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Hippotherapy: An Alternative Treatment from the Perceptions of Practitioners

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Bridgewater State University

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Dr. Lydia Burak, Thesis Director
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Hippotherapy: An Alternative Treatment from the Perceptions of Practitioners

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Abstract

Hippotherapy can be defined as a dynamic service offered by occupational, physical, and speech-language pathologists that utilizes a horse's unique movement to achieve functional outcomes. While there are an abundance of studies demonstrating the effectiveness of hippotherapy, very few have examined the perceptions of the practitioners. The purposes of this thesis are to investigate hippotherapy's effectiveness as well as to examine the beliefs and attitudes towards hippotherapy use among occupational therapists, physical therapists, and speech therapists. A literature review was conducted to examine the effectiveness of hippotherapy.

The study included a total of 15 occupational, physical, and speech-language therapists who currently practice hippotherapy in the state of Massachusetts. These therapists were surveyed regarding their beliefs about the use of hippotherapy. In addition, 10 therapists who do not practice hippotherapy were interviewed regarding their perceptions of the practice. It was concluded that hippotherapy is a wide-reaching modality that serves many different populations. Both therapists that practice hippotherapy and those that do not are aware of the many benefits that hippotherapy offers. While there does seem to be growing awareness based on the data, there is a lack of understanding that hippotherapy is part of a treatment provided by occupational therapists, physical therapists, and speech-language pathologists who use it as a treatment tool to address the goals of their patients. The major issues with its lack of availability to patients is due to insurance, costs, and lack of practicing therapists. In order for this problem to be solved, future evidence-based research with more individuals with the same disability needs to be conducted to alter the perceptions of insurance companies. If hippotherapy were more widely

accepted by insurance companies, perhaps in turn, more therapists would use or prescribe it as a treatment tool.

History

Hippotherapy is a treatment with the help of a horse and is derived from the Greek word *hippos*, meaning horse (Heine & Benjamin, 2000). The American Hippotherapy Association (AHA) defines hippotherapy as a physical, occupational, or speech/language therapy treatment strategy incorporating the movement of the horse (Bender & McKenzie, 2008). The first person to describe the benefits of horses for rehabilitation purposes was Hippocrates, calling horseback riding a universal exercise (History of Hippotherapy, 2010). Later on, medical professionals in Germany, Italy, Austria, and England, as well as eventually in the United States, used horses in the rehabilitation of people with disabilities (History of Hippotherapy, 2010). In the United States, there is a distinction between equine-assisted activities and equine-assisted therapy. Equine-assisted activities (EAA) involve horse related skills (such as riding) and are used to improve quality of life. EAA are a subtype of animal-assisted activities, which can be provided by anyone who receives specialized training and certification (Macauley & Gutierrez, 2004). Equine-assisted therapy (EAT), a subtype of animal-assisted therapy, is the integration of the horse into goal-directed treatment and is provided by licensed therapists (Macauley & Gutierrez, 2004). Hippotherapy is a specialization of EAT.

Today, equine-assisted therapy is incorporated into physical, occupational and speech therapy treatment plans world-wide. The American Hippotherapy Association, Inc. (AHA, Inc.) was formed in 1992 to provide a forum for education, communication, and research among health professionals interested in the use of equine movement in treatment. The AHA, Inc.

membership is comprised primarily of physical therapists, occupational therapists, and speech-language pathologists (Use of Hippotherapy, 2017).

AHA, Inc. created a conceptual framework for incorporating equine movement in therapy practice in 1997. The framework was developed to provide therapists with a theoretical basis for the implementation of equine movement for improved function, promote effective clinical problem-solving, and generate hypotheses for scientific research (Use of Hippotherapy, 2017). The current conceptual framework is based on motor learning principles, dynamic systems theory, and sensory processing strategies.

Certification

According to the AHA, Inc., therapists who incorporate hippotherapy into their practice must pursue specialized training (Use of Hippotherapy, 2017). AHA, Inc. has developed continuing education courses that emphasize safe and effective treatment. A separate entity, the American Hippotherapy Certification Board (AHCBS), has developed two levels of certification for therapists: AHCBS Certified Therapist and Hippotherapy Clinical Specialist®. These are two, four-day courses taught by AHA, Inc. approved faculty (Present Use of Hippotherapy, 2000).

Not any horse can be used for hippotherapy. Therapy horses do not need to be of a certain breed, although some breeds are predisposed to being a good fit (Criteria for Therapeutic Horses, 2008). Quarter horses tend to have a quiet temperament, average size, versatility and availability (Criteria for Therapeutic Horses, 2008). Desired traits for a therapy horse include soundness, three stable gaits at the walk, trot and canter, good temperament, ability to tolerate attention by many people, a low flight response, as well as a height of 14 hands to 16 hands in order to serve children and adult riders (Criteria for Therapeutic Horses, 2008). There is also no particular

training that a horse must go through in order to be used as a therapeutic modality. Well-schooled horses of any discipline are preferred. As long as they are well-mannered and have the qualities listed above, they can be seriously considered. Once a horse is deemed a good candidate to be on trial for a therapy program, the horse is exposed to all aspects of the riding classes. Horses are taught to be led in a manner that encourages the horse to walk beside the leader's shoulder and speed up and slowdown in response to the leader's body language and rhythm (Criteria for Therapeutic Horses, 2008). The potential horse must also be exposed to various loud noises, such as music, as well as assistive teaching devices like toys, batons, rings and flags, in addition to riders with enthusiasm (Criteria for Therapeutic Horses, 2008). Even when an ideal horse is used, the treatment quality and results are based on the specialized training of the therapist, his/her clinical experience and expertise, and how well he/she integrates equine movement into a comprehensive treatment plan (Use of Hippotherapy, 2017).

Targeted Populations

Hippotherapy can be used to benefit many different populations including those with autism, cerebral palsy, other neurological disorders, those who have suffered injuries like a stroke, and those who have chronic pain (Bender & McKenzie, 2008). During a hippotherapy session, the patient on the horse is not learning to ride or control the horse; instead, the three-dimensional movement of the horse manipulates their body. Gait motion generated pulses are transmitted to the patient through contact with the horse's back. These pulses generated by the horse are quite similar to the human motion of bipedal locomotion. The equine movement forces the patient to change their body position in response and therefore train, or retrain neuromuscular responses (Bender & McKenzie, 2008). Most activities from a traditional therapy session can be adapted to the hippotherapy environment (Macauley & Guitierrez, 2004). The purpose of this

kind of therapy is to attain functional living skills and to move the patient closer towards these goals.

Benefits

Ample evidence supports that hippotherapy is successful. The horse's rhythmical movement, resembling the human gait has both physical and psychosocial benefits (Macauley & Gutierrez, 2004). The direct physical benefits include improved muscle symmetry, postural alignment, improved balance and gait, decreased spasticity and improved respiratory and motor control of speech (Macauley & Guterrez, 2004). Psychosocial benefits may include improvement in self-concept, locus of control, affect, and behavior (Macauley & Guterrez, 2004).

Following hippotherapy, significant improvements in physical benefits, such as gross motor function (Herrero, et al. 2012), muscle symmetry (Benda, McGibbon, Grant, & Davis, 2003), decreased spasticity (Lechner, Kakebeeke, Hegemann, & Baumberger, 2007), improved posture (Bertoti, 1988), sensory processing (Ajzenman et al., 2013), balance (Silkwood-Sherer, Killian, & Martin, 2012), and gait (Sung et al., 2013) can occur in adults and children with varying disabilities. The benefits appear to be greatest following multi-week interventions with one or more sessions per week (Shurtleff & Engsberg, 2012). The vast body of literature shows that hippotherapy works well for children; there are comparatively fewer studies on this matter involving adults. The existing body of research provides evidence that equine-assisted activities and therapies are an effective means of improving many measures of physical health and emotional well-being (Holm et al., 2014). However, more controlled trials are needed to strengthen the current knowledge base in addition to more studies involving adult and elderly populations.

Pediatric Population

Children are the primary population that benefits from hippotherapy. Today, there are growing numbers of children with disabilities. In particular, students with learning disabilities comprise 45.2% of the population with disabilities and 5.5% of the total population in prekindergarten through 12th grade. Students with speech or language impairments are the next largest group (U.S. Department of Education, 2002), comprising 17.2% of the population with disabilities and 2.1% of the total population. Macauley and Guterrez (2004) examined the effectiveness of hippotherapy versus traditional classroom-based therapy for children with language-learning disabilities. They claim that children with language-learning disabilities appear to be at a greater risk of negative affect or mood. The increase in their brains' chemicals lead to negative emotions. In turn, this negatively affects their ability to participate and respond to therapy. These children benefit from innovative, creative therapy techniques and environments because if presented with a pleasant task, their brains will secrete hormones such as endorphins, causing them to enjoy and find it easier to complete (Macauley & Guterrez, 2004). The researchers were particularly interested in hippotherapy because of its ability to integrate all body systems. The horse's movement stimulates the sensory-motor system of the client, allowing the nervous system a template from which to build its physical and cognitive responses (Macauley & Guterrez, 2004). They created a survey for three young boys, ages 9, 10, and 12, and their parents, and administered the survey after speech therapy in the classroom and again after a hippotherapy session. When comparing the two questionnaires, the researchers found both the parents and the children reported improvement in speech and language abilities after both therapies. However, overall, responses were noticeably higher following hippotherapy, with

additional benefits of improved motivation and attention also reported (Macauley & Guterrez, 2004).

Intellectual disabilities are another common form of disability in children in the United States. According to the American Association on Intellectual and Developmental Disabilities (2013), an intellectual disability is characterized by significant limitations in both intellectual functioning and in adaptive behavior which are needed for many everyday social and practical skills. This disability originates before the age of eighteen and can impact certain conceptual, social, and practical skills. Giagazoglou and colleagues (2012) examined the effects of a hippotherapy program on static balance and strength in adolescents with intellectual disabilities. According to the researchers, individuals with intellectual disabilities (ID) often suffer from limitations in motor abilities because ID is a condition of deficient brain development. This type of condition affects the cognitive as well as the motor functions. Nineteen adolescents with moderate intellectual disabilities were assigned to either an experimental group (n=10) or a control group (n=9). The experimental group attended a 10-week hippotherapy program (Giagazoglou et al., 2012). Static balance was assessed using three tasks of increasing difficulty: Double-Leg Stance with opened or closed eyes, and One-Leg Stance with opened eyes. These were performed while standing on an EPS pressure platform. “The system uses 2304 force sensing resistors in an active area of 70 cm × 50 cm to record plantar pressure at 25 Hz” (Giagazoglou et al., 2012, p. 2265). The strength measurements consisted of three maximal isometric half-squats from the seated position (knee joint at 90°). The hippotherapy intervention program resulted in significant improvements in strength parameters, and on the more complex balance task (i.e. standing on one leg). This study provides evidence that hippotherapy can be used as an effective intervention for improving balance and strength in individuals with

intellectual disabilities, and could thus influence functional activities and quality of life by increasing meaningful participation in everyday activities.

Hippotherapy also benefits children with cerebral palsy. According to the cerebral palsy Foundation (2017), cerebral palsy is a blanket-term commonly described by a loss of or impairment of motor function. It is considered a neurological disorder caused by a non-progressive brain injury or malformation that occurs while the child's brain is under development. Balance, posture, and coordination can also be affected by cerebral palsy. Tasks such as walking, sitting, or tying shoes may be difficult for some, while others might have difficulty grasping objects. It is a common disorder, affecting about 200,000 individuals per year (Cerebral Palsy Foundation, 2017). Shurtleff and Engsberg (2012) performed a case study with a video motion capture system and found head/trunk control improvements after just 12 weeks of hippotherapy. This case study followed a 6-year-old child with cerebral palsy who underwent 12-week pilot study of hippotherapy. In order to observe the effects hippotherapy had on the child, the researchers placed reflective markers on the participant and used a six-camera motion analysis system to measure dynamic trunk and head stability. "Twenty-one 9mm diameter reflective surface markers were placed on anatomical landmarks of the subject's head and trunk. Three markers defined a barrel frame of reference. The video motion capture (VMC) system recorded the 3D position of each marker to 0.5mm precision at 60 Hz, or 60 measurements per second" (Shurtleff & Engsberg, 2012, p.361). The researchers then followed him for an additional 24 weeks. Measurements after 24 more weekly treatments showed no further improvement on the original variables. Between the pre and post-tests, the subject's amplitude changes in average rhythmic movement decreased noticeably (from 18.8cm to 7.5cm at C7, 19.6cm to 8.2cm). Shurtleff and Engsberg (2012) found it surprising that in the six-month

follow-up test, the subject's rhythmic movement amplitude was almost the same as his twelve-week measure. In addition, an unanticipated improvement in postural sway was found at the end of 9 months. Originally, researchers thought hippotherapy may plateau quickly and no further improvement should be expected; however, to investigate this, "the movement over the time series of the tests was plotted and they found that improvement in sway should thus improve efficiency of functional task performance by stabilizing proximally and enabling improved control of the distal upper extremities. Therefore, the control of sway is as important to improve functional skills as responding to pelvic perturbation" (Shurtleff & Engsberg, 2012, p.364). The researchers from this study suggest that additional investigations are needed with more children with cerebral palsy over longer periods of receiving hippotherapy to identify outcomes from extended interventions beyond the 6-12 weeks of most published hippotherapy studies.

Additionally, Shurtleff and Engsberg (2012) believe that further research could support better treatment planning and inform discharge criteria considering diminishing returns. This study was unique in that it went beyond the length of any other previously published study and identified changes in outcomes that had not been realized in the initial 12-week length of other studies.

Even different gaits used by the horse, such as trotting instead of walking can benefit patients. Antunes et al. (2016) aimed to explore the immediate effects of a hippotherapy protocol using a walk-trot pace on spatio-temporal gait parameters and muscle tone in children with Bilateral Spastic CP. According to Pakula et al. (2009), Spastic Cerebral Palsy is caused by damage to the motor cortex and the pyramidal tracts of the brain, which connect the motor cortex to the spinal cord. Bilateral spastic cerebral palsy is characterized by jerky movements, muscle tightness and joint stiffness. Children with spastic CP could have muscle stiffness in one arm, both legs, or one full side of their body (Bocheck & Kimberlee, 2016). Ten children diagnosed

with BS-CP and 10 healthy aged-matched children took part in this study. The children with BS-CP underwent two sessions of hippotherapy with two different protocols. One was a walk-trot pace and the other was just walking. Children from the reference group were not subjected to treatment. Antunes et al. (2016) concluded that the spasticity of the hip adductors was significantly reduced as an immediate result of both protocols, but this decrease was more evident after the walk-trot. The walk-trot protocol is feasible and is able to induce an immediate effect that improves the gait spatio-temporal parameters and the hip adductors spasticity (Antunes et al., 2016).

Benda, McGibbon, and Grant (2003) also conducted a study with children diagnosed with spastic cerebral Palsy. The objective of this study was to evaluate the effect of hippotherapy on muscle activity in children with spastic cerebral palsy. Benda et al. (2003) used a pre-test/post-test control group. Subjects included fifteen children ranging from four to twelve years of age diagnosed with spastic cerebral palsy. Children meeting inclusion criteria were randomized to either eight minutes of hippotherapy or eight minutes astride a stationary barrel. Benda et al. (2003) used surface electromyography (EMG) to measure muscle activity of the trunk and upper legs during sitting, standing, and walking tasks before and after both interventions. They found that after hippotherapy, there was a significant improvement in symmetry of muscle activity in those muscle groups displaying the highest asymmetry prior to hippotherapy. No significant change was noted in those sitting astride a barrel. The researchers concluded that eight minutes of hippotherapy resulted in improved symmetry in muscle activity in children with spastic cerebral palsy. These results suggest that the movement of the horse rather than passive stretching accounts for measurable improvements (Benda et al., 2003).

In May of 2016, Cabiddu et al. (2016) examined autonomic control in patients with CP. The autonomic nervous system is part of the nervous system that carries out involuntary actions such as heart rate, breathing, and digestion. Cabiddu and fellow researchers investigated children with neurological disorders, such as CP and examined the effects of hippotherapy on autonomic control. Often times, the inability to maintain a stable internal environment is observed in individuals with (CP), most likely due to autonomic dysfunction (Ferreira et al., 2016). The objective of this study was to investigate the effects of a single hippotherapy session on cardiovascular autonomic control by time domain and non-linear analysis of heart rate variability (HRV). The HRV signal was recorded continuously in twelve children affected by neurological disorders during one hippotherapy session. This session consisted of ten minutes sitting, fifteen minutes of sitting on the horse, fifteen minutes of hippotherapy, and a final ten minutes of sitting position recovery. Results indicated that hippotherapy may benefit children with disabilities attributable to neurological disorders by eliciting an acute autonomic response during therapy and during the recovery period (Cabiddu et al., 2016).

Patients with Down syndrome can also improve trunk and postural control through hippotherapy. Down syndrome is defined as a chromosomal condition that is accompanied with intellectual disability, a characteristic facial appearance, and weak muscle tone (hypotonia) in infancy (U.S National Library of Medicine, 2017). All affected individuals experience cognitive delays, but the intellectual disability is usually mild to moderate. Champagne and Dugas (2010) report that the complex sensory motor stimulation offered by the horse's movement is very difficult to reproduce in a traditional therapy setting. In their study, the researchers described the positive impact of an eleven-week hippotherapy program on the gross motor functions of two children (28 and 37 months old) diagnosed with Down syndrome. They report that an adult horse

walking can offer “up to 110 postural perturbations in various directions in 1 minute. Most hippotherapy sessions last 30 minutes; the horse will take 3000 steps during a session, walking at 100 steps/minute, which implies that the child explores a range of motor solutions in terms of muscle synergies involved in trunk and head control” (Champagne & Dugas, 2010, p.564). The children were assessed using the Gross Motor Function Measure (GMFM) and accelerometry. The results of this case report indicated that both children improved in gross motor function, particularly for running, walking, and jumping which require good control of the trunk and head. Analysis of the acceleration signals showed improvement in postural control of either the head or trunk because the children adopted two different adaptive strategies to perturbation induced by moving the horse (Champagne & Dugas, 2010).

Children diagnosed with autism spectrum disorder additionally benefit from hippotherapy. Practitioners use this form of treatment to increase function and participation in daily activities as well as improvements in motor control. Autism is a prevalent developmental disorder that affects numerous aspects of a child's daily functioning, including but not limited to communication, social interaction, cognitive functioning, motor functioning, and sensation (Taylor et al., 2009). “The many impairments that characterize autism also have the potential to affect a child's volition, defined by the Model of Human Occupation as a child's interests, self-efficacy, and motivation to engage in new activities” (Taylor et al., 2009, p.192).

Ajzenman, Standeven, and Shurtleff (2013) studied the effects of hippotherapy on motor control, adaptive behaviors, and participation in children with autism spectrum disorder. Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by impairments in social skills and communication, and repetitive and stereotyped behaviors. Although subtle motor impairments are not considered an identifying factor or a symptom of ASD, between 80%

and 90% of children with ASD display these behaviors (Ajzenman, Standeven, & Shurtleff 2013, p.653). The researchers state that children with neurological disabilities typically have a reduction in postural control during functional tasks. They believe this is due to an improper interaction among the somatosensory, visual, and vestibular systems (Ajzenman et al., 2013). Motor control and sensory processing theories suggest that children with ASD have decreased ability to regulate degree, intensity, and type of responses to sensory information, resulting in limited abilities to habituate and adapt during daily activities (Ajzenman et al., 2013). Because each step of the horse is a challenge to stability, hippotherapy provides a unique opportunity to challenge and improve postural control. As a result, children must repeatedly respond to the variability in the horse's movement to maintain stability (Shurtleff, Standeven, & Engsborg, 2009). It is also possible that with similar improvements in trunk stability, children with ASD could improve distal control after hippotherapy enabling more functional gross upper-extremity movement and fine motor hand use. Ajzenman and his fellow researchers conducted a pilot study comprised of six children, ages 5-12, with ASD who participated in 12 weekly 45 minute hippotherapy sessions. Measures pre- and post-hippotherapy included the Vineland Adaptive Behavior Scales-II and the Child Activity Card Sort. Motor control was measured pre-intervention and post-intervention using a video motion capture system. Results showed that postural sway significantly decreased post-intervention. Significant increases were observed in overall adaptive behaviors (receptive communication and coping) and in participation in self-care, low-demand leisure, and social interactions. The researchers concluded that hippotherapy has a positive influence on children with ASD and can be a useful treatment tool for this population.

Holm et al. (2014) examined whether different doses of hippotherapy influenced parent-nominated target behaviors of children with ASD. In other words, they looked to see if this type of therapy influenced children's behavior during the session, at home, and in the community. The researchers had the participants participate in hippotherapy one, three, and five times per week. Three boys with ASD, 6-8 years of age, participated, and counts of target behaviors were collected in each setting and phase of the study. Compared to baseline, 70% of the target behaviors were better during the intervention and improvement was retained in 63% of the behaviors following the sessions. Increased doses of hippotherapy were significant for magnitude of change, and the effect of the therapeutic riding sessions generalized to home and community. This means that hippotherapy not only helps with physical symptoms of disorders, but also social/emotional aspects (Holm, et al. 2014).

In addition to physical benefits, there are also psychological benefits of hippotherapy, especially for those diagnosed with autism, such as decision making. Taylor et al. (2009) completed a study regarding volitional change in children with autism after receiving hippotherapy. The objective of the study was to determine the effects of a 16-week hippotherapy program on the volition of three children with autism. Two occupational therapists used the Pediatric Volitional Questionnaire and rated the three participants' volition at three different points-before, during, and after the hippotherapy session. Following the questionnaire, the therapists used visual analysis of the data to conclude there was an increase in participants' volition over time and that improved volition may be an important and under-recognized benefit of hippotherapy for children with autism (Taylor et al., 2009).

Elderly Population

Despite limited research, there is some evidence that the elderly population also benefits from hippotherapy. Some of the main outcomes are improved balance and lower limb strength. De Araújo et al., (2013) assessed the chronic effects of hippotherapy on functional mobility, muscle strength and balance in the elderly. Twenty-eight volunteers between the ages of 60 and 84 were randomly recruited and divided into an experimental group, with twelve individuals (eight women and four men), and a control group, with sixteen individuals (fourteen women and two men). The experimental group participated in an eight-week hippotherapy program. Functional mobility was assessed before and after the study period and measured by Time Up and Go Test (TUG). Muscle strength of the lower limbs was measured by 30s Chair Stand Test (30CST) and performance in balance was measured by the Berg Balance Scale (BBS). A mixed ANOVA model was applied to establish the effect of the different groups on the functional variables. Researchers found that the functional capacity of the experimental group was increased when compared to the control group after the intervention of the BBS ($p=0.003$) and 30CST ($p=0.032$), but not of the TUG ($p=0.063$). Results indicated that hippotherapy improves both lower limb strength and balance in the elderly (de Araújo et al., 2013).

Adults

Adults with chronic pain can also benefit from this modality. A 34-year-old veteran with low back and neck pain was studied in a case report in 2016. Researchers compared the benefits of traditional physical therapy to hippotherapy combined with traditional physical therapy on his motor performance. The researchers measured the subject's progress using the Sheehan Disability Scale, Oswestry Low Back Pain Questionnaire, and the Neck Disability Index. The combination of hippotherapy and traditional physical therapy resulted in greater improvements in

disability scores on all three outcome measures compared to traditional physical therapy alone (Aldridge et al., 2016).

Unique Approaches to Hippotherapy

This unique form of therapy has even caught the eye of biomedical engineers. Along with therapists, engineers have created a form of robotic hippotherapy that has gradually gained clinical application for therapeutic intervention on postural and locomotor control in individuals with neurological or musculoskeletal impairments (Park et al., 2014). Validity and reliability for the robotic hippotherapy system has not been well established. A study conducted by researchers, Park et al., 2014 investigated the validity and test-retest reliability of the robotic hippotherapy system by comparing it with real horse movements. Park, et al. (2014) confirmed consistent time control and a certain degree of variability between the robotic and real horse movements. The mean resultant accelerations for a real horse and robotic horse were 3.22 m/s² and 0.67 m/s², respectively, accounting for almost five times greater acceleration in the real horse than the robotic horse. So, findings suggest that the real horse is still the better alternative.

Despite the real horse having better results, the robo-horse can also deliver benefits, especially to those who have suffered a stroke. Sung, Kim, Yu, and Kim (2013) investigated whether a hippotherapy simulator has influence on symmetric body weight during gait in patients with stroke. Stroke patients were divided into a control group (n=10) that received conventional rehabilitation for 60 minutes per day, five times per week, for four weeks. The experimental group (n=10) used a hippotherapy simulator for 15 minutes per day, five times per week, for four weeks after conventional rehabilitation for 45 minutes per day. Temporospacial gait was assessed using OptoGait, a system for optical detection, and trunk muscles (rectus abdominis and erector spinae on affected side) activity was evaluated using surface electromyography during sit-to-

stand and gait. Researchers conducted a pre-test prior to the start of the experiment. At the end of the four-week intervention, the researchers performed post-testing. Results showed that activation of the erector spinae in the experimental group was significantly increased compared to that in the control group ($p < 0.01$), whereas activation of the rectus abdominis decreased during sit-to-stand. Of the gait parameters, load response, single support, total double support, and pre-swing showed significant changes in the experimental group with a hippotherapy simulator compared to control group ($p < 0.05$). Moreover, activation of the erector spinae and rectus abdominis in gait correlate with changes of gait parameters including load response, single support, total double support, and pre-swing in experimental group. These findings suggest that use of a hippotherapy simulator with stroke patients can improve asymmetric weight bearing by influencing trunk muscles (Sung et al., 2013).

Future Research

Evidence has shown hippotherapy to be successful in treating an array of both physical and sensory disorders. Yet, more research must be done to promote the use of hippotherapy on a larger scale. Pham and Bitonte (2016) examined how remuneration issues impair the offering of this therapeutic strategy at Southern California rehabilitation centers. The primary objective of their study was to identify the pervasiveness of hippotherapy in Southern California, and any factors that impair its utilization. Researchers identified one hundred and fifty-two rehabilitation centers in the Southern California counties of Los Angeles, San Diego, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara, Ventura, and Kern County and surveyed the riding facilities in these areas to see if hippotherapy was utilized, and if not, why not. Forty facilities responded and results showed that the majority of rehabilitation centers were familiar with hippotherapy, however, only seven reported that hippotherapy was available as a

therapy option. Pham and Bitonte (2016) concluded that hippotherapy is limited in its ability to be utilized, primarily due to remuneration issues.

However, there is widespread acceptance of occupational, physical and speech therapy incorporating hippotherapy within the medical community (Present Use of Equine Movement, 2013). Referrals for this kind of treatment must come from physicians and other medical professionals. The American Physical Therapy Association (APTA), the American Occupational Therapy Association (AOTA), and the American Speech Language-Hearing Association (ASHA) all recognize the use of hippotherapy in treatment to be within the therapist's scope of practice (Present Use of Equine Movement, 2013). Continuing Education Units (CEU's) are consistently granted for AHA, Inc. approved courses taught by clinicians with recognized expertise in the use of hippotherapy in treatment. Presentations on hippotherapy as a physical, occupational and speech therapy treatment strategy are given at many regional, national, and international professional conferences. Universities also contract for placement of their health professional students in affiliations with a clinician who may include equine movement as part of an integrated plan of care for their patient (Present Use of Equine Movement, 2013).

Overall, there are many significant improvements in physical well-being following hippotherapy. These benefits seem to be greatest following multi-week interventions with one or more sessions per week. Most literature and research focuses on the pediatric population. There is a great need for an expansion of research to further uncover the benefits for other populations such as older adults or veterans. This has even come to the attention of the United States government. House Report 114-002 was written on June 28, 2016. A letter addressed to Chairman of the Committee on Armed Forces, John McCain, responded to a request to report on the use of equine therapy to treat members of the Armed Forces. "The Department of Defense

found an insufficient body of evidence to determine the effectiveness and safety of equine therapy for adults at risk for Post-Traumatic Stress Disorder, suicide, and other psychological or emotional conditions” (Peter Levine, 2016, p.1). The Department of Defense vows to continue to review relevant literature every three years to determine when the research evidence supports the provision of equine therapy under TRICARE, a health care program for uniformed service members and their families. This is one example of how an expansion of research on the effectiveness hippotherapy could benefit a new population. Additionally, more research needs to be completed on the perspectives of practicing therapists regarding the use of hippotherapy. This will strengthen the current knowledge base and allow for a deeper understanding of this modality.

Surveys and Interviews

I found there to be minimal research regarding therapists' perspectives of hippotherapy after exhaustive research. One of the few studies found includes an exploration of German and British physiotherapists' views on the effects of hippotherapy and their measurement (Debusse, Chandler, & Gibb, 2005). These researchers created a questionnaire and distributed it to therapists who practice hippotherapy as well as individuals diagnosed with cerebral palsy who use hippotherapy. This study had three purposes. It aimed to establish the pattern of hippotherapy practice in Germany and the U.K., examine the perceived effects of hippotherapy on people with cerebral palsy in Germany and the U.K., and investigate how these effects are being measured in both countries. The results showcased considerable differences in how hippotherapy is practiced in the U.K. compared with in Germany. In spite of this, the study revealed agreement among respondents on the overall perceived effects of hippotherapy on individuals with cerebral palsy. Reported benefits included the regulation of muscle tone, improvement of postural control and psychological benefits. The results also indicate sparse use of outcome measures to evaluate these effects.

Wilson, et al. 2017 published a study regarding Equine-Assisted Therapy in Australia. The purpose was to examine therapists' perspectives on the biopsychosocial benefits and therapeutic outcomes of EAT for adolescents experiencing depression and/or anxiety. The findings suggested a range of improvements within adolescent clients, including increases in confidence, self-esteem and assertiveness, as well as a decrease in undesirable behaviors. Researchers concluded that the effectiveness of Equine-Assisted Therapy was thought to be due to the experiential nature of involving horses in therapy. The lack of understanding in the wider

community regarding EAT was seen as a barrier to recognition and acceptance of EAT as a valid therapeutic intervention.

Both of these studies were done outside of the United States. One only focused on physical therapists and the other examined Equine-Assisted Therapy, which differs from hippotherapy. Therefore, one purpose of this thesis is to assess the attitudes and beliefs among occupational therapists, physical therapists, and speech-language pathologists regarding the use of hippotherapy as well as to investigate the perceptions of practitioners who do not practice hippotherapy.

While there is no such term as a “hippotherapist”, certain kinds of therapists use hippotherapy as a tool to address their client’s goals. Generally, physical therapists are responsible for adjusting the horses’ movement to address the motor needs of their client and to promote functional outcomes in skill areas related to gross motor ability such as sitting, standing, and walking. Similarly, occupational therapists combine the effects of the equine movement with other standard intervention strategies for working on fine motor control, sensory integration, feeding skills, attentional skills, and functional daily living skills in a progressively challenging manner. Lastly, speech-language pathologists are able to use the horses’ movement to facilitate the physiologic systems that support speech and language. They too, are able to combine hippotherapy with other standard intervention strategies to help those who suffer from communication disorders and promote functional communication outcomes (Hippotherapy as a Treatment Strategy, 2017).

Occupational therapy, physical therapy, and speech-language pathology professionals have incorporated hippotherapy in practice in the United States since the 1970s (Use of Hippotherapy, 2017). These therapists decide if and when hippotherapy should be incorporated

in an individual's treatment plan. Each treatment plan is based on the therapist's evaluation and the patient's functional goals. The therapist selects certain equine movements to match the specific needs of the patient.

Methods

Participants

Participants in this study were practicing and licensed occupational therapists, physical therapists, and speech-language pathologists. All participants in this study were volunteers and received no compensation. A convenience sample of fifteen therapists who currently practice hippotherapy was surveyed. These fifteen therapists included eight physical therapists, five occupational therapists, and two speech-language pathologists. All currently work at therapeutic riding centers in Massachusetts.

Therapists who do not practice hippotherapy also were chosen through a convenience sample of therapists in Massachusetts. These therapists were contacted via telephone and asked to participate. There was a total of ten interviewees. They included four occupational therapists, three physical therapists, and three speech-language pathologists.

Materials

The survey included twelve questions (ten multiple-choice and two open-ended) all regarding the use of hippotherapy. For some of the questions, participants could choose more than one answer. This survey was mailed to seventeen therapists who use hippotherapy in the state of Massachusetts.

Eight in-person interviews as well as two telephone interviews were also conducted. These participants were provided with a form for informed consent, which included information

about the procedures, benefits and risks of participating, and contact information of the researcher. The interviews included roughly six open ended questions (see appendix).

Design and Procedures

The surveys were mailed in two batches the sample of 17 therapists practicing hippotherapy in Massachusetts. Approximately two weeks following the first round of surveys, I mailed reminders to all participants. Another round of surveys were mailed following these reminders. Survey participants were given a business reply envelope to return their surveys so that anonymity would be maintained. Participants were instructed to return the survey in this envelope and to not leave any identifying marks.

I conducted interviews either in person at the therapists' places of employment or via telephone.

Results

Surveys

Of the potential 17 participants, there were 15 therapists who successfully completed and returned the survey, resulting in an 88% response rate. The therapists who responded were primarily physical therapists (n=8). Occupational therapists also responded (n=5), as well as speech-language pathologists (n=2). All of these practitioners are currently practicing hippotherapy at certified riding facilities in the state of Massachusetts.

Therapists were asked 12 questions regarding their beliefs and attitudes pertaining to the use of hippotherapy. All therapists responded that they primarily work with children (100%). These children were reported to mainly have developmental disorders (93%), however, therapists

also reported work with those with other mental/cognitive impairments such as autism and mental health disorders (Table 1).

Many different factors were reported to be taken into consideration when deciding if hippotherapy is an appropriate treatment for an individual. When asked, 14 of 15 therapists cited “Functional abilities” as an important determinant. Other important factors reported include diagnosis (85%), however, not as many therapists reported taking age into consideration. Despite therapists not listing age of patient as a deciding factor in terms of the use of hippotherapy, it is interesting to note that the majority of clients are children. There were additional responses that included physician’s recommendation, weight, medical precautions (2), contraindications (3), patient size, allergies, motivated working with animals, lack of head control, catheters (2), impulse control, behaviors that affect safety, condition that affects proper helmet fit, spinal level injury, and active seizures (Table 2).

When questioned about the main purposes of hippotherapy, approximately 80% of therapists were in agreement that they are to “increase functional outcomes” and to “improve neuromotor function”. Other responses included to improve inferencing skills regarding nonverbal communication and perspective taking, sensory integration, self-regulation (3), impulse control, increase fine motor skills, bilateral coordination, improve circulation, improve sensory motor processing, improve socio-emotional confidence, and to improve cognitive development.

While there are many reported benefits to hippotherapy, there is a lack of hippotherapy being practiced, especially in this region of the country. When asked how hippotherapy could be made more accessible and mainstream, most therapists reported that there needs to be more insurance acceptance and coverage. Other issues that could be improved upon indicated by

therapists include more awareness, more facilities, better affordability, and more therapists (Table 3).

Finally, open-ended responses revealed that most therapists believe evidence-based research to be valuable and necessary for the growth of this treatment style. Therapists reported that what is lacking is the number of patients with the same disability and challenge areas to be tested. According to therapists, insurance companies claim there is a lack of evidence-based research solely on the number, but there are many pilot studies done on a small number of individuals which show great effectiveness. Additionally, some patients have multiple diagnoses which further complicates evaluation. Therapists also mentioned that hippotherapy is becoming increasingly accepted and recommended by physicians. Lastly, language was reported as an inhibiting factor. Language consistency must be present. Therapists suggest using the same definition of hippotherapy universally.

Interviews

The purpose of the interviews with therapists who do not practice hippotherapy was to inspect their perceptions of the practice. The first question I asked participants was regarding what they know about hippotherapy. Out of ten participants, one therapist was confident she knew about hippotherapy. The majority responded that they had heard about it and knew it incorporated equine movement. Two of the therapists claimed they have patients that use hippotherapy. Others replied that while they had encountered it while in school or knew of facilities within Massachusetts.

Seven out of ten interviewees reported that they do not work with any other therapists who use hippotherapy. One therapist claimed she had a fieldwork supervisor while in school who had experience with this type of modality, but had none herself. Another therapist reported he had worked at a facility that offered hippotherapy, but that he only conducted consultations and evaluations at this location.

While therapists reported they have heard some mixed pros and cons, all of the therapists that were interviewed believed hippotherapy offers great benefits and demonstrated that they perceive it to be very effective for certain disabilities. One therapist who was knowledgeable regarding hippotherapy was able to offer insight on its effectiveness through first-hand experience. She informed me of a patient she has diagnosed with spina bifida who attends hippotherapy sessions every week. She reported that he cannot feel from the knee down, but with hippotherapy, he is learning to hold the horse with his legs and actually kick. Referring to its success, the therapist claims, “There’s things from the horse than you just can’t get from traditional therapy. Because you’re touching on so many points of the brain, you’re really working with the neuroplasticity that a child has and essentially, rewiring the brain. The different environment is a total game changer.” This particular therapist also adds that she remembers hearing about one boy who was completely nonverbal and who had never spoken before, say the word “go” during a hippotherapy session.

When asking what opinions they have heard from other therapists in their field, I received responses such as that it “improves overall function, well-being, patient happiness, strength, and core stability” which are all congruent with prior studies. One therapist that was interviewed knows of two girls that were in her graduating class that have their own horses and practice hippotherapy. She claimed that the girls in her program loved it and emphasized the trunk and

motor control benefits. A quote from one therapist, “Everybody wants to do it. There are so many benefits and it’s fun. Studies show it forces great interactions with other disciplines, making it a total team approach”. Overall, more than half of the therapists reported that they would consider getting certified to instruct hippotherapy sessions if given the opportunity.

Despite these positive reactions to hippotherapy, there is a lack of practice/use. These therapists that were interviewed agreed with those who were surveyed that cost is a major hindrance. One therapist mentioned that she works at a sensory and motor clinic that has the same need for expansion. She claims that more research is definitely needed to add value and respect and that coverage in payment is also needed in order for anything to become more widespread. “Little niche things often get put by the wayside. Congress needs to back this in addition to organizations”. A lack of facilities is also a present issue in addition to the lack of transportability of horses.

Discussion

The primary purpose of the surveys was to examine beliefs and attitudes regarding the use of hippotherapy among occupational therapists, physical therapists, and speech pathologists. The survey allowed comparison of the therapists’ objectives regarding the use of hippotherapy as well as to see if they have suggestions on how hippotherapy can be improved as an alternative treatment. Hippotherapy appears to be a flexible and wide-reaching modality. Analysis of the surveys indicated that hippotherapy provides benefits to many individuals, mostly children, with varying disabilities. This conclusion is consistent with prior research . One may infer that different kinds of therapists have different purposes in mind of how hippotherapy aids their patients and use different ways of measuring success of hippotherapy. Further study should examine a larger sample of therapists, including therapists outside of Massachusetts.

In sum, both therapists that practice hippotherapy and those that do not are aware of the many benefits that hippotherapy brings to a vast range of patients with varying disabilities. While there does seem to be growing awareness based on these data, there is a lack of understanding that hippotherapy is part of a treatment provided by occupational therapists, physical therapists, and speech-language pathologists who use it as a treatment tool to address the goals of their patients. The major issues with its lack of availability to patients are due to insurance, costs, and lack of therapists. In order for this problem to be solved, future evidence-based research with more individuals with the same disability needs to be conducted to alter the perceptions of insurance companies as well as an increase in awareness and acceptance regarding hippotherapy.

Conclusion

Hippotherapy is a wide-reaching modality that offers numerous benefits to many different populations with varying disabilities. Rehabilitation professionals seem to be aware of the advantages hippotherapy brings, however there is a lack of knowledge regarding exactly how hippotherapy is used as a treatment tool. The major issues with its lack of pervasiveness as a treatment modality is due to insurance, costs, and lack of practicing therapists. In order for these issues to be mitigated, future evidence-based research with more individuals with the same disability needs to be conducted to alter the perceptions of insurance companies. If hippotherapy were more widely accepted by insurance companies, perhaps in turn, more therapists would use it or prescribe it as a treatment tool. Further study should be done to examine a larger sample of therapists, including therapists outside of Massachusetts.

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Appendix

Table 1
Principal Diagnoses of Hippotherapy Patients

	Physical Therapist		Occupational Therapist		Speech Therapist	
	n	%	n	%	n	%
Developmental Disorders	8	100	4	80	2	100
Neuromuscular Disabilities	8	100	3	60	0	0
Skeletal Impairments	1	12	1	20	0	0

Table 2
Factors Taken into Consideration when deciding if Hippotherapy is an Appropriate Treatment

	Physical Therapist		Occupational Therapist		Speech Therapist	
	n	%	n	%	n	%
Age	6	75	2	40	2	100
Diagnosis	8	100	3	60	2	100
Functional Abilities	7	88	5	100	2	100

Table 3
How Hippotherapy Could be Made More Accessible

	Physical Therapist		Occupational Therapist		Speech Therapist	
	n	%	n	%	n	%
More Awareness	6	75	3	40	1	50
Better Affordability	5	63	3	60	1	50
More Therapists	4	50	3	40	2	100

Dear Participant,

I would appreciate your assistance with this study looking at some of your knowledge and opinions regarding hippotherapy. I am a student completing my honors thesis on this topic. The results of this research may provide more awareness about this form of treatment. Therefore, I implore you to participate. As a practitioner currently using hippotherapy, your insight is crucial.

All you need to do is complete this survey. If you do not wish to participate, simply return the questionnaire. Responses will be completely anonymous; your name will not appear anywhere on the survey. After completing the survey, please place it in the return envelope provided. **Please do not include your name or any indicating marks on the survey. Also please do not include your return address on the envelope.** Completing and returning the survey constitutes your consent to participate.

If you have any questions regarding this research, please feel free to contact me at (774) 955-6159 or at LTinkham@student.bridgew.edu.

Sincerely,

Leah Tinkham

Dear Participant:

You are invited to participate in a research study designed to examine hippotherapy use among occupational therapists, physical therapists, and speech pathologists. You will be asked to answer five short questions regarding hippotherapy. There are no foreseeable risks. This study is important to society as it may bring more awareness of hippotherapy as a valid form of treatment.

Your participation in this study is voluntary and you may refuse to participate or discontinue your participation at any time. You are also free to decline to answer any questions that make you uncomfortable. If you have any questions about this study, please feel free to contact me, Leah Tinkham, at (774- 955- 6159) or at LTinkham@student.bridgew.edu.edu.

Thank you for your help.

Sincerely,
Leah Tinkham

Consent

I understand that my participation is completely voluntary. I understand that this interview will last approximately thirty minutes. I understand that with my permission, this interview will be transcribed by the researcher. I do not have to answer any questions that I do not feel comfortable with and may stop the interview at any time. I am aware that only the researcher will have access to my interview and that my interview will not have any identifying information on it. The completed transcription and all notes will be stored in a secure, locked cabinet. No information will be released or printed that would disclose any personal identity.

I hereby consent to participate in this study.

Signature of Participant

Date

Signature of Researcher

Date

Interview Questions

1. What do you know about hippotherapy?
2. Tell me about other therapists that you have worked with who have used hippotherapy.
3. What is your opinion on the effectiveness of hippotherapy?
4. What opinions have you heard from other therapists in your field regarding hippotherapy?
5. Tell me about any opportunities you have had to practice hippotherapy. Given these opportunities, please explain why you have or have not used it.

HIPPO THERAPY SURVEY

1. Are you a...

- PHYSICAL THERAPIST
- OCCUPATIONAL THERAPIST
- SPEECH PATHOLOGIST

2. What factors should be taken into consideration when deciding if hippotherapy is an appropriate treatment?

- AGE OF PATIENT
- DIAGNOSIS OF PATIENT
- PATIENT'S FUNCTIONAL ABILITIES
- OTHER _____

3. What are the principal diagnoses of your hippotherapy patients? (Choose all that apply)

- DEVELOPMENTAL DISORDERS
- NEUROMUSCULAR DISABILITIES
- SKELETAL IMPAIRMENTS
- OTHER _____

4. What population do you work with the most?

- CHILDREN
- ELDERLY
- OTHER _____

5. What is the average length of time your patients spend using hippotherapy?

6. Is hippotherapy used with the majority of your patients?

- YES
- NO

7. What is the purpose of hippotherapy?

- TO IMPROVE RESPIRATION AND SPEECH
- TO INCREASE FUNCTIONAL OUTCOMES
- TO IMPROVE NEUROMOTOR FUNCTION
- OTHER _____

8. How do you measure success of hippotherapy?

- STANDARDIZED ASSESSMENTS
- GAIT ANALYSIS
- PATIENT SATISFACTION
- OTHER _____

9. Do you coordinate services with other providers? If so, who?

- YES, _____
- NO

10. What are the most noticeable outcomes among your hippotherapy patients?

- INCREASED BALANCE
- INCREASE POSTURAL CONTROL
- INCREASED MOBILITY
- OTHER _____

11. How could hippotherapy be made more accessible and mainstream?

- IF MORE PEOPLE WERE AWARE OF IT
- IF IT WERE MORE AFFORDABLE
- IF THERE WERE MORE PRACTICING THERAPISTS
- OTHER _____

12. According to Norman White, MD, medical director at Presbyterian Health Plan in Albuquerque, "The lack of evidence-based research is hindering further acceptance [of hippotherapy]". How would you respond to this statement?

