



Results of a Large-Scale, Randomized Study

AUTISM SPECTRUM DISORDER AND THERAPEUTIC RIDING

There is a plethora of anecdotal evidence that therapeutic riding is helpful to children and adolescents who have autism spectrum disorder (ASD). For example, reports from families of children with ASD indicate that equine-assisted activities and therapies (EAAT), including therapeutic riding, increases social-communication and self-regulation in this population.

By Briar Dechant and Robin L. Gabriels, PsyD

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AND SHUTTERSTOCK

In 2010, encouraged by the results of our research team's pilot study (Gabriels et al., 2011), we began a four-year randomized trial of therapeutic riding and children with ASD using a standard manual approach; that manual is now available for dissemination (Shoffner & Gabriels, 2016). This trial was made possible by a grant awarded in 2010 to Dr. Robin Gabriels, principal investigator, by the National Institutes of Nursing Research and NIH/Mars-WALTHAM partnership. For the first time, a large-scale randomized study of therapeutic riding with a comparable control condition was initiated. Generating scientifically

sound evidence-based data to validate EAAT was an important milestone in determining the efficacy of therapeutic riding in the field of complementary and alternative treatments. Specifically, key elements of this type of validation process are to conduct large-scale randomized controlled trials that incorporate blinded evaluators and objective measures (Arnold, 2015).

The diagnosis of ASD is classified by impairments in three main categories: social skills, communication skills, and the presence of repetitive behaviors and/or restricted interests (American Psychiatric Association, 2013). As the

name implies, the severity of ASD symptoms can vary greatly between individuals but, invariably, these deficiencies hinder the development of practical daily living skills that require self-direction and social judgment. The latest ASD prevalence numbers from the Centers for Disease Control and Prevention (CDC) indicate that as many as one in 68 children are affected by ASD (Christensen, Baio, Braun, et al., 2016). Although the efficacy of behavioral teaching methods has been well documented, as of yet there is no universally effective treatment package for all individuals with ASD. Rather, the spectrum of ASD impairments calls for individually tailored intervention approaches.

STUDY METHODS

Encouraging results from the pilot study to investigate the effects of therapeutic riding on children and adolescents with ASD (Gabriels et al., 2011; Shoffner & Gabriels, 2011) led to this four-year follow-up study (Gabriels et al., 2015) conducted at the Colorado Therapeutic Riding Center (CTRC), a PATH Intl. Premier Accredited Center in Longmont, CO.

A total of 127 participants with ASD, ages 6-16 years, were randomized to one of two 10-week intervention groups: therapeutic riding intervention or barn activity control group. The structure of the two groups was similar, and the curriculum of the barn activity control group followed that of the therapeutic riding group, except that participants in the control group did not interact with horses during the 10-week session. Both the therapeutic riding group and barn activity control group were equivalent on the following factors: one hour weekly small group format (two to four participants), at least one volunteer assigned to each participant, implementation of ASD-specific learning style teaching method and



► The outcomes of a four-year randomized trial conducted by Dr. Robin Gabriels, a professor and clinical program director, give credence to the notion that therapeutic riding may be a viable treatment option for children and adolescents who have autism spectrum disorder (ASD).

similar equine education content. The therapeutic riding group involved 45 minutes of mounted horsemanship activities followed by 15 minutes of grooming and tacking activities; mastery of horsemanship skills was emphasized. Participants progressed at their own pace; for instance, some developed the skills of posting trot and riding off-lead at the walk while others continued to work on “whoa” and steering their horse. Pairing of horse with rider was based on the needs of the participant and the health and welfare of the horses. Each participant was accompanied by a volunteer horse-leader and one or two sidewalkers, depending on participants’ needs.

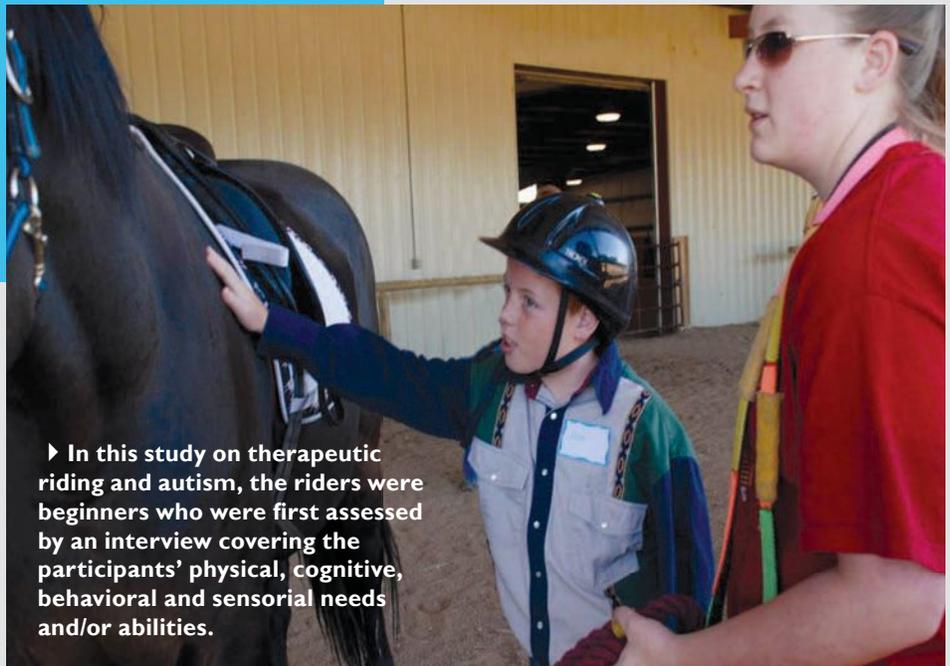
Before the 10-week intervention phase, therapeutic riding group

participants, along with their caregivers, were required to visit CTRC to complete an evaluation that consisted of an interview followed by mounting a horse. The interview covered participants’ physical, cognitive, behavioral and sensorial needs and/or abilities. During the mounted portion of the evaluation, the participant put on a helmet, went through the basic steps of mounting, rode the horse for a short period and dismounted. As the standard curriculum was tailored to novice riders, instructors conducting the initial evaluations judged potential participants’ skills, and only beginning riders were enrolled in this study. Age, cognitive functioning and riding ability were used to determine participants’

group assignments. Participants assigned to the barn activity control group completed a similar evaluation minus being exposed to a horse.

The 10-week therapeutic riding intervention lesson format was similar to CTRC's typical therapeutic riding classes, following best practices established by industry standards. However, it was important to consider how individuals with ASD learn and interface with the world: they tend to be visual learners and think in a concrete fashion, struggle to generalize information learned in one setting to novel settings and are apt to be distracted by sensory stimuli. The consistent structure of the weekly therapeutic riding and barn activity control group sessions across the 10-weeks of intervention phase (Shoffner & Gabriels, 2016) was fundamental in working effectively with this population as was trying to avoid behavioral issues during the groups. The essential components of the therapeutic riding intervention groups were monitored by Dr. Gabriels and co-investigator Dr. John Agnew after they achieved at least 80% inter-reliability on an intervention fidelity measure developed for the study. Twenty percent of the therapeutic riding 10-week sessions were rated on a four-point Likert scale. This fidelity instrument targeted eight core intervention component areas covering environmental, volunteer and instructor factors as they related to creating a structured environment that was consistent with ASD learning needs.

A series of assessment measures were completed within one month before initiating and after the conclusion of the therapeutic riding and barn activity control groups to assess participants' baseline and outcome functioning. A consistent caregiver for each participant also completed a behavior rating form each week of the 10-week session. A speech therapist blind to participants'



► In this study on therapeutic riding and autism, the riders were beginners who were first assessed by an interview covering the participants' physical, cognitive, behavioral and sensorial needs and/or abilities.

intervention condition completed pre- and post-intervention language evaluations with participants.

RESULTS

From baseline to post-intervention, participants in the therapeutic riding group showed significant decreases compared to the barn activity group in irritability and hyperactivity behaviors as measured by the caregiver report on the Aberrant Behavior Checklist-Community (ABC-C) (Aman, Burrow, & Wolford, 1995). Analysis of these weekly reports revealed that significant improvements in these two areas began at the fifth week of the therapeutic riding group intervention. These findings replicated those observed in the pilot study (Gabriels et al., 2011). The therapeutic riding group also showed significantly greater improvement in social cognition and social communication skills compared to the barn activity group participants, as measured by the Social Responsiveness Scale (SRS) (Constantino, 2002). Analysis of the standard language samples collected by the speech therapist using the Systematic Analysis of

Language Transcripts (SALT) software (Miller & Chapman, 2000) showed a significant increase in the therapeutic riding group in both the amount they spoke and in the number of different words they used during a five-minute language sample compared to the barn activity group. For a more detailed account of these results, please see the article published in the *Journal of the American Academy of Child and Adolescent Psychiatry* in July 2015 (Gabriels et al., 2015).

Six-month follow-up data was collected from 64 of the 127 families that completed the study. Six months after completing the intervention phase, caregivers of participants in both the therapeutic riding (n = 36) and barn activity control (n = 28) groups completed a measure of irritability and hyperactivity behaviors (ABC-C). Comparison of change between the two groups from baseline to six months after completing interventions revealed marginally significant improved irritability behaviors in the therapeutic riding group; however, improvements were no longer significantly different between groups in regard to hyperactivity behaviors by six-month post-

intervention phase. Only those who participated in the therapeutic riding group completed the full set of study assessments at the six-month follow-up. The significant improvements in social communication behaviors (SRS) and expressive vocabulary (SALT) observed in the therapeutic riding group immediately after the 10-week therapeutic riding sessions were found to persist at the six-month follow-up.

FUTURE DIRECTIONS

The outcomes of this study give credence to the notion that therapeutic riding may be a viable treatment option for children and adolescents who have ASD. However, there is much more we need to learn. For example, for what types of children and adolescents with ASD does therapeutic riding work best (e.g., IQs greater than 40 and/or those with high levels of irritability)? What is it about riding the horse that improves irritability and hyperactivity, or social cognition and communication skills, including word usage? Is it the movement experienced by the rider when on the horse or is it communicating and working as a partner with the horse? Do the acquired gains persist beyond six months if a therapeutic riding intervention booster is given and, if so, for how long?

Ascertaining the mechanisms involved is important, but attention should be paid to the more practical aspects as well. Therapeutic riding is helping individuals who have ASD to manage symptoms typically addressed through ongoing therapies and medication, so the logical next step might be to compare its efficacy to more traditional treatments. Or, perhaps, it might be to explore the use of therapeutic riding in conjunction with the more traditional treatments to see whether it might provide additional improvements (Arnold, 2015).

Equine-Human Interaction and Future Studies

“The outcomes of this study lend support to findings from previous EAAT studies with the ASD population, suggesting that there is an important active ingredient in the human-equine interaction that can effect positive changes in irritability, hyperactivity, social and communication behaviors in this population.

“Results generate hypotheses regarding the role of the human-equine interaction requiring further investigation. One hypothesis is that riding and working together with the horse to engage in therapeutic riding activities involves a nonverbal joint attention or shared attention experience that may serve as a platform for improving behaviors and social-communication skills in children with ASD. This nonverbal communication between the horse and the rider may include the fact that horses constantly mirror and respond to the rider’s body language. Also, this shared attention experience may be enhanced by the enormity of the horse combined with the task demand for the rider of maintaining bilateral control and balance.

“Outcome measures of joint attention skills, including semi-structured play assessments and behavioral observation coding, may be useful considerations for future studies. A second hypothesis is that the human-equine experience (e.g., warmth of the horse’s body and rhythmic movement of riding the horse) promotes a relaxing context, which may have a calming effect on children with ASD. The impact of therapeutic riding on reducing stress levels can be explored using objective behavioral observation measures combined with biological measures such as galvanic skin response or salivary cortisol. Physiological measures may provide more accurate assessments of the stress levels in the ASD population, as gathering self-report accounts are challenging in this population.”

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