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Effects of Using an Hippotherapy Program on the Development of Students with Special Needs

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Abstract

The objectives of this experimental research were 1) to develop a Hippotherapy Program: HP, and 2) to compare the development of students with special needs before and after using the HP. The experimental group was 20 students with special needs who participated in the HP. The research instruments were 1) the HP; this is a program that develops basic abilities such as movement control, balance, posture, perception and sensory integration, able to respond appropriately to stimuli, and a learning management plan was prepared for 12 times. The HP had IOC between 0.80-1.00, 2) the developmental assessment form, it was a 4-level rating scale. It's IOC and reliability was 0.80-1.00 and 0.98, respectively, and 3) group discussion on efficacy of the HP by 7 qualified persons. The data was analyzed by means of frequency, percentage, mean, standard deviation, and nonparametric statistics – Wilcoxon sign rank test. The results showed that 1) the HP consisted of 6 components: 1.1) importance, 1.2) objective, 1.3) target group, 1.4) curriculum content, 1.5) hippotherapy therapy activity, and 1.6) measurement and evaluation. It will help students with special needs to be able to control movement, balance, posture, perception and sensory integration, and can respond appropriately to stimuli. 2) Students with special needs, before receiving the HP, the overall improvement scores were at good level (μ=2.77, σ=0.57). When considered individually, it was found that most of them were at good quality after receiving the HP. The overall improvement scores were at good level (μ=3.20, σ=0.52) and improvement equal of +0.65 (R=0.65).

Keywords:
Hippotherapy program,
Students with special needs,
Special Education Center

Introduction

Children with special needs have physical, emotional-mental, social, language, intellectual, and other disabilities. Children will not be able to carry out their daily lives like normal children. Therefore, education management must provide teaching that is different from normal children to be consistent and appropriate with the condition of the disability and the types of the child personality (Supsamut, Sukkasem, Phanomwan Na Ayutthaya, Suksai, & Wongpornchai, 2014). Disability is a contested

concept, with shifting meanings in different communities. It has been referred to as an embodied difference (Dolmage, 2014). Disabilities are classified into 9 types: Visually impaired person, Hearing impaired person, Persons with intellectual disabilities, Persons with physical disabilities or movement or health, Persons with learning disabilities, People with speech and language disabilities, Persons with behavioral or emotional disabilities, Autistic person, and Person with multiple disabilities (Office of the Basic Education Commission, 2021). Animal -assisted therapy is an alternative or complementary type of therapy that includes the use of animals in a treatment (Brooks et al., 2018). Animal-assisted therapy can be classified by the type of animal, the targeted population, and how the animal is incorporated into the therapeutic plan (Charry -Sánchez, Pradilla, Talero-Gutiérrez, 2018). The most commonly used types of animal-assisted therapy are canine-assisted therapy and equine-assisted therapy. The goal of animal-assisted therapy is to improve a patient's social, emotional, or cognitive functioning and literature reviews state that animals can be useful for educational and motivational effectiveness for participants (Marcus, 2013). Horses are used to help in therapy, known as hippotherapy (HP), in order to improve the development of special children. Children will do various activities on horseback. Horses are intelligent creatures, able to communicate and perceive human/rider feelings quickly. Children will be stimulated and develop skills, muscles, build confidence and increase mental tenderness, know how to control their emotions. In addition, the children were trained in environmental adaptation, which is an experience gained by supporting themselves to be able to sit on a horse. When a special child has the opportunity to sit on a horse, it is like learning to walk on their own. Sitting on a horse also stimulates different muscles to move rhythmically because they have to move all the time (Siriratrekha, 2009). It can help reduce various kinds of spasticity as well as a form of physical therapy (Hassadee, 2016). Special Education Center, Educational District 11, Nakhon Ratchasima Province, has a role to provide services to help children with disabilities from birth or encounter disabilities, prepare, develop potential and refer to specialized schools or co-educational schools. This place organizes activities suitable for gross motor, fine motor, language and communication, social, and self-help skill. At present, there are 20 students with special needs, some of which have problems with sedentary behavior, uncooperative activities, unable to communicate, do not know what they like or dislike, do not turn around, like to play alone, poor balance, unable to sit on horseback etc. may cause the child to have problems living in the future. In the past, the Special Education Center, Education District 11, Nakhon Ratchasima Province has always tried to think of ways to promote the development of students with special needs. According to related research studies, there are studies on the fear of movement (Pichai, 2006; Special Education Center, Educational District 7, Phitsanulok Province, 2013) social skills (Kwankijbavonkul & Hirunchalothorn, 2016) and behavioral development (Hassadee, 2016). Most were studied with children with autism (Office of the Health Promotion Fund, 2011; Special Education Center, Educational District 7, Phitsanulok Province, 2013; Chanthapassa & Chaisriha, 2019), and children with cerebral palsy (Rakkha, Lekskuchai, & Akamanon, 2014); Thawinchai, 2021) but not with children with more than one type of special needs. Based on the above reasons, the researchers are interested in studying the effect of the use of an HP on the development of students with special needs, Special Education Center, Education District 11, Nakhon Ratchasima Province. The application or design of various activities on horseback according to the developed HP will help develop basic abilities of students. In addition, special education teachers and parents help develop occupational therapy.

Objectives

The aims of this research were 1) to develop an HP for students with special needs at a Special Education Center, Education District 11, Nakhon Ratchasima province, and 2) to compare the development of students with special needs at a Special Education Center, Education District 11, Nakhon Ratchasima Province before and after using the HP.

Methods

Research Respondents

The target group is students with special needs, Special Education Center, Education District 11, Nakhon Ratchasima Province, 20 people were obtained by purposive sampling. These students are between 3-11 years old, male and female, weight 15-65 kg, and height 93-170 cm. All students with special needs who participate in the program undergo a medical examination by a doctor and are confirmed to be eligible for the HP.

Measures

Tools used in this research are as follows

Hippotherapy Program

This is a program that develops basic abilities such as movement control, balance, posture, perception and sensory integration, and being able to respond appropriately to stimuli.

The learning management plan was used in the experiment with the target group for 12 times.

Development Assessment Form

The development assessment form created by the researchers is divided into 2 parts as follows:

Part 1 General information for students with special needs in a completed form

Part 2 The development assessment form created by the researcher consists of 4 aspects: physical (3 items), emotional-mental (4 items), social (6 items), and intellectual (3 items). Index of item objective congruence: IOC values between 0.80-1.00. The development assessment form, as a whole, had a reliability of 0.98. It is characterized as a four-level valuation scale as follows:

4 means being able to practice fluency at a very good level

3 means being able to practice fluency at a good level

2 means being able to practice fluently at a fair level

1 means unable to implement and should be improved

Experimental scheme

The experiment was conducted using the One Group Pretest - Posttest Design experimental model (Kanchanawasee, 2015), with the following experimental model:

Target Audience	Pre-test	Hippotherapy Program	Post-test
E	T1	X	T2

E represents students with special needs.

X represents Hippotherapy Program.

T1 represents an assessment of development prior to the use of the Hippotherapy Program.

T2 represents evaluation of development after the use of the Hippotherapy Program.

After completing the 12 trials, the post-test development assessment was conducted.

Data collection

1. To request a letter from the Special Education Center, Education District 11, Nakhon Ratchasima Province for permission to bring students to train according to the HP at the 8th Cavalry Battalion, Suranaree Camp, Nakhon Ratchasima Province.

2. The development assessment form was used to assess the students individually prior to organizing the HP.

3. The researcher assigned teachers participating in the HP as research assistants to collect data using the HP to promote self-control skills among people with autism between May 2019 – April 2020.

4. The researchers were self-employed practitioners of the HP and followed the learning management plan prepared. The researchers spent 12 trials with the 20 students, 2 days a week, 40 minutes a day, from 9:00 a.m. - 11:00 a.m. at the 8th Cavalry Battalion, Suranaree Camp, Nakhon Ratchasima Province.

5. There were 6 horses used to train children with special needs. Several horses were used in each training session, alternating between which day was ready and stable for the child to ride.

6. The learning management plan has 12 sessions as follows:

1st training: Warm-up activities, horse greetings, guidance activities, commanding activities, touching, horse familiarization activities, first riding lessons, physical relaxation activities, and thank you to the trainers, mentors and horses.

2nd training: Warm-up activity, horse greeting, guidance activity, commanding activities, touching,

leash and leash training, physical relaxation activity, thanks to trainers, mentors and horses.

3nd training: Warm-up activity, commanding activities, touching, horse familiarization activities, first time riding on a horse, physical relaxation activity, thanks to trainers, mentors and horses.

4th training: Warm-up activity, fun activities to practice skills, training for riding on a horse, physical relaxation activities, thank you trainers, mentors and horses.

5th training: Warm-up activity, fun activities to practice skills, training to ride on a horse, balance training on horseback, exercise and balance on horseback, physical relaxation activities, thank you trainers, mentors and horses.

6th training: Warm-up activity, fun activities to practice skills, training for riding on a horse, exercise training and balance training on horseback, physical relaxation activities., thank you to the trainers, mentors and horses.

7th training: Warm-up activity, touch and greet the horse, fun activities to practice skills, training for riding on a horse, exercise training and balance training on horseback, physical relaxation activities, thank you to the trainers, mentors and horses.

8th training: Warm-up activity, touch and greet the horse, fun activities to practice skills, training for riding on a horse, exercise training and balance training on horseback, physical relaxation activities, thank you to the trainers, mentors and horses.

9th training: Warm-up activity, touch and greet the horse, fun activities to practice skills, training to ride on a horse, exercise training and balance training on horseback, physical relaxation activities, thank you to the trainers, mentors and horses.

10th training: Warm-up activity, touch and greet the horse, fun activities to practice skills, training for riding on a horse, exercise training and balance training on horseback, physical relaxation activities, thank you to the trainers, mentors and horses.

11th training: Warm-up activity, touch and greet the horse, fun activities to practice skills, training to ride on a horse, exercise training and balance training on horseback, physical relaxation activities, thank you to the trainers, mentors and horses.

12th training: Warm-up activity, touch and greet the horse, fun activities to practice skills, training for riding on a horse, exercise training and balance training on horseback, physical relaxation activities, thank you to the trainers, mentors and horses.

7. The researcher assessed self-control skills before and after the use of the HP among autistic person between April 1-30, 2020.

Data analysis

The researchers conducted the data analysis using a packaged program to calculate the basic statistical values as follows:

1. General information of the target group was analyzed by calculating frequency and percentage.
2. Data from the development assessment form which was classified into four dimensions; physical development, emotional-mental, social, and intellectual both before and after using the HP were analyzed by calculating the mean, standard deviation, and nonparametric statistics – Wilcoxon sign rank test. The criteria for interpreting the data are as follows (Boonchan, 2020).

3.25-4.00 means being able to practice fluency at a very good level

2.50-3.24 means being able to practice fluency at a good level

1.75-2.49 means being able to practice fluently at a fair level

1.00-1.74 means unable to implement and should be improved

Table 1: Profile of respondents (N=20)

Basic Information	n	%
Sex		
Male	16	80.00
Female	4	20.00

Basic Information		n	%
Age			
	3-5 years	6	30.00
	6-8 years	10	50.00
	9-11 years	4	20.00
Weight			
	15-27 kg	14	70.00
	28-40 kg	5	25.00
	41-53 kg	0	0.00
	54-66 kg	1	5.00
Height			
	90-110 cm	5	25.00
	111-131 cm	11	55.00
	132-152 cm	3	15.00
	153-173 cm	1	5.00
Types of Respondents			
	Autism	12	60.00
	Persons with intellectual disabilities	6	30.00
	Persons with physical disabilities or mobility or health	1	5.00
	Persons with hearing impairments	1	5.00
Total		20	100

From Table 1, it was found that students with special needs who attended the HP, there were a total of 20 people, mostly male (80.00%), 6-8 years old (50.00%), 15-27 kg. (70.00%), and 111-131 cm. (55.00%). Most of them were autism (60.00%), followed by six people with intellectual disabilities (30.00%).

Results

1. Development of a HP to promote the development of students with special needs, Special Education Center, District 11, Nakhon Ratchasima Province, it consisted of 6 components: 1) importance, 2) objective, 3) target group, 4) curriculum content, 5) hippotherapy therapy activity, and 6) measurement and evaluation. The developed HP helps students with special needs to have the ability to control movement, balance, perception and sensory integration, and to respond appropriately to stimuli.

2. The students with special needs had higher improvement scores than before using HP as showed in Table 2.

Table 2: Improvement scores of students with special needs before and after using HP

NO.	Development Progress											
	Social			Physical			Emotional			Cognitive		
	BEF	AFT	R	BEF	AFT	R	BEF	AFT	R	BEF	AFT	R
1	2.47	3.00	+0.53	3.00	3.60	+0.60	3.00	3.11	+0.11	2.00	2.90	+0.90
2	2.97	3.32	+0.35	3.00	3.50	+0.50	3.00	3.35	+0.35	3.00	3.30	+0.30
3	3.25	3.52	+0.27	3.50	4.00	+0.50	2.90	3.04	+0.14	3.50	3.70	+0.20
4	3.00	3.25	+0.25	3.00	3.50	+0.50	3.00	3.12	+0.12	3.00	3.20	+0.20
5	1.75	2.07	+0.32	2.50	2.70	+0.20	1.50	1.87	+0.37	2.00	2.30	+0.30
6	2.75	3.20	+0.45	2.00	2.30	+0.30	3.00	3.22	+0.22	3.00	3.90	+0.90
7	2.17	2.80	+0.63	2.70	3.10	+0.40	2.00	2.84	+0.84	2.00	2.70	+0.70
8	3.22	3.65	+0.43	3.50	3.80	+0.30	3.00	3.81	+0.81	3.90	4.00	+0.10
9	2.75	3.35	+0.60	3.00	3.60	+0.60	3.00	3.50	+0.50	3.00	3.30	+0.30
10	3.67	4.00	+0.33	3.70	4.00	+0.30	3.60	4.00	+0.40	3.50	4.00	+0.50

NO.	Development Progress											
	Social			Physical			Emotional			Cognitive		
	BEF	AFT	R	BEF	AFT	R	BEF	AFT	R	BEF	AFT	R
11	3.45	4.00	+0.55	3.50	4.00	+0.50	3.60	4.00	+0.40	3.50	4.00	+0.50
12	3.50	4.00	+0.50	3.80	4.00	+0.20	3.50	4.00	+0.50	3.50	4.00	+0.50
13	1.97	2.45	+0.48	2.70	3.00	+0.30	2.00	2.91	+0.91	2.00	2.20	+0.20
14	2.35	2.75	+0.40	2.70	3.00	+0.30	2.50	3.05	+0.55	3.00	3.20	+0.20
15	2.52	3.17	+0.65	3.00	3.50	+0.50	2.60	3.54	+0.50	2.50	3.00	+0.50
16	2.25	2.85	+0.60	1.10	2.00	+0.90	2.90	3.58	+0.68	3.00	3.50	+0.50
17	2.35	2.85	+0.50	2.90	3.20	+0.30	2.00	2.63	+0.63	2.50	2.70	+0.20
18	2.15	2.72	+0.57	1.50	2.00	+0.50	3.00	3.14	+0.14	2.10	3.00	+0.90
19	2.70	3.27	+0.57	3.20	3.70	+0.50	3.00	3.31	+0.31	2.10	3.10	+1.00
20	3.60	4.00	+0.40	3.70	4.00	+0.30	3.50	4.00	+0.50	3.70	4.00	+0.30
M	**2.77**	**3.20**	**+0.43**	**2.90**	**3.33**	**+0.43**	**2.83**	**3.30**	**+0.47**	**2.84**	**3.30**	**+0.46**

The students with special needs prior to receiving the HP had an average overall improvement score of good quality (μ=2.77, σ=0.57). When considered individually, most were in good followed by a fair level. As for very good, there are 5 people, which is the smallest number. One of the students with the highest score was at a very good level (μ=3.67, σ=0.61). And one of the students with the lowest score was at the fair level (μ=1.75, σ=0.44). After receiving the HP, students with special needs had a good improvement score (μ=3.20, σ=0.52). When considered individually, most were found to be of very good followed by good. As for the fair level, there are 2, which is the smallest number. Four students with the highest developmental scores were at the very good level (μ=4.00, σ=0.00). And one of the students with the lowest score was at the fair level (μ=2.07, σ=0.41). When comparing the overall improvement scores before and after using the hippotherapy program, the students with the most progressive overall improvement had R = 0.65.

Table 3: Comparison of the development of students with special needs at a Special Education Center, Education District 11, Nakhon Ratchasima Province before and after using the HP

Variable		N	Mean rank	Sum of ranks	Z	P
Before	Negative Ranks	0	.00	.00	-3.920**	.000
After	Positive Ranks	20	10.50	210.00		
	Ties	0				
	Total	20				

**p<0.01

Discussion

1. The HP consists of 6 components: 1) importance, 2) objective, 3) target group 4) curriculum content, 5) hippotherapy program activity, and 6) measurement and evaluation. HP promotes the development of students with special needs for motor control, balance, sensory perception and integration, and are able to respond appropriately to stimuli. This may be due to the fact that the researchers developed a HP with the aim of the study being to promote physical development, emotional-mental, social, and intellectual aspects of students with special needs. The HP provides activities or contents that are relevant to the daily lives of students with special needs. The researchers have

designed the activities to suit all aspects of the growth of the students with special needs. The researchers have received cooperation from many agencies, such as the 8th Cavalry Battalion, 7th Cavalry Regiment, 2nd Army Area, supporting personnel in organizing activities in the HP. Fort Suranari Hospital conducts screening and assessment of the development of students with special needs, thereby making the HP reliable and under the highest professional safety control. The development of a HP is based on the synthesis of relevant literature, therefore, there are 6 components mentioned above. Any activity should consider the cooperation between the participants and the resource speakers including brainstorming together about development issues, development processes, visions, principles, goals, key competencies of students, desirable characteristics, and learning standards of the curriculum (Noppakun, Boonchan, & Tungprasert, 2018). Conducting the activities as stated will demonstrate real knowledge and competence in the development of a HP (Jermthienchai, 2015). HP should be designed for students to learn in order of difficulty without being separated from each other (Khamanee, 2005). It is an experience related to student's daily life so that they have the opportunity to solve problems various things in life to live happily (Panich, 2016). HP should be designed for students to learn in order of difficulty without being separated from each other (Khamanee, 2005). It is an experience related to the daily life of children to give them the opportunity to solve problems in life in order to live happily (Panich, 2016), increasing and promoting essential basic skills of children (Setthapanich, Wisetsiri, & Suchiwa, 2007), Encouraging children to develop knowledge, skills, attitudes, and creativity in life (Darling -Hammond & Snowden, 2005), encouraging children to do independent activities working together as a team, to know how to live together in a democratic society (McConnell & Llewellyn, 2002), teaching methods and equipment are appropriate (Meyer & Ostrosky, 2014). This is consistent with research by Nopakun et al. (2018) on the development of teacher competency in educational institutions. It was found that the development model consisted of 6 components: 1) principle, 2) objective, 3) curriculum structure, 4) curriculum content, 5) development process, and 6) measurement and evaluation. It also corresponds to Klayluck, Chanbanchong, Pakdeewong, and Konpong (2013) which studied the model of teamwork competency development of educational personnel working in educational institutions, primary education service area offices, found that the training model consisted of six major structures: principles and rationale, course aims, course structure, course content and training activities, training process, and measuring and evaluation of training.

2. Students with special needs have a physical development, emotional-mental, social, and intellectual scores, overall, it was at a good level (μ=2.77, σ=0.57). After receiving the program, the students had an improvement score at a good level (μ=3.20, σ=0.52). After using HP, students had a higher overall improvement than before using HP equal to +0.43. This may be due to the fact that HP gives students better control over their body movements because they have been trained to sit on horseback. HP has also been used in the treatment of autistic children with motor control problems (Intharat, 2018). Sitting on a horse is like learning to walk on your own and it stimulates different muscles to move in rhythm. In addition, sitting on a horse requires sitting upright and moving according to the horse's gait, which develops a graceful personality (Diawkee, 2018). HP reduces distraction and increases the emotional stability of children (Saejung & Wiriyangkun, 2019).

HP has been tested with students with special needs in several areas with different contexts but got similar results. As a study by Siriratrekha (2009), it was found that 1) Sensory aspect, helping the muscles to work together more efficiently, 2) Concentration, supporting children to have a longer attention span, 3) Emotional regulation, learning the appropriate emotional response from those around them, 4) Social skills, learning how to live with animals, trainers, or other people, and 5) Psychologically, learning to be compassionate with animals through regular activities with horses. In addition, some centers or rehab facilities offer horse bathing for students or feed the horses which makes the students tender. While conducting the experiment, The Special Education Center is in cooperation with the 8th Cavalry Battalion, 7th Cavalry Regiment, 2nd Army

Region and Fort Suranari Hospital. The researchers followed the learning management plan prepared by using experimental time with the target group for 12 times, 2 days a week, 40 minutes a day from 9:00 a.m. - 11:00 a.m. The medical team of Fort Suranari Hospital screened and assessed the development of students with special needs. For this reason, the results of the study are reliable and under the highest safety control of professional professionals. What can be clearly seen is that all the students with special needs who took this HP development session showed improvement in all areas. After using HP, the students showed higher improvements than before using HP, in accordance with the hypothesis. It corresponds to a study of the Special Education Center, Educational District 7, Phitsanulok Province (2013), it was found that HP made students with special needs improve their concentration and body control. After riding, the balance and excretion of students with cerebral palsy were improved, reduced pain and joint problems (Office of the Health Promotion Fund, 2011). Riding consecutively will increase the strength of the breathing muscles for the students and can reduce scoliosis (Thawinchai, 2021). HP is a proven effective training technique (Rakkha, et al, 2014), will help develop three areas of social skills: 1) conversation skills, 2) social coexistence skills, and 3) basic behaviors such as making eye contact and asking for help. However, students should be provided with consistent and continuous horseback riding activities (Kwankijbavonkul & Hirunchalothorn, 2016). After participating in the HP activity, students were able to control their mood, concentration, and relationship with peers better than before participating in the activity with a statistical significance of .05 (Hasdee, 2016). Students have a better perception, adjust the mood appropriately, self-control, able to adapt to new environments and communicate well with others (Chanthapassa & Chaisriha, 2019), social motivation (Bass, Duchowny, & Llabre, 2009), massive muscular development (Park, 2014), and student's balance abilities (Biery & Kauffman, 1989; Kwon, Stefanone, & Moon, 2015; Pasha & Singh, 2015).

Limitations

The relatively short trial duration may affect the reliability of the findings. Special Education Center requires cooperation from third parties, in the event that outsiders are busy or inconvenient in conducting activities, this may affect the scheduled activity. Parents of some students with special needs lack confidence in their safety while conducting HP trials, causing parents to intervene during HP activities. Implementation of this program should take into account its suitability for the type of students with special needs and their age. If students continue to practice using this program, they will improve their balance. Further research should explore factors related to the treatment of students with special needs, such as animal type, nature of activity, number of training sessions, duration of training, age of the child, etc.

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