

Effects of Equine Assisted Therapy on Social and Undesirable Behaviors of Youths with Autistic Spectrum Disorder

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Abstract

The purpose of this study was to develop and investigate the effects of equine assisted therapy on social and undesirable behaviors of youths with autistic spectrum disorder (ASD). Six youths with autistic spectrum disorder aged 14-25 years were recruited by purposive sampling. They attended the 8 session program, twice a week. Each session took 80-90 minutes. The program included 4 activities: orientation/introduction, food preparation and feeding, grooming, and leading a horse. Subjects' social and undesirable behaviors were assessed before and after the program using the following: 1) Recording forms for social behaviors and undesirable behaviors (Sung-U et.al, 2009) 2) The Scale of Independent Behavior-Revised (SIB-R) (Bruininks, 1996) using subtests for social interaction and communication skills, and a subtest for undesirable behaviors: frequency and severity of these behaviors. The Wilcoxon Signed-Rank test was used for data analysis, to compare units of measurement before and after the program. The results showed scores of SIB-R in subtests of language comprehension and language expression. The total scores were significantly increased ($p<0.05$). However, the subtest of social interaction was not significantly increased ($P>0.05$). Furthermore, the frequency scores of undesirable behaviors were not significantly decreased ($P>0.05$), but the severity score of these behaviors was significantly decreased ($p<0.05$). The social behavior score from the record forms was not significantly increased ($P>0.05$), but

scores of undesirable behaviors were significantly decreased ($p<0.05$). The study concluded that a program of equine assisted therapy can encourage social behaviors and reduce undesirable behaviors in youth with autistic spectrum disorder.

Keywords : Youth with autistic spectrum disorder, Program of equine assisted therapy, Social behaviors, Undesirable behaviors.

Introduction

Autistic Spectrum Disorder (ASD) is a neurological developmental disorder. People with ASD have developmental impairment in social and communication skills. They also have repetitive behavioral patterns and rigid interest that lead to limitations in their lives (Siriratraka, 2012). Animal Assisted Therapy (AAT), which involves an appropriate animal as part of a therapeutic program, is regarded as one, among various kinds of therapeutic approaches that can help ASD clients. Equine assisted therapy, which uses horses, is one AAT taking advantage of the movement of horses to improve physical, social interaction, behavioral, psychosocial, and cognitive functions of the clients (Latella & Langford, 2008). Impairment in social interaction and behaviors are typically seen in ASD persons as they experience difficulty in starting interaction or communication with others, as well as shaping their appearance and behaviors properly into contexts (Siriratraka, 2012). According to advantages of the equine assisted therapy

program on learning, perception, cognition, behaviors, emotion, and social skills, this study therefore, aims to apply equine assisted therapy to an occupational therapy program. Much literature supports applying equine assisted therapy to encourage proper social behaviors and to decrease undesirable behaviors in this client group. Stoner (2004) reported improvement in sensory adaptation of autistic children after they participated in a 60-minute equine assisted therapy program for ten weeks. A similar study by Bass, Duchowny, and Llabre (2009) also reported the improvement seen in autistic children, both in sensory adaptation and social skills, after participating in the program for twelve weeks. Each session of the equine therapy program in the study cited, consisted of an introduction, riding and non-riding, doing activities on horse-back, and horse grooming steps, which took 60 minutes in total. A study concerning the effect of equine assisted therapy on 3-7 year old Thai autistic children found the significant difference to be $p<0.05$ in overall development of the research subjects, particularly in expressive language, usage of language, social and sensory aspects, and perception. Development of the subjects was assessed by using a treatment evaluation form (Thai version) and the results were compared before, and after, participating in the one-hour weekly program over twelve weeks (Koonrungsrisomboon, 2012). However, there is little research evidence, particularly in Thailand, of applying equine assisted therapy to an occupational therapy program. A small amount of research evidence reported in Thailand, focused on the horse riding of a negligible amount of adolescents. Thus, this study intended to examine the effect of equine assisted therapy on the social and undesirable behaviors of youths with autistic spectrum disorder, with the aim of developing a program that can encourage proper social behaviors and decrease undesirable behaviors in this subject group.

Objectives

To study the effects of equine assisted therapy on social and undesirable behaviors

Terminology

Individuals with Autistic Spectrum Disorder refers to adolescents who have various abnormal developments, i.e. in social interaction, language, and restricted or repetitive behaviors, and who have been diagnosed as having ASD.

Social Behaviors refers to social behaviors exhibited by the subjects during participation in the equine assisted therapy program which were assessed by a Social and Undesirable Behaviors Record Form (Sung-U et.al, 2009), and social behaviors exhibited by the subjects in their everyday lives which were assessed by 'The Scale of Independent Behavior-Revised (SIB-R): social interaction and communication items' (Bruininks, Woodcock, Weatherman, & Hill, 1996), Thai version (Sung-U et.al, 2009)

Undesirable Behaviors refer to negative behaviors of adolescents with ASD which they exhibited during participation in the equine assisted therapy program and in their everyday lives. The former were assessed by the Social and Undesirable Behaviors Record Form (Sung-U et.al, 2009) and the latter were assessed by 'The Scale of Independent Behavior-Revised (SIB-R): Problematic Behaviors item', Thai version (Sung-U et.al, 2009)

Equine assisted therapy refers to a therapeutic program using a horse as a therapeutic media. The therapeutic program consists of four activities: introduction, preparing and feeding a horse, cleaning a horse, and preparing and walking a horse. All four activities took 80-90 minutes.

Frames of Reference and Conceptual Framework Used in the Study Conceptual Framework of Animal Assisted Therapy

Animals are included as a part of a therapeutic program to help encourage physical or

mental development of children or adolescents (Delta Society, 2012). Many animals such as dogs, elephants, dolphins, and horses can be used for animal assisted therapy. Equine assisted therapy is viewed as a fundamental program for improvement of both neuromotor and sensory functions. Equine assisted therapy can also encourage a sense of achievement, body coordination, self-confidence, and social interaction (Kroger, cited in Heipertz, et al., 1981)

Sensory Integrative Frame of Reference (SI)

SI is a neurological process that organizes sensory information both within the body and externally, e.g., tactile, vestibular, proprioceptive, visual, and auditory senses, in order for individuals to effectively function in daily life. Abnormal functions of the brain lead to 'Sensory Modulation Disorder' and result in behavior problems of individuals (Bundy, Lane, and Murray, 2002). An equine assisted therapy program conveys a variety of sensory information to the subjects; so that they gain appropriate adaptive behaviors when participating in the program within an appropriate environment (Smith, 2011).

Human Occupations Frame of Reference

Humans are seen as an open system interacting with the environment they are in, and the tasks they perform. Such an open system consists of three sub-systems: volition, habituation, and mind-brain-body performance. The volition sub-system can be divided into personal causation, values, and interests. The habituation sub-system can be divided into roles and habits. When individuals perform anything, the volition, habituation, and mind-brain-body performance work closely together in order to control performance patterns and procedures (Kielhofner, 2002; 2004).

Methods

The study design was a Quasi-Experiment investigating the effects of equine assisted therapy on social and undesirable behaviors of youths with ASD aged between 14-25 years old. The subjects of this study were six youths, 1 female and 5 male, aged from 14-25 years old, who were diagnosed with ASD. Recruitment of the research subjects was done through purposive sampling.

Inclusion criteria

- Participants must have been diagnosed as having ASD
- Participants must be able to communicate in Thai and respond to conversations with others comprehensively.
- Based on information from guardians, the participants must have no other disorders, for example, epilepsy, asthma, or allergic conditions, or taking drugs that can limit participation in the program.
- Based on information from guardians or from an evaluation done by the researcher, the participants must be able to perform activities successfully. For example, they must be able to follow commands or explain their routine activities step by step correctly.
- The participants must give their assent and their guardians must give their consent voluntarily. Both parties need to sign an assent/consent form.
- The participants must not participate in other therapeutic programs. During participation in this program, their routine activities of daily living must be maintained without any change.

Exclusion criteria

The subjects were excluded if they refused to participate in the equine assisted therapy program. For example, if they refused to take part in activities in which a horse was involved, or if they refused to follow any other program procedure.

Research Instruments

1. Equine assisted therapy program:

Each subject, under supervision of an occupational therapist and a veterinary student, participated in the equine assisted therapy program twice a week, for 4 weeks, which made 8 sessions in total. Each session took 80-90 minutes. The program consisted of 4 activities: introduction, preparing and feeding a horse, cleaning a horse, and preparing and walking a horse.

2. A video recorder

3. Social and Undesirable Behaviors

Record Form: Social and undesirable behaviors (Sung-U et.al, 2009)

4. The Scale of Independent Behavior-Revised (SIB-R) Assessment Form: Social interaction and communication skills (Bruininks, Woodcock, Weatherman, & Hill, 1996) Thai version (Sung-U et.al, 2009)

5. Assent Form and Consent Form

Research Methods

1. Designed an equine assisted therapy program that could affect the social and undesirable behaviors of ASD persons.

2. Formed teams consisting of a researcher, a veterinary student, an adolescent with ASD, and a horse.

3. In the piloting step, the designed program was tested on two other ASD youths.

VDOs were recorded of behaviors, and used by the researcher and research assistant to look for congruence in data collection.

4. Interviewed the guardians twice using SIB-R: before starting, and after ending the program.

5. In the intervention step, VDO clips were recorded during the first and last sessions of the equine assisted therapy program. According to the 'Social and Undesirable Behaviors Record Form and The SIB-R Assessment Form', scoring was done by another occupational therapist who was well-trained but not involved in data collection.

6. Ran the equine assisted therapy program, twice a week for four weeks. The program took 80-90 minutes per session.

7. Analyzed the data: Scores from the 'Social and Undesirable Behaviors Record Form' and 'SIB-R', before starting the program (pre-test) and after ending the program (post-test), were compared.

Descriptive statistics and the Wilcoxon Signed-Rank Test, non-parametric statistics, were used to compare social and undesirable behaviors scores. Nevertheless, the SIB-R score of one subject was not included in the analysis because an error occurred when the guardian of the subject responded to the SIB-R at the same point of time. Therefore, scores from only five subjects were analyzed.

Results

Table 1: Number and percentage of the subjects categorized by age and gender (adolescents with ASD)

Characteristics	Number (n=6)	Percent
Gender		
Male	5	83.3
Female	1	16.7
Age (Years)		
Average	20.67	
Median	20.50	
Minimum	18	
Maximum	24	

The six subjects consisted of five male and one female youths with ASD. Their average, median, minimum, and maximum age was 20.67, 20.50, 18, and 24 years, respectively.

Table 2: The subjects' pre-test and post-test 'SIB-R' scores

Parameters	Pre-test		Post-test	
	Mdn	Q.D.	Mdn	Q.D.
Social behaviors				
Social interaction	16.60	4.27	18.80	3.49
Language comprehension	11.60	7.79	16.40	7.50
Language expression	12.00	6.36	16.80	8.52
Total	40.20	15.09	52.00	15.58
Undesirable behaviors				
Frequency	8.40	5.72	6.20	4.08
Severity	5.20	2.95	3.20	3.56

Mdn : Median scores; Q.D. : Quartile deviation scores

Table 3: The subjects' pre-test and post-test 'Social and Undesirable Behaviors' scores

Parameters	Pre-test		Post-test	
	Mdn	Q.D.	Mdn	Q.D.
Social behaviors	121.67	21.37	122.00	21.42
Undesirable behaviors	6.33	3.88	2.83	2.99

Mdn : Median score; Q.D. : Quartile deviation score

Table 4: Pre-test 'SIB-R' scores compared with post-test 'SIB-R' scores

Parameters	Evaluations	Rank-		Rank+		Ties	Z	p
		N	Mean	N	Mean			
Social behaviors								
Social interaction	Posttest -Pretest	0	0.00	4	2.50	1	-1.82	0.068
Language comprehension	Posttest -Pretest	0	0.00	5	3.00	0	-2.06	0.039*
Language expression	Posttest -Pretest	0	0.00	5	3.00	0	-2.02	0.043*
Total	Posttest -Pretest	0	0.00	5	3.00	0	-2.02	0.042*
Undesirable behaviors								
Frequency	Posttest -Pretest	3	3.00	1	1.00	1	-1.47	0.141
Severity	Posttest -Pretest	5	3.00	0	0.00	0	-2.06	0.039*

*p<0.05

Comparing the pre-test 'SIB-R' scores with the post-test 'SIB-R' scores, results are as follows: at p<0.05, social interaction scores increased; language comprehension, language expression and total social behaviors increased significantly; frequency of undesirable behaviors decreased; and severity of undesirable behaviors decreased significantly.

Table 5: Pre-test ‘Social and Undesirable Behaviors’ scores compared with post-test ‘Social and Undesirable Behaviors’ scores

Parameters	Evaluations	Rank-		Rank+		Ties	Z	p
		N	Mean	N	Mean			
Social behaviors	Posttest -Pretest	2	3.50	4	3.50	0	-0.73	0.462
Undesirable behaviors	Posttest -Pretest	6	3.50	0	0.00	0	-2.22	0.026*

*p<0.05

Comparing pre-test with post-test ‘Social and Undesirable Behaviors’ scores, the results show that, at p<0.05, social behaviors scores increased, whereas undesirable behaviors scores decreased significantly.

Conclusion

This study developed an equine assisted therapy program that can improve social behaviors and diminish undesirable behaviors effectively in adolescents with ASD. The research subjects showed an improvement in social behaviors: language comprehension, language expression, and overall social interaction, while the severity and frequency of their undesirable behaviors decreased.

Discussion

The social behaviors and undesirable behaviors of youths with ASD who participated in this study were measured as follows: Social and undesirable behaviors which took place during the equine assisted therapy sessions were measured by the “social and undesirable behaviors record form”, whereas social and undesirable behaviors which occurred during their daily lives were measured by SIB-R. Pre-test (before the program) and post-test (after the program) scores were compared. The results showed that the subjects’ social behaviors, which occurred during the equine assisted therapy sessions, increased non-significantly. Their social behaviors: language comprehension, expressive language, and overall behaviors which took place during other times, increased with statistical

significance of p<0.05; social interaction increased but not significantly. On the other hand, the subjects’ undesirable behaviors which occurred during the equine assisted therapy sessions, decreased with statistical significance of p<0.05. Severity of their undesirable behaviors, which took place during other times, decreased significantly with p<0.05, while frequency of their undesirable behaviors, which occurred during other times, decreased with no statistical significance.

The results showed that, by participation in the equine assisted therapy program, the subjects’ social behavior scores yielded during the sessions and at other times, tended to increase. According to the conceptual framework of animal-assisted therapy, this kind of therapy encourages social interaction through conversations with other participants and with animal handlers, and encourages emotion, facial expression, and communication of the subjects (Morse and Field, 1995). Additionally, equine assisted therapy can foster social interactions (Kroger, cited in Heipertz, et al., 1981). All of the designed activities of the equine assisted therapy in this study, provide opportunities for the subjects to experience various kinds of sensory stimulation. According to the SI frame of reference, the brain will inte-

grate all sensory information. For example, through continuously listening to instructions and by changing position during activities, hearing and vestibular senses of the subjects will integrate, resulting in improvement of expressive and receptive language skills. Moreover, through touching and carrying grass, touching and brushing the horse's hair, changing body position while doing activities, moving the eyes to look for the horse's stable or to observe the horse's responses, the vestibular, proprioception, tactile, and visual senses of the subjects will be integrated, leading to their emotional security, attention, self-regulation, and motor planning skills which will encourage them to respond properly to the surrounding contexts (Ayres, 1972 cited in Bundy, Lane, & Murray, 2002).

The results also showed a decrease of undesirable behavior scores. According to the animal-assisted therapy conceptual framework, animals help relieve fear, anxiety, or temper of individuals (Barker, Pandurangi, & Best, 2003; Zisselman, Rovner, Shumely, & Ferrie, 1996). Animals also encourage good emotional status of individuals from the inside, improve social perceptual skills and enhance positive experiences toward themselves (Beth, Joseph, & Grace, 2005). Therefore, doing activities with horses encourages individuals to advance their interaction skills, leading to a sense of achievement, self-confidence, and good learning experiences (Bundy, Lane, & Murray, 2002). Occupational therapy views that individuals are in need of performing purposeful activities (Engel, cited in Bracher, 2000). According to the Model of Human Occupation (Kielhofner, 2002; 2004), horses can be viewed as helpers for youth with ASD, to achieve their goals when participating in the program. Horses also help to transform the physical and social environment of the subjects, and create an opportunity for experiences in social interaction. Relationships between humans and animals, or the human-animal bond, affect the foundation of healthy behaviors;

such that the bond can also shape good social interaction between humans as well (Catanzaro, 2001). In short, as described by Bracher (2000) regarding the SI frame of reference, the Model of Human Occupation, and the animal-assisted therapy conceptual framework, horses and environment; subjects participating with horses, a therapist, and purposeful activities in this study, could lead to their interest, satisfaction, value, or confidence (as described in the volition sub-system), resulting in the subjects' motivation to participate in the program. Consequently, their sensory integrative functions would be continually stimulated, resulting in adaptation of their brains, leading to adaptive behaviors.

Recommendation

A future study should consider examining the effect of equine assisted therapy in a bigger sample size or in other groups of clients. Also, a further study should investigate whether or not equine assisted therapy could be applied to encouraging the subjects towards an occupation. When horses are included in the program, a large area with shelter is needed to protect them from bad weather and to ensure that the program can be continued regardless of weather conditions.

Clinical Implications

Application of the equine assisted therapy program needs to take into account the physical and emotional preparedness of the subjects and horses, as well as weather conditions. The subjects need to be under the close supervision of an occupational therapist and the horse's handler, who instruct and assist in every situation.

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