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Do Predictive Factors for Post-Traumatic Stress Disorder Elucidate the Variable Prevalence Rates Between National Guard/Reserve Soldiers and Active Duty Soldiers?

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DO PREDICTIVE FACTORS FOR POST-TRAUMATIC STRESS DISORDER
ELUCIDATE THE VARIABLE PREVALENCE RATES BETWEEN NATIONAL
GUARD/RESERVE SOLDIERS AND ACTIVE DUTY SOLDIERS?

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ABSTRACT

Since September 11th, 2001 The United States Arms has deployed a significantly larger percentage of National Guard and Reserve (NG/R) forces to combat zones in support of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF). The United States Office of Veterans Affairs has reported increased suicide rates and suicide risk for Post-traumatic Stress Disorder (PTSD) for Soldiers deployed in support of these conflicts in particular. Few studies have assessed the relationship between military component (Active Duty (AD) vs. NG/R), and PTSD prevalence and risk factors but many of studies that exist have reported higher rates in NG/R Soldiers as compared to AD Soldiers. I sought to identify risk factors that make NG/R Soldiers more vulnerable to PTSD in a sample of 11 Army NG/R and AD OEF/OIF veterans. PTSD Prevalence rates were similar between components, but several predictive factors were significantly correlated with PTSD for NG/R veterans. In my thesis I identify and discuss the possible implications for these specific vulnerabilities.

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INTRODUCTION

As America withdraws forces from the War on Terror and more veterans return to the homeland every month, we begin to observe the aftermath that combat exposure has on our Soldiers. The number of veteran suicides has been increasing yearly since 2001 [1] and Afghanistan and Iraq war zone veterans with mental disorders such as Post-Traumatic Stress Disorder (PTSD) are at increased risk for suicidal thoughts and acts [2]. Since 2008 deployment time and combat zone exposure time has increased for veterans [3], and increasing Soldier combat time increases their likelihood of being exposed to mental disorders like PTSD [4]. As more soldiers who have spent greater amounts of time in combat zones are returning home, the rising prevalence of PTSD is a major concern in our nation's military [5].

Post-Traumatic Stress Disorder Defined

Post-Traumatic Stress Disorder is a mental illness that can arise in anyone as a result of experiencing a lethal or traumatic event [5]. It was first regarded as a psychiatric disorder in 1980 when it was added to the third edition of the Diagnostic and Statistical Manual of Mental Disorders 3rd ed. (DSM-III) [6]. DSM-III distinguished PTSD from other mental disorders by stating its etiology arose from an external traumatic event rather than a congenital individual disorder [6]. The psychological aftermath of exposure to the traumatic event(s) and the development of specific characteristic symptoms are essential key features of PTSD. In general, these include exacerbated feelings of intense fear, helplessness, anhedonia, and restlessness [7]. The DSM-III classified PTSD as an Anxiety Disorder; however the latest Diagnostic and Statistical Manual of Mental Disorders 5th ed. (DSM-V) criteria classify the disease as a Trauma-and Stress-Related Disorder. This means disease onset must have a temporal relationship with exposure to a traumatic event [8]. The DSM-V has eight criteria for the diagnosis of PTSD. Criterion

A is necessary for any diagnosis of PTSD while criteria B-E involve the psychological and behavioral related symptoms to Criterion A.

Identifying exposure to a "traumatic event," Criterion A, is the key to understanding the clinical diagnosis for PTSD. Currently, DSM-V defines a traumatic event as "exposure to actual or threatened death, serious injury, or sexual violence [8]." Exposure to traumatic events can occur in multiple variations including the following: direct experience to trauma, witnessing others experience trauma, learning about events that happened to close relatives or acquaintances, or experiencing repeated exposure to apathetic circumstances of traumatic events. The features of the event predict the development and severity of the disorder [8].

Involuntary recollection of events (Criterion B) that dominate the psychological state of mind is the most common symptom of PTSD. Event recollection occurs in multiple forms including memories, dreams, flashbacks, or psychological or physiological reactions to cues that mirror the traumatic exposure [8]. Criterion C involves persistent avoidance of potential stimuli that could be associated with the traumatic event [8]. In extreme cases agoraphobia persists because the PTSD victim is afraid of confronting potential stress triggers of the event [6]. Negative cognitions and mood depressions fall under Criterion D; these include erroneous conclusions about the PTSD victims themselves, others, and the world around them [6]. Other symptoms of Criterion D include self-blame, event amnesia, diminished interest in previously enjoyed activities, isolation from the company of others, and inability to experience positive emotion [8]. Criterion E is the final behavioral change related criterion and involves alterations in arousal or reactivity. These symptoms are more closely related to those of common anxiety disorders [6]. Indicators include irritability, recklessness, sleep disorders, hypervigilance, and self-destructive behavior [8].

The final three criteria of the DSM-5 PTSD checklist involve technicalities for the aforementioned symptoms. Criterion F states that duration of disturbance (C-E) must be present for at least one month, and G states that the disturbance must cause distress or

impairment in social or occupational activities of daily living. Finally, Criterion H requires that the disturbance is not attributable to physiological effects of external substances [8]. Though the criteria for diagnosis of PTSD are long and explicit, the prevalence is still an alarming rate particularly among combat veterans.

Combat Veterans and Risk for PTSD

Combat veterans are at the highest risk of exposure to all the aforementioned types of traumatic events in Criterion A, therefore putting them at the greatest risk for PTSD [4, 5]. In addition, current literature shows higher prevalence estimates for combat veterans as a subgroup compared to the average population. Meta-analyses and critical reviews on the point prevalence of PTSD in combat veterans report prevalence rates from 4-18% [4, 9, 10]. In comparison, national estimates of PTSD point prevalence and lifetime prevalence are 6.3% and 7.3% respectively [11]. Identifying risk factors may provide an understanding for why some people exposed to traumatic events develop PTSD and others do not. Several studies have correlated internal and external factors that may increase risks for PTSD.

Predictive Factors for PTSD

Generally, risk factors for PTSD are grouped into three categories: factors inherent to the individual that experienced the traumatic event, factors related to the traumatic event, and factors that occurred after the event [4]. Factors inherent to the individual are characteristics that the individual possesses prior to exposure to the traumatic event. This can include prior traumatic experiences, existing psychological disorders, or traits associated with an individual's character such as resiliency. When studying combat related trauma, resilience seems to be the most relevant measure. A meta-analysis published in 2008 comparing over 2,500 studies of PTSD indicated that previous exposure to trauma was not a significant predictor of the development of PTSD (r = .17) [12]. Additionally, the analysis showed that experiencing prior trauma was more closely associated with PTSD when the trauma was noncombatant or not typically experienced in

combat environments [12]. A prior history of psychological disorder is also assessed in the Ozer et al meta-analysis. In general, having a prior psychological adjustment has a small effect on the development of PTSD (r = .17). Moreover, this relationship was more significant when the traumatic event involved interpersonal violence rather than combat exposure [12]. In contrast, individual resilience is considered an important factor contributing to an altered (right word? Additional? Increased?) risk for combat related PTSD [13-15].

Resilience.

Resilience plays a role in decreasing the negative effects of trauma, especially in military populations [15]. It is important to note that resiliency is not simply the opposite of a risk factor but rather an intricate and inherent process that leads to protection from the disease. It is an attribute inherent to the individual and thus encompasses both psychological and biological traits that one may possess and use as a mechanism to deter the pathology of PTSD [16]. Additionally, resilience can be a risk buffer by mediating the effect of other predictors of PTSD such as social support or unit cohesion [15]. The protective effect of resilience has been recorded in veterans of the post-911 era. Generally, a higher resilience rating is associated with lower PTSD symptoms [17] [15, 18].

When assessing predictive factors for PTSD among combat veterans, factors related to the trauma-causing event are conditions of the deployment or combat experience. A Soldier's combat experiences during deployment involve direct exposure to traumatic events that pose immediate danger to physical health or survival [19]. There is a known effect between combat experiences and the development of PTSD but it is an indirect association mediated by perceived threat [19]. A Soldier's perceived threat, or concern about safety and survival, has reaped attention from multiple studies as being more directly associated with PTSD than actual combat experience [19-22]. Individuals with the perception that their safety or survival is endangered have higher risks for PTSD [12]. Additionally, a Soldier's sense of preparedness prior to battle can moderate the relationship between perceived threat and combat experiences. Soldiers that have higher

levels of preparedness perceive threat more closely associated with combat exposure, while those that feel less prepared for deployment perceive high threat regardless of combat experience [19]. Combat experience, perceived threat, and preparedness are all predictive factors that are interrelated.

Predictive factors for PTSD during combat also involve the personal life of a soldier. Concern about family life or disruption and social support during deployment both fall within this realm. Research shows that veterans who screen positive for PTSD report less social functioning as well as less social support during deployments than those that screen negative [23]. They are also more likely to have stress about family life at home when screened positive for PTSD [23].

The final category of predictive factors for PTSD is factors that occur after the trauma. This includes a Soldier's ability and willingness to seek help for PTSD related symptoms as well as post-deployment social support. Stigma for seeking psychological help is considered a barrier to care for PTSD patients and an important moderator for self-reported PTSD symptoms [5, 24]. It is reported that Soldiers who scored positive in a screening for mental health disorders were twice as likely as those who scored negative to be concerned about being stigmatized [5]. This barrier to mental health care arises primarily for a Soldier's concern about how they will be perceived by the rest of their fellow comrades and leadership should they test positive for a psychological disorder. They often fear losing their current classification, rank, or being transferred to another unit [5]. This fear of stigmatism is a major concern among mental health care providers as it often prevents Soldiers from seeking treatment, believing in the effectiveness of treatment, or reporting what they believe to be symptoms of mental disorders [5, 24]. Post-trauma social support is a factor that occurs after the trauma that may be a protector for PTSD. Individuals that perceive themselves as having less social support after combat are linked to more symptoms of PTSD. Similarly, those with more support have less symptoms associated with criteria for PTSD [12, 19, 22]. Identifying and controlling for these factors is important to reducing PTSD Prevalence and its effect on society.

PTSD in Society

Post-traumatic Stress Disorder has a strong impact on society. According to the Center for Disease Control and World Health Organization, suicide is the 16th leading cause of death worldwide and 10th in the U.S. [25, 26]. Specifically, suicide rates in the Army have been increasing over recent years while the civilian suicide rates have remained stable [27]. Suicide rates among military personnel have, historically, been lower than civilian rates but in 2005, shortly after the start of Operation Iraqi Freedom, the U.S. Army suicide trends began increasing [27]. In 2008 the rate of suicide in the U.S. Army surpassed the civilian rate and has continued to rise since then [27]. Correlational studies have found that the increase in the suicide rates of Army Soldiers is paralleled by increased rates of mental illness [28]. One study reported that among anxiety disorders, PTSD is most strongly associated with suicidal behavior [29]. Additionally, those suffering from PTSD are more likely to struggle with interpersonal problems, parenting difficulties, and to experience reductions in household income [29]. Over 90% of PTSD patients have at least one additional comorbid disorder [29]. Most commonly these include major depressive disorder and alcohol abuse or dependence, which are also associated with increased risk of suicidal ideation [30, 31]. Divorce rates also increase in patients with PTSD, and children with parents suffering from PTSD have more emotional problems than the rest of America's youth [31-33]. It is clear that PTSD strongly impacts the military population by negatively affecting psychological functioning and quality of life [16, 34]. According to the 2008 RAND (I don't see this acronym spelled out anywhere…did I miss it) Study the economic cost of PTSD in soldiers involved in the Iraq and Afghanistan war increased from $4 billion to $6 billion over two years[31]. The prevalence of PTSD has continued to rise since these conflicts [4, 9, 10]. Without proper research into interventions or factors that reduce the risk of the disease, the cost of PTSD and its impact on society will continue to grow.

National Guard/Reserve Risk vs. Active Duty Risk

In addition to high combat time exposure and deployment rates, the current War on Terror is unique in that a larger percentage of NG/R Soldiers deployed compared to previous conflicts [31]. As of October 2008, 1,638,817 total Soldiers were deployed in support of either OEF or OIF [31]. The Army provided the majority of this force from the NG/R Component, with 47% of all NG/R veterans followed by the Navy with 23%, the Air Force with 20%, and the Marine Corps with 10% [35]. Studies show that the development of post-deployment PTSD or PTSD related behavior was reported higher among NG/R soldiers than AD Soldiers [16, 36-38].

NG/R units come from a professional and personal culture distinct from AD units. NG/R and AD units differ greatly with respect to military training. While AD units hone their skills daily, the average NG/R unit trains only one weekend per month and two weeks out of the summer at Annual Training [39]. This distinction in training between the two components may contribute to a different effect of deployment stressors. For example, NG/R units may experience less separation time from family and loved ones than AD units, which could make them more vulnerable to experiencing stress from social support during and after deployments. Additionally NG/R soldiers may not feel as prepared for deployment roles as AD soldiers due to less time spent in training environments. This could put them at higher risk for factors like preparedness and perceived threat. It could also have a direct effect on unit cohesion as NG/R soldiers do not have the same time and opportunities to develop lasting strong bond relationships as AD soldiers. A 2008 analysis found that when comparing deployment stressors between NG/R and AD soldiers that concern about family life and disruption was higher among NG/R soldier than AD soldiers [39]. They also found that NG/R soldiers perceived higher threat than AD soldiers although they reported less significant combat experiences [39]. These differences may be indicative of factors that make NG/R more vulnerable to mental disorders like PTSD due to their different military training and lifestyle. In peace time most NG/R soldiers live civilian lifestyles and are only separated from their families once per month and 2 weeks out of the year while AD soldiers often train overseas or experience short term oversea deployments. These findings suggest that these differences

may make NG/R soldiers more vulnerable to mental health disorders as they are not as well prepared to be separated from family and friends [39].

Multiple studies available comparing NG/R and AD soldier deployment stressors have focused on identifying differences on their post-deployment health. One study found that UK reservists experienced higher rates of physical symptoms related to post-deployment mental health impairments including alcoholism when compared to "regular soldiers" or AD Soldiers [40]. Additionally, studies performed on Gulf War veterans found that NG/R experienced more symptoms of fatigue, alcohol abuse, and PTSD related symptoms [41, 42]. More recent post 9/11 research comparing post deployment mental health outcomes in NG/R and AD Soldiers has shown that symptoms related to PTSD was reported higher among the former; however, these studies did not assess for pre-deployment PTSD predictive factors [16, 36-38]. There are clearly predictive factors for PTSD that may make NG/R more vulnerable to PTSD than AD soldiers [12, 15, 17-22, 39]. The need to analyze what factors may make this particular group of soldier more susceptible to the disease is evident based on previous research indicating that NG/R has higher prevalence rates for PTSD [16, 36-38].

According to the 2005 National Defense Authorization Act, operational employment of reserve components will continue to increase in the future as many units will conduct daily operations in support of OEF and OIF [35]. The need to examine explanations for why there is a difference in post-deployment development of PTSD between NG/R and AD Soldiers is evident as many of these veterans will continue to be exposed to combat. While many studies examine rates of PTSD or related symptoms, few correlate the variance between the components with possible indicators or predictive factors that may explain the discrepancy.

OBJECTIVE

My objective for this study was to better understand the higher post deployment prevalence of PTSD among National Guard/Reserve Soldiers compared to Active Duty Soldiers by analyzing the possible predictive factors associated with the variable rates.

Question

My first question asked what association do the following factors - concern about family life and disruption, unit cohesion, resiliency, social support, age, preparation, perceived threat, and stigma for seeking psychological help - have on the prevalence of Post-Traumatic Stress Disorder among NG/Reservists compared to Active Duty Soldiers that deployed during OIF and OEF? Secondly, Do the observed differences provide implications for why prevalence of PTSD is often reported higher among NG/Reservists than Active Duty Soldiers?

Hypothesis

Self-reported post-deployment PTSD or PTSD related behavior is reported higher among NG/R Soldiers than Active Duty Soldiers [14, 15, 16, 17]. The higher self-reported prevalence of PTSD among NG/R Soldiers compared to Active Duty Soldiers is positively correlated with predictive factors associated with the disease.

METHODS

Survey Procedure and Population Sample

The Philadelphia College of Osteopathic Medicine Institution Review Board approved this project via the thesis advisor, Dr. Murray Berkowitz. The sampling population consisted of 11 OEF/OIF Army veterans. 50 soldiers were emailed for recruitment in the study. Of those veterans who received the email, 26 agreed to participate, corresponding to a 52% response rate. Of these 26 only 11 completely finished the survey. I used Surveymonkey to distribute the survey electronically. Surveymonkey does not differentiate between users; if a participant closes out a survey without completing it they must re-open as an entirely new anonymous user. I could not be sure that some of the 15 incomplete responses had not re-entered as new users and were also one of the 11 completed responses, so I chose to only analyze completed data to avoid possible confounders. Overall this resulted in a 22% response rate. Participants were divided evenly between Active Duty and National Guard/Reserve components with 6 (55%) AD and 5 (45%) NG/R.

All participants in the sample provided information on military career and status. All participants reported they were deployed after September 11th, 2001 and all of the participants were male. One participant reported a prior diagnosis of PTSD. The sample consisted of both noncommissioned officers and commissioned officers. There were 8 noncommissioned officers total (73%) and 3 commissioned officers total (27%), 2 of which were NG/R. The current ranks of all the soldiers ranged from SPC/E4 to COL/O6. The ranks at deployment ranged from PFC/E3 to LTC/O5. The current ranks of AD ranged from SGT/E5 to LTC/O5 and the ranks at deployments of AD ranged from SGT/E5 to MAJ/O4. The current ranks of NG/R ranged from SPC/E4 to COL/O6. The ranks of NG/R at deployment ranged from PFC/E3 to LTC/O5. All NG/R reported being deployed only once with an average length of deployment of 11.6 months (*SD = 4.34*).

The average number of deployment for AD was 3.67 (*SD = 1.37*) with an average length of the deployment of 11.33 months (*SD = 2.58*). Overall, the entire population had deployed on average 2.45 times (*SD = 1.69*) and for an average of 11.45 months (*SD = 3.30*). The average current age of the entire population was 32.54 years (*SD = 6.45*), with NG/R averaging 32.4 years (*SD = 7.44*) and AD averaging 32.67 years (*SD = 6.25*). The average age at deployment for the entire population was 30.60 years (*SD = 8.84*), with NG/R averaging 30.4 years (*SD = 13.0*) and AD averaging 29.0 years (*SD = 4.98*). The average total time in service for the entire population was 12.27 years (*SD = 7.66*), with NG/R averaging 10.8 years (*SD = 10.89*) and AD averaging 13.5 years (*SD = 4.32*). The average time in service at the start of the deployment was 7.81 years (*SD = 7.73*), with NG/R averaging 6.20 years (*SD = 11.07*) and AD averaging 9.17 years (*SD = 4.07*).

Table 1: Population Demographics

	Active Duty (n=6)	National Guard/Reserve (n=5)	Both AD and NG/R (n=11)	*t*	R squared (p < .05)
# Times Deployed Since 9/11/2001	X=2.67, SD=1.37	X=1, SD=0	X=2.45, SD=4.34	4.781	0.820*
Length of Deployment (months)	X=11.3, SD=2.58	X=11.6, SD=4.34	X=11.45, SD=3.30	0.120	0.002
Current Age (years)	X=32.7, SD=6.25	X=32.4, SD=7.43	X=32.54, SD=6.45	0.064	0.0005
Age at Deployment (years)	X=29.0, SD=4.98	X=30.4, SD=13.0	X=30.60, SD=8.84	0.227	0.010
Time in Service (years)	X=13.5, SD=4.32	X=10.8, SD=10.9	X=12.27, SD=7.66	0.521	0.051
Time in Service at Start of Deployment (years)	X=9.17, SD=4.07	X=6.20, SD=11.0	X=7.81, SD=7.73	0.568	0.061

Significant Difference

There were no significant associations found between component and length of deployment, current age, age at deployment, time in service, and time in service at start

of deployment (see Table 1). Therefore none of these demographics are confounders in the current study. There was a significant difference between the number of times each component deployed $t(11) = 4.781$, $R^2 = 0.820$, $p < .05$. This was expected as every NG/R surveyed only reported deploying once since 9/11/2001.

Measures

Multiple surveys were used to determine the association between the prevalence of PTSD in the population with the following predictive factors: concern about family life and disruption, unit cohesion, resiliency, social support, age, preparation, perceived threat, and stigma for seeking psychological help.

The PTSD Checklist for DSM-V (PCL-5) was used to screen Soldiers for PTSD. Although a personal interview with a clinician is the Gold Standard for diagnosing PTSD, the PTSD Checklist is a consistently reliable alternative when this option is unavailable [43, 44]. This is a 17-item survey with categories of questions corresponding to symptoms for PTSD [8]. Participants respond to each question using a 5-point response scale ranging from 1 = *not at all to* 5 = *extremely* [8].

Currently, risk factors for PTSD can be divided into three major categories: preexistent factors inherent to the individual, factors related to the traumatic event itself, and events that occur after the trauma [4]. This study examined factors in all three categories.

The Deployment Risk and Resilience Inventory (DRRI) was used to assess the service members' trauma-related experiences [45, 46]. Seven scales from the DRRI was used in this study: combat experiences, perceived threat, preparedness, deployment [46] social support, unit cohesion, concern about family life and disruption, and post-deployment social support [45, 46]. All items in the scale show strong reliability and validity with a coefficient alpha of at least .82 for all [45, 46].

Combat Experiences.

Combat experiences are events that are related to warfare, such as firing a weapon or being fired upon, engaging the enemy or being engaged by the enemy, or going on combat patrols. This is a 15-item scale with a 6-point Likert response format based on how often a service member experienced combat situations during deployment (1 = *Never*; 6 = *Daily or almost daily*) [46].

Perceived Threat.

Perceived threat quantifies the extent to which a service member feels he is in danger, particularly in response to experiencing a war zone [46]. This is a 15-item scale with a 5-point Likert response format (1 = *Strongly disagree*; 5 = *Strongly agree*) [46].

Preparedness.

Preparedness is the extent to which an individual feels he is prepared for deployment. This includes having the proper equipment, supplies, and training to perform his duty. Additionally, this includes the extent to which the veteran feels he was sufficiently informed in what to expect in his role during deployment [46]. This is a 10-item scale with a 5-point Likert response format (1 = *Strongly disagree*; 5 = *Strongly agree*) [46].

Deployment Support from Family and Friends.

This measure quantifies the extent to which a service member feels emotional support and assistance from family and friends back home during a deployment. This is how emotionally well cared for by family and friends a service member feels while on deployment [46]. This is an 8-item scale with a 5-point Likert response format (1 = *Strongly disagree*; 5 = *Strongly agree*) [46].

Unit Social Support.

Unit social support is the extent to which a service member perceives encouragement from his military unit. This includes the extent to which the Soldier feels camaraderie with his fellow Soldiers and appreciation from his unit leaders [46]. This is a 12-item scale with a 5-point Likert response format (1 = *Strongly disagree*; 5 = *Strongly agree*) [46].

Concerns about Family Life and Disruption.

Concerns about family life and disruption measures how worried a Soldier is that the deployment may affect other domains of his home life. This primarily involves family concerns or damaging relationships with spouses and/or children. This is a 15-item scale with a 4-point Likert response format (1 = *not at all*; 4 = *a great deal*; 0 = *not applicable*). When scoring, *not applicable* is coded the same as *not at all.*

Post-deployment Social Support.

Post-deployment social support is the extent to which a Soldier's family and friends provide emotional support and assistance after the Soldier returns to the homeland. It refers to the extent that soldier feels he has received emotional and tangible aid to grow accustomed and be successful in life after deployment [46]. This is a 10-item scale with a 5-point Likert response format (1 = *Strongly disagree*; 5 = *Strongly agree*) [46].

The Connor-Davidson Resilience Scale (CD-RISC) will be used to assess resiliency as a pre-existent factor inherent to the individual. Resiliency is an individual's ability to recover from hardship and is thus a type of stress coping mechanism that can modify an individual's risks for psychological disorders like PTSD [47]. The CD-RISC shows strong reliability and validity with a correlational coefficient of .87 [47]. CD-RISC is a 25-item scale with a 4-point Likert response format (0 = *not true at all*; 4 = *true nearly all the time*) [47].

The Treatment Reactions Scale (TRS) will be used to assess stigma for PTSD treatment. The TRS was developed to assess stigma amongst combat Soldiers specifically [24]. It focuses on five content areas: embarrassment/shame for seeking treatment, career impact for seeking treatment, perceived debasement for receiving treatment, willingness to recommend treatment, and confidence in belief or efficacy of treatment [24]. The TRS shows strong reliability with an overall alpha coefficient of .95 and a range of .81-.89 for each subset [24]. The survey format is 31 items with a 5-point Liker response format (1 = *strongly disagee*, 5 = *strongly agree*) [24]. The TRS also has multiple subscales that can measure various aspects of reactions to psychological treatment. In addition to the total score, I used the *Embarrassment/*Shame subscale to assess shame for seeking a particular treatment. This involved scoring items 2, 5, 22, 24, and 29 separately.

DATA ANALYSIS

I used the aforementioned measures to find the self-reported prevalence rates of PTSD in the sample. I used simple statistical analysis of variance using Graphpad Prism 6 Software to find if there were any statistical differences between prevalence rates. Descriptive statistics for all PTSD predictive factors and PCL-5 scores were then calculated separately between each component. Finally, simple linear regression analysis was used to determine correlations between predictive factors and PTSD within each component. 95% confidence intervals were used for all tests with $p < 0.05$. All scores were recorded in an excel spreadsheet. Participants were randomly assigned numbers as their surveys came in in order to organize their results. No personal identifiers were used as Surveymonkey is completely anonymous and cannot be traced back to an individual.

Table 2: Demographic Input Data by Component

Participant	Gender	Component	# Times Deployed since 9/11	Length of deployment (months)	Current Age	Age at Deployment	Time in service (years)	Time in service at deployment (years)	Rank	Rank at deployment	History of Mental Illness
1	male	AD	3	12	28	22	11	2	SSG/E6	SSG/E6	
2	male	AD	4	11	33	31	13	11	SSG/E7	SSG/E7	
3	male	AD	3	11	32	27	13	8	SGT/E6	SGT/E5	
4	male	AD	4	9	33	32	12	11	SGT/E5	SGT/E5	Y. PTSD
5	male	AD	2	16	44	36	22	14	LTC/O5	MAJ/O4	
6	male	AD	6	9	26	26	10	9	SSG/E7	SSG/E7	
Mean			3.666666667	11.33333333	32.66666667	29	13.5	9.16666666			
SD			1.366260102	2.581988897	6.2533324	4.979959839	4.32434966	4.07021702			
7	male	NG/R	1	16	25	20	6	1	SGT/E5	SPC/E4	
8	male	NG/R	1	11	26	24	4	2	SPC/E4	PFC/E3	
9	male	NG/R	1	11	36	33	5	1	SGT/E5	SGT/E5	
10	male	NG/R	1	15	32	23	9	1	1LT/O2	SPC/E4	
11	male	NG/R	1	5	43	52	30	26	COL/O6	LTC/O5	
Mean			1	11.6	32.4	30.4	10.8	6.2			
SD			0	4.335896678	7.436396977	13.01153335	10.8949529	11.0770032			

Table 3: Demographic Input Data for all Participants

Participant	# Times Deployed since 9/11	Length of deployment (months)	Current Age	Age at Deployment	Time in serivce (years)	Time in service at deployment (years)
1	3	12	28	22	11	2
2	4	11	33	31	13	11
3	3	11	32	27	13	8
4	4	9	33	32	12	11
5	2	16	44	36	22	14
6	6	9	26	26	10	9
7	1	16	25	20	6	1
8	1	11	26	24	4	2
9	1	11	36	33	5	1
10	1	15	32	23	9	1
11	1	5	43	52	30	26
Mean	2.454545455	11.45454545	32.54545455	30.6	12.27272727	7.818181818
SD	1.694912173	3.297381882	6.455441679	8.846845012	7.66930126	7.73069443

Table 4: Raw Scores for each Participant

Participant	PCL Score	PTSD 50+	PTSD DSM	BOTH	CD-RISC (0-100)	TRS Total (0-145)	TRS Shame (0-25)	Combat Experiences (17-102)	Percieved Threat (12-60)	Training and Deployment Prep. (10-50)	Deployment Support from Family and Friends (8-40)	Unit Social Support (11-55)	Concern about Family Life and Disruption (15-60)	Postdeployment Social Support (10-50)
1	13	N	N	N	58	104	19	72	42	37	24	55	36	32
2	0	N	N	N	94	73	16	32	18	48	32	45	43	35
3	11	N	N	N	88	75	13	70	39	41	38	38	33	47
4	18	N	Y	N	55	67	11	23	31	24	30	40	40	40
5	19	N	Y	N	83	64	12	37	37	40	31	43	30	39
6	10	N	N	N	88	87	17	44	16	50	40	55	26	47
Mean	11.8333333	0	33%	0	77.6666667	78.3333333	14.6666667	46.3333333	30.5	40	32.5	46	34.6666667	40
SD	6.85322309				16.7888852	14.8817562	3.14112506	20.3043509	11.0770032	9.2736185	5.78791845	7.37563557	6.3140056	6.13188389
7	24	N	Y	N	67	99	23	84	47	39	22	40	18	26
8	21	N	N	N	45	80	11	54	42	50	39	54	35	39
9	2	N	N	N	65	61	10	17	26	39	39	41	36	47
10	0	N	N	N	93	59	7	30	33	43	33	52	37	45
11	1	N	N	N	93	64	10	17	16	47	40	55	31	49
Mean	9.6	0	20%	0	72.600	72.600	12.200	40.400	32.800	43.600	34.600	48.400	31.400	41.200
SD	11.8448301				20.5134102	16.9204019	6.22093241	28.6757737	12.3975804	4.87852437	7.56967635	7.3006849	7.82943165	9.28439551

RESULTS

Table 5: Descriptive Statistics between Component and Survey Results

T-Test Results	Active Duty		NG/R			
Factor	M	SD	M	SD	t	R squared (*p* < .05)
CD-RISC	77.66	16.79	72.60	20.51	0.44	0.02
TRS Total	78.33	14.88	72.61	16.92	0.59	0.04
TRS Shame	14.67	3.14	12.21	6.22	0.80	0.10
Combat Experiences	46.33	20.30	40.43	28.68	0.39	0.02
Perceived Threat	30.50	5.79	32.85	12.4	0.32	0.01
Training	40.00	9.27	43.62	4.88	0.82	0.08
Deployment Support	32.50	5.79	34.64	7.57	0.51	0.03
Unit Cohesion	46.00	7.38	48.40	7.30	0.54	0.03
Concern about Family Life and Disruptions	34.67	6.31	31.41	7.83	0.75	0.07
Post-deployment Social Support	40.00	6.13	41.23	9.28	0.25	0.01
PCL Score	11.83	6.85	9.60	11.84	0.46	0.02
PTSD DSM	0.33	0	0.20	0	0.46	0.02

Table 4 displays averages and their standard deviations for all scores in every survey for AD and NG/R. The table also shows *t* statistics and R-squared values reflecting results of score comparisons between the two components. The table shows that there were no

significant differences in scores for any of the predictive factors or PTSD symptoms in this analysis.

Linear regression analysis was performed for each military component separately to determine if there were correlations between predictive factors and PTSD symptoms. AD linear regression tests were performed first, followed by NG/R. For each component, the first round of regression analysis involved comparing PCL scores with CD-RISC scores, TRS Total scores, and the scores from the TRS Shame subset. The second round of regression analysis involved comparing PCL scores with the scores from the DRRI-2 subscales Combat Experiences, Perceived Threat, and Training. The third and final round of linear regression analysis compared PCL scores with the scores from the remaining DRRI-E subscales Deployment Social Support, Unit Cohesion, Concern about Family Life and Disruption, and Post-deployment Social Support. 95% confidence intervals were used for all regression analysis with $p < 0.05$.

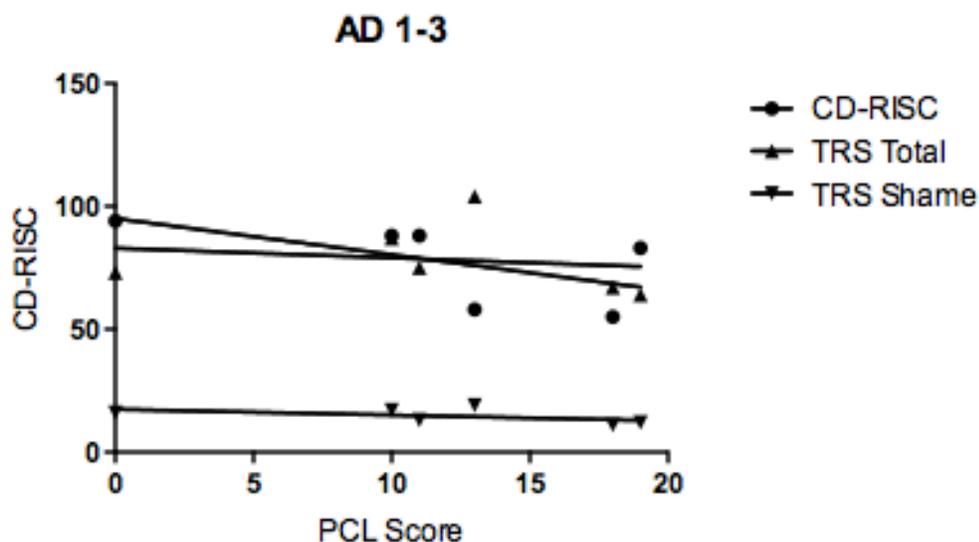**Figure 1: Linear Regression of AD PCL Scores with CD-RISC, TRS Total, and TRS Shame scores**

Figure 1 displays the first round of linear regression analysis for AD. PCL Scores were compared to CD-RISC scores, TRS Total scores, and the subscale TRS shame scores. R-squared values for CD-RISC, TRS Total, and TRS Shame were 0.36, 0.03, and 0.26 respectively. There were no statistically significant correlations in this analysis.

Figure 2: Linear Regression of AD PCL Scores with Combat Experiences, Perceived Threat, and Training
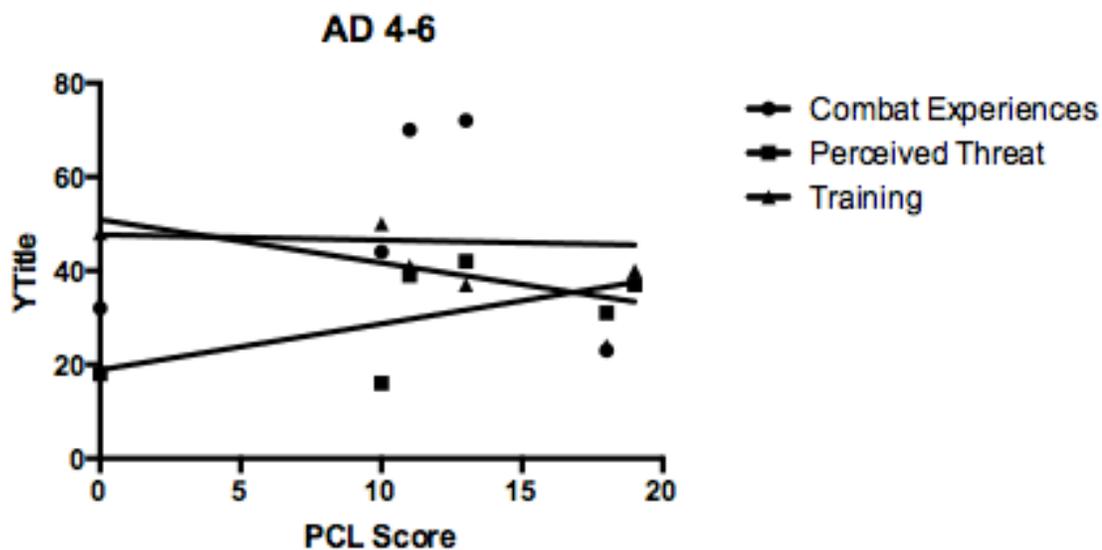

Figure 2 displays the second round of linear regression analysis for AD. PCL Scores were compared to scores of the DRRI-2 subscales Combat Experiences, Perceived Threat, and Training. R-squared values for Combat Experiences, Perceived Threat, and Training were 0.001, 0.37, and 0.46 respectively. There were no statistically significant correlations in this analysis.

Figure 3: Linear Regression of AD PCL Scores with Deployment Social Support, Unit Cohesion, Concern about Family Life and Disruption, and Post-deployment Social Support
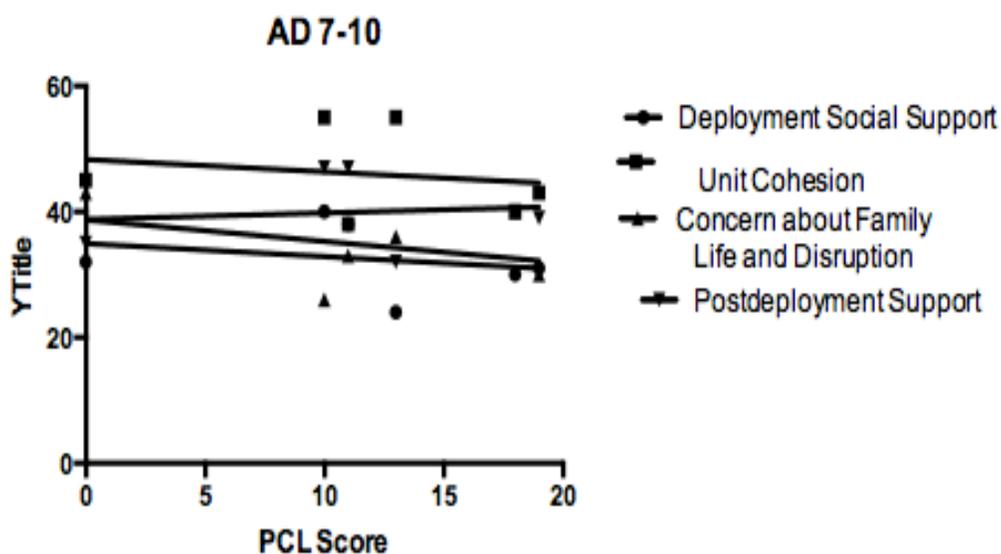

Figure 3 displays the second round of linear regression analysis for AD. PCL Scores were compared to scores of the DRRI-2 subscales Deployment Social Support, Unit Cohesion, Concern about Family Life and Disruption, and Post-deployment Social Support. R-squared values for Deployment Social Support, Unit Cohesion, Concern about Family Life and Disruption, and Post-deployment Social Support were 0.06, 0.03, 0.14, and 0.05 respectively. There were no statistically significant correlations in this analysis

Figure 4: Linear Regression of NG/R PCL Scores with CD-RISC, TRS Total, and TRS Shame scores
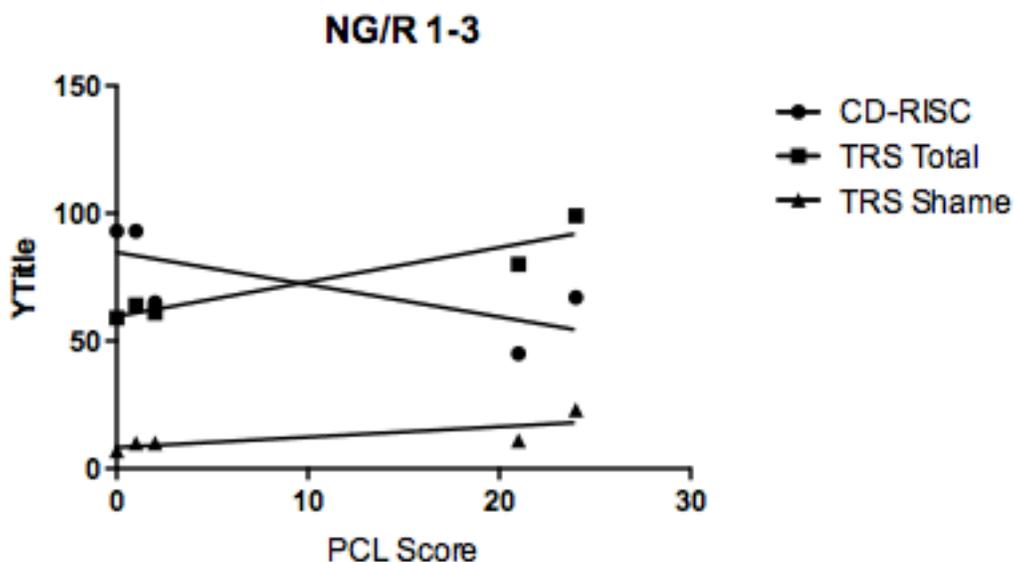

Figure 4 displays the first round of linear regression analysis for NG/R. PCL Scores were compared to CD-RISC scores, TRS Total scores, and the subscale TRS shame scores. R-squared values for CD-RISC, TRS Total, and TRS Shame were 0.53, 0.89*, and 0.59 respectively. There was a statistically significant association found between the total TRS score and PCL scores ($R^2 = 0.89$). *Signifies statistically significant value.*

Figure 5: Linear Regression of NG/R PCL Scores with Combat Experiences, Perceived Threat, and Training

Figure 5 displays the second round of linear regression analysis for NG/R. PCL Scores were compared to scores of the DRRI-2 subscales Combat Experiences, Perceived Threat, and Training. R-squared values for Combat Experiences, Perceived Threat, and Training were 0.86*, 0.74, and 0.006 respectively. There was a statistically significant association found between Combat Experiences and PCL scores ($R^2 = 0.86$). *Signifies statistically significant value.*

Figure 6: Linear Regression of NG/R PCL Scores with Deployment Social Support, Unit Cohesion, Concern about Family Life and Disruption, and Post-deployment Social Support
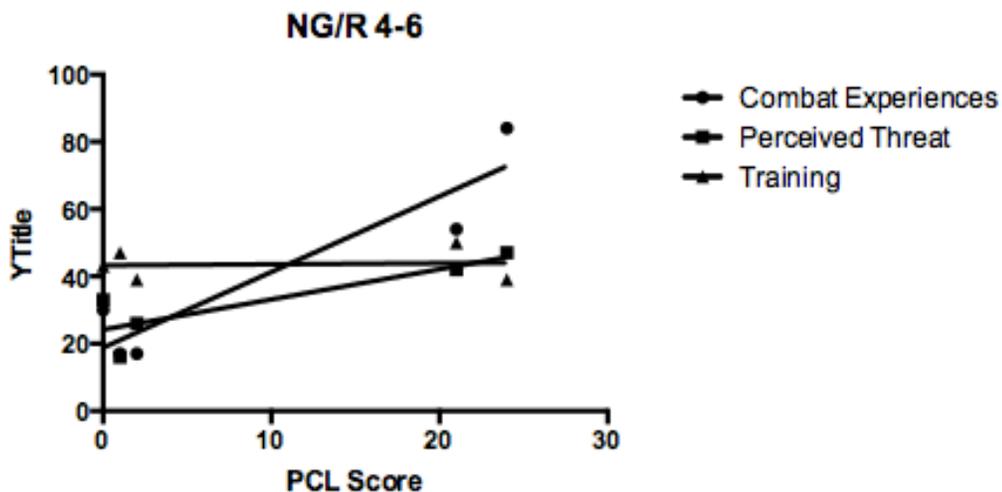

Figure 6 displays the second round of linear regression analysis for NG/R. PCL Scores were compared to scores of the DRRI-2 subscales Deployment Social Support, Unit Cohesion, Concern about Family Life and Disruption, and Post-deployment Social Support. R-squared values for Deployment Social Support, Unit Cohesion, Concern about Family Life and Disruption, and Post-deployment Social Support were 0.30, 0.07, 0.40, a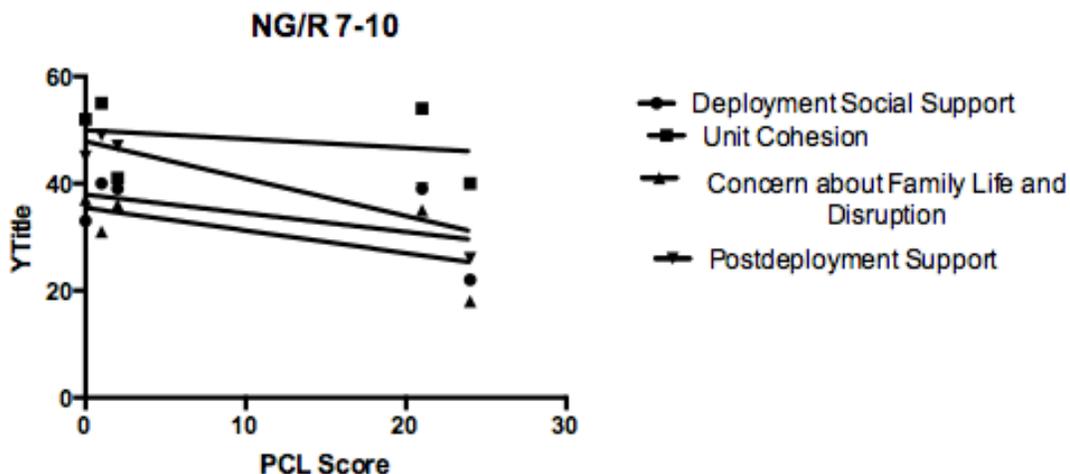nd 0.79* respectively. There was a statistically significant association found between Post-deployment support and PCL scores ($R^2 = 0.79$). *Signifies statistically significant value.*

DISCUSSION

The current study assessed differences in self-reported PTSD prevalence rates and their associations with predictive factors between Active Duty and National Guard/Reserve veterans deployed after September 11th, 2001. The results did not support the first research hypothesis that the NG/R component would report higher prevalence rates. In this case, I accepted the null hypothesis, as there was no statistical association found between PTSD prevalence rates for each component. This indicates that NG/R and AD experience the same types of predictive factors for PTSD before, during, and after deployments.

More important to this research was the second hypothesis that there are predictive factors that could elucidate vulnerabilities among NG/R. Although NG/R did not have higher self-reported PTSD prevalence rates, there were specific predictive factors that correlated with higher PTSD related symptoms among this group when compared to AD. Thus I rejected the null hypothesis and accepted the research hypothesis. The predictive factors that were significantly correlated with PTSD related symptoms among NG/R included stigma for seeking psychological help ($R^2 = 0.89$), combat experiences ($R^2 = 0.86$), and post-deployment social support ($R^2 = 0.79$). These associations may show specific areas of vulnerability for PTSD unique to NG/R.

The association between stigma for seeking psychological help and PTSD related symptoms shows potential barriers to healthcare for this component [5, 20]. This stigma could potentially prevent service members from seeking treatment for mental disease, believing in effectiveness of treatment, or reporting symptoms of mental illness, as they fear it could stain their military careers. This association could be stronger among NG/R because they may not receive the same mental health education opportunities as AD. They only train one weekend monthly and two weeks out of the summer as opposed to the daily training and education that AD receive [39]. Perhaps they simply do not have

the time in their priority of tasks to learn more about the importance of mental health and seeking treatment and thus naturally develop stigma against it. More research is necessary in this area to determine ways to circumvent these negative connotations associated with mental health.

The correlation found between combat experiences and PTSD related symptoms among NG/R is consistent with the initial idea that because NG/R do not deploy as frequently as AD they may not be well equipped to cope with war zone experiences. It is important here to note that though there was not a statistically significant difference in combat experience scores found between NG/R and AD, the mean for NG/R was lower than AD (X = 40.43, and X = 46.33 respectively). Active Duty soldiers experienced higher levels of combat exposure and yet this group did not show a significant association with PTSD related symptoms. This could be a sign of the greater psychological impact of combat experience on NG/R than AD. This finding builds on the statistically significant mean differences between the numbers of times deployed for each component. AD having deployed more frequently, may build coping mechanisms overseas that NG/R do not have the opportunity to build with fewer deployments. Additionally, it worth noting the correlation between perceived threat and PTSD symptoms among NG/R. Though this correlation was not statistically significant it was still high ($R^2 = 0.74$), and is also consistent with the idea that experiencing less training and deployment opportunities could make NG/R less equipped to perceiving danger during combat and ultimately more vulnerable to PTSD.

Post-deployment social support and PTSD symptoms were also a significant correlation among NG/R. This is also consistent with the idea that because NG/R experience less time away from family and friends than AD, they are not as prepared to deal with the aftermath of this separation upon returning from deployment. Feeling emotionally and tangibly supported by family and friends after deployments could be an important factor to prevent the development of post-deployment PTSD. Deployments put a lot of stress on family and personal relationships for a soldier. Returning to "norm" after a deployment takes time and patience for all parties involved. Because NG/R do not

experience this separation as often as AD, they may not be able to readjust to life at home as easily. The aftermath of this stress could fuel symptoms of PTSD, making them more vulnerable to the disease.

CONCLUSION

There are several limitations to this study that should be outlined for future research. First, the population size was very small (n < 12). For all purposes of this pilot study, this population size was sufficient; however, in order to confirm the findings found here a larger sample population should be used. This study also did not include women. Recent literature finds that women are at higher risk for PTSD than men, and therefore a larger sample size should include controls for female veterans [39]. Additionally, population demographics in this study did not include race, ethnicity, or education level. Including these in future studies may help reduce some degree of potential bias [12]. I also did not have the means to perform multiple regression analysis in this study, which would have been useful in identifying multiple variables that effect PTSD prevalence independently (including military component). Finally, the self-report nature of the survey tool used in this research may reflect response bias due to psychological distress.

Despite previous research, the current findings did not indicate a difference in self-reported prevalence between Active Duty soldiers and National Guard/Reserve soldiers. This study also found no significant differences between the predictive factors for PTSD experienced by each component before, during, and after combat deployments. The current findings do however indicate specific predictive factors for PTSD that may make National Guard/Reservists more vulnerable to the disease including stigma for psychological help, combat experiences, and post-deployment social support. Future research should focus on further exploring these vulnerabilities and expanding upon the population sample used in this study. The War on Terror has deployed more National Guard/Reserve forces than any other conflict to date [31], and the United States will continue to deploy more of these units to support daily operations in the future [35]. With the rising military suicide and PTSD prevalence rate [4, 9, 10, 27, 29], future research should continue to explore the vulnerabilities to PTSD of this particular component.

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