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The Effects of Equine Therapy on Social Functioning of Children with Autism Spectrum Disorder

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Animals have been used in therapy for decades however; recent research conducted focuses on the effects of equine therapy on children with Autism Spectrum Disorder. Equine therapy began in the 1960's and utilizes horses or ponies to improve aspects of life including social functioning, muscle strength, and speech (Chandler, 2005). Horses react to and mirror people's behaviors and emotions, which aids in the therapeutic aspect of this type of treatment (Bates, 2002). Positive therapeutic outcomes have resulted from using equine therapy with those diagnosed with Autism Spectrum Disorder. Two hundred and ten children with Autism Spectrum Disorder will be recruited to research the effects of equine therapy on their social functioning. I hypothesize that children with ASD will have a more significant change in social functioning with equine therapy sessions that incorporate riding and ground activities than ASD children in equine therapy sessions that only use riding, or only ground activities.

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Although all species of animals have been exceedingly versatile and valuable to humans for centuries, it was not until the ninth century that people first introduced animals as a form of therapy for those with disabilities (Morrison, 2007). Animal Assisted Therapy includes animals in treatment plans to form a relationship with the client and help the client achieve his or her goals (Chandler, 2005). Animal Assisted Therapy is a tool used for people ranging from childhood to elderly (Nimer & Lundahl, 2007). Many animals have supplemented psychotherapy including dogs, horses, rabbits, and birds have been identified for therapeutic use (Morrison, 2007; Rothe, Vega, Torres, Soler, & Pazos, 2005). Dogs visiting hospitals or nursing homes are one of the most common types of Animal Assisted Therapies (Nimer & Lundahl, 2007).

Nimer and Lundahl (2007) employed a meta-analysis to study outcomes of Animal Assisted Therapy on Autism Spectrum Disorder, medical symptoms, behavior, and well-being. Animal assisted therapy, in conjunction with physical therapy, has been shown to improve gross and fine muscle strength and control, and to aid in mental functioning

(Chandler, 2005). Recently, there has been more research investigating the use of horses in Animal Assisted Therapy. Professional Association of Therapeutic Horsemanship International, PATH Int., defines Equine-Assisted Therapy as incorporating horses, their environment and equine activities into a treatment plan (EAAT Definitions, 2014). The client, medical professional, and equine staff collaborates to establish and meet individual client goals (EAAT Definitions, 2014). Equine therapy, also called hippotherapy, combines aspects of physical, occupational, or speech therapies to achieve client's goals (EAAT Definitions, 2014).

Equine therapy originated in Europe and spread to North America by the 1960's, where it became widespread and increasingly popular (Gabriels et al., 2011; Lessick, Shinaver, Post, Rivera, & Lemon, 2004; Morrison, 2007). Originally, traditional hippotherapy focused more on physical rehabilitation, but now it incorporates psychological, social, emotional, behavioral, cognitive, and educational aspects (Granados & Agis, 2011; Lessick et al., 2004). In recent literature reviews by Granados and Agis (2011) and Lessick et al. (2004), researchers concluded that equine therapy provided physical, psychological, and social benefits. Significant improvements were found in specific areas such as muscle strength, balance and posture, concentration, alertness,

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communication, and reduced anxiety in individuals using equine assisted therapies (Granados and Agis, 2011; Kern et al., 2011; Lessick et al., 2004). Horses' unique ability to mirror people's behaviors and emotions, and react accordingly to the projection or transference of those emotions, greatly influence the interactions and outcomes of therapy (Bates, 2002; Zugich, Klontz, & Leinart, 2002; Bizub & Davidson, 2003).

Equine therapy is multifaceted and beneficial to groups such as the mentally and physically disabled and those struggling with mental illnesses, addictions, or unsafe home lives (Bass, Duchowny & Llabre, 2009; Bates, 2002; Granados & Agis, 2011; Klontz, Bivens, Leinart, & Klontz, 2007). Klontz et al. (2007) found equine therapy increased well-being and decreased psychological distress in participants in an eight-month study. Two self-reports measured patterns of their psychological symptoms and their level of self-actualization before and after the therapy intervention (Klontz et al., 2007). Six months later, participants completed a follow-up form. Results showed a significant improvement of symptoms and well-being from pre-test to post-test, and at the point of the six-month follow-up, the improvements had remained stable (Klontz et al. 2007).

Equine therapy can help children with physical disabilities. Children with Cerebral Palsy showed a significant increase in muscle symmetry, equal strength of leg muscles, with equine therapy (Benda, McGibbon, and Grant, 2003). Children in the experimentation group sat on a horse for eight minutes (Benda, McGibbon, and Grant, 2003). Children in the control group sat on a barrel, rather than ride a horse, for eight minutes (Benda, McGibbon, and Grant, 2003). Horse's and human's similar walking movements and the warmth of the horse help loosen the children's muscles (Benda, McGibbon, Grant, 2003; Klontz et al. 2007). Muscle activity in the upper legs and trunk of each participant was recorded with a surface electromyography, electrical nodes placed on the body to record muscle tension and activity. Muscle symmetry was recorded while walking, sitting, and standing before and after the intervention of either the horseback ride or sitting on the barrel (Benda, McGibbon, Grant, 2003). Results showed no significant changes in muscle symmetry of the children in the control group of sitting on the barrel, however, children in the group who sat on the horse showed significant improvements in muscle symmetry (Benda, McGibbon, Grant, 2003).

The proposed study will examine the effect of equine therapy on children with autism. Autism Spectrum Disorder (ASD) is diagnosed in almost one in 100 people worldwide and contains four different disorders: Asperger's, childhood disintegrative disorder, pervasive developmental disorder not otherwise specified, and autism (American Psychiatric Association, 2013). Individuals are diagnosed with one of the four disorders, which share similar symptoms and behaviors, although they may vary in degree of severity. Difficulty in communication, sensory perception and integration, and adapting to changes, and limited gross or fine motor movements are criteria for ASD diagnosis (American Psychiatric Association, 2013).

The struggles that children with ASD face greatly affect their families as well. Studies have shown that autism is highly heritable and is influenced by abnormalities in at least five structures of the brain (Freitag, Staal, Klacuck, Duketis, & Waltes, 2010; Belmonte et al., 2004). Psychologists have the ability to accurately diagnose ASD in children as young as two years old (Moore & Goodson, 2003). Specific diagnoses had 87.5% accuracy an additional two to three years after the initial diagnosis. Benefits of early diagnosis greatly influence the immediate availability of appropriate therapies, interventions, and planning for the child as well as support for the parents and family members (Moore & Goodson, 2003). People affected by ASD generally receive occupational therapy, physical therapy, speech therapy, and animal assisted therapy (Treatment & therapies, 2014).

According to Granados and Agis's (2011) review of past research, equine therapy provided physical, psychological, social, and educational benefits to children with a wide range of physical or mental difficulties. In particular, equine therapy seems to improve autistic children's social skills, focus, sensory functions, and motor skills (Bass, Duchowny, & Llabre, 2009; Wang, Wang, Huang, & Su, 2010). ASD children who have horse care responsibilities, such as grooming, during their equine therapy session may begin to apply those activities to themselves at home (Bass, Duchowny, & Llabre, 2009). New communication skills through instruction or identifying parts of the horse and forming a relationship with the horses may lead to a transformation in the children's behaviors in other milieus (Bates, 2002; Roberts, Bradberry & Williams, 2004).

Bass, Duchowny, and Llabre (2009) experimentally investigated the effect of a 12-week horseback riding therapy program on the social functioning of 25 children with ASD. Pretests and posttests measuring ASD symptoms and sensory processing were administered to both the control and experimental group. One-hour therapy sessions consisted of mounting and dismounting skills, warm-up exercises, riding skills, mounted games, and care activities. Children in the control group were not reported to have significant changes in any of the areas studied. Experimental group participants demonstrated improvements in sensory and motor functioning, social skills, and focus (Bass, Duchowny, & Llabre, 2009).

Similarly, in another study consisting of 20 children, researchers found that after a six month therapeutic riding program, there was a decrease in the scores of the Childhood Autism Rating Scale (Kern et al., 2011). The CARS rates behaviors as well as severity of autism. Kern et al. (2011) also used the Timberlawn Parent-Child Interaction Scale (TPCIS), Sensory Profile, and Quality of Life Enjoyment and Satisfaction Questionnaire (QLESQ) to assess the effects of equine therapy on autistic children. Participants' caregivers completed all four measures at four different times during the study to provide accurate data. Results showed a significant decrease in CARS scores, an increase in mood and tone in the TPCIS, increased sensory processing, and an increase in the

children's overall quality of life three and six months after equine therapy treatment (Kern et al., 2011).

Following the use of equine therapy, significant improvements in children with ASD were evident in areas of self-regulation, irritability, behavior, hyperactivity, language expression and communication, and motor skills when data from baseline and post-intervention evaluations were compared (Gabriels et al., 2011). Additionally, over a ten-week period, six children participated in equine therapy had improved sensory processing when compared to six children who did not receive equine therapy as measured by sensory scales the caretaker completed (Stoner, 2007). The caretakers of the control and experimental groups completed pre and posttests that measured sensory processing and responses.

Evidence suggests that horses positively affect the lives of children with ASD, especially by improving their social functioning. Many studies conducted investigate the therapeutic effects on various populations; however, their small sample sizes and lack of follow-up data are limiting factors (Benda, McGibbon, Grant, 2003; Kern et al., 2011; Klontz et al. 2007; Lessick et al., 2004). Additional research with quantifiable results is needed to further investigate if equine therapy is an efficacious treatment intervention for children ASD (Winchester, Kendall, Peters, Sears, & Winkley, 2002). Previous studies have not separated riding and ground activities into separate therapy sessions and there may be some speculation as to the benefit of one over the other. I hypothesize that children with ASD will have a more significant change in social functioning with equine therapy sessions that incorporate riding and ground activities than ASD children in equine therapy sessions that only use riding, or only ground activities.

PROPOSED METHOD

Participants

Quota or random sampling will be used to obtain 210 children with ASD from the United States, ages two to 12, who have scored between 37 and 60 on the Childhood Autism Rating Scale (CARS). Children scoring between 37 and 60 are considered to have severe autism and will be selected for this study (Schopler, Reichler, & Renner, 1994). Caregivers of prospective participants will complete an Inclusion and Exclusion Criteria Form (see Appendix A) prior to admission into the study, which will include these items. Children who have more severe autism are more likely to show improvement in social functioning than children who are higher functioning. Demographic variables of age, biological sex, and ASD diagnosis will be collected at the beginning of the study (see Appendix B).

Measures

The Childhood Autism Rating Scale (CARS), Social Responsiveness Scale (SRS), and Aberrant Behavioral Checklist-Community (ABCC) will be used to evaluate social functioning throughout the study. Childhood Autism Rating Scale is a 15-item questionnaire identifying and describing the severity of autism (see Appendix C) (Schopler, Reichler, & Renner, 1994). A non-autistic score is 15 to 29.5, mild to moderate autism is 30 to 36.5, and moderate to severe autism is 37 to 60 (Schopler, Reichler, & Renner, 1994). CARS will be used as part of the inclusion criteria. Social Responsiveness Scale is a 65-item questionnaire measuring the severity of symptoms of autism spectrum disorder on a four-point Likert scale (see Appendix D) (Conastantino, 2002). Aberrant Behavioral Checklist-Community is a 58-item questionnaire evaluating behavior problems of children and adults in community settings (see Appendix E) (Aman, Singh, Stewart, & Field, 1985). All three measures have been found to have high internal reliability, consistency, and validity.

Procedure

This experiment will use a longitudinal design. Participants will have a one-hour, weekly session for two years. The study will take place at a large, therapeutic riding stable within reasonable driving distance of the participants' homes. For those who met the inclusion criteria, participation will be approved by children's caregivers and physicians through an Informed Consent Form. The three measures, CARS, SRS, and ABC-C, will be used to assess the effect of equine therapy on the participant's social functioning throughout the study.

A pretest will be given on the first day of the study to provide a baseline measurement. Two hundred and ten participants will be randomly assigned to one of three conditions: 1) one hour of riding, 2) 30 minutes of riding and 30 minutes of ground activities, and 3) one hour of ground activities. There will be 70 children per condition, divided into 14 groups of five children for each therapy session. Equine therapy sessions will take place seven days a week, with six groups per day. The staff at the riding center will provide one trained instructor or certified occupational therapist and two side-walkers per child and horse pair.

The independent variable, the type of equine therapy, will be manipulated for each condition. Condition A will consist of one hour of ground activities, Condition B will have 30 minutes of ground activities and 30 minutes of riding, and Condition C will be one hour of riding. A possible fourth group, Condition D, will be created from the children who drop out of the study. Riding activities will consist of mounting and dismounting, warm-up exercises, various riding skills required for walking, trotting, and halting their horse, and mounted games such as Red Light, Green Light or Simon Says. Ground activities will include various grooming and washing skills and naming parts of the horse's anatomy. The three aforementioned conditions will help isolate whether it is the ground or riding activities that have the biggest effect on

social functioning of the participants. Six months after starting therapy sessions, and every six months after that while continuing equine therapy, progress tests including all three measures will be completed. A post-test will be completed at the conclusion of the two-year study. To determine the effect of equine therapy on the social functioning of children with ASD, I will compare the results of the three different conditions using an ANOVA analysis. An additional follow up questionnaire will be completed six months after the study ends to determine if the effect of equine therapy extends beyond the conclusion of the study.

Additional considerations include maintaining lists of interventions, such as medications and therapies currently used for each child, and taking note of any changes in interventions during the study. An adequate number of horses or ponies and equine staff per group session will be imperative to run the study smoothly. Researchers and equine staff should be prepared to deal with possible accidents while working with the horses, children who drop out of the study, and possible allergies to horses. Incentive to participate in the study will be half-priced equine therapy sessions during the duration of the study.

CONCLUDING REMARKS

Limitations

One limitation of this study is the equine therapy session curriculum may vary slightly depending on who is leading each session. Everyone has their own teaching method and since there will be several occupational therapists or instructors, the children may experience slightly different approaches to riding and ground activity instructions. Another limitation is the availability of equine staff and participants to remain consistent over the course of the two-year study. Occasionally some overlapping of ground and riding activities may occur in the sessions at least during the first few weeks of the study, which would pose another limitation in separating the effects of ground versus riding sessions. Additionally, Condition D is a control group, however, because it is comprised of those who drop out of the study, it may not be representative of the population.

Significance

Finding a therapeutic intervention to improve the social functioning of children with autism spectrum disorder is a constant struggle. Each child faces diverse challenges and responds to treatment differently. While other studies found equine therapy to be effective, they did not use as large a sample size as this study. Equine therapy has positively affected the social functioning of children with ASD, but this study focuses on breaking down each part of equine therapy and seeing its individual affect on the each child. This will allow for researchers, equine staff, and parents of children with ASD to further understand what type of equine therapy is

best suited for their child. Equine therapy may be of significant therapeutic use to society as a whole. If a certain type equine therapy, riding only, ground activities only, or both, is found to be effective in this study, it will enhance the types of treatment other individuals receive. Possible populations could be those with depression, mental disabilities or disorders, and physical disabilities. Horses have a wide range of therapeutic advantages beyond the social interactions aspect of this study.

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