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Experience of hippotherapy as a treatment for disabled children in India

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Abstract

Hippotherapy is a form of physiotherapy "where the horse is used as a part of the treatment. The aim with this qualitative study is to investigate Indian disabled children's experiences of hippotherapy. The study is based on interviews with four children and three teachers. The interviews were conducted with an interpreter in English and Tamil. The children's interviews were focused on their personal experiences, and the teachers' interviews focused on their observation of the children. Two guides based on open questions were formed for the interviews which were recorded, transcribed and NRC. The results show that the children were positive regarding the hippotherapy and had experienced physical improvement. The teachers experienced that the children had improved regarding motor skills, speech and learning ability. The conclusion based on agreement between children and teachers, is that hippotherapy is a positive form of therapy for these children in both physical and psychological aspects.

Keywords: Hippotherapy, animal-assisted therapy, children, interview, qualitative study

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1. BACKGROUND

Humans have for long time had pets for fun, but during the 10th century a.d., they started in Belgium to use animals for therapeutic purposes for different patient groups, notably in the treatment of disabled persons¹. Long before this, even during the years 430-377 BC Hippocrates mentioned riding as both muscle strengthening and fitness-promotion and in the 16th century was riding used for maintaining health in which it was stressed that riding not only had a good impact on the physical but also the mental health². In the 1950s, more and more physical therapists understand what horses and riding could mean in their treatment of patients, after which Liz Hartel took Olympic silver in dressage in Helsinki in 1952, although she suffered badly during the 1940s by polio. After that, riding as a form of treatment started to be used in the United States, Canada and Europe. 1957 began a physiotherapist at Sättra Brunn in Sweden use of horses and riding in his treatment of people suffering from polio. In the 1960s, the hippotherapy spread and today it is carried on in many countries all over the world^{2,3}.

1.1 Hippotherapy

Hippotherapy is a form of physiotherapy that is used for several patients groups to maintain or improve various physical qualities and features, such as strength, balance, agility, coordination and walking ability. It is a form of treatment that works well in adults and children with physical or mental disabilities⁴⁻⁷. With the hippotherapy means of physiotherapy treatment where the horse is used as a tool and a complement to the rest of the treatment. Riding therapy, or therapy riding as it can also be called, involves riding for therapeutic purposes with physiotherapist, occupational therapist, psychologist, special teacher or psychologist starring². The difference between hippotherapy and horseriding therapy is liquid and clear definitions where the differences described has been impossible to find. Another concept, somewhat more well-known among the Swedish population is handicapped riding, not to be confused with the equestrian therapy or hippotherapy. The reason is that handicap riding are not carried out in a therapeutic purpose, but are classified as custom recreational horse riding for disabled⁸. Other English terms used include equine-assisted therapy, horse riding therapy, horseback riding therapy, equine movement therapy. In this work, the term hippotherapy exclusively to be used. With this term referred to all

physiotherapy treatment seated on horseback as well as training on the horse and the environment around the horse is used for therapeutic purposes.

1.2 Current research

In a literature review in which a total of 17 different publications examined showed strong evidence for physical activity for children and adolescents between the ages of 0-20 years with mental retardation is good and provides significant health gains⁴. In this literature review was that physical activity in the form of hippotherapy, group training or treadmill gave many health benefits in the form of, inter alia, improved gross motor skills, aerobic capacity and a high level of involvement of the patient population. There was not the same evidence to specifically adapted skiing or hydrotherapy would provide the same health benefits⁴.

Studies on hippotherapy as a form of treatment has been made on a range of different diagnostic groups, including Cerebral Palsy (CP), down syndrome and autism^{7,9-11}. It has been shown that hippotherapy affects multiple systems at the same time, such as sensory, muscular and vestibular systems¹². A meta-analysis from the 2011 shows that hippotherapy will improve, inter alia, balance and postural control in children with CP¹³. In an American pilot study from 2010¹⁴ 6 children were followed with CP and 6 children without disabilities was followed during a 12-week intervention in order to study the effects of hippotherapy on main and trunk stability in children with CP, measurement and evaluation instruments used was high-speed video camera, so called Video Motion Capture, which with the help of specific points located on investigation person's body, measuring the body's movements in 3D. The study showed an increased stability in both the torso and head and the differences between the disabled and the healthy children was significantly reduced after the treatment period compared with findings before treatment period¹⁴. Similar results are found in another study of hippotherapy as a treatment method for children with spastic CP⁶. Where focused not only on the main and trunk stability but also on the ability to reach and make a motion to a specific point or object. A treatment intervention for 12 weeks leading to this ability has improved, which is useful in many daily tasks. This led in turn to improve the patients' participation and performance⁶. The patient group children with spastic CP examined even symmetry in the tonus of the leg adductor muscles. Children's walking patterns were examined immediately after ten minutes sitting on the horse and were compared with children who had been so long but sitting over a barrel. After sitting on the

horse was seen a clear improvement in the muscular tone has symmetry. Follow-up after a 12-week period showed that the outcome remained. Of the children who had been sitting over a barrel appeared no difference⁹.

Although many studies have been carried out on children with CP, there are also studies on several groups of patients, including a study in which children with Down syndrome were examined. The children were assessed after hippotherapy using Gross Motor Function Measure (GMFM), a measuring instrument for gross motor functions, and the results showed many improvements in motor skills, such as walking and torso stability⁷. Cuypers, De Ridder and Strandheim¹⁵ demonstrated in 2011 to hippotherapy resulted in significant improvements in the quality of life of self-reported in children with Attention Deficit Hyperactivity Disorder (ADHD). It was also shown that the riding had a positive impact on these children in the form of social interaction, and motor skills¹⁵. Similar results are also displayed in a study conducted in 2009 where Bass, Duchowny, Llabre found that children with autism can have great advantages of hippotherapy, especially the attention and social integration. The horse may have a stimulating effect in the case of social skills¹⁶.

During a search in PubMed with the term hippotherapy, delimited search to children 0-18 years among English-speaking studies published in the last 10 years, found 28 published articles. Most of these focused on how patients' physical abilities had been affected by the treatment. A study from the United Kingdom was found where the focus was on the patients' own perceived effects of the hippotherapy¹⁷, where the interviewed children with CP-harm participated in hippotherapy on at least six occasions, and even relatives of the children who received the same treatment. The interviews were conducted in groups or individually and in total participated 17 individuals between the ages of 4-64 years in the study. The result confirmed many of the results that we have seen in previous studies and gave a new way to look at the effects of the hippotherapy. The study showed (except motor improvements), among other things, increased activity and participation according to the International Classification of Functioning, Disability and Health (ICF), quality of life and self-esteem of the users¹⁷.

In addition to physiological effects, a variety of psychological gains after a treatment intervention with hippotherapy. This was observed in a study of adults with back pain where the benefits in terms of better sleep, increased satisfaction both during and after the treatment, as well as an increased feeling of joy and pride were found⁵. When it comes to

treatment, it is essential that the patient/user finds the selected treatment form fun and fruitful. For many people with disabilities, and children, together with the horse not only to physical training, but the horse also affects the patient on a psycho-social level^{2, 5, 17}.

1.3 Intact Special School (ISS)

The school was founded in 1995 in Tiruchchirappalli in southern India by an Indian man, named Thomas Ebenezer. This after he had a son with a slight mental retardation and realized the deficiencies that existed in the Indian society regarding both rights and opportunities for disabled children. At the school is approximately 70 students aged 5-18 years with different types of disabilities, from ADHD to severe Cerebral Palsy, mental retardation and autism. Most of the children live at the school during the weeks or the entire futures. The school provides both training and individualized physical therapy to promote not only psychological, but also their physical development. There is also a pool for children to learn to swim and therapeutic purposes. Teaching is conducted in small classrooms where children sit tightly together in the benches while the teacher is standing at the blackboard and write or read aloud. Learning is based on making the children repeats what the teacher says or writes. The main subjects taught are English, mathematics, Tamil and writing. In addition to this added personalized training. All children are served lunch at the school in the dining room which also serves as a dormitory for the children who live at the school. During mealtime, children sit on the concrete floor and eat their food with their hands from aluminium plates (cutlery is used very rarely in India, mostly by Westerners and at finer restaurants). The children who need help to bring food to the mouth may get help of someone from the staff of the school or another, slightly older children. The playground is used extensively both during breaks and in teaching. There are swings, climbing frames, a sandbox, and large areas under shade from the trees to move freely. It is also in the playground the morning gathering takes place, where a teacher read aloud from a newspaper and then exercised a little morning gymnastics, all singing a song and related movements. Today, hundreds of children and young adults had received food, shelter, education and in many cases jobs thanks to the Intact Special School¹⁸. In January 2010,

three ponies were brought to the school and currently carried out hippotherapy for school pupils with the help of Indian physiotherapist and Swedish volunteers¹⁹.

1.4 Diagnoses among children in Intact Special School (ISS)

The children who participated in the study suffers from a variety of different diagnoses. In order to understand that the work of the hippotherapy includes several aspects described below are the most common diagnoses (Cerebral Palsy, ADHD and autism) of children at the school.

Cerebral Palsy (CP) is a definition that has brain damage resulting in the child during pregnancy, in connection with childbirth or during the child's first two years of life. Brain damage may be of varying degrees and thus give different motor function disturbances and also various additional handicaps, such as perception disabilities, visual defects, hearing impairment, mental retardation².

Attention Deficit Hyperactivity Disorder (ADHD) is often defined lack of attention and/or impulsiveness and hyperactivity. Children with ADHD often have difficulties to deal with frustration and anger and often overreacts. A person with ADHD need to be active to be calm, have voltage applicant behavior and has difficulty paying attention the other²⁰. Approximately 70% of all children with ADHD have learning difficulties. Because of this, it is not uncommon for problems discovered in school²⁰. In the hippotherapy on Intact Special School uses different strategies to maintain calm and train on the concentration of children with ADHD. At the hippotherapy sessions all children who do not work at the horse are sitting on a bench, waiting for their turn. The last child, this is an hour of waiting, sometimes more, in spite of this, the authors observed that the students and teachers had a quiet time on the bench, fraction and screams were not happening. In the hippotherapy are working all staff together to create calm and order, something that is extremely important for children with ADHD²⁰.

Autism occurs most often in the first year of life but with about one-third can also be detected after 2-3 years²¹. More than half of all children with autism are suffering from a learning disability. In some cases, the child develops any kind of special interest which they

may possess an extremely high intelligence. They can also show extremely well-developed memory, mathematical skills or other talents. People with autism have a very limited ability to understand their disease and the problems it presents²¹. Children with autism do not use eye contact, mimic or gestures to relate to its surroundings. The child is not interested to share their experiences with another²¹. In working with children with autism provides a wide range of educational models that this should not be described in detail. A method that is mentioned in the literature, however, is: *Tangible rewards as a way to justify why*²². The method seeks to use tangible rewards to get the child to perform jobs where the child has a low motivation and justify this preoccupation with linking to a future reward. This is something that is used frequently on the ISS.

1.5 The hippotherapysessions

Hippotherapy on Intact Special School developed by the Swedish volunteers who worked on the project, in consultation with the project employed Indian physiotherapist. All volunteers who have worked or are working on a project, have previous experience of hippoterapi and/or horses. During this study two Swedish volunteers was on the ground, a teacher and a physiotherapist.

The stable lays about 7 km away from the school and is located on a half-acre fenced-in land of the ISS. A hippotherapy session consists of several different elements. The goal is that every child will receive 30 minutes of hippotherapy at least 2 times/week. During a typical day, 3-4 students going together with volunteers, physiotherapist and special to the stable. In the meantime, the team focuses on one pupil at a time, and the remaining children sit alongside and is awaiting its turn together with a teacher.

The hippotherapy begin with testing and donning the helmet. Safety spray is consistently and prominently throughout the session. The child may start to brush the horse and comb its mane and the tail. The physiotherapist will guide movements when necessary, but the idea is that the child will be working independently. After the brushing it's time to clean the horse's hooves, so-called picking the hoofs. This means that they are lifting of the horse hoof and clean under it and remove the dirt with the help of a hoofpick. This is a

moment that requires high coordination and precision while the child is in the instruments were position which is balance-intensive. Children with attention problems may help to create structure and order in horse care by counting while brushing. The session continues to lead the horse over a shorter walk. There are usually two laps around a smaller area and turn diagonally across the paddock twice (total distance of approx 300 metres), where necessary, made more difficult the training through the use of beams or cones where, for example, goes zig-zag. The children who is suitable, then sit on the horse when it is stationary, using no saddle but only a saddle pad (a piece of cloth) that is strapped on by means of a girth (a strap around the horse's stomach) with handles that children can hold on to. Exercises carried out on horseback, for example, is to place one or both hands, clapping on both sides of the horse's neck, lean forward and backward, raise the arms and lifting arms out from the body and go after balls or rings.

All treatment is individualized and is exacerbated by their capabilities and requirements. The children can get a ride and it is then usually the same area, where they previously led the horse. Usually the horse is handled by one person and one person supports and supervises the child. Similar exercises are carried out during the riding previously happened when the horse stood. All horse riding in walk, horse's slowest horse gait. In this the horses gait transfer multidimensional movement that inputs to the rider. It is this very specific motion treatment. With the help of this you can train: postural and master control, torso rotation, abduction and extension of the legs (which has a positive impact on the usual spasticity of the adductor muscles in children with CP), equilibrium reactions, balance and much more. Children may also train their concentration, coordination and social contacts².

1.6. Problem definition

Children with disabilities are a large and broad patient group. Many disabilities causes major discomfort and impede the ability to live an active and normal life. This makes it particularly urgent to increase knowledge about the treatment of the patient population. The results of the research studies in the area suggest that hippotherapy can provide a number of gains in both the physical and the mental plane^{2, 5-7, 9-11, 17}. The vast majority of studies that have

been made in the region is carried out from a processing perspective. The studies in the area have a wide variation in the design. Case studies and pilot studies are commonly used but even randomized controlled studies found, although not to the same extent. The later, however, may provide more information about the effects of hippotherapy as a treatment. There have been very few qualitative studies on children's own experiences of hippotherapy and also observed effects of the surroundings. There are also some studies conducted on children in developing countries and hippotherapy which form of treatment is still unusual in those countries. It is therefore of interest to investigate how a group of children and their teachers had an intervention with hippotherapy in India which can provide unique and valuable knowledge previously acquired.

1.7 Purpose

The aim of the study is to investigate how the children in Intact Special School has experienced the hippotherapy and effects of hippotherapy and to see if the surroundings, in this case children's teachers, have noticed some physical and/or psychological changes in the children since they began with hippotherapy.

1.8 Research Questions

- How have a group of children with disabilities experienced the hippotherapy?
- How have a group of teachers of these children experienced the hippotherapy?
- Have the children and the teachers experienced any changes with the children after a period of hippotherapy?

2 METHOD

2.1 Design

The study has a qualitative and descriptive research design based on interviews.

2.2 Selection

The people in the study were selected through a strategic choice. Among the students who meet the inclusions and exclusion criteria were the individuals that had the easiest to communicate and thus who could give us so much useful material as possible were chosen. Both boys and girls has been included in the study, including 4 children and 3 teachers.

Inclusion criterias, children: Intact Special School-pupils who took part in the hippotherapy treatment on at least two occasions per week for a period of at least two months in the last year. With hippotherapy treatment means a time which lasted for at least 20 minutes where the horse or the environment surrounding the horse used as physiotherapy. The children should be able to communicate in English or tamil through an interpreter.

Exclusion criterias, children: pupils that in the last year not participated in hippotherapy treatment. Students who are not able to communicate verbally.

Inclusion ckriterias, teachers : Teachers who over the past year taught one or several students that meet children's inclusion criterias. People will be able to communicate in English or tamil through an interpreter.

Exclusion criterias, teachers : Teachers who over the past year not have taught students that meet children's inclusion criterias.

Description of the final study group:

Teachers: Three teachers at the school were met the criterias, and these three were asked if they wanted to be interviewed, all accepted participation in the study. They were all female special needs teachers and had many years of experience working with mentally handicapped children, both in and out of the Intact Special School.

Children: Four children met the criterias. These were asked and accepted to participate in the study. The children were between the ages of 8-13 years, three girls and one boy. Three of them were diagnosed with Cerebral Palsy, all three with spasticity and two with mental retardation and reduced IQ (intelligence Quotient, IQ), one child was diagnosed with autism, but no reduced IQ. Of the four children so two of these were living permanently in the

school's hostel in the weeks to come back home to their families on weekends and holidays. Two of the children lived at the home of her parents permanently and was in school during the day. All the children had participated in the hippotherapy in the period January-March 2010, and two of the children had participated in the hippotherapy a further period, stretching from August to the time of the interviews.

2.3 Implementation

During the month of September, a letter was sent out to the interested parties with information in English about the study (see annex 4). Contact person on site in India (Mr. Barathidasian) translated the information into tamil and informed the interested parties on the location of the study. The authors were on the ground in India during 2 weeks, from October 5 to October 20 in 2011 for the collection of data. After the children who met the criteria of inclusions were chosen, the parents was asked by Mr. Barathidasian on children's participation in the study. Mr. Barathidasian's were collecting the parents written consent (see annex 5) before the interviews began.

The authors were present several times during the hippoterapisessions for observations, in order to gain a better understanding of the informants sensations and experiences.

2.4 Data Collection Method

Data collection was carried out during a two-week period in October 2011 at the Intact Special School. Two interview guides were designed, one for teachers (annex 1) and one for the children (annex 2). The questions for the children were mainly focusing on their own experiences of the hippotherapy, what they thought about the hippotherapy and if they had noticed any changes in themselves since they began to participate in the hippotherapy. Teachers ' main questions was about if they noticed any changes in the children since they began with the hippotherapy. Both the teachers and the children were interviewed one by one. During the teacherinterviewes attended Emma Regberg (E.R.) who interviewed and Therese Petterson (T.P.) who observed and was responsible for audio recording. An interpreter was used in two of the interviews with teachers. The third interview was conducted in English and an interpreter was not needed. During the children's interviews

attended the interviewer (T.P.) and observer/responsible for sound recording (E.R.). Also the child's teacher was present as an additional security to make the children feel more comfortable. An interpreter was used in all child interviews. Other staff from the school was used as the interpreter and the same person was used in both teacher and child interviews.

A test interview was conducted to test interview questions and recording equipment. At this first test interview, it was discovered that issue two and three in the teacherinterviewes partly floated into each other, but by having these questions more information not disclosed during the second question was added, therefore, retained interview guide was also in later interviews. The interviews began with a short presentation by the authors and the purpose of the interviews, as well as how the interview was going to go to was explained. Interviewees were informed that participation was voluntary, and that at any time could interrupt the interview if they so wished. The interviews began with two open initial questions before the 5 key issues were highlighted. All the interviews (children and teachers) took a total of between 8 and 14 minutes to implement.

2.5. Data processing

All of the interviews was transcribed in English and supplemented at a total of three reviews. The material was decoding they were assigned letters ("L" for teachers, "B" for children) and a number 1-4. As "L2" interview of teachers no. 2. The transcript has non-verbal instances also appended, for example: showing with hands, laughing. This strengthens the content of what is said during the interviews and provide a better understanding of the context in which the language is not sufficient.

The materials were analyzed with the help of a content analysis of structure by Granheim & Lundman²³. The transcribed material was reviewed by the two authors, then sentence bearing units was picked and then condensated. The range of differences of bearing units were compared between authors in order to ensure the credibility of the interpretations. When the authors agreed, were the material recovered from the authors for that are grouped into categories and subcategories. Examples of analysis given in table 1. During this phase the authors discussed both with each other and with the supervisor on a number of occasions about the classification into categories.

Table 1. Example of sentence-bearing unit, condensation, subkategori and category.

Sentence-bearing unit	Condensation	Subcategory	Category
<i>"Before she were, she has eh... some fear. Yeah. After she go back, the horse riding and eh... fear was removed." (B4)</i>	Used to be afraid of the horses	Reduced fear	Emotional experiences about the hippotherapy

Material from the childreninterviews and teacherinterviewes resulted in three or four broad categories. Furthermore, the comparison of categories and subcategories from the various interviews with each other and then analyzed and described separately. Finally were analysed and compared their interviews with the children's interviews to see any similarities in the experiences.

2.6. Aspects of credibility

The credibility of qualitative research is about confidence in how well data and analysis processes are processed and used, and that this is related to the study's purpose. Various questions about the credibility of that crop up in qualitative research: selection of issues and participants as well as the approach to the collection and processing of data²³. Selecting participants with different experiences gives an increased ability to illuminate the issues from different perspectives²³. In this study it's therefore have been taken into account in the choice to interview both pupils and teachers.

To further ensure the credibility of the work, and not to important information to be lost during the analysis process, the authors have chosen to maintain differences-bearing devices and quotations in English. Research triangulation²⁴ has been exploited, which means that the authors completely independently of each other, in whole or in part, making the collection and encoding of the material before they compare and agree²⁴. The supervisor has also been included and functioned as a third-party content by some analysis and discussions where the consensus eventually achieved. This is to minimize the risk of error sources and possible misinterpretations²⁴.

2.7. Ethical considerations

Before the work began, the management of ISS authorized to carry out the study. Via mail contact has teachers and parents been informed about how the study would be to go to and

the parents had to give consent to their child's participation before data collection was carried out (see annex 4 and 5). Interested parties were informed of the fact that such participation was entirely optional. All the material has been treated confidentially and the informants anonymity has been ensured by decoding in the transcribed material. Written information concerning the informants kept locked away in the University.

3. Results

Bearing unit	Condensation	Subcategory	Category
"She wants to the... stay there. Don't want to go to school. Yeah. She wants to stay there." (B1) "And enjoying very much there." (B2) "Now she is not happy in the classroom." (B2)	Happy when going to the horses Enjoying the hippotherapy More sad in classroom since she finished with hippotherapy	Joy	Emotional experiences around the hippotherapy
"Before she were, she has eh... some fear. Yeah. After she go back, the horse riding and eh... fear was removed." (B4)	Used to be afraid of the horses	Reduced fear	
"She likes horses very much." (B2) "So only he likes eh, riding. He likes riding on the horses." (B3)	Likes horses very much Likes horseback-riding	Positive attitude on horse care and riding	
"Now she is strong. While she is walking." (B4) "Eh... physically now she's strong. After the therapy." (B2) "Now he can write well."(B3) "Before she cannot play well. Now she can play well."(B2) "Before she goes to have hippotherapy she fell down often."(B2) Now that the tharapy has stopped, yeah. Yeah. Now she feels she cannot eh, fold this leg fld her leg. Is very hard, to fold. Now, she feel." (B2)	Better walking Increased muscular strength. Improved writing skills. Increased playing skills. Used to fall often. After she finished hippotherapy, her legs has become stiffer.		Physical function
"She's making a... a conversation with the horse."(B1)	Making conversation with horse.	Talking to the horses	Language and communication

Below are the results in tabular form and in continuous text. Analysis of children- and teacherinterviewes are reported separately. The results of the children's interviews are presented in table 2 and the results of the teacher's interviews in table 3. Differences of bearing units and condensations is originally written in English but the subcategories and category was originally written in Swedish names in order to increase readability and give a better overall picture. Since the interviews were held in the English language, a translation into Swedish of earlier stage pose a risk that important information is lost.

Table 2. Overview of categories, subcategories and differences bearing units – children's interviews. Four children aged 8-12 years, one boy and three girls, were interviewed with the help of an interpreter in tamil and English. During the interviews was used an interpreter who speaks about the child in the third person. So instead of saying e.g. "I feel happy," says the line "She feel happy" when she reflects what the child said.

Emotional experiences around the hippotherapy

This category includes children's emotional experiences and experiences around the hippoterapin, horses and horse management.

Joy

During the interviews revealed that all the children had positive experiences from the hippotherapy. They told that they are happy when they should go to the horses, and they would rather stay with the horses instead of going back to school when the hippotherapy session was over. Several children are described to the best of hippotherapy was horses in general and riding in particular. They also described the feeling of pleasure arises when they are in the stable.

"She's enjoying that the hippotherapy" (B2)

On several occasions during interviews told the children that they liked the hippotherapy very much. The children talked about the hippotherapy and the horses with great joy, they smiled a lot during the interviews and they also asked several times about when they would be allowed to go to the horses again. The only negative experience around the hippotherapy was when the children did not go to the horses, when it was one child who became unhappy and felt down in spite of other activities in the classroom.

Reduced fear

Some children felt that they had been afraid of horses in the beginning but now, when they are accustomed to the horses and know them, were no longer afraid of them, other children interviewed had no experiences the fear of horses.

Positive attitude on horse care and riding

Experiences around the horses were found to be positive for all of the interviewed children. They told that they cared a lot about horses and some children had acquired a favorite horse.

Several children told proudly that they could distinguish the three horses and that they knew the names of the different horses. The children said that they likes being in the stable and spend time with the horses. The riding was perceived as the best to be in the stable, but all of the children also cared much about the management of the horses. The only negative experience of being in the stable which emerged was that it smelled a bit bad when they picked the hoofs, i.e. clean during the horse-hooves.

"Doesn't like to pick the hoofs because of bad smell" (B2)

The same children who told this, also mentioned the grooming of horses as one of favorite chores in the House.

Physical function

Many children felt that they have become better at certain tasks, both the general and fine motor skills, since they began with the hippotherapy. Several children reported that they experienced an improved balance and walking ability, when they noticed they don't fall down as often as before. Another experience linked to the access capacity was also that muscular strength had improved. It was found that the ability to write and play was also considered to have improved since the hippotherapy was introduced. Generally considered a physical difference on comparing periods with and without hippotherapy, a child described it as:

"Couldn't do anything before the hippotherapy, now I can do everything" (B3)

Another experience was that a stiffness and decreased movement had appeared when the children ended up with hippotherapy. This was presented as it had become more difficult to bend the legs.

Language and communication

Under this category, is the subcategory, *"talk to the horses"* which describes the children's experiences of how their own speech have been affected since the hippotherapy was introduced.

Talking to the horses

One experience which emerged was that children liked to talk and hold a conversation with the horses. One child told that she enjoyed to sing a happy song while she rode.

Bearing unit	Condensation	Subcategory	Category
"Only the children who are going to therapy center, eh... they are very happy." (L2)	Happiness when going to the hippotherapy.	Joy	Emotional experiences
"They each have fear before they going, before everyone have the fear, yeah." (L2) "And eh... eh for X she's before she was very much fear by seeing the horses as X (sjukgymnasten) told she will sometimes urinate also. Of fear. But now she's not having not like that eh experience." (L3)	Fear of horses before started going to the center. Reduced fear.	Reduced fear	
"If you are telling that today is not your turn it's today there suppose to be the others not you you had to do the next day ----?----. Very few children they feel to cry, cry. They wont do any work on that day. They have to compromise make a compromise for nearly half a day. After that they will relax but they will still be so sad they are not having much interest in studies since ---?---." (L3)	Disappointment when not allowed to go to hippotherapy.	Disappointment when hippotherapy is denied	
"They have interest to go to the horse riding, yeah... this is new, eh... new therapy, yeah. They don't here before... .. like this, yeah. But they have some interest to go..." (L1)	Interested to go to the hippotherapy.	Intresse	
"And now she is walking casually and even she can try to run." (L3) "She's having toe walks... but now it's reduced." (L3)	Walking is more casual, can try to run. Problems with toe walk that has reduced.	Walking ability	Physical function
"They have ehm... some ehm... they have strength now, yeah, after the therapy." (L2)	More muscle strength after the therapy.	Muscular strength	
"Her muscle will be so eh spasticity, it's so hard to do some the things but not now it's bit relaxed." (L3)	Reduced spasticity.	Spasticity	
"Sitting position. Now it's upright." (L2)	Sitting position is more upright.	Postural control	
"He has reduced his weight also." (L3)	Reduced weight.	Weight	
"Now she can writing... Yeah writing skills improved, yeah." (L1) "Only the CP-children, before they don't have the coordination on the hands. Now they have, ehm... they are, they are writing, ehm... they hold the pencil, yeah. Very correct, yeah." (L1) "The grooming skills, eh, are increased." (L2) "And also cleaning the outside." (L2)	Writing skills and hand coordination improved. Increased grooming skills. Clean outside.	Motor skills	
"Eh, especially X couldn't raise his voice if I want X say Esmess she will not telling. Like this she would be telling (visar genom att på ett försiktigt och blygt sätt räkka upp handen) but now she is telling Esmess like that. But she couldn't frame the words but she can give the sounds so she is giving it's the voice had in bit louder and eh..." (L3)	Problems with raising voice and frame words. The voice is now stronger.	Communication and interaction	Language and communication
"Before she can not speak well. Now she's speaking ehm lots of ehm words." (L1)	Improved speech, using more words.	Vocabulary	
"And they had... had find out that having the memory capacity has increased." (L3) "All over I can tell that they had improved their attention." (L3) "----?--- the therapy center, ehm... they thought them eh all the color concept, yeah, the same color concept she teach the children. They easy to catch." (L2)	Memory capacity increased and improved attention in classroom. Learning color concept.	Memory and attention	Learning in the classroom
"We use this horse riding eh therapy for reinforcement. Yeah when the child ehm.. ehm doesn't like to do the writing or something, I don't send you to the horse riding, yeah. Immediately they do it, yeah (laughing) It's a reinforcement." (L1)	Use the hippotherapy as a reinforcement.	Motivational amplifiers	

Table 3. Overview of categories, subcategories and differences bearing units – teacherinterviews

Emotional experiences

In this category are a number of subcategories which relate to children's positive experiences of the hippotherapy.

Joy

Teachers explain that the children are very happy since they began with the hippotherapy, they have also observed a great deal of interest among students to go to the hippotherapy. A teacher tells that when the children see the physiotherapist who works in the project they becomes very happy and expectant and immediately ready to go to the horses.

"Only the children who are going to therapy center, eh ... they are very happy." (L2)

Reduced fear

Teachers explain that there had been a fear in students before they started with the hippotherapy and the children who are not in the project are still fearful. The fear is presented for all children targeted to the horses. A girl was so scared at the beginning that she wet herself, but as she spent time with the horses have the fear disappeared and been replaced with discovery enjoyment and interest.

Disappointment when hippotherapy is denied

One teacher talks about the consequences of denying students to go unless it is their turn to participate in the hippotherapy. Some students become sad and difficult to work in school that day. This leads to compromises from the teachers. The students have difficulty in school that day, due to their disappointment, and are not particularly interested in teaching on that day.

Physical function

The category includes physical changes and increased abilities of children as teachers have observed in school. All the teachers have seen any new abilities or improved body functions of the children.

Walking Ability

Teachers have observed great improvements in walking ability. These improvements have been both improved movement patterns, which has become more relaxed, and decreased falling incidents. A teacher telling a student that previously fell often but now may be safer. Another student had previous problems with the foots during walking and went more on her toes, especially on new surfaces. This has decreased and she now uses the whole foot when she walks. Her walking ability has improved significantly.

"But since now she is using the flat foot walk." (L3)

Spasticity

Several of the students who participate in the hippotherapy suffer from spasticity; prevent them to perform certain operations on a daily basis. Since the hippotherapy started spasticity to some extent, have been reduced by several students and facilitates the implementation of several activities of daily life.

Postural control

Two of the teachers describe improvements in students' postural control, both seated and standing. The students have now a more upright stance.

Weight

One teacher describes that a child who previously suffered from overweight decreased his weight since the hippotherapy was introduced.

Motor skills

An experience was that the students have improved in daily life, in activities requiring motor control. The teacher speaks about, inter alia, improvements in body care and says that since the children remained in the team and gets the brush and cleaning the horses have become more conscious also about their own health. They are brushing on their owns and each other's hair and would like to brush on teachers' hair as well. They are even helping out more; cleaning outdoors in the playground. Two of the teachers noted an improvement in children who have limited skills to write. A teacher explains that students with CP previously not had good hand coordination and therefore had difficulty writing. In the hippotherapy there is more momentum, particularly during maintenance of the horses where fine motor

skills is trained. Since the hippotherapy was introduced, several of the children had an improved limited dexterity to write. Another experience was that the improvement has occurred regarding the children's ability to hold a pencil, that they now can grab the pencil with the proper composure.

"Only the CP-children, before they don't have the coordination on the hands. Now they have, ehm ... they are, they are writing, ehm ... they hold the pencil, yeah. Very correct, yeah. " (L2)

Language and communication

This category collects subcategories current changes and the development of children's speech and language.

Vocabulary

In the interviews revealed that the children had been given an improved ability to shape the sounds/words and also the ability to raise their voice, an example of this was a girl who had difficulty raising her voice in the classroom, but now without any problems and clearly respond to the teacher's questions. Several children is making a conversation with the horses during hippotherapy. In the interviews with the teachers revealed that children speaks more also in other contexts. At the hippotherapy, children sometimes preform voice training where they form different sounds, giving clear improvements.

Communication and interaction

Thanks to increased use of spoken language has several students improve their vocabulary and language. Several teachers provide examples of students who previously had a bad vocabulary that is now developed for the better, and use many more words.

"They are making some conversation nowadays."(L3)

Learning in the classroom

The category includes teachers' observations regarding matters that have to do with teaching in the school. In the category fits the following subcategories:

Memory and attention

The teachers described in general that the students received a better learning ability. Both their attention and memory has improved since hippotherapy was introduced. In the hippotherapy they are also using the same methods as in the school to teach students with certain things. An example of this that came up was that they use the same principles with colors in learning as they do at school. In the hippotherapy, the three horses are separated, each with its own color as well as their equipment. This will help the students in the separation of both individuals and the equipment. One teacher described that this makes it easier for students to learn, they understand more quickly against earlier when method was used only in school.

"All over" I can tell that they had improved their attention. " (L3)

Motivational amplifiers

Several teachers told that hippotherapy is used in motivational purposes. It becomes a positive amplifier that can be used to enhance the performance of the students. A teacher describes school work requires more work, more effort compared to hippotherapy as the kids just think is more fun. In the school there are several operations that require effort: children need to sit, listen, write and submit information. In hippotherapy, the kids are having new impressions all the time and look and learn new things. Hippotherapy is not on a daily basis a part of the education in school, these factors are not boring to the same extent as that of school education. The teachers uses this fact as a tool. If a student has a low motivation to perform a task teacher is luring with hippotherapy and can also warn the students that if they are not attending school, the hippotherapy can be deleted. This has been incredibly effective and a great help for teachers motivate students who are struggling in school.

"And study also they will make a solid memorize. and they will finish it, I finish it miss, tomorrow I can go to the horses like that they will" ask. " (L3)

4. DISCUSSION

4.1. Results Summary

Integration of the analytical material from children and teacher interviews shows consistency in a number of areas. Both teachers and children expresses the joy that the horses and

hippotherapy gives the children. Both children and teachers talk about a certain fear that some children may feel for horses but declined with increasing experience. Several children and teachers tell about the experience in improved walking ability, reduced falling incidents and other improved motor skills such as e.g. writing. Teachers describe improvements in memory and attention, and improvements in language and communication. The latter was seen in improved speech and a larger vocabulary. The children tell us that they like to talk and sing while they are in the stable. The teachers felt that children who did not go to the stable became sad and depressed sometimes during most of the day, which is also confirmed by the children's interviews.

4.2. Results discussion

In children and teacher interviews revealed several key areas where clear improvements were described and observed. The result shows that the children feel a great joy, that describe themselves and this is also confirmed by the teacher's observations. In one study in which the use of the horse as a tool in use for children with special needs was shown to work with the horse leads to psychological, social and educational benefits which emerges in behavioral patterns which are also reflected in other environments¹². This has been clearly marked with the children on ISS since they also have shown improvements outside of the hippotherapy, for example, in school and in everyday life. Similar observations were made in a study in which the effects of therapeutic riding was examined in five children with the diagnosis of ADHD¹⁵.

A number of improvements concerning bodily functions have been described, including both children and teachers. One of these was the children's time, where the effects have been described in both improved motion pattern, reduced toe walk and decreased falling incidents. Hippotherapy has been shown to have effects on the balance and postural control in children with CP¹³. This is the determinants of supply capacity. Conclusions can therefore be concluded that the children in Intact Special School received similar benefits of treatment with hippotherapy, although children and teachers do not have the knowledge to specify which bodily functions that determined this improvement.

Teachers of ISS talk about the positive effects on children's language and speech since the hippotherapy was introduced. Similar results by a project implemented by Kristina Byström in child and adolescent habilitation in Skövde, Sweden, in 2004 where four children with autism were studied¹¹. The aim of that project was to investigate how current research findings (which shows that riding and contact with animals seem attractive on children with autism) may arouse curiosity and develop communication and interaction. With the common experiences of the task working personnel to develop children's ability to communication and interaction¹¹. The personnel involved in the hippotherapy of ISS are working also with a view to increasing communication and interaction at all, work with and around the horses, which appeared in both the effects on voice and vocabulary. The project was observed positive effects Byström's seated in the form of a developed play-ability and development of existing language so that, for example, understand the scheme, pronunciation and vocabulary¹¹. All of these effects have also been observed and described by the teachers on the ISS.

The children of ISS have been improving in a number of abilities that had an impact on learning in schools and classrooms as teachers' experiences. This applies, inter alia, attention. This is not the first time that similar effects described in working with animals. Teachers at Intact Special School mentioned hippotherapy as a motivating amplifier, which is also mentioned in the Bass, Duchowny and Llabres study²³ where it explains that the horse can be used as a reward and motivator for social context. This is described in the book about autism by Peeters, where people are talking about that autistic children cannot take the same sort of rewards as non-diagnosed children¹⁸. The ISS has the hippotherapy proved as an excellent tool and acts as a strong motivator and reward even for children with autism.

4.3 Method discussion

Interview collection method of data was chosen to give a so vivid a picture as possible of sensations and experiences with hippotherapy. The election was also due to the limited time that the authors was able to spent on site, and to gather as much information as possible in a limited time. An alternative would have been to do a questionnaire study but this would probably not have given the same vivid imagery of experiences and sensations. In addition, such a survey would be difficult, perhaps almost impossible, to define. This is because the

study was carried out in India, in an area where English is not the primary language, and many children at the school can neither read or write anything other than single words.

The interviews are conducted in English, which makes exchange of information from both sides rather difficult as there is neither the authors nor the informants native tongue. In all the interviews used an interpreter, though not a professional interpreter then there was funding for this, instead used the staff of the school. This means that it is not fully ensure that the information provided is correct, or if the parser in their own perceptions, interpretations, or values of both questions and answers received. In the parsed interviews talks prompt the informant in third person and instead of saying e.g. "*I like it*" says the translator "*She likes it*" when she passed the children's and teachers' responses. This may confuse the reader. It has been shown that the information from the parsed the interviews are consistent with the information found during the interview that was conducted without an interpreter and this strengthens the credibility of the interpreter and consequently work idem. In the interview in which the interpreter is not used are incorrect personal pronouns: "she" and "he" to be confused. This may confuse readers, but hardly affect the results. Interviewing children is also a factor that might affect the outcome, as it is difficult to say how much they understand the questions posed. The children interviewed had diagnostics in the form of CP and autism led to the higher demands put on the one interviewed. It was partly for this reason that the authors chose to interview both children and teachers, in order to ensure the results in a greater extent through the correspondence from the various interviews.

One aspect of the interview process that could affect the credibility is how the informants' responds to questions and their answers are interpreted. That encoding, primary reading and analyses made separately by the authors and also to strengthen the credibility of research triangulation used interpretations of data and results. Another factor that may influence the choice of questions is that affected by the interviewers' own experience and knowledge of the subject²⁵. In this work, the authors' previous experience of horses and disabled children has been a great asset in this process. It has facilitated communication and provided a better understanding of the informants statements and stories. For that past experience does not colorize interviews too much (especially regarding the questions rose) studied the area in advance, research the situation was examined and a review of literature

on hippotherapy was conducted²⁵. In order to take account of this, the authors have both been present at the interviews and together worked out the interview guides were used.

Ethical risk factors existed in mind was that the informants, especially the children, would not understand concepts such as anonymity and voluntariness and, to some extent, feel forced to do the interviews and do not dare to say no. The authors, however, was very clear about this and informed the informants before the interviews if they at any time, cancel his participation during the interviews.

4.4. Conclusion

The study follows numerous positive perceived effects of hippotherapy in children of Intact Special School in India. Many possibilities with treatment form described and positive experiences and impact covers a broader spectrum than expected before the launch. Even teachers describe students received improvements in several areas. Few studies are made on effects of hippotherapy, particularly from the patient/usually perspective. This means that it is primarily clinical experience prove that hippotherapy is a good treatment model, and also that it is a form of treatment that works on a variety of diagnoses. It would be interesting to see more studies on this topic, including observations of children in hippotherapy included. This could provide new knowledge about children who have not been included in this study because of limitations in speech and communications.

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Interview guide, teacher

1. How long have you worked with disabled children?
 - How long have you been working on Intact Special School?
2. Have you experienced any changes of pupils who took the part of hippoterapin?
 - In the performance of the education that you are responsible for in school?
 - In physical abilities: can children of anything now that they have not passed previously?
3. Have there been any negative aspects of treatment with hippoterapi?
 - There has been opposition from one student to participate in hippoterapin?
 - There have been a few accidents in connection with hippoterapin?
4. Tell us about any effect that has been good with students then treatment with hippoterapi was introduced.
5. Talk about anything that you feel has been less good of students since the treatment with hippoterapi was introduced.
6. Is there anything we have not been asked if you would like to add or to tell me more about it?

Interview guide, students

1. How good are you at school?
2. What is your favorite subject?
3. What do you think about hippoterapin?
 - How do you know for a time with the hippoterapi?
 - How do you feel while you are taking part in the hippoterapin?
 - How do you feel after a time with hippoterapi?
4. Tell about a time the hippotherapy have been really good.
5. Tell about a time hippotherapy have been less good.
6. Have you noticed any change in yourself since you began with hippotherapy?
 - Have you become better at something since you began with hippotherapy?
 - Have you gotten worse at something since you began with hippotherapy?
 - Is there anything you are able now to which you previously managed?
7. Is there anything we asked if you would like to add or to tell me more about it?

Background data on students

1. How old are the students?
2. Which sex has the student?
3. Which diagnostic has the student?
4. What is the student's primary disability?
5. What is the student's primary asset in physical and mental skills?
6. What is the student of family relationships?
7. Is the student fully or partly resident at the school?

Dear parents of children at Intact Special School,

This letter is sent to you to inform about a study that will be carried out at Intact Special School in October 2011. It will be performed by us, two physiotherapy-students from the University of Uppsala in Sweden. One of whom has previously visited the School in the winter of 2010.

The study is our bachelor's essay in the 3 year long physiotherapy programme at the University of Uppsala, Sweden, from which we will be graduating in January 2012.

The study will investigate the effects of hippotherapy which some of the students at Intact Special School have been participating in. In order to do this we need to interview some of the children who have participated in the hippotherapy.

The children will be interviewed individually about their experiences of the hippotherapy, when necessary together with an interpreter (who will be one of the school's personnel).

Adult from the school will be present to make the children feel more secure in case no interpreter is needed. To be able to perform the interviews we need approval from the children's parents. The children who will be finally chosen and interviewed are guaranteed confidentiality and will not appear with their names.

For questions about the study you can contact us by email:

emre3024@student.uu.se or thpe2642@student.uu.se

If you approve to your child's participation in the study, please fill in the enclosed form, sign and submit to Intact Special School. We will collect them when we arrive at the school in October. Our bachelor's essay will be submitted to Intact Special School and available for the parents to read after January 2012.

Uppsala, 2011

Emma Regberg and Therese Pettersson

Approval

I give my approval to my child's participation in the study at Intact Special School, Quant the effects of hippotherapy. The study will take place in October 2011 and the children chosen for the study will be interviewed and all children are guaranteed full discretion and their names will not be used in the study.

Children's name

Parents name

Parent's signature

Date