# The Effects of Equine Therapy on Military Veterans with PTSD

# A Case Study Exploration of the Implications of Equine-Assisted Therapy on Post-Traumatic Stress Disorder

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## ABSTRACT

The purpose of this study was to investigate the effectiveness of an Equine-Assisted Therapy (EAT) group program on the reduction of Post-Traumatic Stress Disorder (PTSD) symptoms in military veterans. Prior research suggests that longitudinal equine therapy programs result in lowered PTSD scores, however, fail to acknowledge veterans in Suffolk County, Long Island. The researcher conducted a mixed method correlational case study with veterans from a local Veterans Affairs (VA) Center which acted as a control. Beck's Anxiety Inventory and NIMH Loneliness surveys were disseminated and anecdotal comments were collected in order to achieve an all encompassing approach. Participants included veterans of ages 29-68 from the XYZ equine therapy foundation and from a local VA, with an overwhelming majority of participants being white females. Initial results showed decreased anxiety and loneliness scores, suggesting that equine therapy is associated with a decrease in PTSD symptoms. Therefore, the conclusion can be made that equine therapy is an effective alternative treatment for veterans suffering from PTSD. However, such conclusions are limited to veterans on Long Island, thus, future research should apply this method on a larger, more diverse, sample size to determine effects on a greater population before pushing this therapy out on a wider scale.

## 1. Introduction

### 1.1 Military Statistics
The United States Armed Forces has approximately 1.3 million active-duty troops, with another 865,000 in reserve. According to the National Council for Mental Wellbeing, 30% of personnel deployed in Iraq and Afghanistan have a mental health condition requiring treatment. (National Council for Mental Wellbeing, n.d.).

### 1.2 PTSD
The National Center for PTSD defines Post-Traumatic Stress Disorder as the "result of experiencing a traumatic event during war such as combat, or a non-war traumatic event like a terrorist attack, serious accident, family violence, sexual assault, natural disaster, or serious injury," resulting in symptoms such as anxiety, sadness, fear, and social detachment (National Center for PTSD, n.d.).

According to the US Census Bureau (2019) there were over 18 million veterans in the United States and according to the US Department of Veteran Affairs, roughly 20% of veterans suffer from PTSD (3.6 million people) (US Dept. VA, n.d.). Exposure to trauma among people has always been present yet the specifics of the term PTSD

itself has undergone development over the years. In 1980, the American Psychiatric Association (APA) added PTSD to the third edition of its Diagnostic and Statistical Manual of Mental Disorders (DSM-III) classification scheme.The recognition of PTSD has filled an important gap in the field of psychology (Friedman, 2019).

### 1.3 Treatment Options

The first-line therapy option for PTSD is medication such as sertraline and paroxetine. Alexander asserts that SSRIs affect the neurotransmitter serotonin which is important in regulating mood, anxiety, appetite, sleep, and other bodily functions. It has been shown that those suffering from PTSD experience a 60% response rate to SSRIS, with 20-30% achieving remission. (Alexander, 2012). Another treatment method is cognitive behavioral therapy (CBT). CBT is focused on helping people who are "stuck" in their thoughts about a trauma. Patients are taught to become more aware of their thoughts and feelings and can learn to challenge negative beliefs (Tull, 2020).

### 1.4 Equine-Assisted Therapy

Equine Assisted Therapy (EAT) is "a form of therapy that includes horses and a specialist working with a client to facilitate positive change." The therapist is specifically trained in "EAT along with traditional training in the mental health field. EAT often includes a number of beneficial equine activities" such as observing, handling, grooming, groundwork, and structured challenging exercises focused on the child's or adolescent's needs and goals. EAT may be used for clients with PTSD in order to aid in more positive cognition and behaviors, and increase self awareness of negative feelings (Maker, 2019).

### 1.5 Significance Factor

Moreover, the COVID-19 pandemic has exacerbated PTSD symptoms with an increase in trauma stressors and lack of access to coping strategies. Due to the immense prevalence and detrimental nature of PTSD in society, most notably impacting veterans, it is important to explore this issue in the United States. Such research could aid in developing preventive interventions to benefit people who are at high risk for PTSD.

## 2. Literature Review

### 2.1 Review of Literature

This literature review explores PTSD prevalence in military veterans, accompanying medical disorders, and impact on interpersonal relationships, while also addressing current treatment options and the methods, goals and outcomes of equine assisted therapy (EAT). Following a brief review of EAT, a variety of adoptions and issues in the developing field of EAT research is addressed, concluding with a discussion on the promising approach of EAT as a sufficient therapy for veterans with PTSD.

Contextualization

### 2.2 Post Traumatic Stress Disorder (PTSD)

Soldiers have experienced PTSD since the earliest instance of war, but it did not become a diagnosable disorder until 1980. Prior to PTSD's recognition, it was often misdiagnosed as various neuroses. In order to receive a PTSD diagnosis, symptoms must persist for over one month, whereas symptoms lasting for over six months after initial exposure to the stressor become labeled a chronic case. These symptoms often include flashbacks, distressing thoughts, social isolation and avoidance of places that are reminders of the traumatic experience (Connell, 2016). Additionally, PTSD is associated with increased odds of physical disorders such as hypertension, angina pectoris, tachycardia, heart disease, stomach ulcer, gastritis, and arthritis (Pietrzak, 2011).

According to Pew Research Center statistics, post 9/11, about one-fifth of the nation's 20 million veterans suffer from distressing experiences related to their military service (Pew Research Center, 2019). Similar to the data provided by Pew Research, The US Department of Veteran Affairs (VA) asserts that 11-20 out of every 100 veterans experience Post-Traumatic Stress Disorder. Such trauma can lead to depression and sucidical ideation, resulting in over 20 million veterans to committing suicide daily. Furthermore, only 50% of those who need mental health treatment actually receive it (US Dept. VA, 2019).

## 2.3 Depression and Anxiety

PTSD has been known to be linked to other mental health disorders such as depression and anxiety. According to the National Institute of Mental Health, depression is "a mood disorder that causes distressing symptoms that affect how you feel, think, and handle daily activities, such as sleeping, eating, or working," (NIMH, n.d., para. 1). NIMH also defines generalized anxiety disorder as "characterized by excessive anxiety and worry about a variety of events or activities (e.g., work or school performance) that occur more days than not, for at least 6 months," (NIMH, n.d., para. 2). What compounds this further is that Dr. Ron Kessler asserts that Generalized Anxiety Disorder (GAD) and Major Depressive Episode (MDE) as well as PTSD are known to be highly comorbid, or co-occurring (Kessler, 2008).

## 2.4 Significance

PTSD is a significant public health issue due to its longevity and ability to severely impair daily functioning. The condition exacts an "enormous toll on trauma survivors, their families, and society, and an estimated 354 million adult war survivors globally suffer from PTSD and/or major depression," (Arnon et. al, 2020).

## 2.5 PTSD Measures

To develop PTSD, one must undergo a trauma. Almost all people who suffer from a trauma experience similar symptoms including re-experiencing, avoidance, arousal, and negative changes in beliefs and feelings. In order to identify if a patient is suffering from PTSD, clinicians utilize the Clinician-Administered PTSD Scale (CAPS). Created by the National Center for PTSD staff, "the CAPS is a 30 question structured interview designed to make a categorical PTSD diagnosis, as well as to provide a measure of PTSD symptom severity." The structure corresponds to the DSM-IV (fourth edition of the Diagnostic and Statistical Manual of Mental Disorders) diagnostic feature criteria, with "PTSD symptoms rated for both frequency and intensity," (these two scores are summed to provide severity ratings) (Weathers, 2018).

## 2.6 Depression & Anxiety Scales

A significant comorbidity, or simultaneous presence, with PTSD includes depression. According to Dr. Janine D. Flory (2015), approximately 50% of people with Post-Traumatic Stress Disorder (PTSD) also suffer from Major Depressive Disorder (MDD). She suggests that the "comorbidity reflects overlapping symptoms in the two disorders and that the co-occurrence of PTSD and MDD could possibly represent a subtype of PTSD." This correlates with Dr. Kessler's claims that depression and anxiety coincide. Common scales to determine depression and anxiety severity are the Beck Depression and Anxiety Inventories. The Beck Anxiety Inventory is a 21-question multiple-choice self-report inventory, one of the most widely used psychometric tests for measuring the severity of depression and anxiety. BAI was utilized in Dr. Oh's Korean study which successfully reported the subjects' anxiety symptoms (Oh, 2018). Loneliness, the feeling of sadness when socially isolated, correlates with the aforementioned psychiatric disorders. The National Institute of Mental Health's (NIMH) Loneliness Scale calculates the severity of an individual's symptoms in a similar method to Beck's. Five responses are recorded such as "I feel lonely" and "I feel left out" which when totaled up, a score from 5-25 is reported, with 5 being the lowest loneliness score and 25 the highest loneliness score (Hughes, 2008).

Perspectives

### 2.7 Animal Assisted Therapy (AAT)

According to the American Psychological Association, around 75% of people benefit from psychotherapy as it has been shown to improve emotions, behaviors, and cause positive changes in the brain and body. The benefits also include "fewer sick days, less disability, fewer medical problems, and increased work satisfaction," (American Psychological Association, n.d.). A form of psychotherapy is animal-assisted therapy (AAT). According to the Dept. of Animal and Aquacultural Sciences at the Norwegian University of Life Sciences, AAT means that health professionals use animals as part of the therapeutic process completing simple tasks like grooming, walking, or playing. The therapy animal works in partnership with a counselor to provide compassionate and stimulating counseling to facilitate human client recovery (Chandler, 2005).

### 2.8 Pet Therapy

In corroboration with Chandler (2005), Eric Altschuler suggested that AAT might be beneficial for PTSD. A large randomized controlled trial was conducted regarding the use of canine-assisted therapy in the treatment of PTSD. These trials demonstrated that AAT is effective in improving PTSD symptoms, different animals besides canines can be beneficial, and AAT has a role in suicide preention among PTSD patients (Altschuler, 2017).

### 2.9 Equine Assisted Therapy (EAT)

According to Dr. Laura Trask, in order to survive, a horse must be able to read the body movements of their herd members and of predators, including humans. Horses have evolved to communicate non-verbally, and seem to "infuse emotional meaning into every body movement" (Trask, 2010, para. 4). Namely, horses are wired to have social connections and if they are removed from a herd scenario it is not uncommon for a horse to form an interspecies connection, even with humans. Trask explains further that "EAT is the combined use of horses, a licensed therapist and a horse specialist working with clients to address various individual psychotherapy treatment goals." This unique method enables clients to learn about themselves and others by participating in activities with the horses like therapeutic riding and grooming and stable management, and then processing feelings, behaviors and patterns (Trask, 2010, para. 2). Comparably, researchers at St. Mary's University conducted a research study to determine the effectiveness of an eight week Equine-Assisted Psychotherapy (EAP) program in Texas, called the Horse Power Project, on the diminishing of PTSD symptoms among veterans. Wooten and his colleagues hypothesized that the veterans participants' posttest scores of PTSD symptoms following horse related therapy would be lower than their baseline scores. The hypothesis was proven true, concluding that all 14 participants experienced improvement in their PTSD symptoms following equestrian therapy (Wooten et al., 2020). (see Appendix D for equine therapy in action).

2.10 Cognitive Behavioral Therapy (CBT)

Nilamadhab Kar offers a new perspective to PTSD therapy. Kar reviewed the effectiveness of Cognitive Behavioral Therapy (CBT) for the treatment of PTSD following various forms of trauma in the UK. Kar additionally delves into methods involved in CBT and its potential to prevent PTSD, those being guided therapy and cognitive restructuring. The results of Kar's study indicate that "physiological, functional neuroimaging, and electroencephalographic changes correlate with response to CBT" (Kar, 2011, para. 3).

### 2.11 Selective Serotonin Reuptake Inhibitor (SSRI)

Dr. Murray Stein conducted a research study in California testing the effects of olanzapine on male patients diagnosed with DSM-IV PTSD. Each patient had war trauma induced PTSD, and all but three were Vietnam veterans. Stein discusses that standard treatment for PTSD illnesses are usually relative to pharmacological interventions. In this study, olanzapine was shown to decrease posttraumatic stress more than the placebo. (Stein, 2002 para. 6). Kar's study contradicts Stein's findings on medication being the best method to treat PTSD. Kar found through empirical data and

her own study that cognitive behavioral therapy is the superior therapy method. Both respective alternatives can provide opposing perspectives for the researcher's study on equine assisted therapy's effects on PTSD symptoms.

## Theoretical Framework

### 2.12 Emotional Processing Theory

The Emotional Processing Theory has guided an enormous amount of research, particularly for Post-Traumatic Stress Disorder (PTSD). Dr. Foa and Dr. Kozak (1986) drew from the theory in developing prolonged exposure, a landmark PTSD treatment and the gold standard approach to PTSD treatment. According to the Emotional Processing Theory, "fear is activated through associative networks that include information about the feared stimulus, escape or avoidance responses to the feared stimulus, and the meaning of the fear." They explain that fear is problematic when it interferes with functioning. The Emotional Processing Theory proposes that exposure can ameliorate this fear.

### 2.13 Beck's Theory on Depression & Anxiety

According to Dr. Beck (1985), "negative thoughts, generated by dysfunctional beliefs, are typically the primary cause of depressive symptoms." In other words, a direct relationship occurs between the amount and severity of someone's negative thoughts and the severity of their depressive symptoms. Cognitive Theory has explained anxiety as the tendency to overestimate the potential for danger. Aaron T. Beck's cognitive formulation of anxiety and depression provides an elaborated account of the cognitive and neural mediational processes of cognitive therapy (CT).

## Gap/Research Question/ Hypothesis

The purpose of this paper is to analyze and determine the efficacy of Equine Assisted Therapy (EAT) for veterans suffering from Post-Traumatic Stress Disorder (PTSD). As observed by aforementioned authors, (Wooten et al. 2020) the effects of equine therapy on veterans with PTSD do not research the question "How does equine assisted psychotherapy affect veterans with PTSD in Suffolk County, Long Island?" This clearly identifies the gap in this research to be veterans in Suffolk County, Long Island. Due to previous research on equine assisted psychotherapy and theories regarding the field of mental health, it is hypothesized that an equine therapy program will benefit veterans with PTSD and lower scores on the Beck Anxiety Inventory and NIH Loneliness Questionnaires, indicating a decrease in PTSD symptoms.

## 3. Methods

This section delves into the rationale of the study's methodology, setting, sample and data collection while further addressing the procedure, limitations and ethical considerations.

### 3.1 Methodology

The methodology chosen for this study was a mixed method correlational case study. According to Leedy and Ormrod, mixed-method research is "not only collecting, analyzing, and interpreting both quantitative and qualitative data but also integrating conclusions from those data into a cohesive whole," (Leedy and Ormrod, 2016, pg. 56). This method was utilized due to quantitative data (the survey data) and qualitative data (veteran narratives) being utilized in this study. Furthermore, a case study is "a type of qualitative research in which in-depth data are gathered relative to a single individual, program, or event for the purpose of learning more about an unknown or poorly understood situation," which is applicable due to the specific groups of veterans in Suffolk County, on Long Island who were surveyed. Correlational research is defined as "a statistical investigation of the relationship between two or more variables," in this study the variables being PTSD symptoms (quantified by scores on the questionnaires) and equine therapy (Leedy

and Ormrod, 2016, pg. 33). This method was chosen due to the data collection of both anecdotal comments and quantifiable symptom surveys based on a specific group to determine a correlation between equine therapy and improved PTSD symptoms in veterans (see Appendix A).

### 3.2 Participants

Wooten's study on the effectiveness of EAT on military veterans in the Horse Power Project used the criterion of "that any-era veteran diagnosed with a mental health disorder is eligible to participate in the 8-week EAT group program," which is similar to this research study's methodology despite the differed locations of Texas and Long Island (Wooten et. al. 2020). The target population in this research study was veterans from Suffolk County, Long Island who have been diagnosed with Post-Traumatic Stress Disorder and are a part of an equine therapy program or a member of a local VA. As of 2015, there was reported to be a population of N=76,263 veterans living in Suffolk County, and out of those, the sample n=14, were surveyed (Curtin, 2017). The number of participants in this study were 8 veterans in the equine program and 6 veterans from the VA, serving as a control. Of the participants in the equine program, 7 veterans were female, and one was male, with a mean age of 31.4, and 50% served in the Marines. The VA group had a mean age of 60 and all 6 participants were female. The sample population of the equine group was 100% caucasian, whereas the VA group did not disclose further demographic information. Moreover, certain participants in the equine program were unwilling to participate in the study, so they were excluded from the experimentation.

### 3.3 Instruments

The instruments utilized in this study were the Beck Anxiety Inventory (see Appendix B) and NIMH Loneliness Survey (see Appendix C) due to their ability to effectively quantify the symptoms experienced by participating veterans. According to Dr. Yuan-Pang Wang "The Beck Anxiety Inventory showed high reliability and good correlation with measures of depression and anxiety," (Wang, 2013, para. 2). These surveys are self-reported symptom questionnaires which ask the participants to rate their symptoms from 0, being none at all, to 3 being the highest along a Likert Scale model. Examples of responses are: "Nervous: 0- not at all; 1-mildly, but it didn't bother me much; 2-moderately-it wasn't pleasant at times and 3-severely-it bothered me a lot." At the end of the questionnaire is a scoring guide which categorizes responses into 0-21 low anxiety, 22-35 moderate anxiety and 36+ potentially concerning levels of anxiety which is garnered from the sum of the participant's responses. As for the qualitative portion of the data, the researcher organized comments (by words used like "anxiety" and "content") left by the participants at the bottom of the surveys who wanted to share their experiences in order to achieve an all-encompassing approach to the research. These comments included common themes expressing their emotional states before and after partaking in equine therapy. Additionally, a pilot study was conducted before carrying out the study to ensure ethicality and efficacy of the surveys in answering the research question.

### 3.4 Sample Selection

The sample that was chosen for this study was stratified sampling in which "researchers divide subjects into subgroups called strata based on characteristics that they share," (Leedy and Ormrod, 2016, pg. 33). The researcher chose this sampling method over simple random sampling because the participants of the sample had to fill requirements of strata such as military service, which is not common among every member of the population. Additionally, the sample group is very specific and applies to a specific situation and correlation allows the connection between PTSD symptoms and therapy.

### 3.5 Procedure

The research question that was analyzed in this study was "How does equine therapy affect veterans with PTSD in Suffolk County, Long Island?" The researcher hypothesized that post therapy, the numerical values of the scores on the surveys would decrease suggesting a lessening in the PTSD symptoms of the veterans. Firstly, the researcher contacted a foundation, XYZ, on Long Island that employs equine assisted psychotherapy for local veterans with

PTSD and gathered consensual participants through stratified sampling to take part in this research study. A series of 5 therapy retreats occurred throughout October 2020 to February 2021 in which each participant filled out the Beck's Anxiety Inventory and National Institute of Mental Health's Loneliness Scale surveys. Prior to therapy, the veterans filled out the surveys via the foundation's website in which coded and anonymous responses were sent via email to the researcher's password protected computer due to the COVID-19 pandemic's restrictions and to aid in comfortability for ensuring honest responses. It was assumed that the veterans would answer the questionnaires honestly via email. After the therapy was completed, in which a licensed equine therapist works with the horse and veteran in various exercises, such as therapeutic horseback riding, the participants filled out the same surveys. The VA group of veterans acted as a control and were able to fill out the surveys in the same anonymous email method in which personal information was coded before the researcher had access.

Then, the researcher compiled and entered the data into Google Sheets, since it is a user- friendly and widely regarded spreadsheet software application, in a locked computer which only the researcher had access to. After compiling the data, the researcher completed a correlational statistical analysis to determine whether the equine therapy and survey scales are correlated. However, it is important to note that the researcher was not determining a causal relationship. Responses to the surveys were analyzed using the Statistical Package of Social Sciences (SPSS) software in which conclusions were presented. SPSS is a software package used for statistical analysis that can be used to perform data entry and analysis and create tables and graphs. SPSS is commonly used in the Social Sciences, so it is appropriate for this study.

### 3.6 Ethical Considerations

Prior to conducting this research study, the researcher completed various ethics courses to ensure boundaries of responsible conduct and inquiry were sustained. The researcher completed the National Institute of Health's (RCR-Interdisciplinary) and Responsible Conduct of Research in the Social and Behavioral Sciences courses. The researcher took additional ethics courses through Collaborative Institutional Training Initiative (CITI) Program in basic COVID safety training and Human Subjects Research (see Appendix E-G). In addition to the completion of these courses, the research project was approved by the Institutional Review Board (IRB) at the school in which a selected committee applied research ethics by reviewing the methods to determine if they are ethical (see Appendix I and J). Additionally, prior to administering the surveys, consent forms were distributed and signed to ensure ethicality was sustained and that the participants could enter research voluntarily with full information about what it means for them to take part (see Appendix H).

### 3.7 Limitations

Limitations amongst the methods would be the fact that a case study inherently limits data collection due to the observation and analysis of a specific sample group of veterans in Suffolk County. Additionally, the COVID-19 pandemic inhibited large sample sizes in the retreats which limited the legal amount of participants to gather due to the social distancing guidelines, resulting in only 14 veterans being able to participate. Furthermore, the CAPS interview could not be utilized due to the COVID pandemic, which could have collected more accurate results on the participants' PTSD than the self-reported anxiety and loneliness symptom surveys.

## 4. Results

There were $n$=14 (13 female, 1 male) veterans who participated in this study. Members of the equine therapy program included 8 of the subjects, and 6 veterans were members of a local V.A who did not receive equine treatment and were the control group. The members of the equine group were all caucasian, while the V.A. veterans did not disclose their race. The ages ranged from 29-68 ($\mu$=47.5) in both groups. In the equine program, 75% of participants disclosed the branch in which they served with 37.5% being in the Marines, 25% in the Army and 12.5% in the Coast Guard. The

equine group completed both the Beck's Anxiety Inventory and the National Institute of Mental Health's Loneliness Scale before and after their therapy session, while the V.A. veterans completed the surveys at their discretion.

In order to analyze the results, a correlational analysis was conducted which is appropriate for this study in that the relationship between anxiety and age was to be determined. The r value, correlation coefficient, shows the strength and direction of the correlation (Leedy and Ormrod, 2016).

The p value was also calculated, which determines the significance of the data.

**Table 1.** Correlations Between Age, Pre-anxiety scores, post-anxiety scores, pre-loneliness scores, and post-loneliness scores.

**Correlations**

|  |  | Age | BAI_Pre | BAI_Post | NIMH_Loneliness_Pre | NIMH_Loneliness_Post |
|---|---|---|---|---|---|---|
| Age | Pearson Correlation | 1 | -.794** | -.420 | -.918** | -.081 |
|  | Sig. (2-tailed) |  | .002 | .580 | .010 | .919 |
|  | N | 12 | 12 | 4 | 6 | 4 |
| BAI_Pre | Pearson Correlation | -.794** | 1 | .463 | .971** | .296 |
|  | Sig. (2-tailed) | .002 |  | .537 | .000 | .704 |
|  | N | 12 | 13 | 4 | 7 | 4 |
| BAI_Post | Pearson Correlation | -.420 | .463 | 1 | .213 | .938 |
|  | Sig. (2-tailed) | .580 | .537 |  | .787 | .062 |
|  | N | 4 | 4 | 4 | 4 | 4 |
| NIMH_Loneliness_Pre | Pearson Correlation | -.918** | .971** | .213 | 1 | -.045 |
|  | Sig. (2-tailed) | .010 | .000 | .787 |  | .955 |
|  | N | 6 | 7 | 4 | 7 | 4 |
| NIMH_Loneliness_Post | Pearson Correlation | -.081 | .296 | .938 | -.045 | 1 |
|  | Sig. (2-tailed) | .919 | .704 | .062 | .955 |  |
|  | N | 4 | 4 | 4 | 4 | 4 |

**. Correlation is significant at the 0.01 level (2-tailed).

*Note:* The table depicts the correlations between pre and post anxiety and loneliness scores of 4 veterans in the equine program, with a correlation coefficient of *R*=-.794 between age and pre anxiety scores. This suggests that the older the veteran, the less anxiety they experience. Additionally, this table displays the p-value of this study was .002. Since the p-value is less than .05, the results are statistically significant.

**Figure 1.** Scatterplot of Correlation between Pre-anxiety Scores and Age.



BAI Pre vs. Age
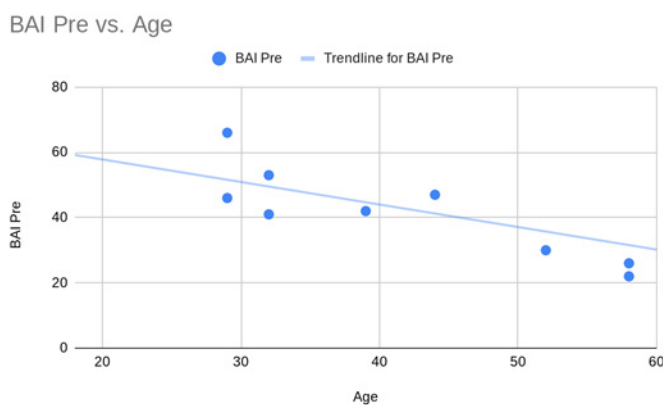
*Note:* This graph corresponds with the statistics in Table 1. This scatterplot depicts the correlation between the ages of veterans and their pre BAI scores. The correlation coefficient of R=-.794 reveals a strong negative correlation between the aforementioned variables suggesting the older the veteran, the lower their anxiety.

**Figure 2.** Graph of Mean and Standard Deviations for the Equine and VA Groups
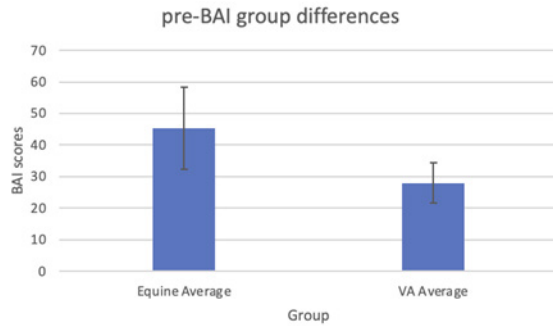


*Note*: This graph conveys the average pre anxiety scores along with respective standard deviations of the equine and V.A. groups. The average for the equine group was 45.43 with a standard deviation of 13.02. The VA group had a mean average score of 28 with a standard deviation of 6.45.

**Table 2.** Pre and post narratives by 6 veterans of the equine group.

| Subject | Pre-Comments | Post-Comments |
|---|---|---|
| A1 | 1 | 1 |
| A3 | 1 | 1 |
| A4 | 2 | 2 |
| A5 | 1 | 2 |
| A6 | 1 | 1 |
| A7 | 1 | |

*Note:* There were 6 veterans at the equine therapy foundation who recorded comments detailing their emotional states before and after an equine therapy session. This table conveys coded preliminary findings of comments recorded by veterans in the equine program, both before and after the therapy session (see Appendix K for more specific narratives).

For the pre-comments, the 1 indicates an anxious mood before therapy, while the 2 represents a relaxed mood. The post-comments indicate a 1 for helped anxiety and a 2 for a good time at the ranch.
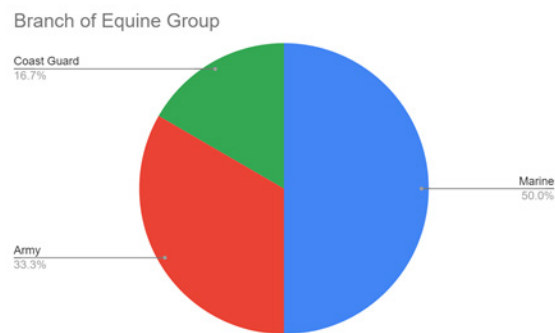
**Figure 3.** Veteran Groups
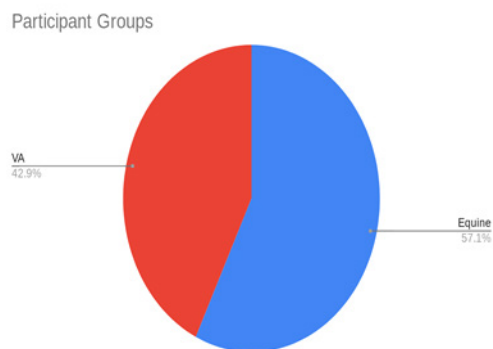


**Figure 4.** Veteran Ages
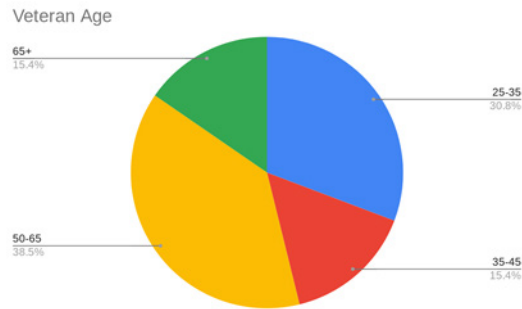
**Figure 5:** Veteran Branches



Figures 3, 4 and 5 display some of the demographics of the study such as branch of military, age as well as the two groups of the participants. Out of the total participants, 57.1% were from the equine group and 42.9% were from the VA group. 50% of the equine group were marines. 38.75% of total participants were in the age category of 50-65 (see Appendix L for more specific demographics).

# 5. Discussion and Analysis

This mixed method correlational case study investigated the effectiveness of an equine therapy program on military veterans with PTSD. The majority of prior research regarding PTSD treatment focused on medication and cognitive behavioral therapy (Stein, 2002 and Kar, 2011). Those who delved into EAT's effects on veterans did not investigate the correlation of the therapy with anxiety and loneliness severity in Suffolk County, on Long Island, so this study filled that gap in the body of knowledge (Wooten et. al, 2020).

The correlation between the age and pre anxiety scores of 4 veterans was a strong negative correlation (R=-.794) meaning that the lower the age, the higher the anxiety. Overall, the average anxiety scores were higher for the equine group than the VA group as shown by the disparity of 46 vs. 29, which opposes the original hypothesis that equine therapy would directly correlate with lower PTSD symptoms. This may be due to the fact that the veterans who are seeking therapy have more anxiety to begin with, since those scores were from before therapy. EAT still appeared to be effective since the qualitative comments provided by the veterans indicated that there were common narratives. Prior to encountering equine therapy, many of the subjects stated that they were "anxious," "stressed," or "depressed." After participating in the equine therapy program, they claimed to feel more "relaxed," "confident," and "safe."

It is important to connect this research to the body of knowledge. As stated through the results, this research suggests a strong negative correlation between veteran age and pre anxiety scores, supported by a correlation coefficient of r=-.794. Essentially, the older the veteran, the lower the anxiety scores. These findings somewhat corroborate

research completed by Wooten et. al. (2020) who found that the 8 week equine program had a strong positive correlation of 0.91 between equine therapy and improved PTSD symptoms. They had found a direct correlation between PTSD symptoms and amount of equine therapy, whereas this study delves into the relationship of age and anxiety. Moreover, confounding variables should be taken into consideration. Other factors could have impacted the participants moods such as familial situations, finances or social interactions. Nonetheless, the results showed an improvement in scores directly after participating in the equine therapy suggesting a relationship, not a causation, between the variables. At the end of the research process, the researcher developed the new understanding that this research provides a basis that equine therapy, which has been suggested through this study, can decrease PTSD symptoms in military veterans.

## 5.1 Limitations

Limitations to the study must be addressed. The lack of demographic information was a limitation of the survey itself in that there were no questions directly inquiring race and age,  so they were collected separately. Perhaps future research should attempt to garner a more racially diverse group of participants to determine if race impacts response to therapy and level of PTSD. Additionally, The V.A. veterans did not disclose which branch they had served in which was a limitation, but future research can expand this study to evaluate the differences in responses and PTSD symptoms based on the military branch. Most importantly, according to Leedy and Ormrod (2016) on page 170,  the social desirability effect is when some participants may misrepresent facts and this may have led to dishonest responses since the data collected was self-reported.

## 5.2 Implications

The implications for this study would greatly benefit American society as a whole. First, this research serves to improve knowledge surrounding the importance and prevalence of mental health of veterans in society. As stated in the Literature Review, other perspectives on therapy for veterans include medication and CBT that could potentially pose limitations like side effects and the inability for a veteran to open up to a therapist. Equine therapy can be a life-changing experience for these men and women as seen by their anecdotal comments and can ameliorate their suffering so they can re-enter and function within society effectively.  This study can aid in establishing equine therapy as a legitimate therapy method as opposed to a recreational activity. Thus, awareness could be promoted to allow for more options for veterans to heal. Perhaps this study can promote the establishment of more equine therapy facilities across the United States in order to achieve the aforementioned goals.

## 6. Conclusion/ Future Research

In summarizing the interpreted data, it can be asserted that equine therapy may be  successful in lowering anxiety and loneliness scores of military veterans with PTSD which is supported by the strong negative correlation between age and pre anxiety scores of r=-.794.  Generally, this initial observation aligns with the work of Wooten et. al. (2020) who claimed that the Horse Power Project, an 8 week equine therapy program, lowered PTSD symptoms among military veterans. However, the research of Wooten et. al. (2020) along with the majority of the Body of Knowledge did not include veterans in Suffolk County, on Long Island, which this research question amended. Through the analysis of pre anxiety test scores and the observation of personal statements made by the veterans before and after treatment, it was determined that the therapy was successful in lessening symptoms. However, this data is only relevant to a small group of veterans on Long Island. As such, a larger, more diversified study should be carried out to fully determine the efficacy of equine therapy as an alternative therapy method. For example, the researcher's sample group

consisted of a majority of female, white veterans, so this research process should be replicated in order to see generalizable results.

Relating the research back to the original hypothesis, it somewhat corroborates the original hypothesis that a negative correlation exists between PTSD symptoms and participation in EAT, in that as participation in equine therapy increases, PTSD symptoms decrease. However, my findings show a strong negative correlation between age and pre anxiety scores which can suggest that the longer the veteran spends in the therapy (the higher the age) the lower the scores will be.

Future research should combat the limitations of this study by garnering a larger sample size. Additionally, equine therapy could be correlated against other mental health disorders like anhedonia, which is one's inability to feel pleasure. Other locations should replicate this study to garner more generalizable results since the results of this study are only applicable to the group of veterans in Suffolk County, Long Island.

## Acknowledgments

## References

1.      Alexander, W. (2012). Pharmacotherapy for post-traumatic stress disorder in combat veterans: focus on antidepressants and atypical antipsychotic agents. *NIMH*. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3278188/

2.      Arnon, S., Fisher, P., Pickover, A., Lowell, A., Turner, J., Hilburn, A., . . . Neria, Y. (2020). Equine-assisted therapy for veterans with PTSD: Manual development and preliminary findings. *NIMH*. www.ncbi.nlm.nih.gov/pmc/artics/PMC7282489/

3.      Chandler, C. (2010). Matching Animal-Assisted Therapy Techniques and Intentions with Counseling *Guiding Theories*. https://www.avmc.org/assets/Site_18/files/case-study/Chandler2010AATTheoreticalOrientatipm.pdf

4.      Connell, Christy L. (2016) "PTSD in the 20th Century American Military: Its Diagnosis, Effects, Treatment, and Management, With a Focus on the Vietnam War," Bound Away: m *The Liberty Journal of History: 1*(2). Committee on the Assessment of Ongoing Efforts in the Treatment of Posttraumatic Stress Disorder. (2014). *Research on PTSD*. Treatment for Posttraumatic Stress Disorder in Military and Veteran Populations: Final Assessment. https://www.ncbi.nlm.nih.gov/books/NBK224871/

5.      Flory, J. D., & Yehuda, R. (2015). Comorbidity between post-traumatic stress disorder and major depressive disorder: Alternative explanations and treatment considerations. https://www.ncbi.nlm.nih./gov/pmc/articles/PMC4518698/

6.      Healy, T. (2019). Long Island veterans: A look at our population. *Newsday*. https://projects.newsday.com/long-island/data/veterans-day/

7.      Hughes, M. E., Waite, L. J., Hawkley, L. C., & Cacioppo, J. T. (2004). A short scale for measuring loneliness in large surveys: Results from two population-based studies. *NIMH*. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2394670/

8.      Kessler, R.C., Gruber, M, Hettema, J.M., Hwang, I., Sampson, N., Yonkers, K.A. (n.d.). Co-morbid major depression and generalized anxiety disorders in the National Comorbidity Survey follow-up. *NIMH*. https://pubmed.ncbi.nlm.nih.gov/18047766/

9.      Leedy, P. D., Ormrod, J. E., & Johnson, L. R. (2019). *Practical research: Planning and design.* Pearson. Maker, Amaira. (n.d.). Equine assisted therapy: A unique and effective intervention. *Psychology Today.* https://www.psychologytoday.com/us/blog/helping-kids-cope/201903/equine-assisted-therapy-unique-and-effective-intervention

10.     Oh, H., Park, K., Yoon, S., Kim, Y., Lee, S.-H., Choi, Y. Y., & Choi, K.-H. (2018). Clinical utility of Beck Anxiety Inventory in clinical and nonclinical Korean samples. *NIMH*. https://www.ncbi.nlmnih.gov/pmc/articles/PMC6288426/.

11.     Parker, K., Igielnik, R., Barroso, A., & Cilluffo, A. (2020). Views of Post-9/11 military veterans. *Pew Research Center's Social & Demographic Trends Project*. https://www.pewresearch.org/social-trends/2019/09/10/the-american-veteran-experience-and-the-post-9-11-generation/

12.     Pietrzak, R. H., Goldstein, R. B., Southwick, S. M., & Grant, B. F. (2011). Medical comorbidity of full and partial posttraumatic stress disorder in US adults: Results from Wave 2 of the National Epidemiologic Survey on alcohol and related conditions. *NIMH*. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3188699/

13      Tull, Matthew (n.d.). Is cognitive processing therapy a fast way to treat PTSD? *Verywell Mind.* https://www.verywellmind.com/cognitive-processing-therapy-2797281

14.     U.S. Census Bureau. (2021). Veterans in the United States statistics. https://www.statista.com/topics/3450/veterans-in-the-united-states/#:~:text=According%20to%20the%20U.S.%20Census,prior%20to%20World%20War%20II

15.     U.S. Department of Health and Human Services. (n.d.). Depression. *NIMH*. https://www.nimh.nih.gov/health/topics/depression/.

16.     U.S. Department of Health and Human Services. (n.d.). Generalized Anxiety Disorder. *NIMH*. https://www.nimh.nih. gov/Health/statistics/generalized-anxiety-disorder

17.     *VA.gov: Veterans Affairs*. PTSD Basics. (2018). https://www.ptsd.va.gov/understand/what/ptsd_basics.asp

18.     *VA.gov: Veterans Affairs*. How common is PTSD in adults? (2018). https://www.ptsd.va.gov/understand/common/common_adults.asp

19.     *Veterans*. National Council. (2021). https://www.thenationalcouncil.org/topics/veterans/

20.     Wang, Y., et .al. (2013). Psychometric properties of the Beck Depression INVENTORY-II: A comprehensive review. https://pubmed.ncbi.nlm.nih.gov/24402217/

21.      Weathers, F. W., Bovin, M. J., Lee, D. J., Sloan, D. M., Schnurr, P. P., Kaloupek, D. G., Keane, T. M., & Marx, B. P. (2018). The Clinician-Administered PTSD Scale for DSM-5 (CAPS-5): Development and initial psychometric evaluation in military veterans. *NIMH*. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5805662/

22.      Wooten, R.,Wong, C.,Hill, H., Ratliff, D., (2020). The effectiveness of an equine-assisted group psychotherapy program on military veterans with ptsd: a program evaluation (Publication No. 27833685) [Doctoral Dissertation, St. Mary's University]. ProQuest Dissertation Publishing.