Examining a horse therapy in 8. 12 year-old boy children with autism spectrum disorders

Abbas Minoei¹, Mahmood Sheikh², Rasoul Hemayattalab³

¹ MSc, Motor Development, University of Tehran, Tehran, Iran

^{2,3} PhD, Motor Behavior, University of Tehran, Tehran, Iran

Abstract

The purpose of this study is to examine a horse therapy in $\$_12$ year-old boy children with autism spectrum disorders. it is a quasi-experimental study so 18 children with autism spectrum disorders and with an average age of 9.44 ± 1.26 years from Tehran Autism charity were studied using purposive sampling. All children were participated in pretest by questionnaire Gars 2. The samples were divided into two equal groups (homogeneous) of experimental and control groups Experimental group consisted of 8 subjects and the control group consisted of 10 participants. Subjects in the Experimental group undertook a 12-session interventional procedures. At this time the control group continued their daily activities. After 12 sessions, both groups assessed in a posttest. Covariance analysis of multivariate Hotelling effect was used to test our hypothesis.

The results showed a significant difference between the post-test scores of experimental and control groups in stereotyped behaviors (P<0.01, $F_{18-3}=4.63$), such that subjects in Experimental group showed less stereotyped behaviors than the control group. No significant differences were found between both group in communication and social interactions. horse therapy training interventions improved stereotypes behavior of children with autism spectrum disorder.

Key word: Autism spectrum disorders, Boy, Horse riding selected program, questionnaire Gars, Stereotyped behaviors

[·] Correspond author Abbas minoei, Department of Control and Motor Learning, University of Tehran, North Kargar St, P.O.B: 1439813117, Tehran, Iran. Tel: +989374860046 Email: <u>Abbas.minoi@ut.ac.ir</u>

Introduction

Autism is a pervasive developmental disorder characterized by severe impairment in social interaction and communication skills and stereotypical behavior, interests and activities (APA, 2000). These children have sensory processing disorder so they show abnormal responses to sensory stimuli (e.g., avoidance responses and overreactions to them) (Kintez et al., 1997; Jasim et al., 2009) Disorder and difficulties in emotions (Rapin, 1991), motor skills, fine motor, especially the hands, daily life activities and games (Watling et al., 2001) Natural language learning (Corbette et al., 2006) and difficulties in imitation of others can be seen in these children. (Sevlever et al., 2010). It can be said these children have a wide range of medical and psychological disorders (Klein, 2006). With current estimates the prevalence of ASD-autism spectrum disorder has increased. Nearly 600% during the past two decades. Current research shows that one out of every 88 children is diagnosed with autism spectrum disorders (Center for Disease Control and Prevention, 2011). In the experimental study, the cost of treatment for children with autism spectrum disorder has been reported very high and staggering (National Standards Project, 2009). Meanwhile each household spend averagely ½ million dollars for treatment of their child (Jenkins et al., 2013). However, there are countless treatment options, which should be chosen by experience and research.

For example Romanczyk et al (2008), introduced about 414 different interventions for children with autism spectrum.

Despite of receiving many medical interventions the main symptoms of ASD in children remains (Accordino et al., 2007). Fortunately standards for assessing the effectiveness of developed interventions can help children and families. However, differente criteria used to assess the validity of the research makes it difficult to achieve important consensus to choose the appropriate treatment method. Also, this diversity confuse families and visitors (Reed et al., 2008). Moreover there is no empirical evidence for treatments (e.g. used supplementary and alternative CAM- complementry and Alternative medicines). Available methods are used as a supplement or alternative to current treatments (Jenkins et al., 2013).

Types of CAM include: targeting the body, mind, and biological techniques, body manipulating and a general physical system approach that integrates all the cases described (Atkins et al., 2010). AAT-animal-assisted treatment is types of CAM involve the use of animals. THR- therapeutic horseback riding is a type of AAT including horseback riding skills in good form, controling horse with voice commands and other generic skills needed in riding horses (Barcher et al., 2000).

The goals of treatment include improved balance, posture, gross and fine motor skills and communication skills (Bertoti et al., 1988; Sinder et al., 2007) and in previous research has pointed to the advantages of this method (Bass et al., 2009;

Gabriel et al., 2012; Kern et al., 2011; Nelson et al., 2011) For example, Bass et al (2009) suggest improved autistic children social functioning that the results obtained by standardized questionnaire. The program includes 12 weeks of THR with one experimental group of 19 children with autism spectrum disorders and one control group consisted of 15 patients.

In recent years, Iran has taken steps to diagnose and treat children with autism. Yet the medical centers have not achieved valid and complementary therapy. In this study, we tried to measure and assess THR in Iranian society.

Methology

Is a quasi-experimental study. The statistical population consists of all children and adolescents with an average age of 9.44 ± 1.26 years who visited the Tehran Autism charity. The sample size for this study consisted of 18 participants who visited Tehran autism charity. They were randomly selected among more than 150 visitors to the center.

Gars 2 questionnaire was used in the study, which consists of three subscales that include stereotyped behavior, communication and social interaction. Reliability and validity of this test is assessed in Iran and is obtained 0.80 and 0.89, respectively (Ahmadi et al., 2011). Collected Data were analyzed by SPSS16 software.

Children referred to this center had the diagnosis of the autism spectrum disorders. Researcher conducted Gars 2 questionnaires before and after the intervention. Administrator ask their parents questions to complete the questionnaire.

In this study, children were transferred to the horse riding field of Ariasb located in Cheetgar Forest Park. All children in this training intervention group used pony horses. The program lasted 12 sessions (6 weeks) and included not only horse riding but also children playing with horse. Catching harness of horses, running with horses and saddling horses were also part of the program. Children could ride the horseback with the help of the coach and caregivers and training was given to them.

Finding and Result

The present study was designed to "examine the effect of horse training therapy on children with autism spectrum disorders and an average age of 9.44 ± 1.26 years". After data collected, the finding were analyzed with descriptive characteristics (mean and standard deviation) and inferential statistics (analysis of covariance) in the form of tables and written reports for the main variables.

Table 1- The mean and standard deviation of the experimental and control groups in the pre-test and post-test

		Experimental			Control			
	Pre-test		Post-test		Pre-test		Post-test	
	M	<u>SD</u>	<u>M</u>	<u>SD</u>	M	<u>SD</u>	M	<u>SD</u>
Stereotyped behaviors	15.90	3.92	12.60	3.80	16.11	4.60	16.22	4.46
communication	19	4.13	18	5.02	21.55	6.45	20.44	5.34
social interaction	29.70	6.27	29.10	5.61	28.62	4.07	27.77	3.90

As Table 1 shows the differences between the pre-test and post-test, but it is not clear whether these differences are much higher than chance or the difference. To test this difference, due to an alien diffraction source with minimum distance scale that there is no direct experimental control (pre-test), the analysis of covariance (ANCOVA) was used. S-k test and Levin test were used to respectively assess normal distribution of data and homogeneity of experimental and control groups. The results are shown in the table 2.

	Nor	mality	Н	Homogeneity of variance			
	<u>Curvature</u>	<u>Z k-s</u>	Sig	F	Sig		
Stereotyped behaviors	0.52	0.89	0.40	1.52	0.23		
social interaction	0.30	0.58	0.88	1.63	0.21		
	0.25	0.46	0.93	0.46	0.53		

Table 2- S-K Test for normal distribution of data and homogeneity of variance

As Table 2 shows the deformation of the sample is not much higher than chance and is not statistically significant .This means that variables in the population has a normal distribution. On the other hand, the same variance for two groups of variables is established. Following the results of a multivariate analysis of covariance effect Hotelling (P<0.01, $F_{18-3}=4.63$) it indicates that there is significant difference between the experimental and control groups at least in one variable. The results are reported below.

Diffraction source	SS	df	MS	F	Sig	Rate effect	
Stereotyped behaviors	97.84	1	97.84	13.68	0.002	0.93	
communication	0.30	0.58	0.88	1.63	0.21	0.36	
social interaction	0.25	0.46	0.93	0.46	0.53	0.49	

Table 3- Univariate analysis of covariance for variables

As can be seen in Table 3 and Graph 1, there is significant differences between control and experimental groups in each variable of stereotyped behavior (P<0.01, F_{18-3} =4.63). The results showed that among three variables, our intervention program was effective in reduction of stereotyped behavior variable.

Graph 1. Pretest and posttest's mean scores of control and experimental group in stereotyped behavior variable



Graph 2. Pretest and posttest's mean scores of control and experimental group in communication variable





Graph 3. Pretest and posttest's mean scores of control and experimental group in social skills variable

Discussion

The overall purpose of the study is to investigate the effects of 12 sessions of horse therapy on 8_12 year-old children with autism. 18 person participated in this study, including 8 participants in experimental group and 10 in control.

The results of horse therapy study show the effect of (THR) on stereotyped behavior in children and helps decrease in scores of Gars 2. One may debate whether specific developmental disorders are mental impairment or not, but there is no doubt about pervasive developmental disorders. Because these disorders are completely pervasive and include large and multifaceted problems so that the psychological devastation they cause cannot be doubted. Autism is the most important pervasive developmental disorder. Autism is a developmental disorder (of the type of social relations) and highlighted with the abnormal communication and verbal behavior. The symptoms of this disorder occurs before the age of three and the main cause is unknown. The disorder is more common in boys than girls.

Psycho-analytic theory prevailed during the 1950s and 1960s. Bettelheim said, when a child is facing with unresponsive world that is destructive, he/she withdrew from the people. So far in this theory, hierarchical specific measures (the mother) is considered the destination in the development of autism. In other words, cold and unkind parent will cause autism. But this theory seems no longer acceptable and has lost its dominance. The growing interest in the biological and behavioral theories and the lack of scientific evidence to confirm this theory has contributed greatly to its obsolescence. A small number of autistic cases result from various diseases such as congenital rubella, Tvbrasklrvzys, and Nvrvfybrmatvzys. Children with congenital rubella are affected with rubella before birth resulting in infection with these types of malformation, deafness, blindness and central nervous system anomalies and attacks and retardation.

Horse therapy strategy originated in Denmark in 1952 as Madame Liz was dependent on a wheelchair because of polio. But she improves her condition by the help horse and won Olympic medals by the help of the horse (King, 2007). Since then, the use of THR method increased and improved to enhance physical, emotional, psychological and cognitive performance. Horses can transfer feel of comfort to his rider. One reason for the effectiveness of horse therapeutic, said Linda Kohonav, pioneer of this treatment, is that the horses reflect emotions that people want to hide.

The results obtained in this study is consistent with the results of Bass et al (2009) noted the improvement in social functioning of autistic children. The results of the procedure in the study was obtained by standardized questionnaire. THR program includes 12 weeks and the experimental group were 19 children with autism spectrum disorders. The results of this study is consistent with Gabriels et al (2012). Gabriel and colleagues found interesting results using standardized physical and behavioral assessments. Reports indicate improved self-regulation behavior, expressive language and motor skills of a group of 26 children with ASD who had participated in a 10-week THR. The study result is also consistent with Nelson et al (2011).

But the results are inconsistent with studies of Jenkins et al (2013) analyzed the effects of horse therapy in behavior of children with autism. Perhaps one of the factors that make a difference in the results between the two studies is the measurement and data collect method. Because direct observation and repeated measures was used in the study.

The different session numbers of THR can be another reason for the difference in the results. Participants in the mentioned study each worked 9-week session THR, each session 1 hour (2.5 hours at 6 months). While this research they performed training intervention 12 sessions (6 weeks, 12 hours).

Due to the above cases and the results of research it seems that the horse therapy (THR) is complementary or alternative therapies for children with ASD. Considering the results of this research and similar studies, researchers suggest family with ASD children the use of THR. However, gender of the study and use of a single measurement test limit the present study results. Therefore researchers suggest future studies on female samples and the use of other test that discuss different aspects of treatment.

Acknowledgments

Here is my duty to thank all dear friends who helped me in the study. (Tehran Autism Charity, track riding Ariasb, Mr. Hadi Saee)

References

American psychology association (APA). 2000. Diagnostic and statistical manual text revision: Chicago IL association. p:68.

Kientz MA, Dunn W. 1997. A comparison of the performance of children with and without autism on the Sensory Profile. Occupational Therapy J. 51: 530-7.

Jasmin E, et al. 2009. Sensori-motor and daily living skills of preschool children with autism spectrum disorders. autism and developmental disorders J. 39: 231-41.

Rapin I. 1991. Autistic children Diagnosis and clinical features. Pediatrics J. 87: 751-60.

Watling RL, et al. 2001. Comparison of sensory profile scores of young children with and without autism spectrum disorders. Occupational Therapy J. 55: 416-23.

Tharpe AM, et al. 2006. Auditory characteristics of children with autism. Ear and hearing J. 27: 430-41.

Corbett EL, Prelock PA. 2006. Language play in children with autism specturm disorder: implication for practice. Rev Neural J. 27: 21-31.

Sevlever M, Gillis JM. 2010. An examination of the state of imitation research in children with autism: Issues of definition and methodology. Research in developmental disabilities J. 31: 976-84.

Kelin A. 2006. Autism and aspergercsyndrome. an overview: Rev bars psiquiter J. 28: 3-11.

Center for disease control and prevention. Facts about autism retrieved september. from http://www.cdc.gov/ncbdd/autism/facts.html.

National standards project. 2009. Evidence-based practice and autism in the school: A guide to providing appropriate interventions to student with autism specturm disorder. Natinal autism center.

Jenkins SR, Reed FDD. 2013. An experimental analysis of the effects of therapeutic horseback riding on the behavior of children with autism. Research in Autism Spectrum Disorders J. 7: 721-40.

Romanczyk RG, et al. 2008. Comprehensive treatment packages for ASD perceved vs proved effectiveness. Clinial assessment and intervention for autism specturm disorder J. 8: 741-50

Accordino R, et al. 2007. Searching for music's potential: A critical examination of research on music therapy with individuals with autism. Research in Autism Spectrum Disorders J. 1: 101-15.

Reed FDD, Reed DD. Towards an understanding of evidence-based practice. Early and Intensive Behavior Intervention J. 5: 20-31.

8

Akins RS, et al. 2010. Complementary and alternative medicine in autism: an evidence-based approach to negotiating safe and efficacious interventions with families. Neurotherapeutics J. 7: 307-19.

Bracher M. Therapeutic Horse Riding: What has this to do with Occupational Therapists? Occupational Therapy J. 63: 277-82.

Bertoti DB. 1988. Effect of therapeutic horseback riding on posture in children with cerebral palsy. Physical therapy J. 68: 1505-12.

Snider L, et al. 2007. Horseback riding as therapy for children with cerebral palsy: is there evidence of its effectiveness? Physical & occupational therapy in pediatrics J. 27: 5-23.

Bass MM, et al. 2009. The effect of therapeutic horseback riding on social functioning in children with autism. autism and developmental disorders J. 39: 1261-7.

Gabriels RL, et al. 2012. Pilot study measuring the effects of therapeutic horseback riding on school-age children and adolescents with autism spectrum disorders. Research in Autism Spectrum Disorders J. 6: 578-88.

Kern JK, et al. 2011. Prospective trial of equine-assisted activities in autism spectrum disorder. Alternative therapies in health and medicine J. 5:14-20.

Nelson K, et al. 2011. A preliminary analysis of therapeutic horseback riding. Social Sciences and Education J. 1: 644-56.

Ahmadi SJ, et al. 2011. Psychometric evaluation of a diagnostic test for autism Garz. Cognitive and behavioral science research J. 1(1): 87-104.

Bettelheim FA, Paunovic M. 1979. Light scattering of normal human lens I. Application of random density and orientation fluctuation theory. Biophysical J. 26: 85-96.

King N. 2007. Perceived efficacy of therapentic riding for children with autism. Enhancing human accupation through hippotherapy. American occupationd therapy association J. 5: 119-126.

Stoner J. 2007. Efficacy of hippotherapy as a treatment strategy fpr children with autism. Enhancing human accupation through hippotherapy. American occupationd therapy association J. 4: 103-110.