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ASSESSMENT OF THE INFLUENCE OF HYPOTHERAPY ON PSYCHOSOCIAL DEVELOPMENT OF CHILDREN UNTIL 18 YEARS OLD

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ABSTRACT

Introduction. Hippotherapy is one of the most popular forms of zootherapy. The ability to provide a disabled person with a close contact with a horse has a strong impact on the emotional, cognitive, social and physical spheres. The aim of the study was to assess the impact of hippotherapy on psychosocial development of children up to the age of 18.

Material and methods. The studied group consisted of children and adolescents aged 4-18. The study involved 100 people, and the studied group was divided into two groups: intellectually disabled (n=59) and physically disabled (n=41). Additionally, in order to study the effect of the length of therapy attendance in relation to the achieved effects, the studied group was divided into 3 subgroups depending on the duration of therapy attendance (T1-0-2

years, T2-3-4 years, T3-5-10 years). The research tool was an original questionnaire addressed to parents and carers of disabled children.

Results. During the study a significant improvement in the motor sphere was achieved, it was mainly an improvement of balance, posture and muscular strength. In the psychic sphere, aspects such as communication skills, speech development, motivation and family life improved.

Conclusion: Hippotherapy has a positive effect on the psychosocial development of children, taking into account both the motoric and mental spheres.

Key words: hippotherapy, disabilities; rehabilitation, physiotherapy, zootherapy, animal-assisted therapy.

INTRODUCTION

The World Health Organization (WHO) defines rehabilitation as the use of all means to reduce the impact of disability and disabling states and by creating conditions that enable people with disabilities to achieve an optimal level of social integration. Nowadays animal-assisted therapy (zootherapy) plays an important role in the rehabilitation process as an adjunct method. It is well known that communing with animals is very important for every human being, especially for the ill and disabled. The possibility of surrounding the animals with care, cuddling, stroking, provides a lot of stimuli positively affecting both the mental and motor sphere of patients. Through the touch the endocrine system is stimulated and the hormones of happiness are released, which consequently relieves pain and improves the patient's well-being. What is more, there is also a reduction in the release of cortisol and noradrenaline - hormones secreted by the body under stress – which, in turn, causes a reduction in the level of stress and additionally stimulates the patient's immune system. Animal-assisted therapy is addressed to people with disorders and deficits in the psychomotor sphere, and above all to children with Down's syndrome, with cerebral palsy, autism, limb paralysis, muscular dystrophy, attention deficit disorder (ADHD), and people who are delayed in their intellectual and motor development and blind. [9].

Currently, one of the most dynamically developing types of therapy with animals is hippotherapy. Polish Hippotherapy Canons define hippotherapy as a targeted therapeutic action aimed at improving human functioning in the emotional, cognitive, social and physical spheres. In the therapeutic process an integral part for this type of therapy is a well-prepared and trained horse. [2,8,12]

The first mention of the positive healing qualities of horses dates back to antiquity, where Hippocrates recognized that horse riding stimulates all functions of the body, and then Socrates concluded that horse-riding stimulates not only the body, but above all the senses [21, 22]. The phrase "therapy with the participation of animals" was used the first time by American psychiatrist Boris Levinson in 1964. In the 1970s, clinical trials were intensified to demonstrate the positive impact of animals, mainly horses, on improving the functioning of patients in the mental and physical spheres. In Poland, hippotherapy was recognized as a rehabilitation method only in 1988. [5].

METHODOLOGY OF TREATMENT

In the methodology of hippotherapeutic treatment the most important is the principle of individual selection of exercises. During the rehabilitation session it is important to adapt the course of therapy to the skills and current physical and intellectual fitness of the child taking part in the classes. The therapist's task is to present the exercises in a simple and understandable way. If the situation requires it, the hippotherapist should lead the child's movement himself showing the correct exercise and thus coding the correct movement pattern [22]. In the hippotherapeutic process, it is important to accurately assess the physical condition of the child. In the case of self-moving people, the exercises are performed sitting on the back of a horse, while those who are not able to sit alone lie on the trunk of the horse or sit with the hippotherapist on the back. Depending on the physical and intellectual state of the child, the therapy begins with contact with the horse from the ground. Being asked for the indication of particular parts of the animal's body such as the nose, ears, nostrils, then the belly and limbs, smoothly going to the tail, the child already learns the outline of the animal's body structure, which at a later stage will be discovered from a sitting position on a horse. It is important that we proceed slowly to the next more complex exercises and requiring greater balance, coordination and sense of the position of one's body in space and only when previous exercises of easier difficulty are already mastered by the child [19].

During the process of improvement, it is very important to focus on the major disorders of the individual and on this basis, choose the appropriate range of exercises such as equivalent exercises, developing coordination, proprioception, special orientation, and those that aim to increase the awareness of particular parts of the body such as knees, torso or hips. All the above exercises at the same time strengthen individual muscles leading to the appropriate and normalized tension. The next therapy sessions should start with the repetition of the exercises already known to the child, then move on to new and more complex exercises. Each exercise must be repeated many times until the child acquires a physical habit and should be exercised in a free and physically correct manner in various forms and changing conditions. In order to arouse interest and thus full involvement of the child, the exercises should be performed in the form of fun [24].

Therapeutic methods used during hippotherapy

In hippotherapy, we can distinguish four types of activities during a therapeutic session. It should be known that individual forms are not isolated but they complement and permeate each other during therapy [19].

1. Physiotherapy on a horse- a person taking part in the therapy succumbs to the swinging movement of the animal, additionally performing gymnastic exercises on the horse's back [1, 17].
2. Contact therapy with the horse – IT is used when there are contraindications for horse physiotherapy. During this kind of therapy mainly the contact of the person with the animal is used (feeding, stroking) which creates a therapeutic situation. During such sessions the person acquires self-confidence and, above all, improves communicativeness [11, 17].
3. Psycho pedagogical horse riding - the main task of this form of therapy is to influence the intellectual, cognitive, emotional and physical spheres. The therapist focuses mainly on educational and pedagogical activities, sometimes also introducing elements of psychotherapy. Classes should be conducted in contact with a psychologist and pedagogue [22].
4. Horse riding for disabled people is a form directly related to hippotherapy. The main advantage of continuing hippotherapy in the form of horse riding is the mobilization

of disabled people to physical activity, spending time in nature and constant contact with the animal and other participants which improves interpersonal communication [17, 19].

Spheres of the interaction of hippotherapy

The interaction of hippotherapy can be divided into two main areas - motor and mental sphere of a man. The term "motoric" covers all human behavior, activities and needs, that is all aspects of movement and changes in position in the space which are a consequence of changes in the position of the body or its individual elements [4, 13]. In the development of the motor sphere of man, the main advantage of hippotherapy is the horse's slowest movement, that is a walk. It has been proven that in one minute the horse performs the same number of steps as a man during a leisurely walk. During the tour the pelvis of the patient sitting passively (who mounted appropriately) on the back of the horse is put in a three-dimensional motion thus imitating the correct human walking pattern [5]. Moreover, hippotherapy based on the improvement of the motor and physical spheres, in addition to correct gait pattern leads to many positives such as: normalization of muscle tension, improvement of coordination, balance and improvement of proprioception [8, 14].

Therapy with the participation of a horse not only affects the physical sphere but above all it has great effects regarding the mental sphere [5]. The main condition for a positive effect on the psyche of a person taking part in therapy is establishing a kind of partner relationship with the animal. Classes preceded by contact in the form of cleaning, stroking and feeding develop self-confidence and eliminate fears. During these first activities there is already an impact on the emotions and motivation by increasing the self-esteem and a significant reduction in various types of emotional disorders [8]. The observation shows that a child taking part in hippotherapy willingly performs commands and properly selected exercises in comparison with other forms of rehabilitation carried out, for example, in an exercise room. This is a very important aspect because a child who is fully involved and motivated to participate can be expected to receive visible treatment progress much faster. In addition, it is well known that the contact of a child with an animal and nature contributes to the silencing and neutralization of neurotic, hyperactive and aggressive reactions. We then observe increased communication of the child, facilitation in establishing new interpersonal contacts and a great openness to new tasks in everyday life [11, 18]. Through the child's

reception of many sensory, auditory and visual stimuli, hippotherapy also influences the cognitive sphere of the person taking active part in the therapy. It develops deep sensibility, significantly improves the awareness of the position of the body in space, stimulates memory, thinking, focusing and speech. Staying and working with the horse allows to observe non-verbal messages. Many disabled people have difficulty in establishing contacts with their peers, usually caused by their inability to express their own feelings. Thanks to contact with the horse, mutual acceptance of both individuals and the creation of a safe emotional bond, the functioning of the social sphere of a disabled person is improved at a later stage [12].

Indications and contraindications for hippotherapy

Indications and contraindications for participation in hippotherapy classes are strictly defined and developed by the Canons of polish hippotherapy and the Polish Hippotherapeutic Society (PTHip). The indications were divided into three groups, the first of which includes neurological syndromes in children, such as: brain palsy, children after craniocerebral injuries, children with muscle dysfunction (over 3 points on the Lovett scale), children with vision problems - blind and partially sighted, mental illness and psychological disorders. The second group are orthopedic syndromes, i.e. various types of developmental defects of the lower and upper limbs, amputations, postural defects that require correction and I grade scoliosis according to Cobb. The last group includes Down's syndrome and spinal cord hernia [15]. The main indications for participation in hippotherapy classes for adults are: multiple sclerosis (MS), states after stroke, various addictions and social pathologies. The Polish Hypotherapeutic Society divides contraindications into two groups: absolute contraindications, i.e. sensitization to animal fur, open wounds that are difficult to heal, fear of the animal, ophthalmologic disorders, aggravation and exacerbation of neurological diseases, inability to control the position of the head and general poor health with increased body temperature. Relative contraindications include: epilepsy, severe mental retardation, dislocations in the hip joints and permanent bone deformation [8, 15].

Objective of the thesis

The purpose of this thesis was to assess the impact of hippotherapy on psychosocial development of children up to 18 years of age. Specific objectives were to determine which elements of the motor and mental sphere achieved significant improvement, to examine the

correlation of the effects of hippotherapy with respect to the period of its application and the type of disability, as well as to determine the results of the discussed therapy in the context of improving the quality of family life.

MATERIAL AND RESEARCH METHODS

The research was carried out from September 2018 to March 2019 in four equestrian centers of the West Pomeranian Voivodship, conducting activities in the field of hippotherapy. The studied group consisted of children and adolescents aged 4-18 with intellectual or motor disability participating in hippotherapy classes. The study involved 100 people, 54 girls and 46 boys. A diagnostic survey was used as the research method. The research tool was a questionnaire addressed to parents and guardians, containing 26 questions - 16 questions of the relevant closed type (single and multiple choice), 4 questions about the studied population and 6 supplementary questions related to the simultaneous participation of the surveyed patients in other forms of therapy, a source of financing of classes, determinants of the choice of the discussed form of therapy.

The collected data was subjected to statistical analysis using the mean value, standard deviation (σ) and Chi square test (X^2). The level of significance was assumed at the level of $p < 0.05$.

RESULTS

The studied group was diverse in terms of age, gender, period of participation in hippotherapy classes as well as the type of disability. The average age of the respondents was 11.4 years old with a standard deviation of $\sigma = 3.56$. The average period of participation in hippotherapy was 2.7 years ($\sigma = 1.81$). For research purposes, the studied group was divided into two subgroups according to the criterion of the disorder - patients with motor disability - G1 ($n = 41$) and intellectual G2 - ($n = 59$) (Chart 1), and three subgroups - according to the period of participation in classes hippotherapy (T1-0 ÷ 2 years, T2-3 ÷ 4 years, T3 -5 ÷ 10 years) (Chart 2).

Chart 1. Division of the tested group according to disability

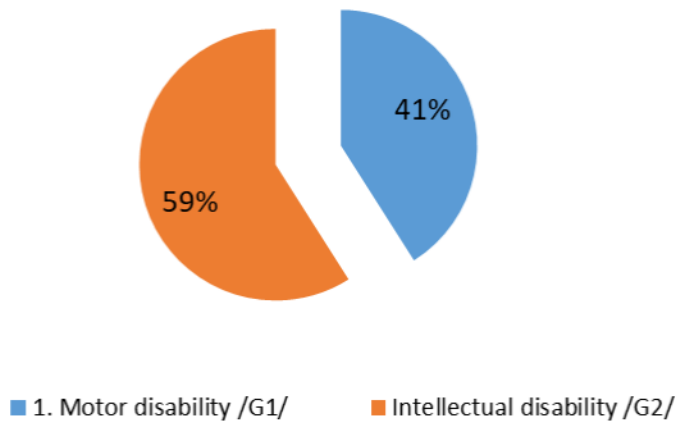
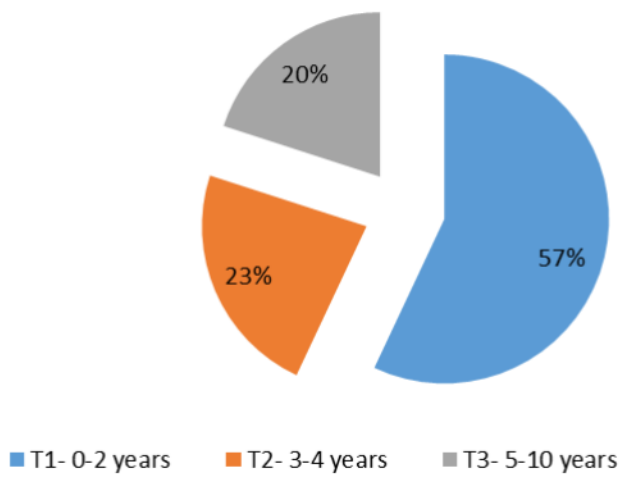
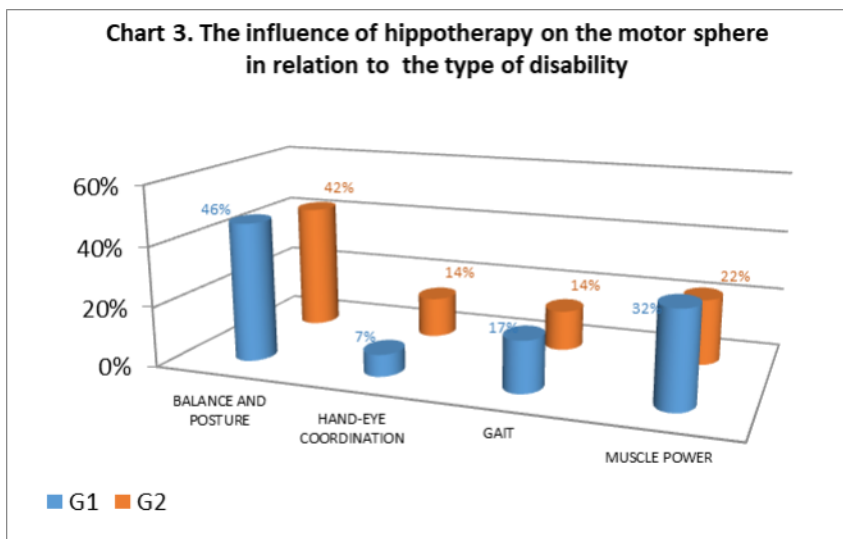


Chart 2. Division of the studied group according to the period of participation in hippotherapy





In all of the studied motor spheres, positive effects of hippotherapy were observed (Chart 3). The greatest progress was achieved in the area of improvement of balance and correct posture - 46% of carers of children with physical disabilities and 42% of carers of children with intellectual disabilities indicated this area as the one in which there was a visible improvement in the condition of their charges. Significant progress was also achieved in the field of muscle strength and improvement of muscle tone. A positive effect was found in 13 patients with motor disability (32%) and 13 patients with intellectual disability (22%). In seven cases of motor disability (17%) and in eight patients with intellectual disability (14%), the gait improved. The smallest effects were noted in the sphere of hand-eye coordination. Statistical analysis did not show the relationship between the type of disability and the effects of hippotherapy in particular areas of the motor sphere. The significance level of $p > 0.05$ was obtained in all four studied levels.

Analyzing the above areas of the motor sphere in relation to the length of the hippotherapy period, it was found that the positive effects of the discussed therapy increase systematically with the extension of the length of its period (Chart 4). There was a significant relationship between the duration of hippotherapy and the improvement of balance - the correct posture ($p = 0.037$). In the other areas of the motor sphere, there was no relationship between the effects of hippotherapy with regard to its length ($p > 0.05$).

Chart 4. The influence of hippotherapy on the motor sphere in relation to the period of therapy

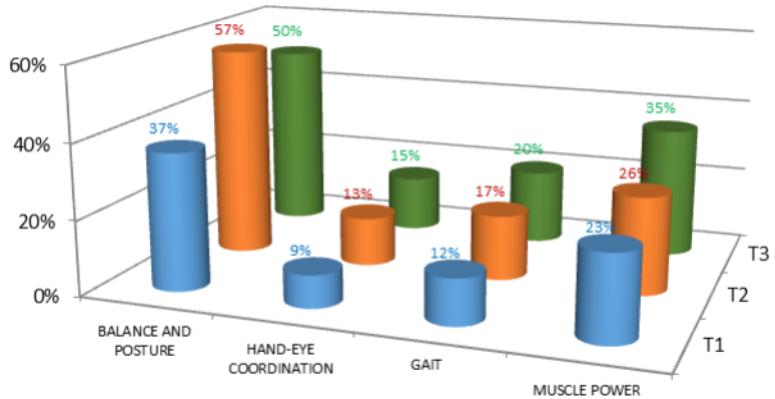


Chart 5. The influence of hippotherapy on the psychic sphere in relation to the type of disability

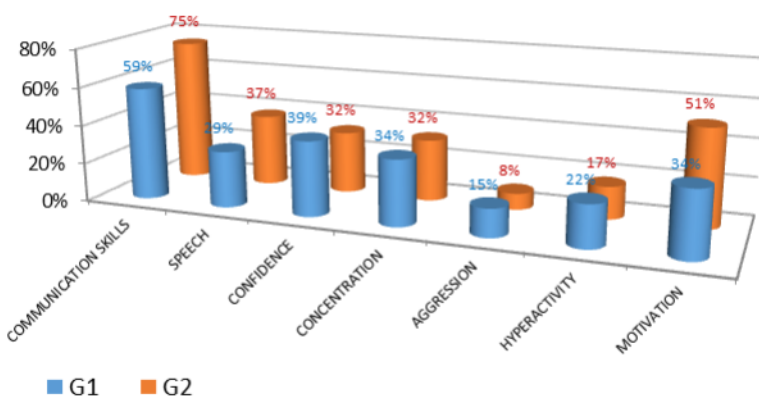
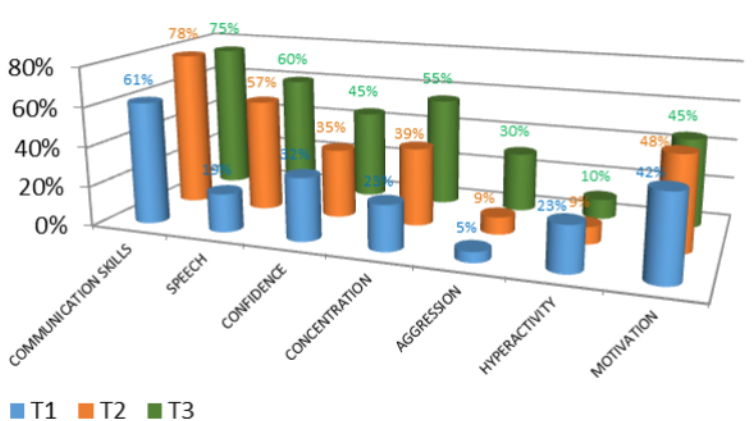
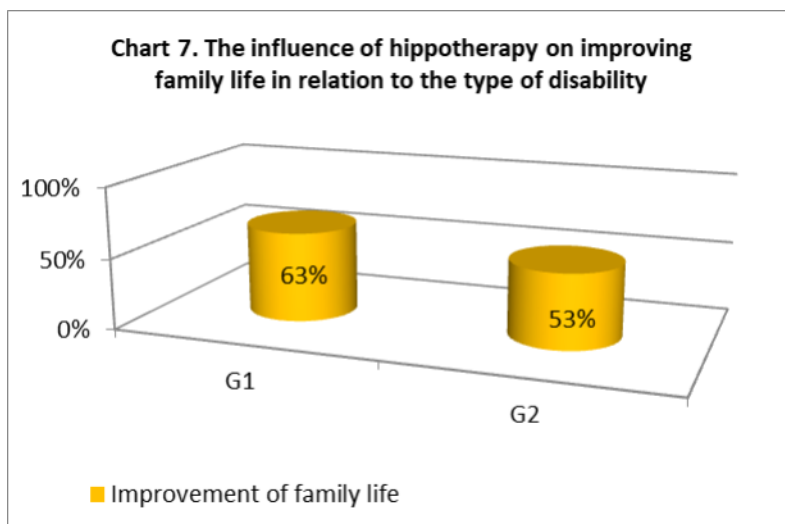


Chart 6. The influence of hippotherapy on the psychic sphere in relation to the period of therapy

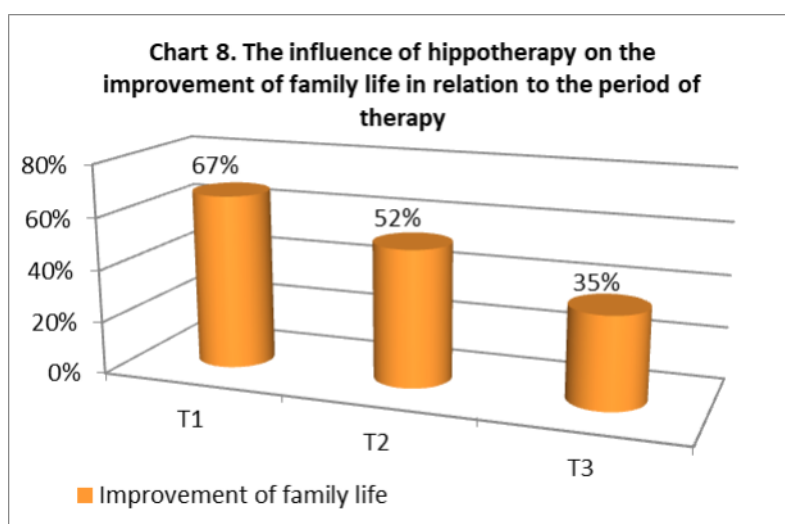


The research shows that thanks to hippotherapy there is an improvement in many areas of the mental sphere of patients, both with physical and intellectual disability (Chart 5). The largest increase in positive effects was noted in the area of improving communication skills. Progress was observed in 24 cases (59%) in patients with motor disability and in 44 patients (75%) with intellectual disability. Statistical analysis has shown that hippotherapy classes have a greater positive impact on patients with intellectual disabilities. Dependencies are statistically significant: $p = 0.015$. An analogous relationship was found in the case of the study of the influence of hippotherapy on the speech development of the examined patients and the increase in their motivation to perform new tasks. 37% of carers of children with intellectual disability and 29% of carers of patients with motor impairment observed an improvement in speech in their charges. In 30 people with intellectual disabilities (51%) as well as in 14 patients with motor impairment (34%), hippotherapy had a positive impact on their motivation. The statistical analysis shows that in the above-mentioned areas of the psychological sphere better results were obtained among patients with intellectual disability, and the observed relationships are statistically significant - the level of significance $p = 0.046$ and $p = 0.016$, respectively. In the remaining areas of the psychic sphere, despite the observed improvement in all subjects, no statistically significant dependencies were found. It can be considered that the level of improvement in such areas as increasing self-confidence, improving concentration, reducing aggression and hyperactivity is not dependent on the type of disability. Analyzing the effects of hippotherapy on the patient's psychological sphere in relation to the duration of therapy, it was found that in almost all examined levels improvement in patients' condition was in a positive correlation with the length of participation in the therapy (Chart 6).

In the first analyzed period (0-2 years) the greatest progress was achieved in such areas as improving communication skills (61% of carers observed positive effects), increased motivation (42%), increase in self-confidence (32%). In the following periods of therapy, a further increase in positive effects was observed in the above-mentioned areas, however, based on a statistical analysis, it was found that these relationships are not statistically significant ($p > 0.05$). The close relationship between the effects of hippotherapy and the length of its duration occurred in cases of improved concentration ($p = 0.027$), speech improvement ($p = 0.04$) and reduction of aggression ($p = 0.008$). It can be concluded that in the case of the above-mentioned studied areas of the psychological sphere, the prolongation of the period of hippotherapy causes a definite progression of its effects. A slightly different relationship was observed in the field of hyperactivity of the patients examined.



The statistical analysis shows that there is a statistically significant relationship between the duration of therapy and the effects in the above-mentioned sphere ($p = 0.029$), however, the greatest improvement is achieved in the short term, while with the extension of the therapy time, the observed progression is definitely lower. The research shows that thanks to the participation of the child in hippotherapy classes, in all the subgroups studied, there was an improvement in the sphere of family life (Chart 7, Chart 8). There were no statistically significant correlations between the improvement in the study area and the type of disability ($p = 0.508$).



The analysis of the results concerning the improvement of family life in relation to the period of participation in hippotherapy shows that the progression of the discussed parameter is statistically dependent ($p = 0.001$) on the duration of therapy. Hippotherapy was the most successful in the first period of its use (0-2 years). In later years, progress in the sphere of family life was systematically

decreasing. The interview with randomly selected parents shows that over time, along with the positive effects of hippotherapy, parents' fatigue, worry and even fear for the future of their children are increasingly felt. Bearing in mind the above and the frequently occurring financial troubles and continuous deficit of time, it can be assumed that the downward trend of the examined parameter - improvement of family life - is justified and understandable.

Discussion:

Analyzing the results of research on the impact of hippotherapy on the rehabilitation process in people with intellectual or motor impairment, especially in children, we see many positive effects of this type of therapy. Based on the conducted research, we observe significant progress in the motor sphere. In the above results as well as in Szymczak's research, there is a noticeable improvement in maintaining the correct body posture and balance in over half of the studied group [23]. The research carried out by Polańska and Mańkowska shows that even after one conducted therapeutic session an improvement in the sphere of the correct posture of the patient's body is obtained [16]. A similar opinion is presented in the research of Maćków, Małachowska-Sobieska and others [13]. The positive impact of hippotherapy on the posture and balance in patients is also confirmed by the research results of Matusiak-Wieczorek and others who focus solely on children with cerebral palsy. According to the authors of the study after a 12-week period of hippotherapy covering 30 minutes of classes once a week, after the end of therapy, the study found a reduction in balance disorders and improved functioning in everyday activities [14]. Similar reviews are presented in the research of Kulwer who made a detailed observation based on participation in hippotherapy classes of people with intellectual disabilities and balance disorders. After performing a series of tests before and after the therapy, the effects clearly indicate an improvement in this motor sphere [10]. Confirmation of the obtained results can also be obtained based on Szymczak's research, in which the author investigated the ability to perform active movements of upper and lower limbs before and after the beginning of hippotherapy that lasted six months. The results of the study indicate a significant improvement in muscle strength and tension, which resulted in the possibility of performing more repetitions of particular movements both upper and lower limb of people with motor disabilities [23]. Proprietary research also shows progress in this area in all studied groups.

The problem of the effectiveness of therapy with the participation of a horse was studied by Ciechanowicz. The author, based on available scientific publications, analyzed the effects of hippotherapy and distinguished a significant improvement of balance, posture, gait

and communication in people using this type of therapy and also improvement of social perception [6]. Proprietary research shows a significant improvement of all the above-mentioned aspects of the motor sphere.

The conducted research shows the positive impact of hippotherapy on the patient's mental sphere. This is confirmed by the available scientific works on the subject matter discussed. Rybarczyk in his research, based on surveys completed by his parents, shows significant progress in the psychological sphere, especially in such aspects as: improvement of communication skills, speech and increase of self-confidence [20]

An important issue and the expected effect in children with intellectual or motor disabilities is the ability to reduce hyperactivity and aggression. According to the proprietary research after the analysis parents are satisfied with the effects of therapy in view of the aforementioned aspects. Gebriels published a research on this subject, which examined a group of 116 patients aged 6-16 years old with autism spectrum disorders. The subjects were divided into two equal subgroups with only one group subjected to therapy involving horses. Observations of the subjects started one month before the last 10 weeks of therapeutic classes and ended one month after class completion. The obtained results clearly show that in the group of patients undergoing hippotherapy the most beneficial effects of the therapy were obtained. Significant improvement was found in the level of aggression and hyperactivity of the examined patients. Positive changes in the area of speech improvement and social communication were also observed [7].

One of the very important effects of the therapy is the improvement of family life. The level of parents' satisfaction as well as acceptance of their child's illness are important elements of the rehabilitation process. The research shows that only 16% of respondents use the total co-financing of therapy, and 30% receive partial funding. In addition, the location of hippotherapy centers often involves long travels. This results in a permanent time and material burden on the parents and it should be added that often one of the parents is not working because of the need to provide permanent care to the child. Despite the above difficulties, over 50% of carers and parents pointed to the improvement of family life as a result of hippotherapy. Bialoszewski and others focused on a similar aspect, who in their work carried out research to check the influence of hippotherapy on improving the comfort of family life. The research results indicated a significant increase in the parents' satisfaction and improvement of the family situation. An increase in the acceptance of the child's illness was also found [3].

Analyzing the results of any research on the impact of hippotherapy on the rehabilitation process of disabled people, especially children, it should be borne in mind that child rehabilitation is a very complex, long-lasting and also continuous process. The obtained effects of improving the patient's physical and mental condition should be interpreted as a resultant of the activities of all forms of therapy and effort of all involved persons. The research results show that 78% of respondents participate at the same time in other forms of therapy (occupational therapy, dog therapy, W. Sherbone) and 100% of carers and parents continue the process of rehabilitation at home.

It should be remembered that in hippotherapy as well as in other forms of rehabilitation used in order to obtain effects and to sustain them later, continuity, regularity and appropriate intensity of exercises are necessary. 82% of the surveyed population participate in the above-mentioned activities once a week, 7% -2-3 times, while only 4 people use hippotherapy each day. The average time of one-off classes in the studied group is 32 minutes. The downward trend in the number of participants in this form of therapy in relation to its duration is worrying. Despite the fact that 99% of parents and carers of disabled children taking part in the research declare their intention to continue this form of therapy, according to observations and interviews , for reasons often independent of carers (health, economic), the number of hippotherapy participants decreases with their age.

One should also be aware that hippotherapy will not replace a speech therapist, orthopedist, psychologist, psychiatrist or therapist of another specialty. Its success is largely determined by targeted cooperation with other therapists, specialists and physicians. The program and goals of therapy should be determined by the hypnotherapist based on the recommendations of the doctor directing the patient to classes, taking into account the patient's individual needs.

CONCLUSIONS:

1. Hippotherapy brings positive effects both in the motor and mental sphere of the patient;
2. The greatest effects in influencing the motor realm were obtained in the area of improving balance and correct posture;

3. The greatest effects of hippotherapy on the psychological sphere of patients were noted in the area of improved communication, speech development and increased motivation;
4. The progression of hippotherapy effects is correlated with its duration;
5. In all cases studied, positive effects of hippotherapy on family life were found.

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