

PARENTAL PERCEPTIONS OF THE EFFECTIVENESS OF
EQUINE THERAPY FOR CHILDREN WITH
SPECIAL HEALTH CARE NEEDS

A DISSERTATION

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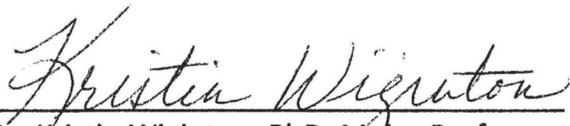
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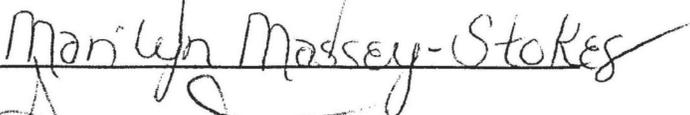
I am submitting herewith a dissertation written by Mary Kathleen Hughes entitled "Parental Perceptions of the Effectiveness of Equine Therapy for Children with Special Health Care Needs." I have examined this Dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy with a major in Health Studies.

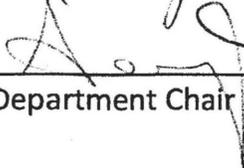


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ABSTRACT

MARY KATHLEEN HUGHES

PARENTAL PERCEPTIONS OF THE EFFECTIVENESS OF EQUINE THERAPY FOR CHILDREN WITH SPECIAL HEALTH CARE NEEDS

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The purpose of the research was to examine the parental perceptions of the effectiveness of equine therapy for children with special health care needs as evidenced by a positive change in the child's behavior and in the child's health following therapeutic riding. It is estimated that over 10 million children in the United States are confronted by special health care needs annually. Over 8.8 million households have at least one child with a special health care need. This equates to 13.9% of children ages 0-17 and 21.8% of households (Child and Adolescent Health Measurement Initiative, 2010). Since time is limited in the identification and intervention process due to the potential developmental repercussions facing the child, health care objectives should support any method that could better serve the child. Animal-assisted interventions have proven successful for a variety of settings and populations. The human-animal bond, along with inherent characteristics of the animal, provides the foundation for understanding the potential of this therapeutic partnership.

This mixed-method study incorporated a convenience sample of 27 children between the ages of 20 months and 15 years who were involved in therapeutic riding at a center in North Texas during the spring of 2010. Post-therapy surveys were utilized for collection of data. Quantitative data was extracted from the PedsQL Quality of Life Inventory Scale, the PedsQL Cognitive Functioning Scale, and the PedsQL Family Impact Module. Simple logistic regressions were conducted on the PedsQL subscale scores and overall PedsQL scores in order to predict the perceived benefits. Qualitative data was drawn from the Demographic Survey and the Therapeutic Riding Survey.

Both quantitative and qualitative findings supported the effectiveness of equine therapy for Special Health Care Needs Children, regardless of age or developmental stage. Positive changes were seen in behavior, in health, and in improved quality of life factors for the child. Qualitative findings revealed that parents perceived that therapeutic riding decreased anxiety in their children, enhanced mental focus, improved motor skills, promoted communication, increased motivation, and increased self-confidence and self-worth. Findings also supported perceived benefits beyond behavior change, including an increase in cognitive functioning, auditory processing, and improvement in overall mental health.

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CHAPTER I

INTRODUCTION

Though there is no recognized, single definition of special health care needs, the American Academy of Pediatrics and the Maternal and Child Health Bureau of the U.S. Department of Health and Human Services adopted the current definition of Children with Special Health Care Needs (CSHCN) as those “children and youth who have or are at increased risk for a chronic physical, developmental, behavioral, or emotional condition and who also require health and related services of a type or amount beyond that required by children generally” (McPherson, Arango, & Fox, 1998).

The definition is intended to be broad and inclusive, not focusing on a limited, specific set of health conditions. Many of the children and their families share common needs and experiences due to the ongoing nature of their health care needs. The Centers for Disease Control and Prevention’s National Center for Health Statistics conducted a National Survey of Children with Special Health Care Needs (NS-CSHCN) in 2005-2006. Based on the findings from the survey, it is estimated that there are approximately 10.2 million children with special health care needs in the United States. This equates to 13.9% of children ages 0-17 and 21.8% of U.S. households. Over 8.8 million households have at least one child with a special health care need (Child and Adolescent Health Measurement Initiative, 2010).

The two major goals set forth by Healthy People 2010 focus on increasing the quality and years of healthy life and the elimination of health disparities. Several critical objectives for children and adolescents with special health care needs are directly related to these goals as evidenced by the leading health indicators—access to health care, injury and violence, tobacco and substance abuse, high risk sexual behavior, and mental health problems or mental disorders. Through collaboration, education and research, the main objectives of disease prevention and health promotion can be enhanced and issues identified and addressed much more quickly (Healthy People 2010, 2008).

In dealing with the special health care needs of children and adolescents, the element of time is of great importance, since there is the possibility of developmental delays or a break in developmental growth for the child. The earlier problems are identified and interventions are implemented, the less chance there is for developmental repercussions (Fine, 2006). Due to the time-sensitive importance of intervening on behalf of the child, health care objectives should encompass any method that could better serve the child. Incorporating the use of animals in therapeutic interventions with children and adolescents offers unique advantages that can enhance traditional clinical methods. The world of medicine is witnessing the amazing power of animals to detect certain cancers, seizures and impending heart attacks. Additionally, animals are recognized as being strong deterrents against loneliness and depression,

they encourage physical activity and social interaction, and they are beneficial in the treatment of chronic conditions. For the child who is physically or emotionally challenged, the animal can serve as a bridge to interpersonal communication and attachment and provide a safe passage to a healthier life (Becker, 2002).

Animal-assisted activities (AAA) and animal-assisted therapies (AAT) are often combined with other forms of therapy, and utilized across interdisciplinary fields in the promotion or improvement of health. The type of animal and the settings in which the animal can make a positive difference are virtually limitless. According to the Delta Society (2009), a non-profit organization dedicated to improving human health through service and therapy animals, animal-assisted therapies are beneficial in each of the four functional domains: physical, social, emotional, and cognitive.

Statement of the Purpose

Equine therapy and other forms of animal-assisted interventions offer alternative forms of therapy that have proven to be successful for a variety of settings and populations. The human-animal bond, along with the inherent characteristics of the animal, provide the foundation for understanding the potential of this therapeutic partnership. There is a pressing need, however, to evaluate and measure the effectiveness of animal-assisted programs in order to prove their therapeutic benefit and add further support to the existing body of research.

The purpose of this study was to examine the perceptions of parents/guardians of children with special health care needs on the effectiveness of equine therapy in improving the quality of life for the child and family as evidenced by a positive change in behavior and in health. The study focused on the following areas: 1) description of demographic, personal, and environmental factors; 2) assessment of the effectiveness of equine therapy from the parent/guardian perspective; 3) exploration of relationships among the various factors and parental perceptions; and 4) examination of the impact of the child's disorder and therapeutic riding on the family.

Research Questions

1. Did parents/guardians perceive therapeutic riding as beneficial to their child?
2. Did parents/guardians believe that therapeutic riding improved the quality of life for the child, parent and family?

Null Hypotheses

H₀1 – There will be no statistically significant differences in mean scores on the quality of life scale, cognitive functioning scale, or family impact scale based on descriptive variables (e.g. age, gender, health condition).

H₀2 – Quality of life scores, cognitive functioning scores, and family impact scores will have no significant effect on parental perceptions of therapeutic riding.

H₀₃ – Quality of life scores, cognitive functioning scores, and family impact scores will have no significant effect on parental perceptions of the benefit of therapeutic riding on the perceived quality of life for the child or family.

Delimitations

This study had the following delimitations.

1. Only parents/guardians of children 18 years of age or younger who participated in the Spring/Summer 2010 riding program were included in the study.
2. Only parents/guardians whose residence also served as the primary residence for the child participating in the riding program were included.

Limitations

This study had the following limitations.

1. Information collected in this study was of a self-report nature which was subject to several potential sources of error.
2. Convenience sampling was utilized, with the sample being chosen from one location which limited its generalization to a broader population.
3. The variables under study may have been influenced by time or events occurring during the study period.

Assumptions

This study had the following assumptions.

1. Participants responded truthfully and comprehensively to the questions.
2. Participants were able to read and write English and fully comprehend the questions.

Definitions of Terms

Acute stress disorder: The initial or immediate pathological response to trauma involving intense fear and a minimum of three dissociative symptoms. Symptoms occur within two days to one month following the traumatic event (Jonker & Hamrin, 2003).

Animal-assisted activity (AAA): According to the Delta Society (2009), animal-assisted activities are designed to enhance the quality of life through the human-animal bond. Animal-assisted activities are delivered in a variety of environments by specially trained professionals, paraprofessionals, and/or volunteers, with animals that meet specific criteria (Delta Society, 2009).

Animal-assisted therapy (AAT): The Delta Society (2009) identifies animal-assisted therapy as a goal-directed intervention that incorporates the human-animal bond as an integral component of the treatment process. AAT involves health or human service professionals with specialized expertise and animals that meet specific criteria. AAT is designed to promote improvement in human physical, social, emotional, and/or

cognitive functioning. It can be offered in a variety of settings, either group or individual. Lastly, this process must be documented and evaluated.

Equine-assisted activity (EAA): A sub-section of AAA that utilizes a horse or horses in the activities (Fine, 2006).

Equine-assisted therapy (EAT): EAT is a sub-section of AAT where a horse is the chosen therapeutic agent (Fine, 2006).

Equine-assisted psychotherapy (EAP): EAP is an experiential approach that incorporates horses for emotional growth and learning. The main focus is on ground activities versus riding, and can be used with individuals or groups. This approach has been compared to the ropes courses used for human development, leadership, and team building (EAGALA, 2007).

Equine-facilitated psychotherapy (EFP): This is a form of an experiential psychotherapy that utilizes the horse as the therapeutic agent. A licensed mental health professional works in conjunction with a credentialed equine professional. Activities may include handling, grooming, longeing, riding, driving, and vaulting. It falls in the category of AAT (Fine, 2006).

Hippotherapy: This method of therapy is a sub-specialization of EAT, and means treatment with the help of a horse. The term is derived from the Greek word *hippos*, which means "horse". According to the American Hippotherapy Association, physical, occupational, or speech therapy treatment strategies are incorporated utilizing the

movement of the horse. During this activity, the rider does not influence the horse, but is primarily a passenger. The horse's movement influences the rider (Macauley & Gutierrez, 2004).

Posttraumatic stress disorder (PTSD): A psychological syndrome that includes a set of symptoms that develop in response to witnessing or experiencing a threatening or harmful event that evokes feelings of fear, helplessness, or horror. PTSD is further characterized by the symptom clusters of re-experiencing, avoidance or numbing, and hyperarousal (LaGreca, Silverman, Vernberg, & Roberts, 2002).

Traumatic event: Defined by its capacity "to evoke terror, fear, helplessness, or horror in the face of a threat to life or serious injury" (American Psychiatric Association, 1994).

Importance of the Study

The evaluation of animal-assisted therapeutic interventions is needed to describe, document, and prove the efficacy of these alternative therapies. Animals have served mankind since the beginning of human existence. It was through domestication, however, that the relationship of man with the animal shifted, and an emotional attachment began to develop. From this attachment, the human-animal bond was forged. This bond, along with inherent characteristics of the animal, has elevated the connection between the species and created the potential for a therapeutic partnership. This connection cannot only enhance the intangible "quality of life," but it can also

improve human health. The incorporation of therapy animals in a clinical intervention is a creative model that can promote a feeling of safety for the child, thus initiating or advancing the healing process (Becker, 2002; Fine, 2006). An evaluation of an existing equine program will hopefully showcase how a connection with another species can lead a person and family to a healthier place both emotionally and physically.

The study will provide information for the health educator in identifying alternate interventions in the prevention and promotion of various health issues. The findings will not only be useful for dissemination among individuals and families, but will be crucial in promoting and ensuring collaboration among other health professionals. Through research, the health educator can provide the necessary data to showcase the economic impact of special health care needs on the individual, family and community and demonstrate the benefits of animal-assisted therapies. Ultimately, this could translate into program funding and insurance coverage, which would make animal-assisted therapies available to a greater number of people (Aduroja et al., 2007).

CHAPTER II

REVIEW OF THE LITERATURE

Empirical studies in the area of animal-assisted interventions have been somewhat limited, but have shown significant positive results for a number of populations. Clinical observation and anecdotal evidence add to the appeal and belief in these alternative approaches. From the youngest to the oldest members of society, studies have shown that animals can serve through life's transitions or at times of greatest need.

The developmental stages of human growth change throughout the life cycle, though the foundation that supports this growth begins to form at the very beginning of life. According to the Federal Interagency Forum on Child and Family Statistics (Federal Interagency Forum on Child and Family Statistics, 2010), seven interrelated domains influence the likelihood of a child developing into a healthy adult. Family and social environment, physical environment, economic circumstances, health care, behavior, education, and health all impact a child's growth and development. Included in the overall category of health are physical, mental, and social indicators.

Children with Special Health Care Needs

Children with Special Health Care Needs (CSHCN) are a diverse group, representing all ages, ethnicities, and income levels. Gender prevalence varies

nationally, with 16.1% of males and 11.6% of females being affected. Functionality is also quite diversified, with some children being rarely impacted by their condition to those whose lives are significantly altered by their condition or conditions. In the Health Status Profile of the NS-CSHCN sixteen specific health conditions are listed, as well as 14 sets of functional difficulties. Results of the survey indicate that 91% of CSHCN have one or more conditions, while 25% of CSHCN have 3 or more of the conditions. Furthermore, 85% of the children experience one or more of the functional difficulties, whereas 28% have 4 or more of the listed functional difficulties (Child and Adolescent Health Measurement Initiative, 2010).

Each child with a special health care need, and his or her family, share common characteristics with others that fall within this group. There is an increased need for access to a wide range of services, both medical and support, in order to sustain, development and maintain the physical, mental, and emotional health of the child. In coping with the consequences of a child's condition, families often require support in terms of respite care and family counseling. Not only must the child and family have access to these different services, it is important that the services be family-centered, with the recognition that the family members are the child's primary caretakers (Child and Adolescent Health Measurement Initiative, 2010).

A family's finances and employment status are often compromised in caring for a child with a special health care need. According to the NS-CSHCN, 20.0% of families pay

\$1,000 or more annually in out of pocket medical expenses for the child; the parents of 18.1% of CSHCN report that the child's condition has caused financial problems for the family; and 9.7% of the families spend 11 hours or more per week providing or coordinating the child's health care. Financial problems are further exacerbated if the parent must decrease work hours or stop working in order to provide care for the child, as reported by 23.8% of the families in the survey (Child and Adolescent Health Measurement Initiative, 2010).

The stress of caring for a child with special health care needs directly affects the quality of life and mental health of the families, especially the primary caregiver of the child. Several factors influence the impact on the family, including the level of severity and disability of the child's diagnosis, coexisting behavioral problems, social support, socio-economic status, parental and child characteristics, and coping strategies (Mugno, Ruta, D'Arrigo, & Mazzone, 2007).

In a study by Herring et al. (2006) on toddlers with pervasive developmental disorders, the researchers found that the child's emotional or behavioral problems contributed significantly more to the mother's stress, parental mental health problems, and perceived family dysfunction than the actual diagnosis. An important conclusion drawn from this research was the need for early support and intervention for the primary caretaker and the family in order to diminish the overall impact on their quality of life.

Researchers in Canada examined the health and well-being of caregivers of children with cerebral palsy. Though caregiving is a normal component of the role of parent, it takes on greater significance when a child has functional limitations and possible long-term dependence. Both child behavior and caregiving demands affected the psychological and physical health of the caregivers (primarily mothers). The study showcased the direct impact of family function, that of the family working closely together, on the health of the caregiver. There was a direct correlation between family function and the psychological and physical health of the caregiver, including the effect on self-perception and stress management. The influence of support provided by extended family and friends was recognized as second in importance to that of family function (O'Donnell et al., 2005).

Health Status Profile

Autism or autism spectrum disorders accounts for 5% of the children with special health care needs in the Health Status Profile of the NS-CSHCN. Although the percentage is not as significant as other conditions listed, over the past decade Autism Spectrum Disorders (ASD) have captured the attention of parents with their ever-escalating occurrence, their unknown origin, and their lack of a cure. The Autism Spectrum Disorders are a group of related developmental disorders that include autistic disorder, pervasive developmental disorder, and Asperger Syndrome. They affect a child's behavior, and social and communication skills in varying degrees. The latest data

suggest that approximately one in 110 children in the United States has an ASD. The American Academy of Pediatrics (2009) advocates strongly for early and continuous surveillance and screening for ASD in order to implement interventions as soon as possible. Though there is no single best treatment for ASD's, early intervention can greatly improve a child's development and ability to learn new skills (CDC, 2010).

The Health Status Profile indicates that 21% of CSHCN suffer from depression, anxiety, or emotional problems. The very fabric of American society has become fragmented, decreasing the protective value of social connectedness. Statistics showcase the breakdown of the family, and the escalating incidence of abuse and domestic violence (Centers for Disease Control, 2008). National statistics point to a hidden epidemic that affects the youngest and most vulnerable members of our society. The CDC identifies child maltreatment as all forms of abuse (physical, sexual, or emotional) and neglect that occur among children under the age of 18. According to the Childhelp Center (2006), over 900,000 cases of child abuse and neglect are reported each year in the United States. That places the rate at 12.3 per 1,000 children. The rate of victimization increases for children between 0 and 3 years of age. The rate for this age bracket is 16.4 per 1,000 children. Conservative estimates, however, place the actual number of cases to at least three times that rate. Sadly, 1,500 children die each year from abuse, which equates to over 4 fatalities every day in this country (Childhelp Center, 2006).

It is estimated that approximately five million children in the United States experience some form of traumatic experience annually. By the age of eighteen, one in four children are predicted to have been touched directly by interpersonal or community violence (Childhelp Center, 2006). It is important to clarify what constitutes a traumatic event, and has the potential to lead to childhood traumatic stress. Traumatic occurrences involve an extreme threat of violence, serious injury, or violation of physical integrity (i.e. sexual abuse). These situations may also include witnessing the violence versus actually being subjected to it. The experiences can be further characterized by who is exposed—individuals, families, communities, or populations, and whether the occurrence is intentional or accidental, natural or human-made (Ursano, Fullerton, & Norwood, 2003).

The National Survey of Children's Exposure to Violence was conducted in 2008 with 4,549 children to measure children's exposure to violence in the home, school, and community across all age groups from birth to age 17. Findings confirmed that more than 60% of the children were exposed to violence within the last year, either directly or indirectly. According to the survey, bullying at school has been on the rise since 2001. Fourteen percent of students ages 12 through 18 reported being bullied during school in 2001, but by 2007 that percentage had increased to 32 percent. Non-bullying forms of assault occurred at least once to 46.3% of the children surveyed (Finkelhor, Turner, Ormrod, Hamby, & Kracke, 2009).

Living in the age of technology, violent acts and disasters occurring throughout the United States are reported and replayed repeatedly, bringing the tragedies ever closer to each individual witnessing the violence. Columbine, Virginia Tech, and Hurricane Katrina conjure up images of destruction, death and violence penetrating environments previously believed to be safe. The prevalence of violence and traumatic events has incited research on the topic of psychological trauma due to terrorism, disaster and violence. The impact on children's mental health, however, has not been widely researched. Studies have concentrated on adults with the assumption that children and adolescents respond in the same manner (Cook-Cottone, 2004). An accurate assessment of posttraumatic stress in children can proceed from the adult knowledge base, but needs to include essential and different manifestations specific to children and adolescents (Ursano, Norwood, & Fullerton, 2005).

Recent research has begun to recognize factors that predict which children may fall into the high-risk category for developing greater psychological reactions (LaGreca, Silverman, Vernberg, & Roberts, 2002). A study completed after Hurricane Floyd demonstrated that girls were twice as likely as boys to exhibit or report symptoms (Russoniello et al., 2002). Preexisting academic problems and attention difficulties prior to the traumatic event indicated a risk factor. Symptoms in special needs children varied from the general student population (LaGreca, Silverman, Vernberg, & Roberts, 2002). Urban youth were identified as having higher rates of violence exposure which

predisposed them to a greater level of vulnerability. Newly immigrated children from war-torn countries suffered a greater likelihood of previous victimization and witnessing of extreme acts of violence (Wooding & Raphael, 2004). The identification of children at high-risk and the timely recognition of symptoms increases the likelihood of early intervention and prevention of further problems.

Several additional elements must be considered in predicting or determining the possible impact on any given child. The individual's age, gender, ethnicity, exposure to trauma, death of family or friend, relocation or frequent moves, previous vulnerability, methods of coping, the child's social environment, disruption in social support networks, and continued stress effects exhibited by parents or other caretakers are all factors or stressors that can influence the development of dysfunction or recovery for the child or adolescent (Wooding & Raphael, 2004).

Traumatic experiences can have devastating effects on the children, impacting their physical, emotional, cognitive and social development. The consequences of child maltreatment and other traumatic experiences outlined by the CDC include physical, psychological, and behavioral effects. Behaviorally, children who experience maltreatment and other traumatic occurrences are at an increased risk for substance abuse, eating disorders, severe obesity, depression, suicide, sexual promiscuity, teen pregnancy, low academic achievement, mental health problems, and certain chronic diseases (CDC, 2008). If not treated, children who have suffered from abuse, neglect, or

other forms of trauma are at risk for developing severe emotional disorders that can carry into adulthood. The psychological effects may not be manifested by children or adolescents immediately, but may be delayed and prolonged (Silva, 2004). Symptom manifestation also varies depending on the developmental age of the child or adolescent. The utilization of a developmental approach in research is important (Wooding & Raphael, 2004). Cook-Cottone (2004) identified age-specific symptoms of posttraumatic stress disorder (PTSD) from preschoolers to high-school aged teens. Australian researchers utilized a developmental psychological approach in their study to examine the different responses. Their conclusions suggested that younger children had a higher risk for developing depressive symptoms, while children in the middle grades were at higher risk for developing posttraumatic stress symptoms (McDermott & Palmer, 2002). Identification of posttraumatic psychological effects are enhanced with knowledge of the differences between the developmental stages. The importance of early identification and intervention in children is essential in order to prevent the development of chronic psychiatric disorders, developmental arrest, or a break in developmental growth for the child. The psychosocial difficulties that may result can have devastating implications not only for the child, but for families, friends, schools, and communities (Jonker & Hamrin, 2003; Stover & Berkowitz, 2005).

The Social Cognitive Theory

The Social Cognitive Theory developed by Albert Bandura in the 1960's has often been viewed as a bridge between behaviorist and cognitive learning. In 1963, Bandura added the principles of observational learning and vicarious reinforcement to the existing social learning theory. Bandura emphasized the fact that most human behavior is learned observationally through modeling. From observing others, a person learns the value of particular behaviors with regard to goal achievement or outcomes. The concept of self-efficacy was added in 1977. Self-efficacy represents a person's belief in his/her ability to successfully perform a particular behavior, overcoming any barriers that stand in the way of accomplishing the goal. Self-efficacy can be acquired or enhanced through performance accomplishments (experiences of success or failure), vicarious experience (witnessing others' successes and failures), verbal persuasion (being told one can or cannot perform successfully), and emotional arousal (degree and quality of emotions experienced during the behavior) (Bandura, 1997). According to Bandura, behavior is influenced by multiple determinants. The concept of reciprocal determinism describes how the dynamic interaction between people, behaviors, and environment directly affects health behavior. A change in one component affects the others. Therefore, the social environment has a continuous impact on the behavior of the individual. Social relationships, social networks, and social support systems have varying degrees of influence on the individual, thereby providing the interpersonal

environment with substantial power over the health behaviors of individuals, and subsequently, their health status (Bandura, 1997; Glanz, Rimer, & Lewis, 2002). What happens, however, when the most important social relationships are weakened or when social support systems are limited or non-existent? When the special health care needs of children are not adequately addressed and met, the negative impact on the child and the family is often lifelong and societal costs are high.

The Social Cognitive Theory is often used in support of animal-assisted interventions. Since the theory is based on the reciprocal relationship between a person's cognitions, behavior, and environment, the therapeutic goal is to enhance positive changes in a person's self-perceptions, which leads to a change in behavior, which then fosters improvements in health. Learning and change occur through observation, imitation, direct instruction, and association. Supported by this theory, animals are utilized as living, interactive tools that can be employed to assist people in seeing themselves and their world in a new light. Therapy animals help people in the acquisition of new skills, both physical and social. A noted benefit of animal-assisted therapy is the ability of the animal to show people the cause and effect of behavior, which in turn, increases the learning of appropriate social interactions. Animals provide unique feedback on social behavior due to their honest and immediate reactions to both pleasurable and aversive stimuli (Fine, 2006).

The Human-Animal Bond

The psychological and social implications of the problems within our society are impacting the health and quality of life for many individuals and families. To help address these issues, a variety of alternative therapeutic techniques are gaining acceptance in the health care field today, including animal-assisted interventions (Rothe, Vega, Torres, Soler, & Pazos, 2004). Animals have served mankind since the beginning of human existence. It was through domestication, however, that the relationship of man with the animal shifted, and an emotional attachment began to develop. From this attachment, the human-animal bond was forged. This bond, along with inherent characteristics of the animal, has elevated the connection between the species and created the potential for a therapeutic partnership. In this era of high-tech medical interventions, animals have once again proven their worth to man by offering assistance on the road to healing, both physically and emotionally. They offer their services and their love unconditionally.

Historical Background

The human-animal bond provides a foundation for understanding the impact of the association of people and animals, and the resulting contribution to an individual's overall health, well-being, and quality of life. Exactly when this interspecies connection first developed is uncertain, although archeological evidence dating back 12,000 years suggests an attachment between humans and animals during that ancient period. In

1976, the remains of a human skeleton clutching those of a puppy were found in Northern Israel, which indicates that the relationship between this human and this animal was one of affection (Salotto, 2001).

In the world of the ancient Greeks, horseback rides were utilized to increase the spirits of the incurably sick. Hippocrates was the first to describe the benefits of utilizing the horse for rehabilitation purposes, labeling the activity a universal exercise. By the 17th century, horseback riding was also found to be beneficial for gout (Fine, 2006). By the early 1790's, animals were introduced by the Society of Friends in England as therapy facilitators for work with the mentally ill. The program not only highlighted the benefits of the human-animal connection, but supported the shift in care from punitive to compassionate. Instead of restraints and drugs, treatment for patients involved caring for animals and gardening (Salotto, 2001).

Florence Nightingale recognized the therapeutic value of animals in the health care setting during the mid and late 1800's. She realized that small pets provided companionship for the patients who required lengthy hospitalizations due to chronic illnesses. As the owner of a cherished pet owl, she recognized the pleasure an invalid could derive from the company of an animal, even a small bird in a cage (Fine, 2006). In 1867, Bethel treatment center for epileptics opened in West Germany, and incorporated animals in their rehabilitative activities. It remains open today, and serves thousands of individuals with various health conditions each year. The initial philosophy

survived, and the community exemplifies the belief that animals are an integral component of the healing process (Salotto, 2001).

In spite of the early successes with animal-assisted interventions, scientific advances in the field of medicine in the 20th century led to the elimination of animals from the hospital setting. In the 1950's and 1960's, however, a rebirth occurred partially due to the work of Dr. Boris Levinson, a child psychiatrist and pioneer in the field of animal-assisted therapy. The integration of animal-assisted therapy into clinical psychology by Dr. Levinson ironically began by chance. The initial case which led to his belief in the healing power of animals involved a young patient who was uncommunicative and had not spoken to Dr. Levinson during the first month of therapy. Arriving early one day, however, the boy happened upon Dr. Levinson's dog "Jingles," and began interacting and speaking to the dog. Dr. Levinson went on to document the psychotherapeutic progress made with patients as they interacted with his dog serving as "co-therapist." He published his reports, authored two books, and shared his findings with other members of his field at psychiatric conferences. His findings highlighted the beneficial effect of a dog's presence during therapy, especially for children who were inhibited, autistic, nonverbal or withdrawn (Chandler, 2005).

A landmark study by Friedmann, Katcher, Lynch, and Thomas in 1980 provided credibility to the long-held belief that animals benefit humans in a variety of ways. These researchers followed 92 cardiac patients for a one-year period, and discovered

that pet owners lived longer than non-pet owners (Pichot & Coulter, 2007). Pet ownership proved worthwhile once again in a study involving cancer patients and their family members. Findings from the two-year study indicated that the presence of companion animals not only helped the patient, but enhanced the psychological adjustment for the caregivers (Raveis, Mesagno, Karus, & Gorey, 1993). More recent studies continue to describe, document, and prove the efficacy of animal-assisted therapies offered within a wide range of settings.

Man's Best Friend

Perhaps no other partnership has brought more distinction to an animal, or paved the way for other members of its species, than the service dog. The service dog has transformed the human-canine bond beyond the ordinary connection. There are approximately 15,000 service dogs in the United States that serve disabled Americans (Partners for Life, 2006). In 2005, the population in the United States was listed at 291.1 million people. According to the Census Bureau, 54.4 million Americans (18.7% of the population) had some level of disability, with 35.0 million suffering from a severe disability (12.0% of the population) (Brault, 2008). People generally tend to think of service dogs as attending to the needs of the visually impaired, but recognition of the adaptability and versatility of canine companions has led to their increased utilization for a variety of conditions. The service dog can provide a lifeline to a world otherwise not accessible to their human companion and partner. An individual's disability is not

influenced as much by his/her abilities, but by the interaction between the individual and the environment (Renty & Roeyers, 2006).

Though the dog remains the most popular choice for animal-assisted therapeutic interventions, cats, rodents, horses, and dolphins have also been used in the promotion of health for humans (Fine, 2006). Animals serve as transitional beings that are capable of showing intentional behavior. Unlike inanimate objects (e.g., stuffed animals), they give and receive affection. Most importantly, they are accepting and nonjudgmental (Chandler, 2005). It is the open, non-judgmental, reciprocal nature of animals that enhance the therapeutic environment, and make this alternative intervention so valuable. Physical, social, and psychological benefits have been reported for individuals of all ages in a variety of settings, including health care institutions, prisons, residential programs, farm settings, schools, and disaster sites (Salotto, 2001).

The Horse

No discussion is complete without recognizing the uniqueness of the horse. From a child's first ride on a carousel, the horse evokes emotion in most people. Due to the size and specific characteristics of this herd animal, the horse is suitable for a variety of intervention techniques different from the smaller animals (Fine, 2006). The size differential provides an opportunity to overcome fear, and increase confidence and self-esteem. The physical power of the horse demands attention and respect. The innate trait of the horse to mirror behaviors creates an atmosphere where mutual trust and

respect is necessary for a productive relationship to develop and flourish. Rebellious adolescents learn that aggression and defiance elicit negative behaviors from the horse, while openness and humility evoke positive reactions (Chandler, 2005). Several intervention techniques are included under the general therapeutic umbrella of equine therapy, including hippotherapy, equine-assisted activities, and equine-facilitated therapies.

*“There is something about the outside of a horse
that is good for the inside of a man.”*

--Sir Winston Churchill

Empirical Studies

Variation was noted in the reviewed studies on animal-assisted therapies, with differences among the studies being seen in sample sizes, sample characteristics, research methods, and findings. The animals of choice varied, but included dogs, dolphins, farm animals, fish, horses, llamas, and rabbits. In general, sample sizes were relatively small ranging from 3 to 118.

Animal-assisted activities (AAA) and animal-assisted therapies (AAT) are often combined with other forms of therapy, and utilized across interdisciplinary fields in the promotion or improvement of health.

"We need light in the darkness and sound in the silence.

*We need bridges in place of walls and we need to be encouraged
To cross those bridges one step at a time
From our own world to a shared world."*

--D. Williams, Australian author with Autism

According to the latest statistics from the CDC, autism spectrum disorders (ASDs) are now estimated to affect one in 110 American children (2010). Researchers in Virginia studied language use and social interaction in 22 children with autism between the ages of 7 and 13. Incorporating quantitative research methodology, they compared two forms of occupational therapy, a regimen that incorporated the use of animal-assisted therapy and one that utilized only standard occupational therapy techniques. Over the course of 15 weeks, each child received one session per week of standard occupational therapy and one session of occupational therapy incorporating the use of animals per week. The sessions involving animals included various activities with llamas, dogs, and rabbits, including riding in wagons drawn by llamas, riding on llamas, guiding the llamas through obstacle courses, assisting in the training of the llamas for competition, and caring for the llamas, dogs and rabbits. Results of paired-sample *t*-tests indicated that the children engaged in significantly greater Use of Language ($t(21) = 2.18; p < 0.05$) and significantly greater Social Interaction ($t(21) = 4.21; p < 0.01$) in the

sessions with animals versus the standard occupational therapy sessions (Sams, Fortney, & Willenbring, 2006).

Researchers in Canada conducted a qualitative ethology study in order to examine the effect of integrating service dogs into the families of 10 autistic children (Burrows, Adams, & Spiers, 2008). The children included 7 boys and 3 girls, ranging in age from 4 ½ to 14 years at the time of dog placement. The parent who was the primary dog handler was the primary source of interview data. The results of the study showcased several major benefits, and also highlighted the triadic relationship between the parent/dog handler, autistic child, and the service dog. The first expected function of the service dog was to improve safety and security by preventing the child from the unpredictable behavior of bolting. This was accomplished as soon as the service dog was placed in the home and the child became comfortable with being attached to the dog. The benefits, however, surpassed the initial expectations of the participants and dog trainers. The service dogs either slept with or near each of the autistic children, and the quality and quantity of sleep for the children and parents improved. Companionship with the dogs aided in the development of the children's fine motor skills. The dogs were instrumental in keeping the children calmer, in preventing or interrupting tantrums, and in halting bolting both in the home and in environments outside of the home. This resulted in a reduction in stress for all family members and increased outings outside the home. Social isolation was further reduced by the public

identification of the service dog with the family. Although the service dog made the family more visible, the attention was more positive. The dog became the focal point, rather than the autistic child. The dog generated empathy and support for the child and family. Parents reported that this altered social acknowledgement also had a positive effect on autism education and awareness. For the parent/dog handler, unexpected results surfaced as the parent worked to establish a bond between the autistic child and the dog. A significant bond developed between the parent and dog, with the parent deriving a sense of companionship and personal time from this relationship. Lastly, the constant presence of the service dog improved the quality of life for both the children and families (Burrows et al., 2008).

Researchers from Washington State University (Martin & Farnum, 2002) evaluated animal-assisted therapy with children diagnosed with pervasive developmental disorders (PDD). Participants included 10 children from ages 3 to 13 years, with all but the youngest attending public school. Of the participants, there were 8 males and 2 females. Three of the participants had an autism spectrum disorder, while the other seven had an unspecified form of PDD. The researchers examined the behavioral and verbal dimensions of the interactions with the dogs, and compared those to two other conditions involving a ball or stuffed dog. Evaluation involved both prosocial and nonsocial interactions. The study incorporated a within-participants repeated-measures design, all participants experienced all three conditions, and each

participant served as his/her own control. Repeated-measures analysis of variance tests were used to evaluate differences in the children's interactions as a function of the three conditions, with paired *t*-tests utilized to determine the location of differences. Though the sample size was small, findings from this quantitative study were favorable, and indicated that interaction with dogs had a positive effect on the behaviors of the participants. The energy level of the participants increased, participants were more focused, and they exhibited a greater awareness of their social environment during the time the therapy dog was present. Example: children spent less time looking around the room in the dog condition than in the ball condition ($t(449) = 4.01, p < .001$) or the stuffed-dog condition ($t(449) = 4.51, p < .001$) (Martin & Farnum, 2002).

A quantitative study in Florida examined the effectiveness of a therapeutic riding program for children with disabilities (Scialli, 2002). The survey design utilized the Horseback Riding Survey, and measured the parents' perceptions of improvement in their child's behaviors. The sample included 64 parents of children aged 4 to 19. According to the parents, 75% of children had more than one disability. Disabilities included autism, developmental delay, mental retardation, physical impairments, and learning, speech and language difficulties. Results from the one-sample *t*-tests indicated improvement in all 67 behaviors measured by the survey, with 27 behaviors significantly higher than a score of 3.5 (range 1-5). The most significant improvements were seen in the physical behaviors involved with range of motion, mobility, balance, and posture,

and the psychological effects on self-esteem, self-confidence, and self-image. Other findings indicated that physically disabled children showed greater improvement in self-image than autistic children, while mentally retarded children surpassed autistic children in improvements in mobility. Lastly, the longer the child participated in the therapeutic riding program, the greater the results (Scialli, 2002).

Researchers in the state of Washington also studied the effectiveness of hippotherapy, but with children encountering language-learning disabilities (Macauley & Gutierrez, 2004). This study compared hippotherapy with traditional methods of therapy. Participants included three boys, aged 9, 10, and 12. Both the boys and their parents independently completed satisfaction questionnaires at the completion of each of the 6-week programs, traditional and alternative (hippotherapy). The traditional therapy sessions took place during the fall academic semester, while the hippotherapy sessions occurred after the winter break. In order to determine whether the parents and boys believed that hippotherapy was less effective, more effective, or as effective as traditional clinic-based therapy, analysis of the questionnaires was done utilizing a paired t test. Parents believed that hippotherapy was more effective ($p < 0.000$, $t = -12.73$, $df=21$), but findings from the boys' questionnaires indicated that they believed both forms of therapy were effective ($p < 0.002$, $t = -3.46$, $df=21$). The results revealed improved speech and language abilities after both forms of therapy, although more positive responses were noted after the hippotherapy program. An additional

finding highlighted a beneficial increase in each boy's level of motivation and self-concept following hippotherapy. The boys appeared to enjoy the hippotherapy sessions more, and were more vocal with their peers and friends regarding this form of therapy (Macauley & Gutierrez, 2004).

A mixed-method study conducted in New York explored the role of therapy dogs among a mixed group of language-impaired and typical preschool children (Gee, Harris, & Johnson, 2007). The purpose of the research was to determine if the presence of a therapy dog influenced the children's ability to complete 10 specific motor skills tasks. Fourteen children, aged 4 to 6, participated in the study. The participants included 4 females and 10 males, and 9 of the children had learning deficits, behavior deficits, or underdeveloped social skills. Significant results from the two-way mixed model factorial analysis were consistent with the researchers' prediction and the supporting literature review. A series of 10 gross motor skills tasks performed by the children served as the 1st variable (Type of Task), with the 2nd variable (Dog Presence) indicating the presence or absence of the dog. The main effect of Dog Presence was significant ($F = 7.47$, $p < 0.05$, $R_2 = 0.17$). Overall, the children performed the tasks faster and without compromising accuracy when the dog was present in all but one of the 6 timed-tasks ($F = 3.67$, $p < 0.05$, $R_2 = 0.32$). The findings indicated that the presence of the therapy dogs served as motivation for the preschool children, and therefore, would be useful during the execution of gross motor skills tasks. Due to the close positive correlation

between the development of gross motor skills and language, the researchers concluded that therapy dogs might prove useful in language education and development (Gee et al., 2007).

In Illinois, 14 participants with multiple disabilities at a residential facility were involved in an animal-assisted therapy program (Heimlich, 2001). All participants were diagnosed with severe to moderate retardation, and included 8 males and 6 females with ages ranging between 7 and 19 years. The purpose of the study was to quantitatively examine student functioning in the areas of attention span, physical movement, communication and compliance in a program that utilized one dog. Results indicated positive effects on all participants, although complete data on all groups was not collected due to the early termination of the study. In addition, generalizations could not be made due to several confounding factors. A lack of consideration for the well-being of the animal was noted, which contributed to the dog being subjected to a high, chronic level of stress. The dog developed several illnesses during the course of the study, which led to the early conclusion of the therapy program (Heimlich, 2001).

A one-year pilot study conducted in Quebec on a pediatric oncology unit utilized the services of 12 therapy dogs, and involved 27 children aged 3 to 16 years (Bouchard, Landry, Belles-Isles, & Gagnon, 2004). The purpose of the program was to help the children adapt to their illness and the hospital environment. The ultimate goal was to reduce the physical and emotional suffering of these cancer victims due to their disease,

hospitalization and frequent painful treatments and procedures. Questionnaires were administered throughout the year to the children, to the parents, and to the nursing staff. Positive effects were observed by all three groups during the first evaluation phase of this pilot program. The second phase of the study has been planned to follow a more rigorous research protocol, but has not yet been reported (Bouchard et al., 2004).

Researchers in California conducted a pilot study regarding canine visitation therapy (CVT) at the Children's Hospital and Health Center (Sobo, Eng, & Kassity-Krich, 2006). The purpose of the study was to explore the impact of CVT on pediatric pain management in post-operative children. The pre-post, mixed-method design was implemented in a pediatric hospital where CVT was already an existing intervention. Participants included 25 children between the ages of 5 and 18 who were experiencing acute postoperative pain. Parents' participation included their presence during the CVT and a brief post-intervention interview. The same dog (Lizzy) and handler were utilized for the study, minimizing the number of animal-related variables. Paired *t*-tests were used for the quantitative data analysis and revealed significant differences for both physical and emotional pain scores. Pre [3.79 (*SD* = 2.51)] and post [1.64 (*SD* = 1.74)] intervention scores for physical pain showed a significance of difference ($p = .001$). Ratings for emotional pain indicated a significance of difference ($p = .000$) between pre [3.89 (*SD* = 2.41)] and post intervention [1.24 (*SD* = 1.68)]. Various themes were

identified from the qualitative data (interviews) with the children. Four themes were most pronounced, including *distraction*, *pleasure/happiness*, *fun/entertaining*, and *home*. Lizzy distracted the children both from their pain and their situation, she brought happiness just by being present, she entertained the children through her tricks and their physical interaction with her, and lastly, the children were comforted because Lizzy reminded them of their own dogs at home. For parents, however, there were 2 overriding, consistent themes—*distraction* and *calming*. The parents felt that because of Lizzy's presence, their children were in less pain. Though this study was limited in size, it supports the benefit of CVT in pain management for children (Sobo et al., 2006).

A qualitative study in Ohio examined the impact of a six-week equine riding program on the grieving process of 5 children between the ages of 4 and 14 (Glazer, Clark, & Stein, 2004). Written information was collected from the child, parent or grandparent, and adult volunteer after each session. The data was analyzed by a qualitative researcher not connected with the project, using open coding procedures. Three main categories in perceived outcomes emerged from the data analysis: *confidence building* (e.g., sense of mastery, independence, and overcoming fears); *trust building* (e.g., trust in self that he/she could learn the riding skills, trust that the horse would respond, and trust in the nonjudgmental environment of the program); and *communication* (e.g., sharing of secrets with the horse and affectionately speaking to the horse). The findings were positive, indicating that all the children gained

confidence, trust, and communication skills. The program helped facilitate the grieving process for the children, but supplemental findings also revealed evidence of transference of the behaviors learned with the horses. The children exhibited a higher degree of trust and openness with their families after the experience. One change recommended as a result of the study was to expand the program to twelve weeks (Glazer et al., 2004).

An estimated 500,000 children are in Therapeutic Foster Care (TFC) in the United States. This type of foster care is reserved for children with severe emotional disturbances, who have experienced physical, emotional, or sexual abuse, as well as abandonment. These children have a great deal of difficulty in trusting others and in establishing quality relationships. Kesner and Pritzker (2007) studied the effects of a 10-week therapeutic horseback riding program on 11 abused children who were placed in the therapeutic foster care system. The children were between the ages of 5 and 17. Three of the children had a history of animal abuse. All had a history of aggressive behavior, lack of respect and very low self-esteem. Both the children and their TFC parents were involved in the study, through the use of questionnaires, interviews, observation, and parents' journals. Findings from the Conduct Disorder Scale (parents) indicated that all 11 participants exhibited a decrease in negative conduct. Since criteria for placement in TFC included aggressive behavior and conduct that indicated the individual was a threat to self or to others, this finding became more significant.

Statistical findings from the Self-Concept Scales revealed that 90% of the participants manifested positive changes in self-concept. All 11 participants demonstrated affection toward their horse, which was especially meaningful since 7 of the participants had experienced symptoms of Reactive Attachment Disorder. Thematic content analysis of the parent interviews indicated change in participants' attitude, respecting rules, and socializing with family. In general, the findings confirmed that the bond developed with the horse during the therapeutic horseback riding improved both emotional and behavioral issues, decreased problematic conduct, and increased the participants comfort level in different social situations (Kesner & Pritzker, 2008).

Additional studies involving animals have shown the versatility of this alternative approach for all ages. Patients waiting for transplants often experience an elevated level of stress during this time period. A study conducted at the UCLA Medical Center examined the effect of fish aquariums in the rooms of ten Status 1 patients in the Cardiac Care Unit who were admitted to the hospital for orthotopic heart transplantation (Cole & Gawlinski, 2000). The average length of time after admittance, but before transplantation, was two months. This quantitative study incorporated a one-group design, with participants acting as their own controls. Participants included 8 men and 2 women, with ages ranging from 18 to 80. Descriptive statistics were used to analyze the characteristics of the sample, while multivariate repeated measures were used to measure levels of anxiety, depression, hostility, dysphoria, and positive affect.

Although no significant differences were noted, positive comments from the participants highlighted the importance and benefits of introducing animal therapy into the intensive care unit (Cole & Gawlinksi, 2000).

Cole and Gawlinksi joined forces with two other researchers (Steers & Kotlerman) in examining the effect of therapy dog visitation on patients hospitalized with heart failure in the Coronary Care Unit of a Los Angeles hospital. The 3-group randomized repeated-measures experimental design involved one group that received a 12-minute visit with a therapy dog and volunteer, a group that had a 12-minute visit with a volunteer, and the control group that received the usual care. Participants included 76 adults. Compared to the control group and the volunteer group, analysis indicated that the volunteer-dog group had significantly greater decreases in systolic pulmonary artery pressure, pulmonary capillary wedge pressure, epinephrine levels, norepinephrine levels, and anxiety both during and after the visits (e.g., decreases in systolic pulmonary artery pressure noted during and after the volunteer-dog visits were recorded at: -4.32 mm Hg, $P = .03$ and -5.78 mm Hg, $P = .001$). The results were significant, leading the researchers to the conclusion that animal-assisted therapy was beneficial in improving cardiopulmonary pressures, neurohormone levels, and anxiety among patients with heart failure (Cole, Gawlinksi, Steers, & Kotlerman, 2007).

Researchers in Norway implemented a randomized controlled trial using farm animals as therapeutic agents with adult psychiatric patients (Berget, Ekeberg, &

Braastad, 2008). The study was based on Green care, a concept which integrates the use of farm animals, plants, gardens, forests, and the landscape. The purpose of the study was to examine the effects of a 12-week intervention with farm animals on self-efficacy, coping ability and quality of life. Although 90 patients began the study, there were 69 participants who completed the intervention and 6-month follow-up. This represented 68% in the treatment group that finished the study (41) and 93% of the control group (28). The patients were diagnosed with a variety of psychiatric disorders that included schizophrenia, affective disorders, anxiety, and personality disorders. The researchers theorized that the combined effect of both physical contact and work with the animals had the potential to affect the patients positively in a two-fold manner. Farm animals could provide a physical connection for the patients to another living creature, and as the patients accomplished the routine tasks involved with the farm animals' daily care, it could increase their coping ability and self-esteem. The ANOVA analysis revealed that self-efficacy was significantly higher in the treatment group before the intervention to the 6-month follow-up period ($F = 4.20, p = 0.05$) and from the end of the intervention to the follow-up ($F = 5.6, p = 0.2$). No difference was noted in the control group. A significant increase in coping ability was also documented from the period before the intervention to the follow-up ($t = 2.31, p = 0.03$). Patients with the largest increase in self-efficacy also demonstrated the largest increase in coping. No significant changes in any of the variables were seen during the actual intervention, nor

were changes in quality of life observed. The results, however, supported the value of animal-assisted therapy with farm animals as an additional treatment with psychiatric patients, especially those with affective disorders (Berget et al., 2008).

In order to examine the utility of equine-assisted psychotherapy, researchers in Tennessee (Klontz, Bivens, Leinart, & Klontz, 2007) conducted a study based on Equine-Assisted Experiential Therapy (EAET). This method combines experiential therapy (role-playing, sculpting, role-reversal, mirroring, and Gestalt techniques) with specific equine activities (choosing a horse, horse grooming, mounted work, lunging, and equine games). Study participants included 31 adults (9 men and 22 women) between the ages of 23 to 70, with an average educational level of 15.77 years, with 90% being Caucasian. The program consisted of 28 hours of equine therapy in a group therapy format over 4 ½ days at a residential center. Data was collected at 3 time points, pre-test, post-test, and 6-month follow-up, in order to determine if general symptom severity would diminish following treatment and if participants would report enhancements in psychological well being. Analysis of data collected from 2 different instruments (Brief Symptom Inventory and Personal Orientation Inventory) completed by the participants at each of the 3 time points, involved conducting a multiple analysis of variance (MANOVA) with repeated measures. As predicted, the findings indicated that participants reported significant improvements in psychological functioning immediately following the EAET program. The changes remained stable at the 6-month

follow-up. The Brief Symptom Inventory (BSI), which measured psychological symptom patterns, indicated a significant effect for pretest versus posttest versus follow-up ($F = 11.019, p < .05, \epsilon_2 = .449$). No significant difference was seen between the posttest and the 6-month follow-up. The Personal Orientation Inventory (POI), employed to examine reported enhancements in psychological well being, revealed a significant effect for pretest versus posttest versus follow-up ($F = 10.442, p < 0.05, \epsilon_2$). Specific areas that improved based on participant reports included: more oriented in the present; better able to live more fully in the present; less burdened by regrets, guilt, and resentments; less focused on fears related to the future; more independent; and more self-supportive (Klontz et al., 2007).

Without effective prevention or treatment, Alzheimer's disease (AD) is predicted to reach epidemic proportions by the middle of the century. Since a cure does not seem to be within reach, quality of life becomes a major issue for those afflicted with this disease. Nutritional status is often compromised with AD patients through weight loss. Patients are further compromised due to the resulting loss of muscle mass. A study in Indiana examined the influence of fish aquariums on the nutritional intake of 62 AD patients (Edwards & Beck, 2002). Over a 16-week period, a time-series design incorporating a nonequivalent control group approach was utilized in the quantitative study. The sample included 24 males and 38 females, with a mean age of 80.1 years. The influence of the aquariums was analyzed by comparing the nutritional intake and

weight change of the residents during the baseline period and the post-treatment period. In order to analyze nutritional intake, a paired samples *t*-test was conducted comparing baseline intake with 6-week posttreatment intake. The results indicated a significant increase in nutritional intake during the treatment ($t = -7.276$), as well as 6 weeks following the treatment ($t = 7.932$). When analyzed individually, it was determined that 87% of the participants had an increase in dietary intake. Less nutritional supplementation was required, thereby reducing health care costs. During the 3 month period prior to the introduction of the aquariums, 54 of the 62 participating residents showed a decrease in weight ($M = 1.71$ lbs.). During the 1st month the aquariums were introduced, there was a significant increase in weight ($M = 0.54$ lbs.) among the residents. The trend continued throughout the course of the study with a mean weight gain of 1.65 lbs. Though not measured, it was observed that socialization between the patients and visitors increased as a result of the aquariums. Staff observations noted that those individuals who had a history of pacing remained at the table for longer periods once the aquariums were added. Lethargic patients also remained more alert during mealtimes with the addition of the aquariums. The researchers found that the use of aquariums for patients with Alzheimer's disease was preferable over the use of dogs, cats, or rabbits due to the unexpected actions of Alzheimer's patients that could inadvertently harm the animals (Edwards & Beck, 2002).

Another common characteristic of Alzheimer's disease deals with behavioral disturbances, such as agitation, aggression, hallucinations, delusions, sleep disturbances, or wandering. A study conducted in a Special Care Unit (SCU) in an extended health care facility in the Midwestern section of the United States examined the behavior of 22 residents with AD after the introduction of a resident dog for a period of 4 weeks (McCabe, Baun, Speich, & Agrawal, 2002). The sample included 15 females and 7 males, with a mean age of 83.7 years. A two-way within-participants repeated-measures ANOVA design was used for the study. Significant changes were noted in the reduction of problem behaviors during daytime hours and continued for a period of one month ($F[1,80]= 7.69, p < .05$), thereby supporting the effectiveness of the use of a resident dog in the unit itself. No significant changes were observed during the evening hours (McCabe et al., 2002).

A rigorous study conducted in Germany utilized dolphin-assisted therapy as a therapeutic intervention for children with significant social and communication disabilities (Breitenbach, Stumpft, Fersen, & Ebert, 2009). The German researchers determined that previous studies in the area of dolphin-assisted therapy contained serious methodological flaws, and as a result, they implemented a controlled research design that would lessen the likelihood of those defects. The method employed a comparison of three control groups and one experimental group, with data being collected 3 times during the course of the study. Data were collected 4 weeks prior to

therapy, 4 weeks after therapy, and 6 months after therapy. The therapeutic program developed for the study was based on the methods utilized by various dolphin centers. Three modules were included: *recreational/vacation atmosphere*—all family members were included for Therapy Week with hotel, meals, child-care, and family and individual recreational activities provided; *counseling*—the entire family was included in the therapeutic process which involved individual and group counseling; *interaction with dolphins*—each child participated in daily 30-minute dolphin-assisted-therapy sessions with the parent observing in an adjacent room. Control group 1 (outpatient therapy group) did not receive counseling, but did interact with dolphins. Control group 2 (farm animal group) received therapy consisting of the three modules at a different location with farm animals instead of dolphins. Control group 3 was utilized to control for the effect of normal development, and therefore, received no form of therapy (Breitenbach et al., 2009).

Over 2000 families applied for the opportunity to participate in the study. In the end, the researchers chose 118 children, ranging in age from 5 to 8 years. The experimental group had 40 children, while each of three control groups had between 24 and 29 children. There were more boys than girls participating, with the percentage of boys in each group ranging from 59 to 62%. Though the children had different disabilities, they were all strongly limited in their communication abilities. Disabilities

included autism, Down's syndrome, and mental and physical disabilities (Breitenbach, Stumpft, Fersen, & Ebert, 2009).

The goal of the study was to measure the changes in communication, social-emotional behavior, and parent-child interaction. In order to measure the effectiveness of the therapy, questionnaires were given to the parents and pedagogic-therapeutic staff in charge of the program 3 times during the course of the study. Behavioral observations were accomplished by video recording mother-child interactions in the child's home at each of the 3 time-points. Findings supported the researchers' hypotheses. In the treatment group, dolphin-assisted therapy led to an improvement in the children's communicative abilities ($F = 1.83$; $p < 0.10$) and social-emotional behavior ($F = 3.10$; $p < 0.05$) based on the parent questionnaires, and remained stable for a period of 6 months. An increase in self-confidence in the children was also noted by the parents. Multivariate analysis of variance of the subscale "Self-Confidence" indicated a significant global effect ($F = 2.09$; $p < 0.05$). Control group 1 (outpatient therapy group) also reported an increase in communicative abilities, but not in social-emotional behavior. Control group 2 (farm animal group) showed short-term benefits related to self-confidence ($p < 0.10$; $d = 0.42$), but the effect was not present 6 months after treatment. The researchers had to conclude from this that all three modules of the therapy program were required. Another important outcome of the data analysis dealt with the influence of the aquatic surrounding of the child during therapy. In the

experimental group, only 50% of the children chose to go in the water with the dolphin. Because no statistically significant differences were detected, it was determined that the benefits of dolphin-assisted therapy was not dependent on being in the water with the dolphin (Breitenbach et al., 2009).

Since the findings indicated the need for all three modules, the researchers considered that this further supported the necessity of including the entire family in therapeutic interventions. Previous dolphin-assisted therapy studies did not consider changes in parental behavior as a mediator in affecting change. However, because parents of children with severe disabilities often have little faith in their own or their children's ability to deal with all the challenges ahead, successful therapeutic interventions can lead the parents to begin to trust in themselves and in their children. Early intervention with parental involvement offers a chance of hope in the future (Breitenbach et al., 2009).

Summary

The research suggests that the incorporation of animals in therapeutic interventions has successfully demonstrated positive outcomes when utilized in a variety of settings. As the body of evidence-based research continues to grow, this alternative form of therapy will undoubtedly be recognized within the scientific world for both its diversity and its uniqueness. Animals not only enhance healing and the quality of life, but they often serve as the bridge connecting back to humans.

CHAPTER III

METHODOLOGY

Population and Sample

This study was exploratory in nature, incorporating a mixed-method design to examine the different variables. Nonprobability sampling was used, specifically convenience sampling. The setting of the study was a therapeutic riding center in North Texas which provided equine-assisted healthcare to over 400 riders during each 12-week session. The program curriculum was unique to this center and included a progression chart with 178 specific steps. One-on-one lessons were provided free of charge by one of the 19 certified instructors. Each rider continued with the same instructor and horse throughout the program unless circumstances dictated otherwise. A parent or guardian was required to participate in each session with the child. Past demographic data provided by the center focused on the female population. In 2009, 48% (202) of the 425 riders were female, with 138 of the females ranging in age from 0 – 19 years. Ethnic distribution was inclusive with half the clients identified as “other/not specified.” Of the 98 out of 202 females identified according to ethnicity, 73 were identified as “anglo.”

After dispersal of flyers, 50 individuals volunteered to participate in the program. Of the 50 packets mailed to the potential participants, 28 were returned. One of the

children was not a current rider, however, and was not included in the study. Of the 27 respondents, 82% were married. The respondents included one father, 20 biological mothers and 3 adoptive mothers. Of the 24 participating families, 3 families had 2 children that were riders at the equestrian center. The children involved in the study included 15 boys and 12 girls, ages 20 months to 15 years. The children were identified within the following ethnic groups: Caucasian (20), Hispanic (5), African American (1), and Asian (1).

Protection Of Human Participants

Institutional Review Board (IRB) approval was granted by Texas Woman's University (TWU). The surveys, consent forms, and counseling referral list were mailed to each interested participant, along with a self-addressed stamped envelope. Participants who began the study were able to opt out of the study at any time regardless of the reason without penalty. The consent form included the following statement: "*Confidentiality will be protected to the extent that is allowed by law*" (see Appendix A). A code was assigned to each form within the set. Once returned to the investigator, each consent form was detached from the surveys and placed in a secure locked box at the PI's residence. All surveys only had the code number with no other identifying marker. Only the code numbers accompanied survey data when transcribed to the computer. Except for the gratitude of the principal investigator and the

knowledge that the participant contributed to the understanding of equine therapy, the participant did not receive any financial remuneration.

Data Collection Procedures

Volunteers were asked to participate in the study through the use of flyers. Mass emails were sent out twice by the therapeutic riding center requesting volunteers for the research study, with the flyer being the main component of the email. Flyers were mailed by the Principal Investigator to those individuals participating at the therapeutic riding center who did not have email (see Appendix B).

Those persons interested in participation contacted the Principal Investigator (PI) by phone, email, or postal service. Each parent or guardian expressing interest in participation was given a complete explanation of the study, its time requirements and purpose. During initial contact, age of the child was determined so that the age-appropriate surveys could be sent.

The surveys, consent forms, and counseling referral list were mailed to each interested participant, along with a self-addressed stamped envelope. A follow-up email was sent to all individuals who received the study packets, emphasizing the volunteer's importance in research and thanking them for their interest in the study.

Instrumentation

Post-therapy surveys were completed one time. Maximum cumulative time commitment was 1½ hours to complete all surveys. Volunteers were asked to complete

five different instruments: the Demographic Survey (22 items) (see Appendix C), the Therapeutic Riding Survey (18 open-ended items) (see Appendix D), the PedsQL Quality of Life Inventory Scale (parent proxy-report/age-specific), the PedsQL Cognitive Functioning Scale (parent proxy-report/age-specific), and the PedsQL Family Impact Module. The 3 PedsQL modules were all based on a 5-point Likert scale anchored by “never a problem” (0) and “almost always a problem” (4).

All participants completed the appropriate PedsQL Quality of Life Inventory Scale which varied based on age: 13-24 months, 2-4 years, 5-7 years, 8-12 years, and 13-18 years. The infant scales had 5 subcategories: physical functioning, physical symptoms, emotional functioning, social functioning, and cognitive functioning. The other ages contained only 4 subcategories: physical functioning, emotional functioning, social functioning, and school functioning. This instrument measured how much of a problem the child had during the last month with items in the different subcategories. All participants, except for parents of the 2 infants/toddlers, completed the PedsQL Cognitive Functioning Scale which contained 6 items. Cognitive functioning was a subcategory in the infant scales in the PedsQL Quality of Life Inventory Scale. The PedsQL Family Impact Module contained 28 items that pertained to problems in the past month that the participant may have had as a result of the child’s health. There were 8 additional items that pertained to problems that the family may have had as a result of the child’s health.

The PedsQL questionnaires were developed by James Varni, Ph.D. as a modular approach to measuring health-related quality of life in children and adolescents who were healthy or those with acute and chronic health conditions. Due to their age specificity, they are viewed as developmentally appropriate. Both child self-report and parent proxy-report have been developed. For this study, however, only parent proxy-reports were utilized. The questionnaires are multidimensional and measure physical, emotional, social, and school functioning. In 2004, Dr. Varni developed the PedsQL Family Impact Module in order to measure the impact of pediatric chronic health conditions on parents, caretakers, and the family. This module evaluates self-reported physical, emotional, social, and cognitive functioning. Family activities, family relationships, and communication are also examined.

Researchers conducted a study with parents of school-aged children with Asperger's Syndrome to determine the usefulness of the PedsQL Generic Core Scales and PedsQL Cognitive Functioning Scales. Both the parent proxy-report for the Generic Core Total Scale ($\alpha = 0.82$) and for the Cognitive Functioning Scales ($\alpha = 0.92$) scored high in reliability. Additionally, the instruments effectively distinguished between children with Asperger's Syndrome and the healthy children (Limbers, Heffer, Robert, & Varni, 2009).

Dr. Varni and his fellow researchers tested the reliability and validity of the PedsQL Family Impact Module with 23 parents of medically fragile pediatric patients with complex chronic health conditions at two different institutions. All respondents, except for one,

were the children's mother. Scale internal consistency reliability was determined by calculating Cronbach's coefficient alpha. Results exceeded the minimum reliability standard of 0.70 for comparison between groups, and either approached or exceeded the reliability criterion of 0.90 for analysis of individual scores: PedsQL Family Impact Module Total Scale Score ($\alpha = 0.97$); Family Functioning Summary Score ($\alpha = 0.90$); Parent HRQOL Summary Score ($\alpha = 0.96$); and Module Scales (average $\alpha = 0.90$, range = 0.82 – 0.97). Construct validity was determined by *t*-tests and effect sizes. All scales but one indicated medium to large effect size (Varni, Sherman, Burwinkle, Dickinson, & Dixon, 2004). Panepinto, Hoffmann, and Pajewski (2009) evaluated The PedsQL Family Impact Module with parents of children with sickle cell disease. A cross-sectional study of 170 parents of children with and without sickle cell disease was conducted in an urban setting. Reliability was supported (Cronbach's $\alpha > 0.80$ in all scales).

Data Analysis

Statistical Package for Social Sciences (SPSS) software package Version 16 was used to analyze the data from the demographic survey and the PedsQL questionnaires. Descriptive statistics were computed to describe the sample populations, and included measures of central tendency (e.g., mean, median, and mode), standard deviation, range, frequency distribution and variance. Crosstabulations with Chi Square analyses were conducted to examine relationships between categorical variables. Differences in categorical data were assessed using chi-square significant values at $p < .05$. Spearman

Rho correlations were conducted to examine relationships between continuous variables. Thematic analysis using memoing and coding were applied to the data from open-ended questions in combination with techniques of immersion and crystallization. Hypothesis 1 was analyzed using analysis of variance (ANOVA), where hypothesis 2 was analyzed utilizing simple logistic regressions with benefits to the child as the dependent variables. Hypothesis 3 could not be analyzed since all parents perceived therapeutic riding as beneficial.

CHAPTER IV

RESULTS

Demographics

The demographic characteristics of the parents of the cohort participants are shown in Table 1. The majority of the parents/guardians were married (82%), and the remainder were categorized as either living together, single, or separated. The level of education of each of the parents was determined. For the mothers, 51.9% graduated with a college degree, 22.2% had a high school diploma and/or some college, and 25.9% had a master's degree or PhD. The level of education for the fathers showed a similar trend to the mother's educational level. For the fathers, 50% held a B.S. or B.A. degree, 31% had a high school diploma and/or some college, and 19% had a master's or PhD.

The employment status of the parents or guardians of participant children was determined (see Table 2). Over half of the mothers were employed (51.9%) and approximately 92% of the fathers were employed. Approximately 33% of the mothers reported being homemakers. Other professions included part-time music teachers, administrators, and nurses. Professions reported by the fathers included computer support, financial analyst, and social work.

Table 1

Frequency and Percentages of Parents' Categorical Variables

	Mother		Father	
	n	%	n	%
Marital Status				
Married	22	81.5	22	84.6
Living together	2	7.4	2	7.7
Separated	1	3.7	1	3.8
Single	2	7.4	1	3.8
Highest Level of Education				
High School or Some College	6	22.2	8	30.8
Undergraduate Degree	14	51.9	13	50.0
Master's Degree or PhD	7	25.9	5	19.2

Note: Frequencies not equaling 27 and percentages not equaling 100% reflect missing data.

The breakdown of gender, ethnicity, the presence of a chronic health condition, and the use of day care is shown in Table 3. A majority of the children were female (55.6%), Caucasian (74.1%), followed by Hispanic (18.5%), with only one African American participant and one Middle Eastern participant (3.7%). Just over 80% reported having a chronic health condition, while the remainder either left the answer space blank or reported no chronic health condition for that specific question. Approximately 77% of the children attended daycare or school.

Table 2

Frequency and Percentages of Parents' Occupation and Occupation Status

	Mother		Father		
	n	%	n	%	
Occupation					
Administrator	2	7.4	Accountant	1	3.7
Business Analyst	1	3.7	Aerospace Engineer	1	3.7
Clerk	1	3.7	Auto Dent Repair	1	3.7
Computer	1	3.7	Computer	2	7.4
Homemaker	9	33.3	Customer Support	1	3.7
IT Systems Analyst	1	3.7	Director	1	3.7
Music Teacher: part time	2	7.4	Electrical Engineer	1	3.7
Music Teacher	1	3.7	Financial Analyst	3	11.1
Office Manager	1	3.7	Glazier	1	3.7
Fitness Instructor: part time	1	3.7	Graduate Student	1	3.7
Psychologist	1	3.7	Lawyer	1	3.7
RN	2	7.4	Sales Manager	1	3.7
Student	1	3.7	Social Worker	2	7.4
Teacher	2	7.4	Software Engineer	1	3.7
			Systems Analyst	2	7.4
			Tech Support Operator	2	7.4
			Unemployed	1	3.7
			US Law Government	1	3.7
			Webmaster	2	7.4
Occupation Status					
Currently Employed	14	51.9	Currently Employed	24	92.3
Not Currently Employed	13	48.1	Not Currently Employed	2	7.7

Note: Frequencies not equal to 27 and percentages not equaling 100% reflect missing data.

Table 3

Frequency and Percentages of Children's Categorical Variables

	n	%
Gender		
Male	15	55.6
Female	12	44.4
Ethnic Group		
African American	1	3.7
Hispanic	5	18.5
Middle Eastern	1	3.7
Caucasian	20	74.1
Chronic Health Condition		
Yes	22	81.5
No	5	18.5
Attends Daycare or School		
No	6	23.1
Yes	20	76.9

Note: Frequencies not equal to 27 and percentages not equaling 100% reflect missing data.

A majority of the mothers completed the survey (88.89%). While most did not report the gender of the siblings, those who did respond listed six brothers and four sisters. Five parents responded that they had no other children. The ages of the siblings were both younger and older than the child in question. As to family members living in the residence, one parent reported that three grandparents, including one great-grandparent, were living in the house. The majority of the children were reported as

living in a two-parent household (21 out of 27). Two of the children lived in a single parent home with his or her mother. One child in this situation also lived with his or her grandparents. Finally, three of the parents indicated that the child in question was adopted and two of those parents also adopted the child's biological sibling.

Parents were asked to list the medical conditions of their children. As shown in Table 4, a majority of parents gave some type of response, and a large number of children had multiple medical conditions. Of the parents who provided a response, 22.7% of the children had autism and 36.4% of the children were reported as having some type of brain or nervous system disorder, including shaken baby syndrome, cerebral palsy and/or seizures. Additionally, another 22.7% of parents who responded reported that their children had some form of breathing disorder, which included asthma and chronic lung disease, and another 18.2% had some type of genetic disorder which would include Down's syndrome. Furthermore, 54.6% of children were reported as having psychological disorders, such as Tourette's syndrome, PDD-NOS, OCD, ODD, and CAPD. Parents reported that 13.6% of the children had some form of sensory disorder, which included hearing impairment, visual impairment, and sensory integration dysfunction, and 9.1% were reported to have some other form of medical condition (i.e., hypertonia and athrogryposis).

Table 4

Frequency and Percentages of Children's Conditions and Current Treatments

	Condition			Treatment	
	n	%		n	%
Autism	5	22.7	Medication	12	44.4
Brain or Nervous System Injuries or Disorders	8	36.4	Specialized Education	5	18.6
Breathing Disorders	5	22.7	Equine Therapy	8	29.6
Genetic Disorders	4	18.2	Occupational Therapy	17	63.0
Psychological Disorders	12	54.6	Group Therapy	4	14.8
Sensory Disorders	3	13.6	Physical Therapy	10	37.0
Other	2	9.1	Other	7	25.9

Parents were asked about current treatments that their child was receiving. Similar to the medication conditions, children were also exposed to numerous types of treatments. As shown in Table 4, the frequencies and percentages of parents' responses are represented only for those who responded. Several children received some type of medication (44.4%) and 18.6% of children received some form of specialized education, such as homeschooling. Several parents (29.6%) reported that their child took part in equine therapy, and 63% received occupational therapy,

including speech therapy and art therapy. Approximately one-third of the children received physical therapy (37.0%), which included swimming therapy and vital stem muscle therapy, and 14.8% received some form of group therapy. Finally, 25.9% received other types of therapy (e.g., homeopathy consultation, hearing aids or eye patching glasses).

The parent's perception of the child's attitude toward the riding sessions is shown in Table 5. The parents were asked questions assessing whether or not their child looked forward to the riding session, liked the horse, and liked the instructor. Overall, there was a positive outlook toward the riding sessions, the horse, and the riding instructor. Parent responses indicated that 22 of the children (81%) looked forward to the riding session, one child did not look forward to the riding session, and 4 children (15%) were either too young or unable to respond to the question. When asked whether their children liked the horse, 92% of the parents responded positively. As before, the other parents stated that their children either responded negatively or were too young to respond. Finally, of the parents who responded as to whether their children liked the instructor, all reported that their children did in fact like the instructor.

Table 5

Frequency and Percentages of Riding Session Variables

	n	%
Child Looks Forward to Session		
Yes	21	80.8
No	1	3.8
Other	4	15.4
Does Child Like Horse		
Yes	23	92.0
No	2	8.0
Does Child Like Instructor		
Yes	24	100.0

The demographic variables obtained included the parent/guardian's age, child's age, household income, age of the onset of the child's diagnosis, number of siblings, number of people residing in the home, length of time the child had participated in therapeutic riding, and the number of the child's riding sessions (see Table 6). The average age of the mother was 38 ($SD = 7.54$), the average age of the father was 39 ($SD = 6.43$), and the average age of the child participant was 6 years ($SD = 3.70$). The average household income of the participants was \$121,500 ($SD = 92,781$). The average age of onset of the child's condition was 7.5 months ($SD = .69$) and the average age of the diagnosis of the child's condition was almost 22 months ($SD = 1.53$). The average

number of siblings of the participants was approximately two ($M = 1.62, SD = 1.39$) and the average number of persons residing at the home of the participant was four ($M = 4.37, SD = 1.18$). The average number of years the children had participated in the riding sessions was 2.37 ($SD = 1.87$) and the average number of riding sessions (riding terms vs. individual weeks) was reported to be 5 ($M = 5.15, SD = 4.13$).

Table 6

Means and Standard Deviations of Family Demographic Continuous Variables

	N	Mean	SD	Min	Max
Age of Mother	27	38.56	7.54	23.00	55.00
Age of Father	26	39.50	6.43	24.00	50.00
Age of Child	27	6.30	3.70	2.00	15.67
Income in Thousands	27	121.52	92.78	7.00	400.00
Age of Onset	22	.62	.69	.10	2.00
Age of Diagnosis	23	1.82	1.53	.10	6.00
Number Of Sibling	26	1.62	1.39	.00	5.00
Number of People in Home	27	4.37	1.18	2.00	7.00
Started at Riding Center	27	2.37	1.87	.50	6.50
Number of Sessions	27	5.15	4.13	1.00	13.00

Additional information was collected about the participants and their parents. This information was termed interference variables, and included measures of the number of days missed from school, number of days the child was too sick to play, number of days the child needed parental care, number of days the parent or parents missed work to care for their child, parental perception of whether or not the care of their child interfered with their daily routine, and the parental perception of whether or not the condition of their child interfered with their ability to concentrate at work (see Table 7). For those responding to this question, the average number of school days missed by the participants was one day ($M = .91$, $SD = 1.69$). This was similar to the number of days the child was too sick to play ($M = 1.04$, $SD = 1.57$). The average number of days the parents or another adult needed to care for their sick child was 10 ($M = 9.79$, $SD = 13.36$). The average number of days the parents missed from work was approximately 2 days ($M = 1.58$, $SD = 2.81$). Parents rated the amount of interference to their occupations on a scale from 1 (*Never*) to 5 (*Almost Always*). The amount of interference with their daily routine ranged from 1 to 5, with an average interference of 2.88 ($SD = 1.31$). The amount of interference with their concentration at work ranged from 1 to 5, with an average interference of 3.12 ($SD = 1.27$).

Table 7

Means and Standard Deviations of Interference Variables

	N	Mean	SD	Min	Max
How Many Days Child Missed School	22	.91	1.69	0	6
How Many Days Child was Sick	24	1.04	1.57	0	5
How Many Days Child Needed Special Care	24	9.79	13.36	0	30
How Many Days Parent Missed Work	12	1.58	2.81	0	8
Parent's Daily Routine at Work	17	2.88	1.32	1	5
Parent's Ability to Concentrate at Work	17	3.12	1.27	1	5

The participating parents answered a number of questions regarding their child's quality of life, the impact of their child's illness on the family, the child's cognitive function, the child's psycho-social health, and the child's physical health (see Table 8). The items were averaged and a subscale score for each section was calculated. Each of the subscale scores was based on a 0 to 100 scale in which a higher score indicated a higher quality of life, cognitive functioning, or overall health. The overall Quality of Life scores ranged from 21.20 to 90.00, with an average score of 54.52 ($SD = 19.09$). The Family Impact Module score ranged from 19.35 to 75.30, with an average score of 43.85 ($SD = 13.78$). The overall Cognitive Functioning score ranged from 0 to 78.13, with an average score of 42.46 ($SD = 25.05$). The overall Psychosocial Health Summary score

ranged from 12.50 to 85.00, with an average score of 53.59 ($SD = 18.25$). The overall Physical Health section ranged from 0 to 100, with an average score of 57.43 ($SD = 32.00$). Finally, an overall PedsQL score was created by averaging all of the PedsQL items throughout the surveys. Those responses ranged from 22.92 to 80.08, with an average overall PedsQL score of 48.19 ($SD = 13.76$).

Table 8

Means and Standard Deviations of Overall Quality of Life, Overall Family Impact Module, Overall Cognitive Functioning, Psychosocial Health Summary, Physical Health, and Overall PedsQL Scores

	N	Mean	SD	Min	Max
Overall Quality of Life Score	25	54.52	19.09	21.20	90.00
Overall Family Impact Module Score	23	43.85	13.78	19.35	75.30
Overall Cognitive Functioning Score	25	42.46	25.05	.00	78.13
Psychosocial Health Summary Score	25	53.59	18.25	12.50	85.00
Physical Health Score	25	57.43	32.00	.00	100.00
Overall PedsQL Score	25	48.19	13.76	22.92	80.08

Preliminary Analyses

As part of the analyses, several crosstabulations with Pearson Chi square analyses were conducted to examine relationships between the categorical variables. A crosstabulation with Pearson Chi square analyses is a combination of two categorical variables and the examination of the relationship between them (e.g., how many Caucasians were female and how many were males). Although several analyses were conducted, only two categorical variables (e.g., mother's education level and father's education level) had significant associations with the other demographic variables. There were no significant associations for mother's current employment status, father's current employment status, child's gender, and child's ethnicity, all *ps ns*. Similar non-significant results were found for mother's age and father's age, with the exception that there was a significant relationship between the age of the father and the age of the mother. This relationship would be expected as younger fathers tended to be paired with younger mothers.

Education Level of Mother

As shown in Table 9, there was a significant association between mother's education level and father's education level, $\chi^2(4) = 10.34, p = .035$, Cramer's $V = .446$. A greater proportion of mothers who had a high school degree or some college had a significant other who also had a high school degree or some college education (66.7%)

than those mothers who had an undergraduate degree (15.4%) or those who had a master's degree or PhD (28.6%). These results should be viewed with caution due to the low number of participants per cell. Finally, there were no significant associations between mother's education level and father's employment status, father's age, mother's age, mother's current employment status, child's gender and child's ethnicity, all *ps ns*.

Table 9

Frequency and Percentages of Age of Mother, Age of Father, Education Level of Father, Mother Currently Employed, Father Currently Employed, Child's Gender and Ethnicity by Education Level of Mother

	High School or Some College		Undergraduate Degree		Masters' Degree or PhD		χ^2	p
	n	%	n	%	n	%		
Age of Mother							.39	.822
Mother Age Less Than 40	3	50.0	6	42.9	4	57.1		
Mother Age 40 or Greater	3	50.0	8	57.1	3	42.9		
Age of Father							.74	.692
Father Age Less than 40	2	33.3	6	46.2	4	57.1		
Father Age 40 or Greater	4	66.7	7	53.8	3	42.9		
Education Level of Father							10.34	.035
High School or Some College	4	66.7	2	15.4	2	28.6		
Undergraduate Degree	1	16.7	10	76.9	2	28.6		
Masters' Degree or PhD	1	16.7	1	7.7	3	42.9		
Mother Currently Employed							1.06	.589
Yes	2	33.3	8	57.1	4	57.1		
No	4	66.7	6	42.9	3	42.9		
Father Currently Employed							5.88	.053
Yes	6	100.0	13	100.0	5	71.4		
No	0	.0	0	.0	2	28.6		
Child's Gender							3.57	.168
Male	3	50.0	10	71.4	2	28.6		
Female	3	50.0	4	28.6	5	71.4		
Child's Ethnicity							.34	.842
Caucasian	5	83.3	10	71.4	5	71.4		
Non-Caucasian	1	16.7	4	28.6	2	28.6		

Education Level of Father

As shown in Table 10, there was a significant association between father's education level and father's age, $\chi^2 (2) = 6.26, p = .044$, Cramer's $V = .491$. A greater proportion of fathers with a master's degree or PhD were currently employed (80.0%) than those with an undergraduate degree (53.8%) and those with a high school degree and/or some college education (12.5%). There was also a significant association between father's education level and mother's education level, $\chi^2 (2) = 10.34, p = .035$, Cramer's $V = .446$. A greater proportion of fathers with a high school degree and/or some college education had a significant other who also had a high school degree and/or some college education (50.0%) than fathers who had an undergraduate degree (7.7%) or fathers who had a master's or PhD (20.0%). There was a significant association between father's education level and mother's current level of employment, $\chi^2 (2) = 6.92, p = .031$, Cramer's $V = .516$. A greater proportion of fathers who had an undergraduate degree had a significant other who was not currently employed (69.2%), in comparison to those fathers who had a high school and/or some college education (50.0%) or those who had a master's degree or PhD (0%). As with the other crosstabulation analyses, these results should be viewed with caution due to the low number of participants within the study. Lastly, there was no significant association between father's education level and mother's age, father's current employment status, child's gender and child's ethnicity, all ps ns (See Table 10).

Table 10

Frequency and Percentages of Age of Mother, Age of Father, Education Level of Mother, Mother Currently Employed, Father Currently Employed, Child's Gender and Ethnicity by Education Level of Father

	High School or Some College		Undergraduate Degree		Masters' Degree or PhD		χ^2	p
	n	%	n	%	n	%		
Age of Mother							3.88	.144
Mother Age Less Than 40	2	25.0	7	53.8	4	80.0		
Mother Age 40 or Greater	6	75.0	6	46.2	1	20.0		
Age of Father							6.26	.044
Father Age Less than 40	1	12.5	7	53.8	4	80.0		
Father Age 40 or Greater	7	87.5	6	46.2	1	20.0		
Education Level of Mother							10.34	.035
High School or Some College	4	50.0	1	7.7	1	20.0		
Undergraduate Degree	2	25.0	10	76.9	1	20.0		
Masters' Degree or PhD	2	25.0	2	15.4	3	60.0		
Mother Currently Employed							6.92	.031
Yes	4	50.0	4	30.8	5	100.0		
No	4	50.0	9	69.2	0	.0		
Father Currently Employed							2.41	.300
Yes	7	87.5	13	100.0	4	80.0		
No	1	12.5	0	.0	1	20.0		
Child's Gender							2.86	.240
Male	5	62.5	8	61.5	1	20.0		
Female	3	37.5	5	38.5	4	80.0		
Child's Ethnicity							1.40	.497
Caucasian	5	62.5	11	84.6	4	80.0		
Non-Caucasian	3	37.5	2	15.4	1	20.0		

Correlations

Several Spearman's Rho correlations were conducted to examine relationships between continuous variables, such as the subscale scores and continuous demographic variables. Correlations may range from -1.00 to +1.00, indicating a perfect correlation. Correlations near zero indicate no significant relationship. Relationships with negative correlations indicate that as one variable increases, the other decreases. Relationships with positive correlations indicate that as one variable increases, the other variable also increases. There were no significant relationships between the subscale scores and mother's age, father's age, annual income, age of onset of child's health condition, or age of diagnosis for child's health condition, all *ps ns*. Additionally, there were no significant relationships between PedsQL scores and child's age, when they started at the Therapeutic Riding Center, or number of therapeutic riding sessions, all *ps ns*.

As shown in Table 11, however, there were significant relationships between the PedsQL scores and subscale scores. Quality of Life score was significantly positively correlated with Family Impact Module score, Physical Health score, Psychosocial Health Summary score and overall PedsQL score ($r_s = .439 - .925, p < .05$), indicating that those with a higher Quality of Life score tended to have a higher Family Impact Module score, Physical Health score, Psychosocial Health Summary score and overall PedsQL score. Quality of Life score was not significantly related to overall Cognitive Functioning score, $r = .199, p = .339$. Family Impact Module score was significantly positively related to

Psychosocial Health Summary score and overall PedsQL score, ($r_s = .517 - .816, p < .05$), indicating that those who had a higher Family Impact Module score tended to have a higher Psychosocial Health Summary score and overall PedsQL score. Family Impact Module score was not significantly related to Cognitive Functioning score or Physical Health score, all ps *ns*.

Table 11

Spearman's Rho Correlations of Overall Quality of Life Score, Overall Family Impact Module Score, Overall Cognitive Functioning Score, Physical Health Score, Psychosocial Health Summary Score and Overall PedsQL Score

	Overall Quality of Life Score	Overall Family Impact Module Score	Overall Cognitive Functioning Score	Physical Health Score	Psychosocial Health Summary Score
Overall Family Impact Module Score	.439 *				
Overall Cognitive Functioning Score	.199	.265			
Physical Health Score	.868 **	.316	.224		
Psychosocial Health Summary Score	.925 **	.517 *	.212	.680 **	
Overall PedsQL Score	.804 **	.816 **	.405 *	.703 **	.824 **

Note: * $p < .05$, ** $p < .01$.

As also seen in Table 11, Cognitive Functioning score was significantly related to the overall PedsQL score, $r = .405$, $p = .045$, indicating that those with a higher Cognitive Functioning score tended to have an overall higher PedsQL score. Cognitive Functioning score was not significantly related, however, to Psychosocial Health Summary score and Physical Health score, all ps ns . Physical Health score was significantly positively correlated with Psychosocial Health Summary score and overall PedsQL score, $rs = .680 - .703$, $ps < .01$, indicating that those with a higher Physical Health score tended to have a higher Psychosocial Health Summary score and overall PedsQL score. Additionally, Psychosocial Summary score was significantly positively correlated with overall PedsQL score, $r = .824$, $p < .01$, indicating that those with a higher Psychosocial Health Summary score tended to have a higher overall PedsQL score. Finally, overall PedsQL scores were significantly correlated with all the PedsQL subscale scores, rs ranging from $.405$ to $.824$, $ps < .05$, indicating that those with a higher overall PedsQL score tended to also have higher PedsQL subscale scores.

As part of the preliminary analyses, analyses of variance (ANOVAs) were conducted to examine the effect of the various categorical demographic variables (i.e., mother's age, father's age, mother's employment status, father's employment status, child's gender, and child's ethnicity) on the PedsQL subscale scores and overall PedsQL scores. There was, however, no significant effect of any categorical variables on any of the PedsQL subscale scores and overall PedsQL scores, all ps ns .

Primary Analyses

The primary analyses focused on parents' perceptions of the benefits of therapeutic riding sessions on changes in their child's health, changes in their child's behavior, and overall change. Perceptions were measured through the qualitative responses provided by parents. Responses were coded as change versus no change for changes in health and changes in behavior. These dependent variables were entered into several simple logistic regressions, and were predicted by the various PedsQL subscale scores and overall PedsQL score. The research question corresponding to overall change will be presented as descriptive responses.

Research Question 1

Research question 1 asked if parents perceived therapeutic riding as beneficial to their child. Based upon the qualitative questions asked, two primary themes were evident in parents' responses as to benefits to their child: changes in child's behavior and changes in child's health. Therefore, research question 1 focused on: a) parent's perceptions of changes in child's behavior, specifically if there was a change in behavior versus no change in behavior; and b) parent's perceptions of changes in child's health.

As shown in Table 12, the simple logistic regression predicting perceived change in child's behavior from PedsQL quality of life score was significant ($\chi^2(1) = 8.01, p = .005$) and predicted 37.9% of the variance (Nagelkerke $R^2 = .379$). Parents who reported that their child had higher Quality of Life scores were more likely to perceive a change in

their child's behavior (*Odds Ratio* = 1.075, $p = .017$). Additionally, the simple logistic regression predicting perceived change in child's behavior from the Physical Health score was significant ($X^2(1) = 7.55$, $p = .006$) and predicted 36.1% of the variance (Nagelkerke $R^2 = .361$). Parents who reported that their child had higher Physical Health scores were more likely to perceive a change in their child's behavior (*Odds Ratio* = 1.042, $p = .021$). The simple logistic regression predicting perceived change in child's behavior from Psychosocial Health Summary scores was significant ($X^2(1) = 5.80$, $p = .016$) and predicted 28.7% of the variance (Nagelkerke $R^2 = .287$). Parents who reported that their child had higher Psychosocial Health Summary scores were more likely to perceive a change in their child's behavior (*Odds Ratio* = 1.066, $p = .039$). Finally, the simple logistic regression predicting perceived change in child's behavior from overall PedsQL scores was also significant ($X^2(1) = 6.81$, $p = .009$) and predicted 33% of the variance (Nagelkerke $R^2 = .330$). Parents who reported that their child had higher overall PedsQL scores were more likely to perceive a change in their child's behavior (*Odds Ratio* = 1.11, $p = .030$). The simple logistic regression predicting perceived change in child's behavior from overall Family Impact Module scores was not significant ($X^2(1) = 1.51$, $p = .220$) and only predicted 8.8% of the variance (Nagelkerke $R^2 = .088$). Similar results were revealed for the simple logistic regression predicting perceived change in child's behavior from Cognitive Functioning scores ($X^2(1) = 1.08$, $p = .298$) and only predicted 5.9% of the variance (Nagelkerke $R^2 = .059$).

Parents reported that their child had less anxiety, better mental focus and improved motor skills. One parent stated that her child was “more willing to assert her needs and was generally less affected by anxiety.” Another parent responded that the riding sessions “motivate him to complete tasks, especially on ‘[riding center]’ day.” Parents also noticed an increase in communication with “more spontaneous speech” and “on the day of his ride he would answer questions about his ride when he got home, which is something he usually doesn't do.” Another parent remarked that “On good weeks, the sessions are an incentive for good behavior. She has become much more verbal and expressive, and will talk about her sessions.”

As previously stated, research question 1 also focused on parents' perceptions of changes in their child's health, specifically if there was a change in health versus no change in health. The simple logistic regression predicting perceived change in child's health from overall PedsQL scores was not significant ($\chi^2(1) = 3.37, p = .066$) and predicted 24.8% of the variance (Nagelkerke $R^2 = .248$). As shown in Table 13, the Quality of Life scores were not a significant predictor of perceived change in child's health ($p = .126$). The simple logistic regression predicting perceived change in child's health from overall Family Impact Module scores was not significant ($\chi^2(1) = .30, p = .582$) and only predicted 3% of the variance (Nagelkerke $R^2 = .030$). The simple logistic regression predicting perceived change in child's health from overall Cognitive Functioning scores was not significant ($\chi^2(1) = .35, p = .503$) and only predicted 3.5% of

the variance (Nagelkerke R^2 = .035). The simple logistic regression predicting perceived change in the child's health from Physical Health scores was not significant ($X^2(1) = 3.61$, $p = .058$) and predicted 26.4% of the variance (Nagelkerke R^2 = .264). The simple logistic regression predicting perceived change in child's health from Psychosocial Health Summary scores was also not significant ($X^2(1) = 1.75$, $p = .185$) and only predicted 13.3% of the variance (Nagelkerke R^2 = .133). The simple logistic regression predicting perceived change in child's health from overall PedsQL scores, though, was significant ($X^2(1) = 3.90$, $p = .048$) and predicted 28.3% of the variance (Nagelkerke R^2 = .283). Overall PedsQL scores, however, were not a significant predictor of perceived change of child's health ($p = .109$).

When parents responded to the question relating to specific examples for improved health benefits, parents commented that the benefits were multi-layered. For example, one parent responded that the riding center "has helped with his speech. It has also helped with confidence, balance, sequencing, following directions." Another parent stated that riding a therapy horse "reduced vocal and motor tics while riding, improved sleep the day she rides, and improved body strength." A third parent commented that "It has probably strengthened his core. He can stand in 2 point without hands for a short time. Also, the grip on the reins has helped his fine motor skills. I'm sure cognitive advances were also made in decision making. It helped to build his immune system and his overall respiratory health, through exposure to outside."

Table 12

Summary of Simple Logistic Regression Predicting Perceived Behavior Change from PedsQL Scores

	B	SE	Wald	Odds Ratio	p
Quality of Life Score	.073	.03	5.74	1.075	.017
Overall Family Impact Module Score	.040	.03	1.39	1.041	.238
Overall Cognitive Functioning Score	.017	.02	1.04	1.018	.309
Physical Health Score	.041	.02	5.35	1.042	.021
Psychosocial Health Summary Score	.064	.03	4.26	1.066	.039
Overall PedsQL Score	.095	.04	4.73	1.100	.030

Note: Quality of Life Summary: $X^2(1) = 8.01, p = .005, \text{Nagelkerke}R^2 = .379$.
 Overall Family Impact Module Score Summary: $X^2(1) = 1.51, p = .220, \text{Nagelkerke}R^2 = .088$.
 Cognitive Functioning Score Summary: $X^2(1) = 1.08, p = .298, \text{Nagelkerke}R^2 = .059$.
 Physical Health Score Summary: $X^2(1) = 7.55, p = .006, \text{Nagelkerke}R^2 = .361$.
 Psychosocial Health Summary Score Summary: $X^2(1) = 5.80, p = .016, \text{Nagelkerke}R^2 = .287$.
 Overall PedsQL Score Summary: $X^2(1) = 6.81, p = .009, \text{Nagelkerke}R^2 = .330$.

Table 13

Summary of Simple Logistic Regression Predicting Perceived Health Change from PedsQL Scores

	B	SE	Wald	Odds Ratio	p
Quality of Life Score	.071	.05	2.34	1.074	.126
Overall Family Impact Module Score	.031	.06	.29	1.031	.592
Overall Cognitive Functioning Score	.016	.02	.44	1.016	.505
Physical Health Score	.039	.02	2.78	1.039	.095
Psychosocial Health Summary Score	.047	.04	1.55	1.048	.213
Overall PedsQL Score	.117	.07	2.57	1.124	.109

Note: Quality of Life Summary: $\chi^2(1) = 3.37, p = .066, \text{Nagelkerke}R^2 = .248$.
 Overall Family Impact Module Score Summary: $\chi^2(1) = .30, p = .582, \text{Nagelkerke}R^2 = .030$.
 Cognitive Functioning Score Summary: $\chi^2(1) = .35, p = .503, \text{Nagelkerke}R^2 = .035$.
 Physical Health Score Summary: $\chi^2(1) = 3.61, p = .058, \text{Nagelkerke}R^2 = .264$.
 Psychosocial Health Summary Score Summary: $\chi^2(1) = 1.75, p = .185, \text{Nagelkerke}R^2 = .133$.
 Overall PedsQL Score Summary: $\chi^2(1) = 3.90, p = .048, \text{Nagelkerke}R^2 = .283$.

Research Question 2

Research question 2 asked if parents or guardians perceived that therapeutic riding improved the quality of life for the child, parent and family. Due to the lack of variation in participants' responses, this research question could not be statistically analyzed. While no specific qualitative answers were given regarding the improvement of quality of life for the child, parent and family, responses about improved behavior and health for the child described in research question 1 imply improved quality of life for the child. This will be further discussed in the next chapter.

Supplementary Findings

Additional findings were addressed based on parent responses to the qualitative question which asked for their overall perceptions of benefits received through the therapeutic riding center. The majority of parents provided answers that would indicate that they perceived their child had received some benefits from riding a therapy horse at the riding center ($n = 20$; 90.91%). However, one parent stated that their child did not receive any benefit from riding, and one parent (4.5% of parents) did not offer a response. Parent responses are presented in frequencies and percentages in Table 14. A majority of children were reported to have increased physical coordination ($n = 14$, 66.7%). Supporting responses included such statements as "has helped with coordination and balance - less falls, can do balance beam, etc." and "our child seemed more comfortable with his body and movement and balance." Parent responses

($n=6$; 28.7% of parents) also indicated an increase in cognitive functioning. Parent statements suggested improvements in “auditory processing and focus ability” and “tactile sensitivities” (e.g., now follows 3-4 step directions more easily, will say go left or right instead of pointing, and will say “that way”).” Additional parent comments (28.7%) revealed increased benefits to their child’s mental health. Several children ($n=4$) were reported to have increased self-confidence and self-worth, with parents providing statements such as: “Improved self-confidence and self-worth. Provided an outlet for her loving nature. Gave her something to look forward to and feel successful at. She shares her successes at the riding center with her peers and teachers and this provides an opportunity for praise.”

Table 14

Summary of Qualitative Responses of Parents' Perceived Overall Changes

	n	%
Physical Coordination	14	66.7
Cognitive Functioning	6	28.7
Mental Health	6	28.7
Increased Confidence and Self Worth	4	19.1
Thinks of Others, not Self	3	14.3
Speech, Communication, and Eye Contact	3	14.3
Age Appropriate Behaviors	2	9.5
Positive Reinforcement	2	9.5
No Benefits	1	4.8

Note: Participants could note more than one perceived change.

A few parents stated they perceived their children started to think of others instead of themselves ($n = 3$; 14.3%). Parent comments included: “helps keep him from being so self-centered—thinking of animals needs and putting them first” and “respect for others as he had to use his brain and manners to get his horse to do what he wished it to do—he could not yell or bully the animal.” As shown in Table 14, another three children were said to have increased speech, communication, and eye contact (14.3%) with parents’ responses such as: “She is excited to go riding and forgets her inhibitions, she did not talk outside of home for a long time except at the riding

center. After riding she is more talkative and happy” and increased “eye contact.” Finally, two children (9.5%) were said to exhibit more age-appropriate behaviors, with the parents indicating that the therapeutic riding center was a form of positive reinforcement for their children. One parent, however, stated that she did not see any benefits for her son (4.8%), reporting that her son “doesn't like new things. He is most comfortable at home. He wasn't afraid of the horse, I just think he didn't like "working" that hard.”

Qualitative Analyses

How Participants First Heard About Equine Therapy

Parents were asked how they first heard about equine therapy. Their responses were categorized in five different types of responses: friends, media, professional referrals, self-research, and I don't know. As seen in Table 15, the greatest percentage of responses by parents were that their friends told them about equine therapy ($n = 8$; 30.7%). Parents stated that some of these friends were parents of a Down's syndrome child, parents of an autism spectrum child, or even a “parent at a playground.” Parents also heard about equine therapy from a professional ($n = 6$; 23.1%). These professionals were occupational therapists ($n = 2$), neurologists ($n = 2$), a psychologist ($n = 1$) and a physical therapist ($n = 1$). Several parents researched equine therapy themselves ($n = 7$; 26.9%). Of these people, most ($n = 5$) found information about equine therapy on the internet; one parent found information from a “preemie parenting group;” and another

read a book about equine therapy. Four individuals (15.4%) first heard about equine therapy from media sources, including the local newspaper and resource fair. Only one parent (3.9%) could not remember how she first heard about equine therapy.

Table 15

Summary of Qualitative Responses of Referral Sources for Therapeutic Riding Center

	n	%
Friend	8	30.7
Media	4	15.4
Professional Referral	6	23.1
Researched It Myself	7	26.9
Don't Know	1	3.9

Note: Frequencies not equal to 27 reflect missing data.

How Parents First Heard About The Therapeutic Riding Center

Parents were asked how they first heard about this therapeutic riding center. As with the previous question, the responses were varied (e.g., other parents, professional referrals, searched on internet themselves, friends and media). As shown in Table 16, 29.6% of parents ($n = 8$) responded that they heard about this specific equine therapy center from professionals (e.g., therapists, physical therapists, neurologists, and psychologists). An equal number of parents ($n = 6$) responded that they heard about the center from other parents of special needs children (22.2%) and media, including the local newspaper and internet (22.2%). A total of five parents stated they first heard about the riding center from a friend (18.5%). Two parents reported they had known about the therapeutic equine center as a professional (7.4%).

Table 16

Summary of Qualitative Responses for How Parents First Heard about the Therapeutic Riding Center

	n	%
Parent	6	22.2
Professional	8	29.6
Self	2	7.4
Friend	5	18.5
Media	6	22.2

Participation At Other Equine Therapy Centers

As shown in Table 17, a majority of parents stated that their child had not attended a different equine therapy center (88.9%; $n = 24$). Of those who did, one parent stated that “it was more pony rides than riding” and another parent stated that she switched because the other center was “prohibitively expensive.”

Table 17

Summary of Qualitative Responses for Participation at Other Equine Therapy Centers

	n	%
Attended Other Centers		
No	24	88.9
Yes	3	11.1

Participation In Other Forms Of Animal-Assisted Therapy

As shown in Table 18, four parents stated that their child had participated in other forms of animal therapy (15.4%), and these animals included a therapy dog as well as cats and dogs to learn life skills. One parent stated that her child “only participated in other forms of animal therapy when she was an in-patient at a psych hospital.”

Table 18

*Summary of Qualitative Responses for Participation in Other Forms of
Animal-Assisted Therapy*

	n	%
Other Animal Therapy		
Yes	4	15.4
No	22	84.6

Note: Frequencies not equal to 27 reflect missing data.

Why Parents Chose Equine Therapy

Parents were asked why they chose equine therapy for their child. As shown in Table 19, the greatest proportion of parents stated that it was good for their child's physical development ($n = 9, 34.6\%$), replying that "we hoped it would benefit her motor, speech and sensory issues," "build strength in a fun way," and "to help with balance, following directions and sensitivities to textures, fine motor skills." Parents also commented that it provided excellent benefits for the child ($n = 6; 23.0\%$). Comments included: "to help her learn to follow instructions and boost her self-esteem;" "her self-esteem is low because she knows she is "different" from other kids;" and "it seemed like a fun, unique type of therapy that was a great addition to the regular therapy routine." Other parents reported they chose equine therapy after it was

recommended for their child ($n = 4$, 15.4%). This was reflected in comments such as, “his sibling was having equine therapy and the director encouraged us to also enroll him,” and equine therapy was “recommended from Neurologist and Primary Care Physician.” Another reason provided by parents was the low cost of the program ($n = 3$, 11.5%). One parent stated that “I heard great things about it, there was no financial cost to try it, I would try almost anything to help my child.” Three parents said that they chose equine therapy because their child loves animals (11.5%). One response was “because it was a once in a lifetime opportunity and he loves animals,” whereas another parent stated “she loves horses, draws them and reads about them often.” Lastly, one parent with two special needs children reported that she knew the value of riding and that this was the reason for choosing equine therapy (3.8%).

Table 19

Summary of Qualitative Responses for Why Parents Chose Equine Therapy

	n	%
Knew Value of Riding	1	3.8
Recommended to Child	4	15.4
Good for Physical Development	9	34.6
Likes/Loves Animals	3	11.5
Cost of Program	3	11.5
Excellent Benefits for Child	6	23.1

Note: Frequencies not equal to 27 reflect missing data.

Key Words Used To Describe Thoughts About The Program

Parents were asked to provide up to five key words that would describe their thoughts about the therapeutic riding center. In total, 114 key words were provided, but these words could be grouped into one of six categories. Table 20 shows the categorization of key words from the 27 participants. The greatest proportion of the words were concepts about the program itself ($n = 51$ words; 44.7%). These words included “amazing,” “professional,” “caring,” “dedication,” and “inspiring.” Key words that were based on the emotions felt by either parents and/or their children ($n = 28$, 24.6%) included words such as “enthusiasm,” “comfortable,” “relaxation,” “optimism,” “fun or enjoyment,” and “calming or peaceful.” Self-concept words accounted for 9.7% ($n = 11$) of the provided key words. These words included “challenging,” “responsibility,” “pride,” “independence,” and “confidence.” Key words also included words that spoke to the physicality of the program ($n = 13$; 11.4%) and included words such as “strengthening,” “balance,” “progress,” “coordination,” and “sensory.” Personal strength was another category of key words and accounted for eight words, or 7% of the responses. These words included “therapeutic,” “focus,” and “face fears.” Not all key words were positive, however. Three parent responses (2.6%) were negative and included “stressful,” “short,” and “inconsistent” (see Appendix E for Key Words).

Table 20

Summary of Qualitative Responses for Key Words Used to Describe Program

	n	%
Physical	13	11.4
Self-Concept	11	9.7
Negativity	3	2.6
Emotions	28	24.6
Personal Strengths	8	7.0
Words about Program	51	44.7

Note: "n" is based on the unlimited number of words or concepts reported by the participants.

Short- And Long-Term Goals

Parents were also asked to respond as to what impact, if any, they believed that therapeutic riding had on short- and long-term goals for their child. As shown in Table 21, most parents reported a mixture of short- and long-term goals. Short-term goals listed by some parents included physical benefits, strength building, and mental gains. Long-term goals identified by some parents referred to “employment, Special Olympics, and measureable improvements” (see Table 21 for number of mixed responses). Of the mixed responses, 15 were physical attributes, which included “strengthening core muscles,” “fine motor skills,” and “mobility.” One parent highlighted these improved physical attributes in her response: “Huge impact! [My son] is crawling much better and now even trying to walk! His balance is much better and has made a huge difference overall.” Other responses ($n = 6$) spoke to improved cognitive functioning—“textures are no longer a problem, speech has improved” and “it has helped with transitioning from one activity to another, staying focused, fine motor skills, eyes constant and academics (counting, colors).” Two parents recognized a greater potential for his/her child in regard to achievements in the child’s life, stating that “It has shown me that [my child] will be able to achieve more than I give him credit for. It also shows me how therapeutic animals can be in helping [him].” Finally, one parent stated that the child’s potty training has improved and another parent stated “friendship” with others had also improved.

Table 21

*Summary of Qualitative Responses regarding Impact of Therapeutic Riding on
Short- and Long-Term Goals for the Child*

	Number of Responses
Mixed	
Physical Attributes	15
Potty Training	1
Friendship	1
Cognitive Functioning	6
Achievements	2
Short-Term Goals	
Build Strength	
Physical and Mental Gains	
Physical Gains	
Long-Term Goals	
Employment	
Special Olympics	
Measurable Improvement	

Note: Only the frequencies of mixed short- and long-term goals are presented.

What Parents Liked Best About The Program

Parents were given the opportunity to comment on what they liked best about the therapeutic riding program. Out of the 27 participants, two people did not respond. Most parents spoke of the benefits to life that their child had received by attending the therapeutic riding center ($n = 10, 40\%$). Benefits included an increased sense of pride and independence, as well as improvements in behavior, physical attributes, and cognitive functioning. One parent wrote that the riding center "...encourages independence, and consideration of how to use the same words and motions on different animals to get same effect." Another parent commented that the riding center gave her child "a sense of pride—a place he can shine and be with his horse." In terms of cognitive functioning, one parent stated that the riding center was key in "teaching her to follow instructions." Parents also liked the physical improvements seen in their children (e.g., balance).

Also shown in Table 22 were comments related to the staff ($n = 8; 32\%$). Parents found the staff to be "enthusiastic," "friendly," and "helpful." One parent stated that "his instructor is so loving, kind and patient." In addition to comments about staff, parents also remarked about the therapy horses ($n = 6, 24\%$), as well as how they liked the interaction between horse and child. One parent stated "the child is involved in all aspects (grooming, saddling, leading, etc). Helps promote responsibility." Another parent commented: "great match of horse/instructor/rider. I think that *the riding*

center feels like Heaven on Earth and is such a tranquil environment.” Finally, one parent with two special health care needs children commented that she enjoyed the “holistic approach” of the riding center (n = 1; 4%).

Table 22

Summary of Qualitative Responses regarding What Parents Liked Best about the Therapeutic Riding Program

	n	%
Animals	6	24.0
Staff	8	32.0
Benefits to Life	10	40.0
Holistic Approach	1	4.0

Note: Frequencies not equal to 27 reflect missing data.

What Parents Liked Least About The Program

Parents were also given the opportunity to describe what they liked least about the program. As shown in Table 23, two of the parents responded that they liked everything about the riding center (7.4%), but other responses were fairly distributed. Most parents complained about the distance (n = 6, 22.2%) because the facility for some

was over an hour away. Five parents (18.5%) stated that they liked the instructors least, stating that the instructor “could've pushed him harder toward goals” or “oftentimes substitutes were not available when the instructor could not attend the session.” Other comments about the instructors included “Our instructor changed just as my child was getting to know her” and “Volunteers showing up consistently late.” In the same vein, two parents ($n = 2$, 7.4%) responded that there was a problem with the horses themselves. One comment was that “The horse my daughter rode was too new to the program.” “The handlers had trouble with him” and “that they make [my son] try to tack the pony when he is in a wheelchair and is non-verbal; he doesn't understand so I do all the work.” Some believed that there were problems with the program itself ($n = 4$, 14.8%) in that the sessions were too short or the children were “doing the same thing weekly.” Four parents ($n = 4$, 14.8%) commented on too few sessions, such as “It's not twelve weeks. It's really closer to 10 weeks (fall) and 8 weeks in the Spring.” Parents also noted that there was a lack of funding for the program ($n = 2$, 7.4%), stating that the “program was cut short this session” and “Sessions ending early due to funding loss.” Finally, two parents had other comments that could not be categorized. One stated that her child reacted negatively to the sessions, whereas the other reported that she had to tote a 35-lb sibling in a backpack while her child was in the riding session.

Table 23

Summary of Qualitative Responses regarding What Parents Liked Least about the Therapeutic Riding Program

	n	%
Distance	6	22.2
Lack of funding	2	7.4
Instructors	5	18.5
Animals	2	7.4
Program	4	14.8
Not Enough Sessions	4	14.8
Other	2	7.4
Nothing	2	7.4

Suggested Changes To The Program

Finally, parents were also given the opportunity to suggest changes to the riding program. All but one parent responded to this question. As shown in Table 24, several parents ($n = 5$; 20.0%) stated that they did not have any suggested changes.

Approximately one-third of parents suggested some changes in regard to the instructors ($n = 8$; 32.0%), stating that “an apprenticeship ... to possibly train how to work with others or work with horses would be a useful addition.” Other comments about instructors included “some instructors were more pony ride instructors and had to be encouraged to challenge skills,” “consistency with volunteers, better warning of daily or session cancellations,” and “more OT trainings for instructors.” One parent suggested that it would be a good idea to meet the child’s instructor before each session and not just on the first day of riding. Other suggested changes were aimed at the actual sessions themselves ($n = 7$; 28.0%). Parents wanted to see longer sessions, more sessions per week or even “consistency in session length.” Additional comments within this category included the need for shorter time between sessions: “we understand there needs to be breaks in between sessions but would like them to be shorter” and “hard to get the child used to the horse at only once a week.” One parent (4.0%) stated that there should be a better policy in place if there was an issue about the therapy animal. She said: “If a horse is not right for the rider (i.e., doesn't mind the handler, bucks when the child is on), the child needs to be given a different horse.” Three

parents (12.0%) stated that there should be other activities for the children, including indoor activities. One parent responded: “I think that for some kids it’s a great idea but after the 2nd week they should allow some kids to skip that part” referring to her son not being able to tack a horse.

Table 24

Summary of Qualitative Responses for Suggested Changes to Therapeutic Riding

Program

	n	%
Instructors	8	32.0
Sessions	7	28.0
Horse	1	4.0
Different Activities	3	12.0
Better Funding	1	4.0
None	5	20.0

Note: Frequencies not equal to 27 reflect missing data.

Summary of Results

The current study focused on the benefits of equine therapy and consisted of both quantitative and qualitative findings. The first null hypothesis was not rejected because there were no significant differences between the mean scores for the Quality of Life scale, Cognitive Functioning scale or Family Impact Module scale based on the demographic factors of the ages of parents, employment status of parents, child's gender or child's ethnicity. The other demographic factors did not have enough variability to use for analysis purposes. The researcher also asked how parents perceived the benefits of therapeutic riding for their child and family. Based upon the responses to the qualitative questions, there appeared to be three clear themes: benefits to child's behavior, benefits to child's health, and overall benefits. Null hypothesis two was partially rejected in that Quality of Life score, Physical Health score, Psychosocial Health Summary score and overall PedsQL score individually significantly predicted a perceived change of behavior in the child. The PedsQL subscale scores and the overall PedsQL score did not, however, significantly predict perceived changes in the health of the child. Finally, an examination of the qualitative responses revealed several parents did perceive changes in their child's physical and mental health, as well as changes in their child's behaviors.

CHAPTER V

SUMMARY, DISCUSSION, AND RECOMMENDATIONS

Children confronted by special health care needs are not alone; their comrades number over 10 million within the United States alone. No specific set of health conditions marks the identification boundaries for the group. No demographic subset escapes membership to this special association. For each child or adolescent impacted by a special health care need, a family is also affected by the child's situation. Nearly 9 million households in the United States share common needs and experiences as a result of the ongoing nature of this confrontation (Child and Adolescent Health Measurement Initiative, 2010). Time is limited in the identification and intervention process due to the potential developmental repercussions facing the child. There is an assortment of natural allies readily accepted by most children that are proving useful in a myriad of unique interventions. As a result of an interspecies connection that dates back at least 12,000 years, the pathway back to a healthier life can be shared by a child and an animal partner (Fine, 2006; Salotto, 2001).

Summary

The purpose of this mixed-method study was to survey parents or guardians of children with special health care needs in order to gain a greater understanding of their perceptions regarding equine therapy and its impact on the child and family. The intent

was to determine if the parents believed that equine therapy was effective in improving the quality of life for the child and family as evidenced by a positive change in the child's behavior and in the child's health. The therapeutic riding center chosen for the research site was unique from others in the area for a variety of reasons. All riding sessions were private (one-on-one) versus group lessons, lessons were free, the program curriculum included a progression chart with 178 specific steps, and a parent was required to attend with the child each time. After receiving IRB approval from Texas Woman's University, volunteer recruitment flyers were sent to all clients of the therapeutic riding center in North Texas through email and the postal service. Interested volunteers contacted the Principal Investigator through email, telephone, and the mail. After determining the age of the child for those interested in participating in the study, 50 age-specific study packets and consent forms were sent out. The returned and completed study packets numbered 27. Although the number of children for the study was 27, the number of families involved was 24. Three of the families had two children each that were clients of the therapeutic riding center. The sample included 15 boys and 12 girls, ages 20 months to 15 years. The children were identified within the following ethnic groups: Caucasian (20), Hispanic (5), African American (1), and Asian (1). One father, 20 biological mothers, and 3 adoptive mothers completed the questionnaires. A majority of the children lived in a two-parent household (21 out of 27). The health conditions were varied, although for some, multiple conditions were reported. The

principal conditions described by parents included: psychological disorders (54.6%), brain or nervous system injuries or disorders (36.4%), autism (22.7%), breathing disorders (22.7%), sensory disorders (13.6%), and other (9%).

Each parent or guardian that volunteered for the study returned a signed consent form, along with 5 different post-therapy surveys which were estimated to take a maximum time of 1 ½ hours to complete. The instruments included: the Demographic Survey, the Therapeutic Riding Survey, the PedsQL Quality of Life Inventory Scale (parent proxy-report/age-specific), the PedsQL Cognitive Functioning Scale (parent proxy-report/age-specific), and the PedsQL Family Impact Module. Qualitative data were drawn from the Demographic Survey and the Therapeutic Riding Survey.

Conclusions

The data analysis revealed five significant quantitative findings:

1. Overall scores from the PedsQL Family Impact Module were significantly positively correlated with PedsQL Psychosocial Health summary scores (subscales of PedsQL Pediatric Quality of Life Inventory) and overall combined PedsQL scores.
2. Overall scores from the PedsQL Cognitive Functioning Scale were significantly positively correlated with the overall combined PedsQL scores.
3. The PedsQL Physical Health scores (subscale of PedsQL Pediatric Quality of Life Inventory) were significantly positively correlated with PedsQL

Psychosocial Health summary scores and the overall combined PedsQL scores.

4. The PedsQL Psychosocial Health summary scores were significantly positively correlated with the overall combined PedsQL scores.
5. The overall combined PedsQL scores were significantly correlated with all other PedsQL scores—PedsQL Family Impact Module, PedsQL Cognitive Functioning Scale, and the PedsQL Pediatric Quality of Life Inventory.

Research question 1 explored whether the parent or guardian perceived therapeutic riding as beneficial to the child. This was evidenced both quantitatively and qualitatively by a change in behavior and a change in health. Simple logistic regressions were conducted on the PedsQL subscale scores and overall PedsQL scores in order to predict the perceived benefits. PedsQL Quality of Life Inventory scores were a significant predictor of behavior change. Individual subscale scores that were significant predictors of change included the Physical Health scores and the Psychosocial Health summary scores (emotional, social and school functioning scales). The overall PedsQL scores, which included all PedsQL items according to the PedsQL scoring algorithm, were also a significant predictor of change. Scores that were significant predictors of change indicated that those children who had higher scores had greater odds of having a change in behavior as reported by their parents or guardians. Qualitative findings supported Research question 1 with parental responses revealing that therapeutic

riding decreased anxiety in their children, enhanced mental focus, improved motor skills, promoted communication, increased motivation, and provided an incentive for good behavior. Supplemental qualitative findings that manifested support for perceived benefits beyond behavior change indicated an increase in cognitive functioning, auditory processing, and improvement in overall mental health. Improved quality of life factors that were enhanced due to therapeutic riding included increased self-confidence and self-worth. This enjoyable, alternative therapy provided an outlet for success—an opportunity for praise and accomplishment. As one parent commented, therapeutic riding gave her child “a sense of pride—a place he can shine and be with his horse.”

Research question 2 focused on whether the parent or guardian perceived therapeutic riding as improving the quality of life for the child, parent and family. All parents perceived therapeutic riding as being effective. Due to this lack of variation in quantitative responses, this question could not be statistically analyzed. As indicated by the responses described for research question 1, however, the parents believed that their child had shown positive changes in behavior and in health. It can be implied, therefore, that there was also an improvement in quality of life. Due to the human-animal bond, the incorporation of therapy animals in a clinical intervention can improve both human health and the intangible “quality of life” as shown by past research (Becker, 2002; Fine, 2006). Various qualitative responses by parents indicated a greater hope in the future for the child physically, mentally and emotionally. This form of

therapy also pleased the parents in that they could offer their children an enjoyable therapeutic opportunity. One mother commented that it gave her great pleasure to be able “to take her child somewhere fun since there was never time for anything enjoyable because of all the doctor visits, occupational therapy, speech therapy...”.

Table 25: Null Hypotheses Summary

Null Hypotheses	
<p><i>H₀₁:</i> There will be no statistically significant differences in mean scores on the quality of life scale, cognitive functioning scale, or family impact module scores based on descriptive variables (e.g., age, gender, health condition).</p>	<i>Not rejected</i>
<p><i>H₀₂:</i> Quality of life scores, cognitive functioning scores, and family impact module scores will have no significant effect on parental perceptions of therapeutic riding.</p>	<i>Rejected</i>
<p><i>H₀₃:</i> Quality of life scores, cognitive functioning scores, and family impact module scores will have no significant effect on parental perceptions of the benefit of therapeutic riding on the perceived quality of life for the child or family.</p>	<i>Could not be tested.</i>

Discussion and Implications

According to the perceptions of parents, both quantitative and qualitative findings supported the effectiveness of equine therapy for Special Health Care Needs Children, regardless of age or developmental stage. Positive changes were seen in behavior, in health, and in improved quality of life factors for the child. The findings from this study are in alignment with previous studies cited in the literature review. Results from a study in Florida that assessed parental perceptions on the effectiveness of therapeutic riding for children with disabilities indicated significant improvements in physical behaviors (e.g., mobility, balance, and posture) and in psychological effects on self-esteem, self-confidence, and self-image (Scialli, 2002). Findings from a qualitative study in Ohio on equine therapy with grieving children also indicated positive changes in confidence building, trust building and communication. Not only did this therapeutic intervention help the children through the grieving process, evidence of transference of the behaviors learned with the horses was seen which led to the children showing more trust and openness with their families (Glazer et al., 2004). Macauley and Gutierrez (2004) found that parents reported greater improvement in speech and language abilities in their children after hippotherapy compared to traditional therapy, along with the added benefits of increased motivation and attention. In a study by Kesner and Pritzker (2008) with children in a foster care system, participants in a therapeutic riding program reported positive results in self-concept and behavior issues due to the

building of relationships, first with the horse and then with the other children in the riding program. The participants gained self-confidence through learning how to direct and control a large animal. In addition, they were taught to treat the horse with kindness and respect. It was noted that the participants demonstrated an increased desire to help each other as the program progressed. The foster care parents also noticed changes in the children's behavior, attitude, confidence level, and efforts to socialize with the other participants. The value of equine-assisted therapy was exemplified in the finding that the participants, as well as some of the foster care parents, experienced a paradigm shift as it related to their sense of value when they viewed themselves in the eyes of their horse.

Although results of this study did not indicate a direct link to an improved quality of life for parents and family, it can be implied. It can be reasoned that if having a child with special health care needs negatively impacts the quality of life for the parent and family, then conversely, the opposite is true if the quality of life for the child improves. Bandura's Social Cognitive Theory supports this concept as substantiated by the belief that there is a continuous reciprocal relationship among a person's cognition, behavior and environment (Bandura, 1997). Parent and family involvement should be encouraged in therapeutic interventions since family members are the child's primary caretakers (Child and Adolescent Health Measurement Initiative, 2010).

A parent in this study reported that she has seen her child with Autism change and grow with every new session. According to the mother, her child makes greater eye contact with others, has demonstrated increased fine motor skills (e.g., able to buckle saddle), and academic and sequencing skills have improved. She further believes that her child's motivation and ability to complete tasks has been enhanced as a result of equine therapy. Another parent involved in the study who has a child with a neurological disorder now believes and hopes that her child can compete in the Special Olympics one day. Riding has definitely improved the child's physical condition, but the mother commented in more detail on what it has done for her child in other ways. Six years ago when her child began at the riding center, her child did not go outside except to the riding sessions. Over the years, she has seen her child forget her inhibitions, especially while riding. Riding has given the child a topic of conversation with family, teachers and classmates. As reported by the mother, the child is "much more talkative and happy." Another parent found value in therapeutic riding in that it was a therapy that the entire family could be involved in with the child.

Findings from the dolphin-assisted therapy study in Germany (Breitenbach et al., 2009) upheld the necessity of including the family in therapeutic interventions, and discovered that parental behavior could be a significant mediator in affecting change. Often parents of children with severe chronic health conditions lack faith in their own or their children's ability to deal with the challenges ahead. When a parent believes a

therapeutic intervention is effective and beneficial to their child, it offers encouragement and hope that can lead the parent to trust in themselves and in their child. This was seen in the current study in remarks by parents who recognized a greater potential for their children and future achievements in life (e.g., “It has shown me that [my child] will be able to achieve more than I gave [him] credit for”).

Parents/guardians responded with positive comments regarding the riding center, the center director, and of course, the horses. Parents were asked to describe their thoughts about the program by providing key words which helped capture the overall meaning of the experience for the parents. The descriptive words offered were overwhelmingly positive (e.g., peaceful, nurturing, encouraging, fun, motivating, unique, joyful). The mother of the youngest participant of the study highlighted what impact this therapy has had on her child and the child’s future. Suffering from “Shaken Baby Syndrome,” her child was unable to sit upright at 15 months of age when the child began therapy at the riding center. The child has successfully completed a year of riding, with improvement noted both physically and emotionally. It has brought this mother both joy and hope.

Qualitative responses for what parents liked least about the program or suggestions for change were consistent with other studies on animal-assisted therapies. The distance to the center was a common complaint, but parents may have chosen this center even if it was farther away since it was free. A majority of parents indicated a desire for longer sessions, more visits per week, and shorter breaks in between sessions.

The study by Glazer et al. (2004) recommended an expansion of their program to twelve weeks. Scialli (2002) found that the longer the child participated in the therapeutic riding program, the greater the results.

The importance of this study can be summarized in its strengths. The major strength relates to *justification* and *credibility*. It contributes to the body of knowledge for health care professionals in general and health educators specifically, but it also provides information for other professional areas as well. Special education programs, associations that aim to develop a body of knowledge in human-animal bonding, animal-assisted activities, animal-assisted therapies (e.g., Delta Society), and therapeutic riding (e.g., NARHA) can benefit from this type of research. Research lends credibility to the therapeutic use of animals in the health care setting. The development of knowledge can also lead to innovations that improve the results of the intervention. Current animal-assisted therapies can be improved and refined through the findings of scientific studies. Lastly, research builds on past research, with each study having the potential to be a building block for the next study.

Research not only justifies a practice, it also creates awareness. If the benefits of animal-assisted therapy are scientifically proven, it could aid private and public funding, research, education and development of programs for training of animals and professionals. More academically prepared professionals could become involved with potential for insurance reimbursement. In order to meet the needs of a child with

special health care needs, there is generally an increased need for a wider range of services to sustain, develop, and maintain the physical, mental, and emotional health of the child. A family's finances and employment status are often compromised in caring for a child with a special health care need, which makes it even more difficult to afford therapies that have no coverage (Child and Adolescent Health Measurement Initiative, 2010).

Animal-assisted therapies are proving their value in ever-widening circles. The health educator can play a significant part in identifying, supporting and advancing these interventions. The role of the health educator focuses on health education, disease prevention and health promotion, and is best described by examining the seven areas of responsibility outlined by the National Commission for Health Credentialing, Inc. (NCHEC, 2010). The health educator's first responsibility is to assess and identify individual and community needs. Creating awareness on every level—individual, local community, state, and national—is essential for the promotion of animal-assisted therapies and the support of children with special health care needs and their families. After assessment, the health educator's role focuses on the planning, implementing, and evaluating of programs and interventions that can benefit the child with special health care needs. To ensure sustainability, programs must be evaluated for effectiveness in order to provide the best product and to maintain or increase funding. Educating the public, professionals, providers, and potential clients on the benefits,

value and availability of these services is very important and can promote collaboration among professionals, agencies, and organizations. Through research, data is provided to demonstrate the benefits of animal-assisted therapies, while at the same time highlighting the impact of special health care needs on the individual, family and community. The health educator can promote acceptance of animal-assisted therapies, serve as a resource person, communicate and advocate in the community and in the political arena.

Limitations

Several limitations were inherent within the study design, and were further exacerbated by time and financial constraints. The first limitation was the lack of a control group. All the children participated in therapeutic riding at the same center. The purpose was to determine if equine therapy was perceived as beneficial by the parent regardless of the child's age or health issue. By not limiting those variables, it was difficult to form a comparable control group. One reason this particular center was chosen as the research site was because there was no cost to clients for the riding sessions. Since it was free, it was hoped that there would be greater diversity among the study population with regards to the demographic variables. Though the study population was fairly homogenous ethnically, the population was diverse in the type and number of health issues confronting the children.

The second limitation focused on the absence of a pre- and post- test. It was not possible to recruit and pre-test before the beginning of the Spring 2010 riding program. The Spring 2010 riding program was shortened to 8 weeks due to the fact that 4 of the riding instructors resigned before the end of the program. As a result of the current economic situation in the country, limited donations have led to financial problems and have jeopardized the Fall 2010 riding sessions, as well as the future of this center. The families are aware of this, and are concerned for the center, the owner, the horses, and their children. The main purpose of the study was to determine if the parents believed equine therapy to be beneficial for their child (e.g., *if* their child had changed due to equine therapy, *not* how much the child changed). Children of all ages and all stages of development were included in the study. In addition, the length of time in equine therapy varied greatly; from first timers to those who had been riding at the center for several years.

The third limitation dealt with the small sample size. Consideration was given during the study design to limit the number of questionnaires and the length of time for completion with the hope that more families would volunteer. Numerous attempts were made to recruit participants and to encourage completion of study packets. Recruitment was implemented after the riding sessions began and continued for several months. As evidenced by the research studies presented in Chapter II, a majority of animal-assisted studies were limited by small study populations. Sample sizes ranged from 3 to 118.

The limitations of this study established parameters on the application and interpretation of the results of the study. It is obvious that the generalizability and utility of findings were impacted by each of the limitations. The use of the sampling procedure decreased the generalizability of the findings to a larger or different group. Due to the lack of a control group or multiple testing, causation could not be proven. The study did provide insight into the lives of children and families impacted by chronic health conditions and their feelings toward equine therapy. Even though it was not possible to make strong conclusions, the data from this study and other small studies can be used to design larger confirmatory studies.

Recommendations

The results of this study have several implications for future research. Quite simply, recommendations for future research would be to eliminate the limitations found in this study. Repeating the study with a control group could assist in the demonstration of effect. Allowing time for pre- and post-testing would also establish and support effect. Implementing a 6-month or one-year post-therapy follow-up could help determine the length of the effects of the therapeutic intervention. Increasing the size and diversity of the sample population could increase generalizability to other populations. Special incentives could be offered to increase participation.

Future prospective studies could investigate causal associations by examining which groups benefit the least or most from equine therapy, and what frequency and

length of riding sessions are the most effective and have the longest-lasting results.

Klontz, Bivens, Leinart, and Klontz (2007) found that clinical improvement remained

stable at the 6-month post-therapy visit following an intense 4 ½ day residential riding

program for adults. At the completion of their study, Glazer et al. (2004) recommended

expanding the therapeutic riding program for children from six weeks to twelve weeks.

Scialli (2002) found that the longer children participated in therapeutic riding, the

greater the results. What are the specific benefits and disadvantages of individual vs.

group lessons? Does peer support outweigh the benefits of individual lessons?

Certainly the findings from Kesner and Pritzker (2007) with children from the foster care

system support the value of social interaction with others during therapeutic riding.

What other avenues could increase comradeship among riders and families?

Future research should give greater attention to the acquisition of qualitative

data. Increasing the amount of qualitative data collected through personal interviews

and observation would add depth to the information. A more comprehensive

perspective would generate a better understanding of the daily trials of children with

special health care needs and their families. This study offered but a slight glimpse into

their world.

I Saw a Child

I saw a child who couldn't walk,
sit on a horse, laugh, & talk...

I saw a child with no legs below,
sit on a horse, and make it go...

I saw a child who could only crawl,
mount a horse and sit up tall...

I saw a child born into strife,
take up and hold the reins of life.

And that same child, was heard to say,
thank God for showing me the way.....

~J. A. Davies

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APPENDIX A

Consent to Participate in Research

TEXAS WOMAN'S UNIVERSITY
CONSENT TO PARTICIPATE IN RESEARCH

TITLE OF STUDY: *Parental perceptions of the effectiveness of equine therapy for children with special health care needs.*

INVESTIGATOR: Mary Hughes, RN, MS mkathughes@yahoo.com 214-213-9454

ADVISOR: Kristin Wiginton, PhD klwiginton@twu.edu 940-898-2860

DEPARTMENT: Health Studies Department
College of Health Sciences
Texas Woman's University

This Consent Form will describe the research study so that you may decide if you wish to participate as a volunteer.

Explanation and Purpose of the Research

You are being asked to participate in a research study for Ms. Hughes' dissertation at Texas Woman's University. The purpose of this research is to examine the perceptions of parents or guardians of children with special health care needs on the effectiveness of equine therapy. You have been asked to participate in this study since you are the parent or guardian of a child participating in equine therapy at SpiritHorse Therapeutic Center.

Description of Procedures

As a participant in this study, you will be asked to complete a variety of questionnaires/surveys. This should take no longer than 1½ hours. You may complete the questionnaires at a time and location of your choosing. A self-addressed stamped envelope is included for return of the consent form and surveys.

Voluntary Participation

Participation in this research study is voluntary. You may refuse to participate, or may discontinue at any time by not completing the questionnaires or submitting them. Your decision to participate or not participate in this study will not impact your child's therapy sessions.

Participation and Benefits

Except for the gratitude of the principal investigator and the knowledge that the participant is contributing to the understanding of equine therapy, the participant will not receive anything in the form of financial remuneration.

Initials

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Potential Risks

Loss of time and inconvenience is a possible risk. As a participant, you may complete the surveys at a time and place that is convenient to you. You do not need to complete all questions at one time.

Possible emotional discomfort may be experienced due to the sensitive nature of some of the questions. Surveys may be completed at home or at a location of your choice. You may take a break as often as necessary while completing the surveys. You may stop answering questions at any point. A counseling referral list has also been provided for you with this consent form.

Loss of confidentiality is a potential risk. Confidentiality will be protected to the extent that is allowed by law. Consent forms will be separated from the questionnaires upon receipt and kept in a locked box at the PI's residence. Upon completion of the study, consent forms will be sent to the IRB office. One year after the completion of the study, all survey forms will be shredded.

Numerical coding will be utilized by assigning a code to each form within the survey set. No other identifying marker will be on the surveys/questionnaires.

There is a potential loss of confidentiality in all email, downloading, and internet transactions.

Coercion is another recognized risk in this study. Non-participation in this study will not impact your child's therapy sessions. The staff at SpiritHorse will not be told who is participating in this study.

The researchers will try to prevent any problem that could happen because of this research. You should let the researchers know at once if there is a problem and they will help you. However, TWU does not provide medical services or financial assistance for injuries that might happen because you are taking part in this research.

Financial Costs

None. Self-addressed stamped envelopes will be provided.

Questions Regarding the Study

You are being sent 2 copies of the consent form. Sign and date one copy of the consent form and return with the completed questionnaires. The other copy of the consent form is for you to keep. If you have any questions about the research study, you should ask the researchers. Their phone numbers are at the top of this form or you may contact them via email. If you have questions about your rights as a participant in this research or the way this study has been conducted, you may contact the Texas Woman's University Office of Research and Sponsored Programs at 940-898-3378 or via email at IRB@twu.edu.

Initials
Page 2 of 3

By submitting this form you confirm that you have read the entire document and understand it completely. You agree to participate in this research freely and voluntarily.

SIGNATURE OF PARTICIPANT:

_____ DATE

Code # _____

If you wish to receive the results of this study, please supply your preferred mailing instructions on the lines below.

Initials
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APPENDIX B

Volunteer Recruitment Flyer

Volunteers Needed

for a research study

“Parental perceptions of the effectiveness of equine therapy for children with special health care needs”



This study is open to parents or guardians of children 18 and younger participating in the riding sessions at SpiritHorse.

The purpose of the study is to better understand therapeutic riding and its impact on the child and family.

As a participant in this study, you will be asked to complete several questionnaires. The maximum time commitment is 1½ hours. The questionnaires will be mailed to you along with a self-addressed stamped envelope. You may complete them at a time and place that is convenient to you.

There is a potential risk of loss of confidentiality in all email, downloading, and internet transactions.

Your participation will be greatly appreciated.

For more information about this study or to volunteer, please contact:

Mary Hughes, Principal Investigator
Department of Health Studies
Texas Woman's University
mkathughes@yahoo.com

APPENDIX C
Demographic Survey

Demographic Survey

ID#: _____

Date: _____

Person completing the questionnaires:

Relationship to child:
(mother, father, guardian, etc.) _____

Information pertaining to parents/guardians:

Age of parents/guardians: mother _____

father _____

Marital status of parents/guardians: mother _____

father _____

Highest level of education: mother _____ father _____

Occupation: mother _____ father _____

Are parents/guardians currently employed (yes/no): mother _____

father _____

Estimated income level of household: _____

Information pertaining to the child:

Age: _____

Gender: male-- _____; female-- _____

Ethnic Group or Race:

(please check)

Black, Non-Hispanic _____ Asian or Pacific Islander _____

Hispanic _____ White, Non-Hispanic _____

Native American or Alaskan Native _____ Other _____

Chronic Health Condition: yes____ no____ Condition: _____

Age of onset: _____

Age of diagnosis: _____

Current treatments (i.e., medication, counseling, occupational therapy, nutritional therapy, etc.):

Number of siblings and ages:

Number of people residing at the home:
(please list relationship to child):

Does your child attend school or daycare? If yes, what grade. _____

In the past 30 days...

How many days did your child miss from school/daycare due to physical or mental health? _____

How many days was your child sick in bed or too ill to play? _____

How many days did your child need someone to care for him/her due to physical or mental health? _____

If you work outside of the home, please answer the following questions.

In the past 30 days, how many days have you missed from work due to your child's physical or mental health? _____

In the past 30 days, has your child's health interfered with...	Never	Almost Never	Sometimes	Often	Almost Always
Your daily routine at work	0	1	2	3	4
Your ability to concentrate at work	0	1	2	3	4

APPENDIX D

Therapeutic Riding Survey

Therapeutic Riding Survey

The purpose of this questionnaire is to gain a greater understanding of your unique experiences and feelings as a parent or guardian of a child with special health care needs, and to explore the effects of therapeutic riding on your child, you, and your family. Please feel free to use additional paper if needed. Thank you.

How did you 1st hear about equine therapy? _____

How did you hear about SpiritHorse Therapeutic Center? _____

When did you 1st start at SpiritHorse? _____

How many 12-week riding sessions has your child attended at SpiritHorse (not counting this session)?

Which parent/guardian has the primary responsibility for attending the riding sessions with the child?

Has your child participated in equine therapy at other riding centers? If yes, please state when, where, for how long, and reason for switching.

Has your child participated in other forms of animal-assisted therapy? If yes, please state when, where, for how long, and type (i.e., dog therapy).

Why did you choose equine therapy for your child?

Did your child look forward to the riding sessions? _____

Did your child like the horse? The instructor? _____

What is your perception of the overall effect the riding sessions had on your child? (please include examples)

Did you notice a change in your child's behavior at home during the weeks of the program? (please include examples)

What is your perception of the effect the riding sessions had on your child's health? (please include examples)

What key words would you use to describe your thoughts about the 12-week therapeutic riding program you child just completed? (please list at least 5)

What impact, if any, has therapeutic riding had on the short- and long-term goals you have for your child?

What did you like most about the riding program? _____

What do you like least about the riding program? _____

What changes would you like to see in the riding program? _____

Thank you for sharing your experiences with us about therapeutic riding.

Your thoughtful answers are appreciated.

Please feel free to add any additional comments, concerns, observations, or thoughts you may have on this sheet or additional pages. Thank you.

APPENDIX E

Table 20: Key Words Used to Describe Thoughts About Program

KEY WORDS USED TO DESCRIBE THOUGHTS ABOUT PROGRAM

Participant	First Word	Second Word	Third Word	Fourth Word	Fifth Word
1	Adaptability	Understanding	Confidence	Special	
2	Encouraging	Productive	Adaptability		
3	Wonderful	Peaceful	Joyful	Inspiring	Provided
4	Nurturing	Supporting	Loving	Encouraging	Sensitive
5	Self Esteem	Sensory	Relaxation	Fun	Face Fears
6	Self Esteem	Sensory	Relaxation	Fun	Face Fears
7	Balance	Focus	Focus		
8	Confidence	Coordination	Balance	Enjoyment	Enthusiasm
9	Enthusiasm	Strength	Pride	Support	Comfortable
10	Fun	Calming	Interactive	Challenging	Loving
11	Confidence	Gentleness	Independence	Responsibility	Balance
12	Health	Positive	Enjoyable	Focus	Peaceful
13	Affordable	Unique	Fun	Relaxation	Progress
14	Encouraging	Upbeat	Refreshing	Relaxation	Positive
15					
16	Calming	Fun	Loving	Motivating	Therapeutic
17	Peaceful	Calming	Relaxation	Friendly	No Pressure
18	Peaceful	Positive	Fun	Productive	Encouraging
19	Great	Inconsistent			
20	Wonderful	Blessing	Terrific	Beneficial	Amazing
21	Consistent	Friendly	Conscientious	Supportive	Professional
22	Happy	Short	Enjoyable		
23	Fun	Hard Work	Dedication	Caring	Optimism
24	Enjoyable				
25	Fun	Exciting	Hard Work	Great	Worthwhile
26	Beneficial	Great	Improvement		
27	Quality	Blessing	Worthwhile	Stressful	Strengthening

APPENDIX F

Institutional Review Board Letter



Institutional Review Board
Office of Research and Sponsored Programs
P.O. Box 425619, Denton, TX 76204-5619
940-898-3378 Fax 940-898-3416
e-mail: IRB@twu.edu

April 12, 2010

Ms. Mary Kathleen Hughes
608 Pecan Creek Dr.
Sunnyvale, TX 75182

Dear Ms. Hughes:

Re: Parental Perceptions of the Effectiveness of Equine Therapy For Children With Special Needs

The above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and appears to meet our requirements for the protection of individuals' rights.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. A copy of the annual/final report is enclosed. A final report must be filed with the Institutional Review Board at the completion of the study. Because you do not utilize a signed consent form for your study, the filing of signatures of subjects with the IRB is not required.

This approval is valid one year from April 12, 2010. According to regulations from the Department of Health and Human Services, another review by the IRB is required if your project changes in any way, and the IRB must be notified immediately regarding any adverse events. If you have any questions, feel free to call the TWU Institutional Review Board.

Sincerely,

Dr. Kathy DeOrnellas, Chair
Institutional Review Board - Denton

enc.

- cc. Dr. Gay James, Department of Health Studies
- Dr. Kristin Wiginton, Department of Health Studies
- Graduate School