuver the various symptoms of mental health precursors leading to suicide. Providing those that need it with not only pharmacotherapeutic options, but CBT, EMDR, a service animal, firearm home safety training, and benefits guidance all together. Establishing effective interventions/treatments/resources for even the less considered factors (i.e. unemployment, spiritual health, etc.) also can compound in a positive manner, with each helping those with ideation to take another step back from the cliff. The intent of this review is not to point out gaps in what is being currently done to reduce suicides within this unique demographic, but to highlight and draw attention to the high level of complexity involved. This composition would desire to leave readers with educated hope; as well as a determined conviction to want to be a part of the solution. With many teams, departments, communities and organizations already in motion against this epidemic, continuing to work together to hone the capabilities for prevention is paramount. For the brave, progress must be pursued; because even one suicide is too many.

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Appendix

Table 1. Survey-Weighted Logistic Regression OR (95% CI) of Suicide Ideation Among Veterans With Mental Illness

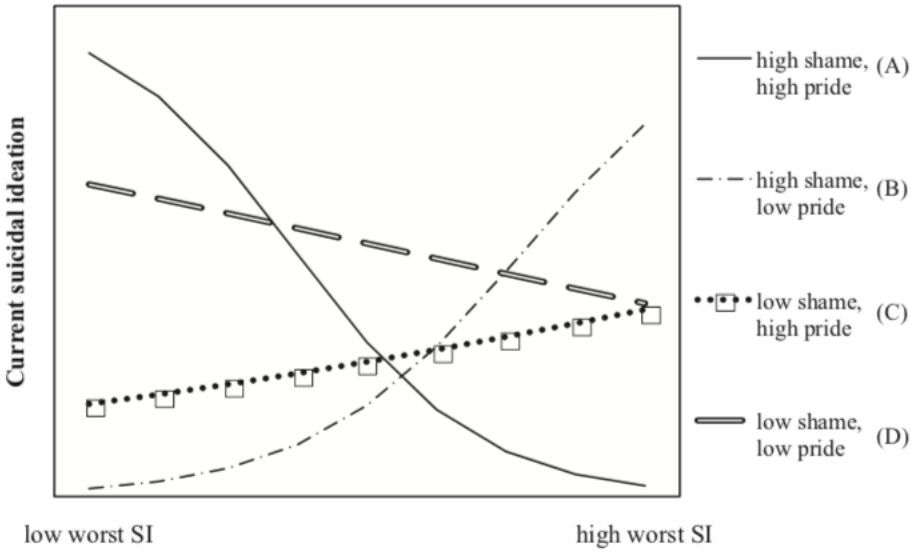
Characteristic	uOR (95% CI)	AOR (95% CI)[a]
Age, years (ref=18–34)		
35–49	1.14 (0.78, 1.66)	1.30 (0.82, 2.04)
50–64 years	1.02 (0.65, 1.61)	1.50 (0.84, 2.69)
≥65	0.84 (0.46, 1.54)	1.49 (0.63, 3.55)
Male (ref=female)	1.29 (0.77, 2.16)	1.43 (0.81, 2.53)
Race/ethnicity (ref=non-Hispanic white)		
Black/African American	0.77 (0.37, 1.59)	0.65 (0.29, 1.46)
Hispanic	1.54 (0.69, 3.42)	1.34 (0.59, 3.06)
Other	0.71 (0.32, 1.55)	0.56 (0.21, 1.46)
Currently not married (ref=currently married)	1.30 (0.85, 1.99)	1.15 (0.73, 1.80)
Poverty level (ref=≥200% FPL)		
100%–199% FPL	1.37 (0.84, 2.23)	1.23 (0.77, 1.97)
<100% FPL	1.54 (1.00, 2.39)	0.97 (0.53, 1.75)
Participated in governmental assistance program (ref=no participation)	**1.65 (1.12, 2.43)***	**1.66 (1.06, 2.58)***
Education (ref=college graduate)		
Some college	1.16 (0.69, 1.97)	1.05 (0.63, 1.74)
High school or less	1.15 (0.66, 2.01)	1.02 (0.58, 1.80)
Currently not employed (ref=currently employed)	1.12 (0.81, 1.54)	1.04 (0.65, 1.64)
Currently not insured (ref=currently insured)	1.27 (0.79, 2.04)	0.90 (0.53, 1.51)
Presence of CVD (ref=no CVD)	0.80 (0.54, 1.17)	0.81 (0.51, 1.30)
Past year illicit drug use (ref=no past year illicit drug use)	1.37 (0.96, 1.97)	1.03 (0.71, 1.50)
Past year alcohol dependency (ref=past year alcohol dependency)	**2.29 (1.39, 3.76)****	**2.03 (1.20, 3.42)****
Ever smoker (ref=never smoker)	0.84 (0.51, 1.38)	0.67 (0.41, 1.09)
Strongly disagree/disagree to religious influence in decisions (ref=strongly agree/agree)	1.08 (0.70, 1.66)	0.96 (0.62, 1.48)
Unmet mental healthcare need (ref=no unmet mental healthcare need)	**4.14 (2.80, 6.11)*****	**4.11 (2.74, 6.17)*****

Source: National Survey on Drug Use and Health, 2008–2013.
Note: Boldface indicates statistical significance (*$p<0.05$; **$p<0.01$; ***$p<0.001$).
[a]Model adjusted for survey year (data not shown).
CVD, cardiovascular disease; FPL, federal poverty level; uOR, unadjusted OR.

Table 2. Generalized regression coefficients predicting severity of current suicidal ideation.

	B	SE	*p*
Depression	0.078	0.032	0.013
Hopelessness	0.934	0.595	0.117
Worst SI	−8.820	3.351	0.008
Shame	−0.211	0.103	0.041
Pride	−0.401	0.233	0.085
Shame × pride	0.017	0.006	0.003
Shame × hopelessness	−0.009	0.011	0.427
Shame × worst SI	0.224	0.081	0.006
Pride × hopelessness	−0.002	0.033	0.940
Pride × worst SI	0.385	0.178	0.030
Pride × shame × hopelessness	< 0.001	0.001	0.522
Pride × shame × worst SI	−0.010	0.004	0.021

Note: Regression coefficients for negative binomial distribution; SI = suicidal ideation.



Slope difference tests

Pair of slopes	t-value	p
(A) and (B)	2.360	.021
(A) and (C)	2.814	.006
(A) and (D)	4.568	.000
(B) and (C)	1.745	.086
(B) and (D)	2.263	.027
(C) and (D)	0.905	.369

Fig. 1. Form of the three-way interaction of worst-point suicidal ideation × shame × pride, with slope difference tests. Note: "high" = two standard deviations above the mean value, "low" = two standard deviations below the mean value.

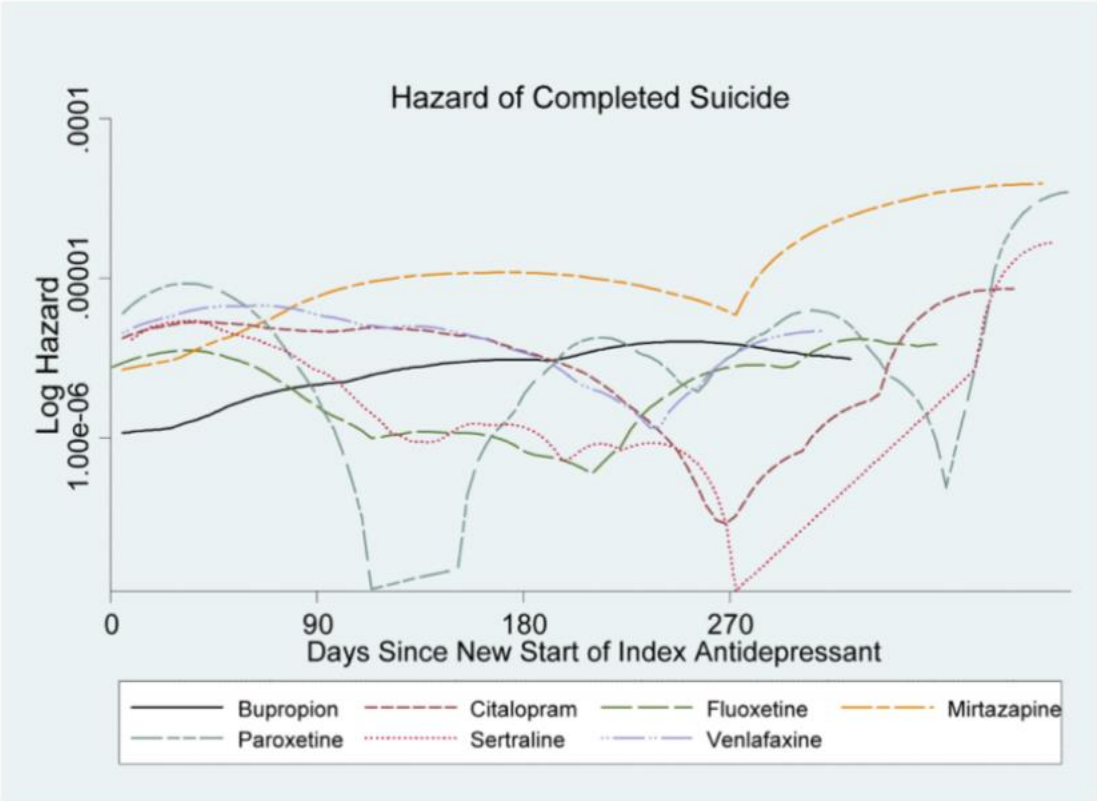


Figure 2. Log hazard of completed suicide over the exposure days since new start of index antidepressant**.**

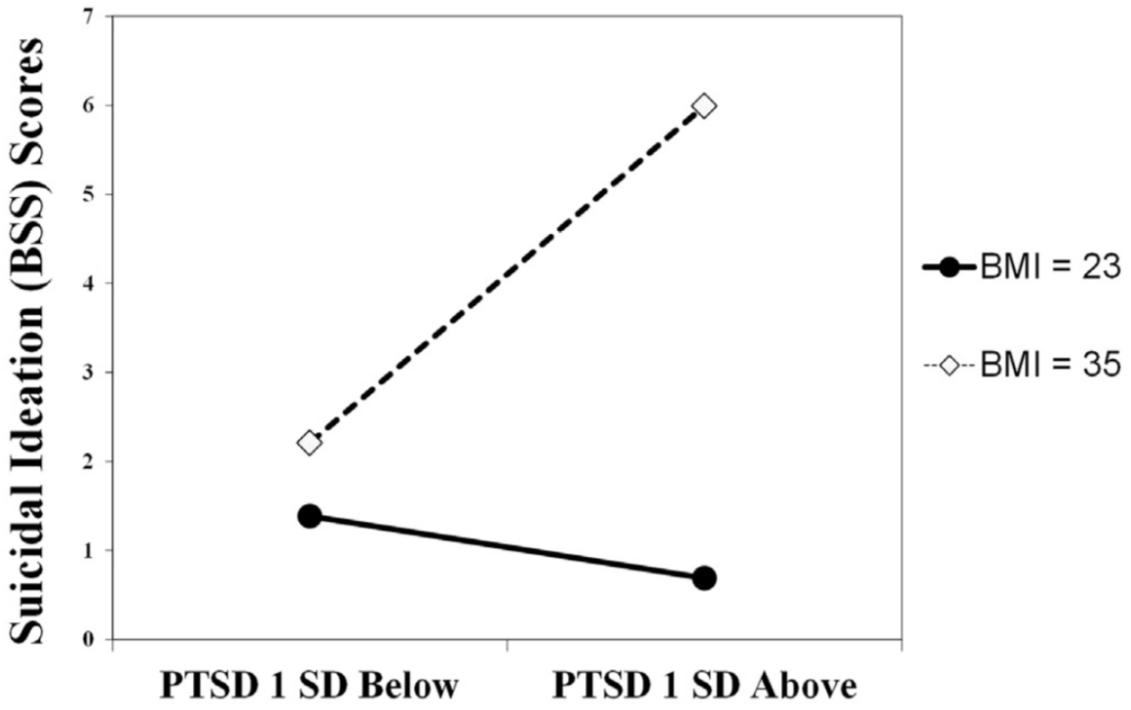


Figure 3: Plot of BMI and PTSD Symptoms Interaction Predicting Suicidal Ideation among Iraq and Afghanistan-era Veterans (N1⁄4130). NOTE: BMI1⁄4Body Mass Index; BSS1⁄4Beck Scale for Suicidal Ideation; PTSD Posttraumatic stress disorder symptoms (measured using the Clinician Administered PTSD Scale).

Table 3. Longitudinal comparison of PTSD Checklist (PCL) scores over time within participants

		Total PCL			Re-experiencing (subscale B)			Avoidance (subscale C)			Arousal (subscale D)		
Condition	***n***	***M* (S.D.)**	***b***	***d***	***M* (S.D.)**	***b***	***d***	***M* (S.D.)**	***b***	***d***	***M* (S.D.)**	***b***	***d***
Waitlist													
Baseline (application for dog)	60	69.7 (8.7)	–		19.8 (3.4)	–		28.3 (3.9)	–		21.6 (3.3)	–	
During waitlist [a]	66	66.3 (11.7)	−2.60	−0.32	18.4 (4.6)	−1.19	−0.35	27.1 (5.0)	−0.10	−0.27	20.9 (3.4)	−0.43	−0.34
Before dog placement [b]	33	70.7 (10.7)	1.65	0.11	19.7 (3.6)	0.01	−0.03	29.3 (4.8)	1.26	0.23	21.7 (3.4)	0.39	0.04
Service Dog													
3-weeks after dog placement [b]	35	47.9 (11.7)	−21.36***	−2.11	14.6 (4.1)	−5.17***	−1.38	18.2 (5.0)	−9.94***	−2.25	15.1 (4.3)	−6.25***	−1.43
Follow-up [a]	74	58.2 (13.1)	−11.54***	−1.03	16.5 (4.3)	−3.28***	−0.85	23.2 (6.2)	−5.17***	−0.98	18.5 (4.3)	−3.08***	−0.90

PTSD, posttraumatic stress disorder; n, sample size; M, mean; S.D., standard deviation; *b*, unstandardized coefficient (reference category: baseline), *d*, effect size,

*, $p < .05$;

**, $p < .01$;

***, $p < .001$

[a] Data from cross-sectional between group comparison at a single time point.

[b] Training consisted of a 3-week period on site at the service dog provider.

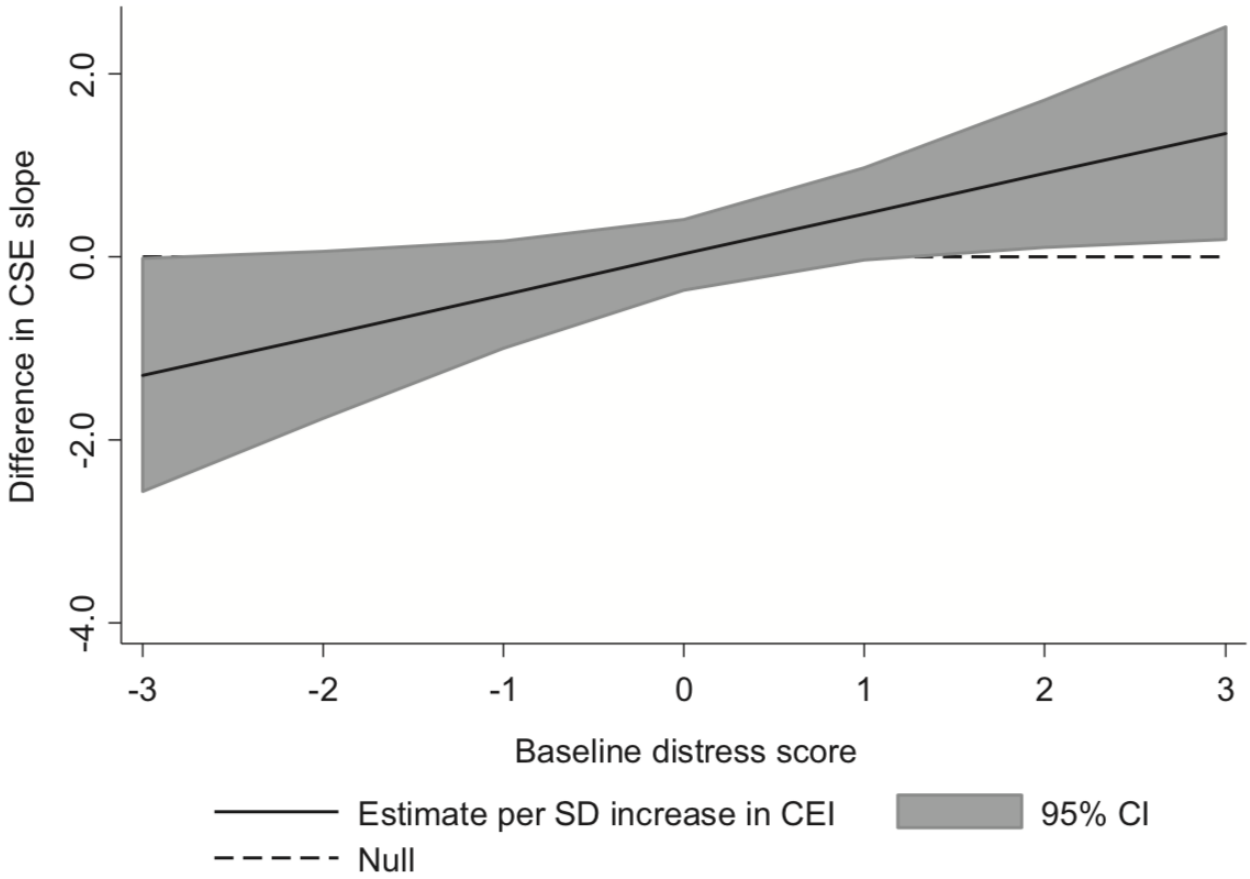


Figure 4: Difference in the rate of change of coping self-efficacy associated with one standard deviation increase in curiosity, by level of baseline distress. Legend: CSE=coping self-efficacy; CEI=Curiosity and Exploration Inventory; CI=confidence interval; SD=Standard Deviation.