

Equine Therapy - Applications in the Recovery of Disabled Children

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Abstract

Introduction: *The recovery and social integration of children with psycho-motility disabilities is an important goal for the integration of Romania into the European Union regulations. Studies conducted in this area reveal that people, who practice therapy using the horse due to a recommendation by professionals, benefit from a much faster recovery and at a much higher level.*

Objectives: *Identification of results for adaptive areas due to participating in a therapy program with the help of the horse for children with psycho-motility disabilities.*

Methods: *A number of 26 children with psycho-motility disabilities shall take part in the study. They will participate in 20 sessions of treatment with the help of the horse over a period of 2 months. All participating children are aged 2 to 14. The diagnostics of children are: autism, ADHD, cerebral paralysis. All participants will be assessed at the beginning and at the end of the program. For assessment, the ABAS II assessment form shall be used. It is a multifunctional tool used to assess the overall skill level of everyday subjects necessary for the efficient adaptation in life and research.*

Results: *The results of the assessments are composite scores for skills areas in the General Adaptive, Conceptual, Social and Practical field. These scores are rated as average for each subject. The value of the average will determine how horse therapy using adaptive skills influences the uptake in the scored areas.*

Conclusion: *This research aims at demonstrating that therapy with the help of horses - hippotherapy is a method that produces positive effects on the acquisition of skills necessary to children with psycho-motility disabilities.*

Keywords: *hippotherapy, autism, ADHD, cerebral paralysis, therapy*

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I. Introduction

Lately, the need for recovery and integration in society of the disabled lead to the research and implementation of a great number of therapies which reach this objective. After the EU accession and the harmonization of the local regulations with the EU laws and regulations, our country has also benefited from access to international information. Thus, within projects or individually, scientific researcher's exchanges and trainings on supporting therapies for the disabled aiming at increasing the number of disabled children integrated in the school and social environments were possible. This is a benefit both for the society and the affected person and his/her family.

As Romanian specialists were increasingly open to acquiring new information for the rehabilitation of disabled children, it was possible for a newer therapy - besides the usual therapies - to emerge. In time, it has proven its efficiency, as underlined by the studies. This therapy, namely the Equine Therapy (ET) is applicable in all domains of human development.

History

The effects of equine therapy were observed and considered by scientists during World War I, when it has been noticed that mentally or physically impaired people had a faster recovery and with better results after being on horseback for long periods of time.

In modern times, hippotherapy was first used for treating poliomyelitis in Europe, after World War II. After a long period of time, it came back to the world's attention during the 1952 Helsinki Olympic Games, when Danish sportswoman Liz Hartel won a horse riding Olympic title although both her legs were paralyzed. Her performance supported the development of a therapy method. A few Norwegian physicians set up a horse riding-based recovery program for children with neuromotor impairment. It was used for the first time in the United States in 1960 and its popularity had been growing as people found out about the efficacy of this therapy.

After the 60s, the equine-assisted therapy has been recognized as alternative therapy method and it has been included in the German, Swiss, Austrian, English and Dutch medical system, and later on in the medical systems of other countries. It is important to mention that the American Hippotherapy Association was established in 1993, promoting both hippotherapy and the other forms of therapy using horses for the recovery of disabilities.

The Federation of Horses in Education and Therapy International, A.I.S.B.L., which was initially called The International Horse Federation for the

Disabled, was set up in 190. (American Hippotherapy Association, *Level I Course Manual*, 4-th Edition, 2013).

The importance of equine therapies in early intervention has already been proven through the recovery of a great number of children afflicted with growth disorders. What is very interesting to the specialists is the way the benefits obtained as a result of these therapies can be maintained as long as possible. In the case of children with developmental disorders, the therapies must take place for the entire duration of their growth, in order to produce effects in their adulthood.

Classification

According to the American Hippotherapy, equine therapy includes several domains: Equine-Assisted Therapy (EAT), Hippotherapy (HPOT), Equine-Facilitated Psychotherapy (EFP) and Equine-Assisted Activities (EAA). One can conclude that equestrian activities in terms of the disabled may be classified as follows:

1. Equine-Assisted Therapy (EAT) comprises all therapeutic activities involving a horse as therapy tool. This therapy includes activities both on horseback and on the ground, which the psychically or motor impaired can deploy for therapeutic goals, as well as the use of the impulse transmitted by the horse in order to achieve a therapeutic objective. This activity requires the presence of a psychotherapist with relevant expertise.

2. Hippotherapy (HT) is included in the larger category of equine therapies. The first information on the beginnings of this therapy goes back to 1930. Hippotherapy is the way specialists use the impulses transmitted by the horse to correct a deficient motor scheme or in order to shape a motor scheme and finally, in order to obtain various impulses with a view to stimulating developmental areas. This activity requires the presence of a kinesiotherapist or a psychotherapist with relevant expertise in hippotherapy.

3. Equine-Facilitated Psychotherapy (EFP) comprises the activities which use the horse as therapy tool for behavioral and emotional therapy. It requires the presence of a psychotherapist with relevant expertise.

4. Assisted Horse riding (AH) is the branch of equine activity which comprises all the equestrian activities deployed by the disabled with a competition aim. It requires a special equipment and the presence of a riding trainer with expertise in adapted horse riding. (American Hippotherapy Association, 2013).

Applications

Equine therapy may apply in all situations aiming at reaching a therapeutic goal whereby a person

with psychical or motor impairments may obtain a benefit in his/her recovery. Therefore, the diagnoses which may benefit from Equine Therapy include: *autism, ADHD, Down syndrome, other degenerative syndromes, brain paralyses, phobias, anxiety, depression, mental retardation, epilepsy* etc.

In each of these impairments, the therapeutic objective is to improve the quality of the subject's life by developing skill areas which would enable independence or better functioning. Thus, equine therapy aims at developing the skills necessary to the subject and adequate to his/her age, for a better functioning in the family, social and academic environment.

The human body is a dynamic system, made up of several sub-systems, which are connected. Thus, any modification to any of these sub-systems shall produce effects in other sub-systems as well. For example, walking is the result of the interaction between the sensorial, musculoskeletal, nervous, respiratory and other systems.

The sub-systems are internal and external. Some may have a higher influence on others, but no hierarchy has been established. Between the sub-systems there is a movement and an ongoing and mutual exchange of information. A change obtained in one of the sub-systems shall produce a continuous self-organization. The interaction and movement of a horse having a patient on its back, together with the interaction with all the internal and external sub-systems, influence the both the patient and the horse. All these changes in the system shall lead to a self-organization and shall change the way the system functions (American Hippotherapy Association, 2013).

Equine Therapy (ET) produces effects in the human body, as this therapy draws reactions in all human systems. Therefore, the following systems can be influenced by hippotherapy:

1) The motor system: the rhythmical and symmetrical impulses transmitted by the horse influence the stability of the spine, through the impulses transmitted by the nerves, whatever the position (sitting up, laying on the back or sideways). The rhythmical movement produces changes in the movement time of the patient. Consequently, the patient's movement pace can be influenced by increasing or decreasing the number of movements per minute.

2) Musculoskeletal: the movement on horseback influences the movement of the pelvis which implies the movement of the patient's spine in several planes: vertical, anteroposterior and sagittal. The movement of the horse produces a tridimensional movement on the patient's pelvis and spine. An

approximation of the impulse transmission force from the ground through the horse influences the impulse transmission force in the patient's joints. The fluctuation of the transmitted vibrations influences the stimulation of the spinal discs, which affects the bone system. The balance position leads to a skeletal alignment, including the head and the neck.

3) The nervous system: the sensorial inputs coming from the horse's movements stimulate the limbic system, especially the visual, proprioceptive, vestibular and olfactory centers, which are involved in the production of emotions. The sitting-up position influences the environment by activating the control postural mechanisms; in its turn, the environment influences the position (a child who always looks down shall not be influenced by the environment, as his/her visual field is narrow and limited, but a child with a raised posture shall have an enlarged perceptive field);

4) The respiratory system: the position of the trunk and the enhancement of a correct position of the trunk, in sitting-up or other position, shall improve the functioning of the diaphragm muscle and lungs. It enhances the rotation of the trunk through lateral flexion or extension movements, mobilizing the pelvis, the spine and the ribs. The rhythmic input changes the respiratory system. The continuous movement transmitted from the ground with a certain force enhances the strengthening of the diaphragm.

5) The circulatory system: the impulses coming from each horse step improve the oxygenation and circulatory function. The non-aerobic impact reduced by the muscular contraction for the postural control and oscillatory movement improves blood flow. The rhythmic activation without significant impact facilitates relaxation and results in a blood pressure drop.

6) The sensorial system: the horse movement produces high vestibular, proprioceptive, tactile and visual sensorial impulses in the context of a pleasant activity. The impulses can be graded and modified by the therapist according to the patient's needs.

7) Language: the postural control influences the verbal capacity. A good control of the head and trunk, with a correct and open position shall stimulate and improve the functioning of the oral, motor and respiratory mechanisms. The respiratory system highly influences the speech functions. Sustaining the sound for at least 5 minutes helps improve the correct pronunciation and influences the quality of speech. A normal muscular tonus is essential for correct speech.

8) The cognitive system: the multidimensional movement of the horse during

walking produces inputs in the same plane for the patient, with a slight delay. The movement of the horse can change the stimulation level according to the need. A slow movement shall produce a decrease of the patient's stimulation level, while an alert and continuous rhythm shall produce a cognitive overstimulation. (Shurtleff, T. L., Engsborg, J. R., 2010); Silkwood-Sherer, D., Warmbier, H., 2007).

To conclude, Equine Therapy influences speech and cognitive acquisitions by enhancing the following aspects:

- normalizes the stimulation level;
- normalizes the muscular and postural tonus;
- improves the respiratory function;
- improves focus;
- improves the organization of the body scheme;
- increases speech output and speech complexity;
- improves reaction times;
- improves language accuracy;
- enhances intonation and voice quality;
- improves speech-related skills;
- improves the oral-motor function.

If the movement of the horse can produce effects in all these developmental areas, knowing and acquiring the way these movement characteristics can be used as therapy tools explains the utility of this method in supporting the disabled.

II. Methods

The research was conducted between September 2014 and December 2015 in the Museum Complex of Natural Sciences Constanta, where equine-assisted therapy activity is deployed under the coordination of Drd. Anca Bîlbă, based on a protocol concluded between the Association for Supporting Therapies "Hipoterapia" and the Museum Complex of Natural Sciences Constanța.

26 children with psychomotor disabilities have been selected for the research. The study group comprised 14 children, who participated in 20 therapy sessions within a period of 2 months. The control group was made up of the other 12 children.

The participants were aged 2 to 14 years. All the participants were assessed at the beginning and at the end of the program.

The ABAS^{xv} II assessment form was used for

assessment. It is a multifunctional tool used for the global assessment of subjects in terms of daily adaptive skills necessary for the efficient functioning in the living environment.

III. Results

The results obtained following the assessment are composite scores for four adaptive domains (General Adaptive, Conceptual, Social and Practical) and for 9 skill areas (Communication, Community use, Functional Academics, Home Living, Health and Safety, Leisure, Self-care, Self-direction, Social Skills). Based on the scores, the mean values for each assessed subject was calculated. The mean value indicates the way the equine-assisted therapy influences adaptive skills assimilation in the 9 skill areas listed above.

Given the average age of the children under treatment and the fact that all participants have severe diagnosis which do not allow self-assessment, the parent form^{xvi} for children aged 0 to 5 and the parent form for children aged 5 to 21 were selected.

The researcher used this approach in order to ensure relevant results for the selected skill areas. The record forms were filled out by parents, after the initial fill-out training^{xvii}.

The form for groups aged 0 to 5 comprises the following skill areas: *communication, community use, functional academics, home living, health and safety, leisure, self-care, self-direction, social and motor*. In total, there are 10 development areas.

The form for children aged 5 to 21 comprises the following development areas: *communication, community use, functional academics, home living, health and safety, leisure, self-care, self-direction, social and work*.

For each subject taking part in the hippotherapy program, the sessions were structured depending on the diagnosis, the child's age and its state at the beginning of the therapy. Following the initial assessment, the adaptive areas with the highest deficit as well as the main development areas depending on the development age were established. Therefore, for

and Daniela Vercellino – Second edition – Bucharest, O.S. Romania, 2012.

^{xvi}Assessment forms – two of the five test forms were selected, i.e. the form for children aged 0 to 5 years, which refers to 9 skill areas and the form for children aged 5 to 21 years which refers to 10 skill areas, of which only 9 were selected, since the 10th area deals with working skills, which is not the case for the studied group, as none of the children has attained his majority.

^{xvii} Each form comprises questions in the developmental areas specific to the selected age group.

^{xv} ABS II Manual – Adaptive Behavior Assessment / Patti L. Harrison, Thomas Oakland; translated and adapted by Dragoș Iliescu

children with language acquisition deficit, therapy programs stimulating speech, including exercises focusing on training the inner muscles, the diaphragm and posture correction were structured.

For children with deficiencies in forming interpersonal relationships and establishing contact, the exercises were generally selected aiming to focusing children's attention through games including several partners, inducing proprioceptive impulses. For the children with motor deficiencies, the main objective was to correct their position, maintain the balance, coordination, alignment.

Depending on the set objective, the adequate horses for the session, as well as the adequate equipment for the child's age and diagnosis were selected. After the twenty sessions of therapy with the study group, according to the analysis of the results

were as follows: each subject recorded a scaled score in the following adaptive skills areas: Communication (COM), Community Use (CU), Functional Academics (FA), Home Living (HL), Health and Safety (HS), Leisure (LS), Self-care (SC), Self-direction (SD), Social Skills (SOC). From the scores obtained, the Initial Mean and the Final Mean were calculated for each skill area by adding up the scores for each skill area. The result was divided by 9, the number of scored skill areas. The results obtained following the assessments are listed below.

a) Study group

Table 1 shows the scores obtained, following the initial assessment, by the children in the study group, while table 2 shows the results of the final assessment, after the 20 equine therapy sessions.

	Com	CU	FA	HL	HS	LS	SC	SD	SOC	Initial Mean
S1	1	1	1	3	4	6	7	2	1	2,8
S2	9	12	4	3	2	7	7	3	6	5,8
S3	2	4	7	5	5	9	6	2	5	5
S4	1	1	1	1	1	1	1	1	1	1
S5	1	1	1	1	1	1	1	2	1	1,1
S6	4	1	1	12	2	7	11	2	2	4,6
S7	1	1	1	1	1	1	1	1	1	1
S8	1	1	1	1	1	1	1	1	1	1
S9	1	8	9	11	3	6	12	8	3	6,7
S10	1	1	1	1	1	1	1	1	1	1
S11	5	7	4	5	7	5	8	7	5	5,8
S12	1	3	1	13	7	8	7	8	8	6,2
S13	1	6	1	13	5	1	7	4	1	4,3
S14	9	5	3	1	7	12	4	5	10	6,2

Table 1. Scaled scores for the initial skill areas of the study group children

Source: data gathered from the filled-out forms

	Com	CU	FA	HL	HS	LS	SC	SD	SOC	Final mean
S1	2	3	1	4	5	6	4	3	1	3,2
S2	10	14	5	5	5	8	8	4	8	7,4
S3	5	6	9	6	8	10	8	6	6	7,1
S4	1	1	1	1	1	1	1	1	1	1
S5	5	7	6	13	10	11	9	11	6	8,6
S6	5	3	1	11	5	7	6	8	3	5,4
S7	1	1	1	1	1	1	1	1	1	1
S8	1	1	1	1	1	1	1	1	1	1
S9	9	11	12	9	5	5	12	5	4	8

S10	1	1	1	1	1	1	1	1	1	1
S11	8	9	6	7	8	10	9	9	7	8,1
S12	2	2	1	9	4	5	7	11	7	5,3
S13	1	4	8	15	10	4	9	6	3	6,6
S14	8	1	3	3	4	13	5	7	7	5,6

Table 2. Final scaled scores for the skill areas of the study group children

Source: data gathered from the filled-out forms

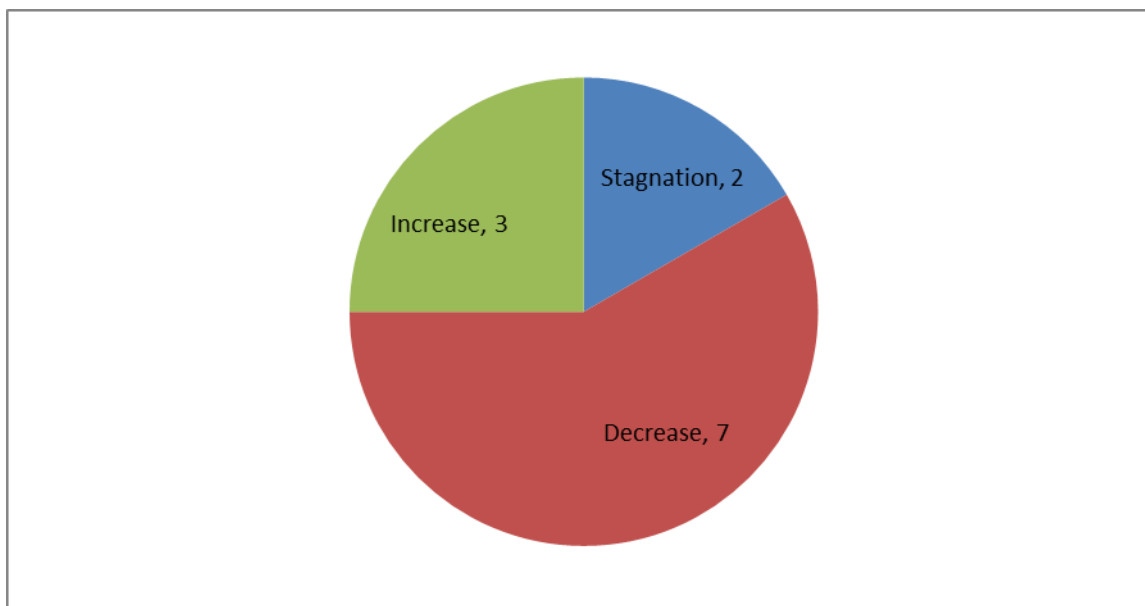


Figure 1 - Progress of subjects in the study group following the ET program for 2 months

Source: own calculations

b) Control group

Table 3 shows the results of the initial assessment, while table 4 includes the results of the

final assessment, although these children did not benefit from ET.

	COM	CU	FA	HL	HS	LS	SC	SD	SOC	Initial mean
S1	1	1	1	1	1	1	1	1	1	1
S2	1	5	1	6	4	3	3	2	1	2,8
S3	5	9	10	6	8	10	7	7	2	7,1
S4	8	6	9	7	6	9	6	9	4	7,1
S5	1	1	1	1	1	1	1	1	1	1
S6	1	1	1	8	1	2	2	2	1	1,5
S7	1	1	11	5	1	1	1	4	3	3,1
S8	5	4	9	6	7	5	3	7	7	5,8
S9	1	1	1	1	7	5	1	1	1	2,1
S10	1	1	2	1	1	1	1	3	1	2,1
S11	4	13	8	10	7	8	10	9	3	8
S12	1	3	1	7	1	3	5	3	2	2,8

Table 3. Scaled scores for the initial skill areas of the control group children

Source: data gathered from the filled-out forms

	Com	CU	FA	HL	HS	LS	SC	SD	SOC	Final mean
S1	1	1	1	1	1	1	1	1	1	1
S2	1	1	1	1	1	5	1	2	1	1,5
S3	4	7	9	5	5	7	3	4	3	5,2
S4	7	7	9	9	5	8	8	7	3	7
S5	1	1	1	1	1	1	1	1	1	1
S6	1	1	1	6	9	3	1	5	1	3,1
S7	5	1	14	12	4	1	5	7	4	5,8
S8	6	2	3	7	7	7	8	7	8	6,1
S9	1	1	1	1	2	4	1	1	1	1,4
S10	1	1	1	1	1	1	1	1	2	1,1
S11	4	7	2	7	6	4	6	3	1	4,4
S12	1	1	1	2	1	1	1	1	1	1,1

Table 4. Final scaled scores for the skill areas of the control group children

Source: data gathered from the filled-out forms

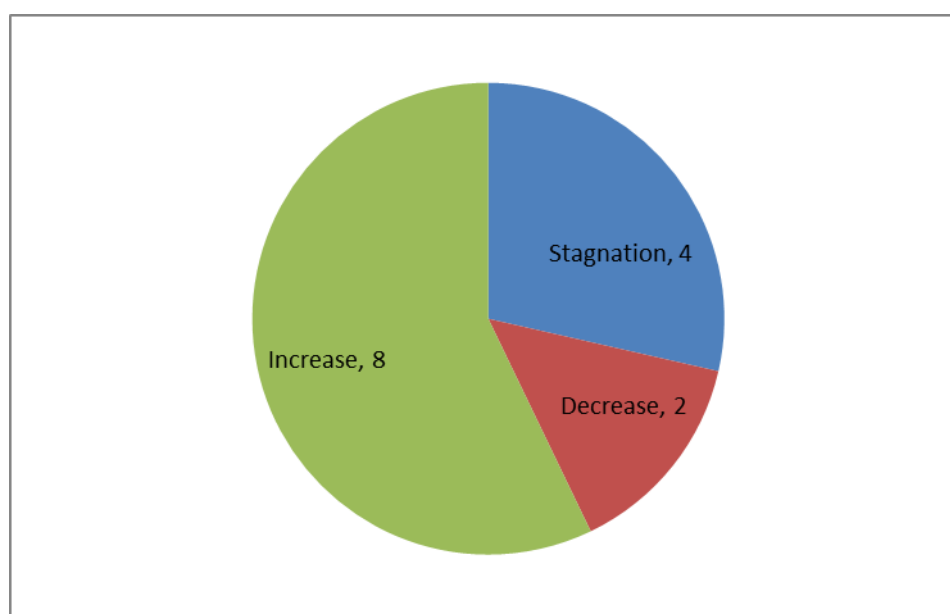


Figure 2 - Progress of subjects in the control group for a period of 2 months

Source: own calculations

Argument

As seen in **figure 1**, following the Equine Therapy sessions, children in the **study group** recorded the following results:

- **28,57%** of the subjects (4 children) taking part in the therapy program recorded a **stagnation** in terms of acquisition of adaptive skills. These children started the program with a very low level of adaptive skills (scaled score 1 for all the skill areas), with a very low cognitive level, which may impact the children's capacity of acquisition, at a general, social, practical and conceptual level;

- **14,28%** of the subjects (2 children) recorded

a decrease in terms of cognitive skills acquisitions;

- **57,14%** of the subjects (8 children) recorded a significant increase in terms of adaptive skills acquisitions in the scored areas.

Figure 2 shows the development of the **control group** children, who did not take part in Equine Therapy sessions during this period.

- **16,6%** of the subjects (2 children) recorded a **stagnation** in terms of adaptive skills acquisitions. It can be seen that in this case also, the children that recorded no change in terms of acquisitions were those with a very low initial score for their adaptive skills

(scaled score 1 for all the skill areas), with a very low cognitive level;

- **58,33%** of the subjects (7 children) recorded a **decrease** in terms of cognitive skills acquisitions;

- **25%** of the subjects (3 children) recorded a significant increase in terms of adaptive skills acquisitions in the scored areas.

IV. Conclusions

We can conclude that, following their participation in the Equine Therapy sessions for children with psycho-motor disabilities aged 2 to 14, a significant increase of the adaptive skills level was recorded in the following skill areas: Communication (Com), Community Use (CU), Functional Academics (FA), Home Living (HL), Health and Safety (HS), Leisure (LS), Self-care (SC), Self-direction (SD), Social (SOC), areas which reflect the children's capacity to adapt and integrate in the family, social and school environments.

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