

INFLUENCE ON FUNCTIONAL MOBILITY AND MOTIVATION OF HIPPO THERAPY FOR PEOPLE WITH SPECIAL NEEDS

Aida Grockienė, Gintarė Dovidaitienė, Sigita Kerzienė, Rolandas Stankevičius

*Department of Animal Breeding and Nutrition, Lithuanian University of Health Sciences
Tilžės 18, LT-47181 Kaunas, Lithuania*

*Corresponding author: Aida Grockiene
e-mail: aida.grockiene@lsmuni.lt; tel. +370 67162793*

Abstract. The purpose of this study was to investigate the influence on functional mobility and motivation of hippotherapy for people with special needs. Twelve people with disabilities (autism, Down's syndrome and cerebral palsy) were divided in two groups: adults with disabilities (T-1) and children with disabilities (T-2). They participated in 8 times (30 min each) hippotherapy sessions. Functional mobility was measured pre and post hippotherapy by Time Up and Go Test (TUG). The motivation was evaluated for every person during each hippotherapy session. Assessing the change of functional mobility before and after the hippotherapy sessions, it can be assumed that the hippotherapy activities have contributed to an improvement. The motivation results show that there is a statistically significant difference from the third hippotherapy session – the intension to participate in the hippotherapy sessions is increasing.

Keywords: Hippotherapy; horse; disability; autism; Down's syndrome; cerebral palsy.

Introduction. Hippotherapy (from ancient Greek word *hippos* – horse) is a therapeutic use of horses. Healing powers of horses have been mentioned in the works of Hippocrates thousands years ago.

The therapeutic effect of horse on the physical condition on disabled people is undoubted: it strengthens muscles, improves balance and coordination, as the rider has to balance sitting on a horse. Riding may improve gait, increase head and trunk control, all the muscle groups of the patient function while being on a horse (Wollenweber et al., 2016). The principle of hippotherapy is that the horse's gait provides a precise, smooth, rhythmic, and repetitive pattern of movement to the rider that is similar to the mechanics of human gait. Muscle spasticity decreases and tone reduction is facilitated because of warmth of the horse's body. Three-dimensional horse movements force the rider to stretch postural muscles, which is hard to get by other forms of physiotherapy (Straubergaitė, 2008).

During hippotherapy the patient experiences human walking movements as horse movement is very similar to the human pelvis during walking. A variety of horse riding speed is one of the essential principles of the hippotherapy procedure (Crossman et al., 2015).

Increasingly, horse therapy is used for people with psychological problems or mental disabilities. During therapeutic exercises with a horse, a person can better understand himself, deepen the horse and his own behavior, the current biopsychosocial state. Research shows that horses are like an impulse for social intervention, facilitating the work of the therapist, and interacting with each other. The presence of a horse awakens people's confidence, self-assurance, self-esteem and reduces stress (Parish-Plass, 2008). Sokolof (2010) delves the field where equine assisted therapy is used for people who have experienced abuse (psychological, physical and/or sexual). Such people need all kind of biopsychosocial support. When communicating with a horse, they can relax and overcome their fears. Positive

connection with the horse encourages the person to open, gives the courage to speak, relax, calm and comfort. Experienced fears are gradually encouraged to turn into a sense of security and self-control, self-esteem to self-confidence, the lack of emotional connection to the search for a new relationship, from trauma to recovery. Riding and communicating with a horse helps to remove or reduce stress. The activities with the horse require constant attention, concentration, while stimulating the development of memory, activating mental processes (Chavatte-Palmer et al., 2017).

The aim of this study was to assess the influence of hippotherapy – the aim of the paper is to investigate the influence on functional mobility and motivation of hippotherapy for people with special needs.

Material and methods

The study was divided into several stages: hippotherapy sessions took place from 1st May 2017 to September 15th in X stud in Jonava district. Hippotherapy sessions took place with the participation of a team of specialists. The team consisted of: a participant with a disability; therapist – physiotherapist; horse expert; sidewalker; a horse. Hippotherapy required safety precautions, wearing a helmet on the rider and running boots. Sessions consisted of 30 minutes of hippotherapy for each participant individually, 8 lessons in total. Another stage of the study was the evaluation of the subjects by test and evaluation of motivation. Before and after the hippotherapy sessions functional mobility was assessed and measured by Time Up and Go Test (TUG). The diagnosis of the disease was taken into account when selecting the participants (three disabilities were selected: autism, Down's syndrome (selected people did not have spinal pathologies that could influence contraindications for hippotherapy) and cerebral palsy). The total study involved 12 people: 4 having autism spectrum disorders, 5 Down's syndrome and 3 cerebral palsy. Two institutions were selected for the study: the Adult Center for the

Disabled in Kaunas and the Special School for Children with Disabilities in Kaunas. Test groups were divided by age - one group were six children with disabilities under 21 years of age (T-2), the other - six adults 21 years and more with disabilities (T-1).

Gross motor functions were measured by TUG test (Time Up and Go). This test is like a tool for quick, meaningful and practical assessment of functional mobility and balance for adults and children (Dhote et al., 2012). Williams et al., (2005) improved and adapted the test for the people with disabilities, since the test was originally designed to assess the skills of elderly people with reduced mobility. Description: test begins when a child or adult is seated on a chair adjusted to his height. The legs should be lowered to the ground, bending the clubs and knees at a 90 degree angle. Then the distance of 3 meters from the chair is highlighted. The instructions are explicitly and without hurry to the subjects, they must wear their normal footwear, they can use auxiliary measures for walking, but not with the help of another person. Investigators are asked to stand up, go to a marked distance, turn around and return to the chair again to sit down. Timing is measured using the stopwatch. The test was performed before and after the hippotherapy cycle for each person individually. Test was carried out at school's gym. The motivation was evaluated during each hippotherapy session and it's assessment used a 5-point scale system: 1 point - the participant does not want to enter the class, resists; 2 points - the participant does not wish to come to the session, but does not express disapproval; 3 points - the participant reflects a desire to come to the session, but the activities involved passively; 4 points - the participant shows the desire to enter the classroom, actively participates in the activities; 5 points - the participant waits for the classes, is happy with them, actively participates in the activities.

The experiment was carried out complying with the Law of the Republic of Lithuania on animal care, housing

and use No. XI-2271 of 03-10-2012, also with the amended Order of State Food and Veterinary Service on Approval for requirements for housing, care and use of animals for experimental and other scientific research (No. B1-872 of 24-09-2015).

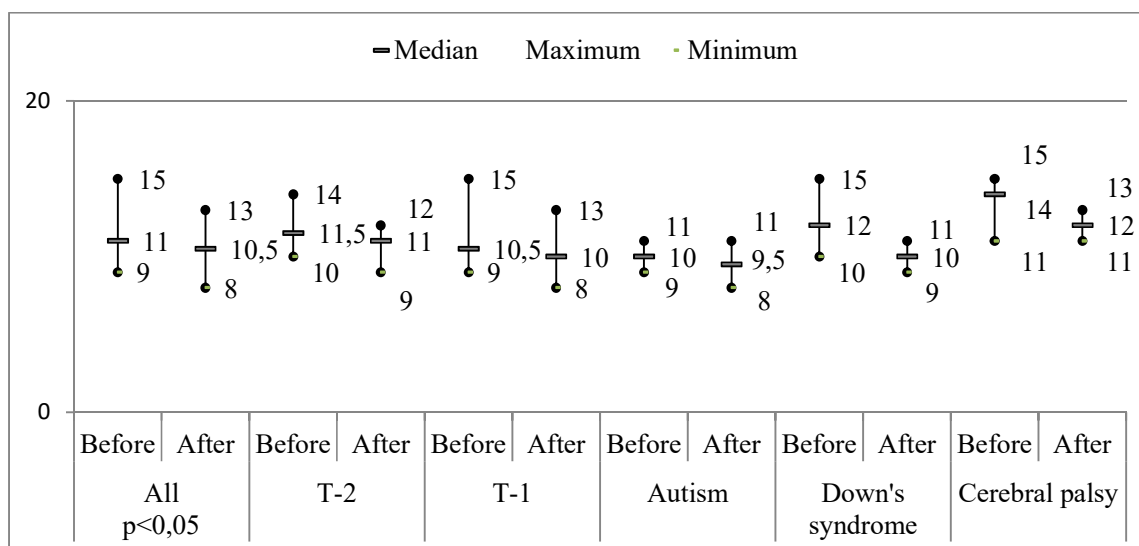
Statistical analysis

The statistical analysis of the data was performed by the statistical program SPSS Statistics 25. After checking the normal distribution of the data, the Kolmogorov-Smirnov test showed that the investigated symptoms normally distributed, so descriptive statistics (mean, standard deviation and bias) were calculated for normal distribution data. Signs of averages were compared before and after the Student test-dependent sampling. As the samples tested were small, a nonparametric analysis was acceptable. Additionally, the median, the lowest and the highest values were given. The results were considered statistically significant if $p < 0.05$.

Results and Discussion

The data from the TUG test is presented in Table 1, which shows that the shortest duration of the test for all subjects before the hippotherapy sessions was 9 s and the maximum duration was 15 s. Results of children and adults at the beginning of the test slightly differed. The shortest time in T - 2 group was 10 s, and in T - 1 group 9 s, the longest time in T - 2 group was 14 s and T - 1 group 15 s. Data after-hippotherapy sessions show that the time of all subjects improved during the TUG test. The average decreased from 11 s to 10.5 s, the shortest time during the test was 8 s, and the longest - 13 s. The TUG indices of all subjects changed statistically significantly ($p < 0.05$), comparing the test results before and after the hippotherapy sessions. There were no statistically reliable results between individual diagnoses, but the average of all the results improved: the average of people with autism - both in children and adults - improved by 0.5 s, dawn syndrome and cerebral palsy patients - by 2 s.

Table 1. Dynamics of Time Up and Go Test Data of the children and adults with disabilities before hippotherapy and after



* $P < 0.05$, T-1 adults with disabilities, T-2 children with disabilities

In the motivation assessment, the data distributions (each time) of the Mann-Whitney-Wilcoxon test were compared. The results show that there is a statistically significant difference from the third time – the intension to participate in the hippotherapy sessions is increasing. The horses are very non-aggressive and social, they are happy to communicate with those who are friendly, which is motivation for people who want to come closer and ride a

horse. The connection between the horse and the human gives the motivation to be interested in the environment, to communicate and to improve (Raskind et al., 2006). Gradually, after learning how to control a horse, self-confidence and trust in others increase. Also the autonomy and sense of responsibility of people with disabilities increases, patience develops (Šapurova et al., 2013).

Table 2. Assessment of Motivation to participate in hippotherapy sessions

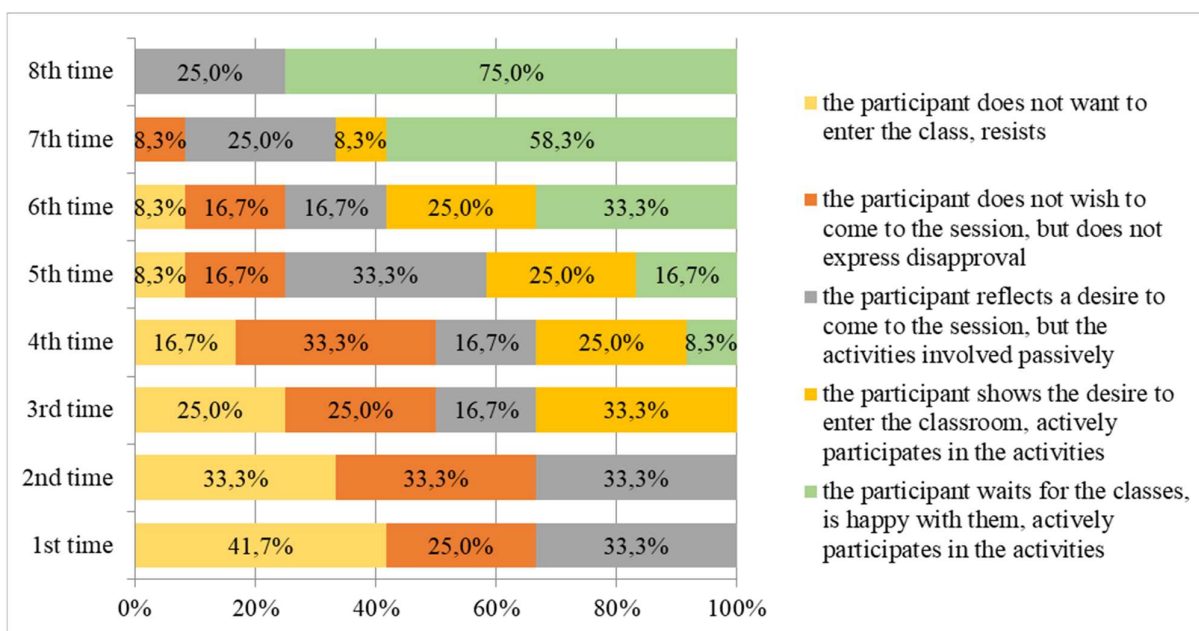
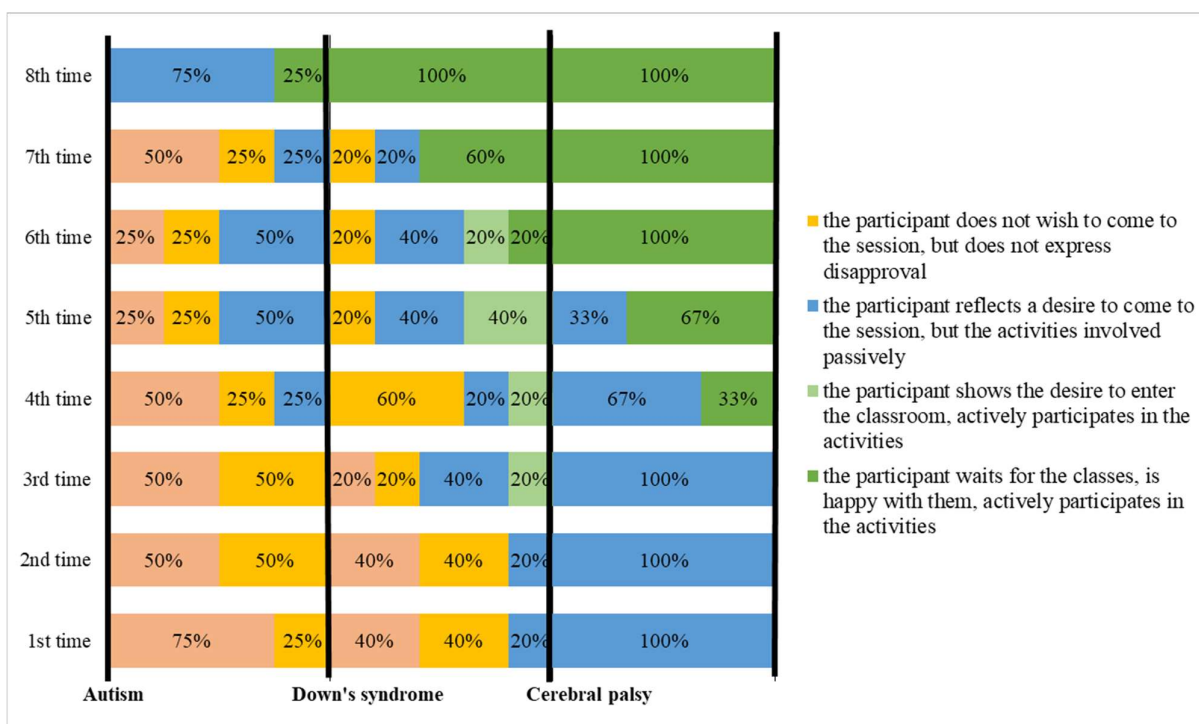


Table 3. Assessment of Motivation to participate in hippotherapy sessions by disabilities



In the picture of motivation assessment (Table 2) we can see how the data of both groups are distributed. There were no changes up to 4th hippotherapy session in the adult group (T - 1), and in the group of children (T - 2) motivation changes were noticed already during the second session. It can be assumed that this is due to the fact that children are more susceptible to innovation. Comparing the beginning of the sessions to the end, there are significant motivational differences in both groups. During the first lessons none of the participants enjoyed or actively participated in the activities but at the end of the course (8th time) such participants were more than half (66.7% in group T-1 and 83.3% in group T-2).

Paying attention to the changes in motivation according to the diagnosis of disability (Table 3), it is seen that distributions are unevenly distributed. Looking at the test data we can see that the hardest part was to work with autism spectrum disorder persons from the first to the seventh time. It is scientifically proven that work with autistic people is very complicated due to the fact that they do not realize the time and hard to overcome the fear of change and innovation. Therefore, improvements in any therapy can be expected for a long time (Marcus, 2012). The greatest desire and motivation showed people with cerebral palsy, they actively participated in therapeutic exercises, awaited them very much. This is perfectly illustrated by the data in Table 3. Motivation assessment and results of physical test show that hippotherapy is one of the implement when the horse helps to heal not only the physical body, but also spiritual experiences, increases the motivation of the child to engage in daily activities, which also facilitates the daily routine of the whole family.

Conclusion

Assessing the change of functional mobility before and after the hippotherapy sessions, it can be assumed that the hippotherapy activities have contributed to an improvement, although marginally. However, longer research is needed.

In assessing the motivation of people during each session, the results were evident and each time the motivation was increasing, disabled people were more and more willing to participate in the classes. This shows that the horse is a great motivator that can engage people with disabilities in various activities (horse riding, horse dressing, combing, feeding, learning different things on horseback riding).

References

1. Crossman G.K., Walsh R.E. The relationship between the government and the horse industry: a comparison of England, Sweden and the Netherlands EAAP Scientific Series: 136 - Pages: 145 – 156 Published Online: December 17, 2015.
2. Dhote SN, Khatri PA, Ganvir SS. Reliability of "Modified timed up and go" test in children with cerebral palsy. *J Pediatr Neurosci*. 2012; 96-100.
3. Marcus AD. Complementary Medicine in Cancer Care: Adding a Therapy Dog to the Team. *Current Pain and*

Headache Reports. 2012 Aug; 16(4): p. 289-291.

4. Parish-Plass N. Animal-assisted therapy with children suffering from insecure attachment due to abuse and neglect: A method to lower the risk of intergenerational transmission of abuse. *Clinical Child Psychology and Psychiatry*, 2008

5. Pascale Chavatte-Palmer, Pauline Peugnet, and Morgane Robles Developmental programming in equine species: relevance for the horse industry Published online July 6, 2017

6. Raskind, M. H., Margalit, M., Higgins, E. L. (2006). „My LD“: Children’s voices on the internet. *Learning Disability Quarterly* 29: 253–268.

7. Šapurova V., Lesinskienė S., Grikinienė J. Hipoterapijos taikymo galimybės kompleksiniame vaikų sveikatos gerinime. VU, Neurologijos seminarai 2013; 17(56): 128–131

8. Sokolof M. Treating Abuse with the Help of a Horse. Society of Counseling Psychology, American Psychological Association. Section 13 of Division 17, 2010; 99-11.

9. Straubergaitė L. Terapinis jojimas reabilitacijoje ir rekreacijoje. Šiauliai: Šiaulių kolegijos leidybos centras, 2008. 9 – 24 p.

10. Vanessa Wollenweber, Marion Drache , Sabine Schickendantz, Andreas Gerber-Grote , Petra Schiller, Dieter Pohlau. Study of the effectiveness of hippotherapy on the symptoms of multiple sclerosis e Outline of a randomised controlled multicentre study (MS-HIPPO). 2016.

11. Williams EN, Carroll SG, Reddihough DS, Phillips BA, Galea MP. Investigation of the timed ‘up & go’ test in children. *Dev Med Child Neurol* 2005; 47: 518–24.

Received 18 May 2018

Accepted 5 June 2018