

The Effect of Equine Interaction on Anxiety in a Population of College Students

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Abstract

The Beck Anxiety Inventory (BAI) was used to measure anxiety in a study accomplished at Middle Tennessee State University. Over a two month period, the BAI measured anxiety twice in a veteran's only section and a typical college student section of MTSU's Basic Horsemanship class (ABAS 2110). Both sections of the experimental group were expected to have a significant decrease in anxiety due to the class' resemblance to Animal-Assisted Therapy (AAT) and research that has shown that AAT decreases anxiety in a wide variety of people. However, results were not significant for either section of the Basic Horsemanship class. In order to come to any conclusions about equine interaction on anxiety in college students more experiments must be conducted involving more participants and longer study time.

Figures

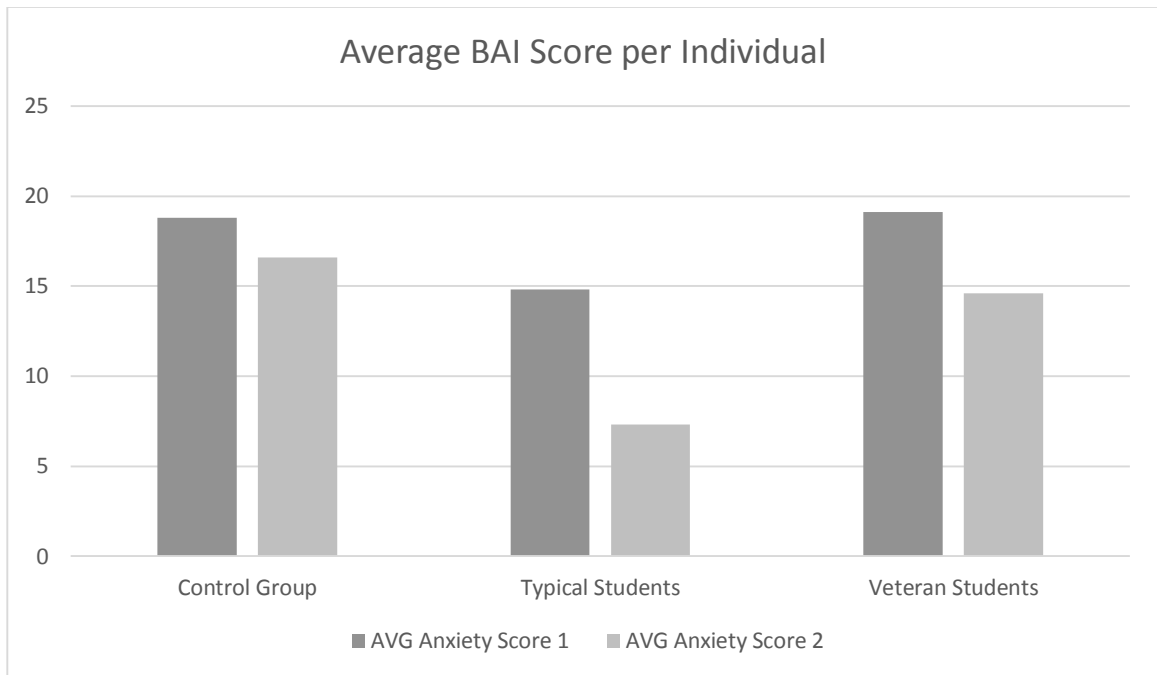


Figure 1: Average BAI Score per Individual. The bar graph compares average anxiety scores for the individual in the first testing of the BAI to the average anxiety scores for the individual in the second BAI testing in control and both experimental groups.

	n^2	Wilk's Lambda	F	p
Control	.05	.95	.87	.364
Typical Class Experimental Group	.26	.74	3.81	.077
Veteran Only Experimental Group	.14	.86	1.80	.207

Figure II: Repeated Measures ANOVA Analysis Data. The table illustrates p , Wilk's Lambda, F, and n^2 values found for the repeated measures ANOVA analysis in the control group, veteran only experimental group, and typical college student experimental group.

Introduction

Anxiety is a general term used to cover a broad range of more specific disorders that have to do with worrying, panicking, fear, phobias, nervousness, and apprehension (“What is Anxiety?”). It may also be described as a prolonged state of emotional or physical reaction to an event (Hartmann, 2014). Anxiety can range from very mild to very severe and can affect a person’s everyday life. In some cases a severe diagnosis leads to life-altering physical symptoms. While some types of anxiety are common (such as test anxiety, public speaking anxiety, etc.) and are not considered disorders, other types are debilitating and prevent people from living normal lives. According to *Medical News Today*, the most common types of anxiety disorders are Generalized Anxiety Disorder (GAD), Panic Disorder, phobias, Social Anxiety Disorder, Obsessive-Compulsive Disorder (OCD), Post-Traumatic Stress Disorder (PTSD), and Separation Anxiety Disorder (“What is Anxiety?”).

Anxiety can be caused by environmental, physiological, or medical factors, or a combination thereof; they may all lead to severe disorders (“Anxiety Causes, Symptoms, Treatment - Anxiety Causes – eMedicineHealth”). These factors can range from mental health disorders that are unrelated to anxiety to prescriptions that a person is taking. In addition, prolonged or extreme stress in a person’s life such as work-related stress, financial stress, stress related to a medical condition, academic-related stress, opiate withdrawal, and stress stemming from problems in personal relationships can cause anxiety. Symptoms of anxiety differ depending on the type of disorder and the severity. The symptoms across the anxiety spectrum include irritability, nausea, sleeping problems, shortness of breath, the feeling of choking, panic attacks, and trouble

concentrating ("Anxiety Causes, Symptoms, Treatment - Anxiety Causes - eMedicineHealth").

Anxiety disorders are the most common mental illnesses in the United States affecting an estimated total of 18% of the adult population ("Facts & Statistics"). Those who are in the age range of eighteen to twenty-four (typical college age) are the most likely to develop some sort of mental health disorder ("Depression and Anxiety Among College Students"). Ayres and Bristow conducted a study and found that nearly all college students suffer from anxiety at some point in their academic careers (Ayres & Bristow, 2009). Although some anxiety is normal (e.g. before tests, before speeches, etc.) it can become debilitating. Broad-spectrum anxiety among typical college students is linked to depression and sleep disturbances (Nyer, Farabaugh, Fehling, Soskin, Holt, Papakostas, Pedrelli & Fava, 2013) while social anxiety in college students has also been found to correlate with drinking habits (Terlecki, Ecker & Buckner, 2014). When young adults in college become newly independent and do not know how to handle new roommates, new ways of thinking and new responsibilities, they have increased anxiety ("Depression and Anxiety Among College Students"). Although a drastic number of college students suffer from some sort of anxiety, only 23% said they would be comfortable with a friend knowing they were seeking help for the problem. The number one reason students do not seek help is embarrassment.

Another demographic very susceptible to anxiety is the military veteran population. Post-Traumatic Stress Disorder is often measured in groups of military veterans specific to the time period that they served ("Epidemiology of PTSD"). The National Vietnam Veterans Readjustment Study (1986-1988) concluded that lifetime

prevalence of PTSD for those men was 30.9% and the lifetime prevalence for women was 26.9%. In another study involving Gulf War veterans (1995-1997), the estimated total PTSD was 10.1% for men and women combined. The Operation Iraqi Freedom Study conducted in 2008 estimated a current PTSD prevalence of 13.8% (“Epidemiology of PTSD”). Symptoms of PTSD may include feeling emotionally numb, suffering flashbacks, anger, loss of sleep, and nightmares (“PTSD”). Counseling, selective serotonin reuptake inhibitor medications, group counseling with other veterans, and volunteering are often used to ease the symptoms of this anxiety disorder.

Anxiety is most often treated with self-help techniques, medicine, and counseling/therapy (“Treatment for Anxiety”). Self-help techniques include learning how to manage the stressors in life, meditation, focusing energy towards other tasks, and practicing breathing techniques. Medicines such as benzodiazepines and antidepressants are used to treat those who cannot handle anxiety on their own. However, the use of benzodiazepines has dropped in treatment recently because of the addictive nature of the drugs (Xanax/Valium). Those who need additional help to control anxiety may combine medication with counseling and therapy (“Treatment for Anxiety”). Cognitive Behavioral therapy focuses on desensitizing the patient to the stressors that cause anxiety by helping them identify what triggers the onset of panic and then using a method to change the behavior that results. Psychotherapy is similar but focuses on talking through the problem and learning how to cope with it. Animal-Assisted Therapy (AAT) is another approach that has proven to help a wide variety of different disorders including mental health problems, autism, and behavioral and medical difficulties (Nimer & Lundahl, 2007).

Animal Assisted Therapy (AAT) is “a goal-directed intervention in which an animal that meets specific criteria is an integral part of the treatment process. AAT is directed and/or delivered by a health/human service professional with specialized expertise, and within the scope of practice of his/her profession” (“Animal-Assisted Therapy (AAT)”). It is used to improve a wide array of cognitive, physical, and emotional difficulties. Its goals include (but are not limited to) improving balance, motor skills, attention skills, social interaction, self-efficacy, and reducing anxiety and depression. According to Barker and Dawson’s study, AAT involving therapy dogs reduced anxiety in hospitalized psychiatric patients across a wide variety of illnesses while therapeutic sessions only reduced anxiety in those who had mood disorders (Barker & Dawson, 1998). The results of another study found that people involved in AAT had lower anxiety, depression, and pulse rates than a group of people involved in stress management therapy (Nepps, Stewart & Bruckno, 2014). Studies of AAT in college students have also been conducted. Leslie Stewart of Georgia State University measured the amount of reduced anxiety in college students after AAT with a therapy dog and found that students reported a 60% decrease on average in their anxiety after the session (“Animal Therapy Reduces Anxiety, Loneliness Symptoms in College Students”).

Animal-Assisted Therapy does not only employ canines; equine AAT is another popular form of this treatment. In Equine AAT, a person is involved with different activities that have to do with taking care of the animal such as feeding, grooming, and leading it around (“What is Animal Assisted Therapy?”). Riding the horse is used in some treatments, but not all. The basic idea behind equine assisted therapy is that the bond formed between horse and patient through the care of the animal allows for

emotional healing in the person. It has been found to have a positive impact on anxiety, behavioral issues, PTSD, and a number of other mental and physical conditions. Most AAT research has not focused on equine interaction, but the field is slowly gaining support from professionals in the therapy community.

The present study expected to measure a significant decrease in anxiety in both a typical college student section and a veteran only college student section of Middle Tennessee State University's (MTSU's) Basic Horsemanship class after two months of hands-on weekly interactions with horses. Significant change was not expected in the control group. Although the class was not technically an AAT class because of the lack of involvement by a mental health professional, interaction with the horses alone for an extended period of time was expected to decrease the amount of anxiety found in both sections. The Basic Horsemanship class involved many of the same activities that equine AAT typically includes, such as grooming, saddling, and leading.

Methods

Participants

Participants in this study were students enrolled in MTSU's 2015 spring semester. Students who participated in the Psychology Pretesting Sessions at the beginning of the semester were used as a control group ($n = 92$). Ages ranged from 18 to 39 [$M = 20.6$, $SD = 3.5$]. Students that were enrolled in the two Basic Horsemanship classes (ABAS 2110) in spring, 2015 were used as the experimental groups. In the typical college student section ($n = 12$), ages ranged from 18 to 35 [$M = 21.7$, $SD = 5.0$]. In the veteran only section ($n = 12$), ages ranged from 24 to 47 [$M = 35.8$, $SD = 8.3$].

Materials & Apparatus

The Beck Anxiety Inventory (Beck, 1988) was used to measure anxiety in this research. The control and experimental groups completed the BAI at two different times roughly two months apart. Age, gender, and whether the participant had previous experience with horses were also recorded. Following established MTSU retesting procedures, the BAI was administered to the control group online through MTSU's SONA system the second time. Participants were contacted through e-mail and given a survey code that was needed in order to access and complete the survey.

The BAI is a self-report questionnaire that measures the severity of 21 different physical symptoms over a month using a scale of 0 - 3 (Beck, 1988). Zero indicates no sign of the symptom at all, one indicates being mildly affected, two indicates that the symptom was bothersome and mildly unpleasant, and 3 indicates that the symptom was severely bothersome to the participant. The scores are added and the total sum is used to rate the category in which a person's anxiety falls. The maximum score possible is 63. A total of 0 to 7 points suggests a minimal level of anxiety, a total of 8 to 15 points suggests mild anxiety, a total of 16 to 25 points suggests moderate anxiety, and a total of 26 to 63 suggests severe anxiety. Results on the testing of the reliability and validity of the BAI are mostly focused on adults but show exceptional scores for both (Osman, Hoffman, Barrios, Kopper, Breitenstein & Hahn, 2002). Official conclusions on reliability and validity of the BAI in a college population have not been made.

Procedure

This experiment followed the Beck Anxiety Inventory protocol (Beck, 1988). The control group was tested at the beginning of February 2015, shortly after MTSU's classes began, during the Psychology Pretesting sessions held at the beginning of the semester. The Psychology Pretesting sessions allowed for a number of different surveys to be completed for campus experimenters. The BAI included an informed consent statement at the top of the survey and no personally identifiable information was included on the forms. Names were collected during the Psychology Pretesting session to allow for retesting. Participants in this research were later contacted through e-mail and given a survey code that was used to access the online survey for the second testing. Participants had the option of terminating the survey at any time; only completed surveys were used in this research.

The same survey form was given to both sections of MTSU's Basic Horsemanship class (typical and veteran) on the first day of classes in January. The one credit hour classes met one day a week for two hours, and covered topics such as barn safety, horse behavior, grooming basics, ground work, showmanship, tackle, and bridling the horse. Classes included hands-on interaction with the animals on a weekly basis. The BAI was given at the beginning of the classes before interaction with the horses began for both the initial survey and the retesting survey. There were roughly two months of classes between each administration of the BAI in the experimental groups.

The BAI retesting of the control group was administered at the beginning of April through MTSU's online SONA system. Completion of the survey was completely voluntary and participants were not rewarded with credit or points in their psychology

classes for their participation. Students who completed the first BAI testing in February were contacted by e-mail at their MTSU email account and given an access code and directions on how to retake the survey. The survey was available to these students online for one week. Repeated measures analysis of variance (ANOVA) was conducted to calculate the significance of differences in scores for all three groups.

Results

Eighteen of the 92 control group participants participated in the second online BAI through Middle Tennessee State University's SONA system. Ages of the second testing group ranged from 18 to 39 [$M = 22.2$, $SD = 5.1$]. The control group's average individual anxiety score was 18.8 at the first testing and dropped to 16.6 over the course of two months (Figure 1). Of the typical college student experimental group, 11 out of 12 students took the second BAI with ages ranging from 18 to 35 [$M = 21.9$, $SD = 5.3$]. The initial individual anxiety score of the typical student section was 14.8 and dropped to 7.3 on average on the second testing (Figure 1). The veteran student experimental section initially averaged a 19.1 anxiety score and dropped to 14.6 over the course of the semester (Figure 1). Ten of 12 students in the veteran class responded to the second testing with ages ranging from 24 to 47 [$M = 33.4$, $SD = 9.6$].

Test scores for the typical experimental group were compared using a repeated measure ANOVA test. Although there was a large difference in the average scores between the two testing times, the difference was not found to be significant at the 5% level [session 1 $M = 14.8$, $SD = 12.7$; session 2 $M = 6.7$, $SD = 6.9$; $p = .077$, one-tailed, Wilk's Lambda = .74, $F(1, 11) = 3.81$, $n^2 = .26$] (Figure 2). Repeated measure ANOVA testing was also conducted for the veteran only experimental group, resulting in no

significant difference at the 5% level [session 1 $M = 19.1$, $SD = 15.4$; session 2 $M = 12.2$, $SD = 13.0$; $p = .207$, one-tailed, Wilk's Lambda = .86, $F(1, 11) = 1.80$, $\eta^2 = .14$] (Figure 2). Eighteen scores were randomly chosen from the control group's first testing to be compared to the second testing that was done online through MTSU's SONA system (18 respondents). A repeated measures ANOVA analysis was conducted for this group as well. The difference in scores was also found to be not significant at the 5% level [session 1 $M = 20.3$, $SD = 14.8$; session 2 $M = 16.6$, $SD = 6.8$; $p = .364$, one-tailed, Wilk's Lambda = .95, $F(1, 17) = .87$, $\eta^2 = .05$] (Figure 2).

Discussion

The data supported one of the two hypotheses for this experiment. As expected, there was not a significant decrease in anxiety in the control group over two months of time without equine interaction. However, the average individual score decreased by half in the typical college student section of the Basic Horsemanship class after two months of interaction, but the decrease was only statistically significant at the 10% level. An additional study should be accomplished to determine whether a greater statistically significant decrease in anxiety could be observed with a greater number of participants. The veteran college student section was also not found to demonstrate a statistically significant decrease in anxiety.

The veteran experimental group post-test average score may have differed from the typical experimental group post-test score for a number of reasons. The ages of the veteran only class were noticeably higher than those in the typical college student section class. The older students in this section are more likely to have additional sources of stress in their lives such as families of their own and additional responsibilities

appropriate and typical of people their age. Having a pet at home may have also affected the anxiety scores of participants in both sections of the class. Animal interaction at home could potentially bring a person's anxiety score down before interaction with the horses occurred, reducing the potential for a significantly lower anxiety score after interaction with a horse in the class. Finally, the amount of time since the individual veterans (and as a group, on average) last experienced combat was not explored and could be a factor in these results. Combat is a known anxiety factor, members of the veteran group could be dealing with this exposure, and the time period tested over may not have been sufficient to allow for a statistically significant change in measured anxiety.

Several additional factors may have affected the outcome of this experiment. The second BAI testing was conducted around MTSU's normal mid-term testing time. Although mid-term tests vary from class to class, the end of March to the beginning of April are the typical few weeks that midterm exams are offered. It is possible that test anxiety spiked around this time in both the control and experimental groups resulting in higher anxiety scores than would have been recorded at another time in the semester. Other types of anxiety that may be involved (e.g. social anxiety, anxiety involving personal problems, financial anxiety, etc.) must also be considered.

Time is another factor that must be considered in interpreting the results of this study. Since the Basic Horsemanship class only meets once a week, there were only between seven and ten official meetings per section of the class. In addition, during MTSU's 2015 spring semester, roughly two weeks of classes were canceled due to inclement weather conditions. This not only reduced student/equine interaction time but also pushed the class' lesson plan back a few weeks. The students did not progress as

much as was originally intended, as topics covered and hands-on interaction with the horses was limited. It is possible that this affected the experimental group's anxiety scores. Some students may have had lower anxiety levels because of the break from class while other students may have had higher anxiety levels if they had children to take care of during the day since schools were closed. In addition, losing two weeks in a semester could have spiked anxiety scores since due dates were pushed back and there was less time to complete assignments.

The number of participants in both experimental groups was relatively small as well. Twelve experimental students in a class is potentially insufficient for statistical validation of an effect over a two month period. Although the average individual anxiety score did drop dramatically in the post-test BAI, twelve participants provides a relatively low number of degrees of freedom with which to calculate the statistical interaction. Additional experimental participants would increase the degrees of freedom, increasing the power of the statistical analysis. The control group started out with 92 participants (a good number for analytical purposes) but only 18 volunteered to take the self-reporting BAI for a second time online. Future researchers may want to include an incentive (credit for classes, prizes, etc.) in order to have more control group participants respond to a second testing. Three participants in the experimental groups did not take the retest BAI, reducing the already low number of subjects and reducing the potential power of the results. This factor alone may have most significantly affected the outcome of the experiment.

Conclusion

Although studies have shown that equine AAT can reduce anxiety (Nimer, 2007), equine interaction did not have a statistically significant effect on anxiety in veteran or typical college students in the Basic Horsemanship class at Middle Tennessee State University. However, average anxiety scores on the second BAI dropped dramatically in the typical college student section, suggesting that there was an effect of some degree in that section of the class. In order to draw any statistically valid conclusions about the effect of equine interaction on anxiety in college students, more studies should be conducted involving more participants over a longer time period, with testing at multiple intervals during the semester.

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