

ORIGINAL ARTICLE

IJPHY

IMPACTS OF HIPPO THERAPY ON CHILDREN WITH CEREBRAL PALSY FROM PARENTS' PERSPECTIVE: A QUALITATIVE RESEARCH

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ABSTRACT

Background: Hippotherapy is a physical treatment strategy with the help of horses and refers to the use of horse's movement as a treatment tool for children with Cerebral Palsy (CP). Hippotherapy refers to the incorporation of equine movement by physiotherapists, occupational therapists and speech therapists. The present qualitative study investigated the impacts of hippotherapy on Greek children with Cerebral Palsy from parents' perspective due to their better understanding of child's special needs.

Methods: Semi-structured interviews were undertaken with 10 participants. An interview topic guide and introductory closed questions were used to conduct the study. Thematic analysis of the qualitative interview data was carried out. Five themes were revealed from the interview process.

Results: The results of this qualitative research provides evidence that hippotherapy is a promising intervention strategy having physical and psychological benefits for children with CP. Hippotherapy improved children's daily activities, their independence and, in general, a better quality of life has been attained, while no negative impacts has been identified. The impacts of these results were discussed in relationship with relative published research. Additionally, new insights were provided. The professionalism and qualification of clinical specialist in hippotherapy were crucial and they influence positively the results of hippotherapy. This study also provided new insights into the context of the relationship-cooperation between clinical specialist in hippotherapy and child, and the financial factor participating in a hippotherapy programme.

Conclusion: Discussion concerning the clinical implications of the present findings and suggestions for future research were provided. Future research should be conducted to provide a clear definition of what hippotherapy is meaning globally.

Keywords: Cerebral Palsy, Parents' perspective, Hippotherapy, Therapeutic riding, Occupational therapists, Physiotherapists.

Received 22nd October 2015, revised 9th November 2015, accepted 20th November 2015



www.ijphy.org

DOI: 10.15621/ijphy/2015/v2i6/80753

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INTRODUCTION

Hippotherapy is a physical treatment strategy in which the movement of a horse is used to improve coordination and gait, to increase head control and trunk control,^{1,4} to improve posture, balance strategies,^{5,6} bilateral integration, joint range of motion, sensory integration, walking ability and daily activities.^{2,3,7} The rhythmical movement, combined with the warmth of the horse, improves flexibility, decreases hyper tonicity and promotes relaxation of children with CP.⁸⁻¹⁰ It offers a precise, rhythmic and repetitive pattern of movement to the user that is similar to the mechanics of human gait.^{2,6} Also, it provides psychological outcomes such as increased self-confidence, self-awareness, self-esteem and concentration.^{2,3,7} Furthermore, hippotherapy enables community participation.¹¹

According to Greek Hippotherapy Model (Figure 1), the therapeutic riding includes: (a) the special therapeutic education and exercise and (b) the hippotherapy. The purpose of this Model is to promote a child-centred approach each time during a hippotherapy session. The therapeutic riding offers many benefits such as pleasure, entertainment, socializing, and it improves skills through exercise or just learning riding as a hobby or sport. Particularly, the aim of the special therapeutic education and exercise is to capitalize on the benefits of the movement of the horse and on the contact of the child with the horse in outdoor activities. Hippotherapy (hippos, Greek = horse) refers to the incorporation of equine movement by physiotherapists, occupational therapists, speech language pathology professionals.⁵ These professionals use evidence-based practice and clinical reasoning to purposefully manipulate the movement of the horse to engage the sensorimotor and neuromotor systems to create functional change in their patient.

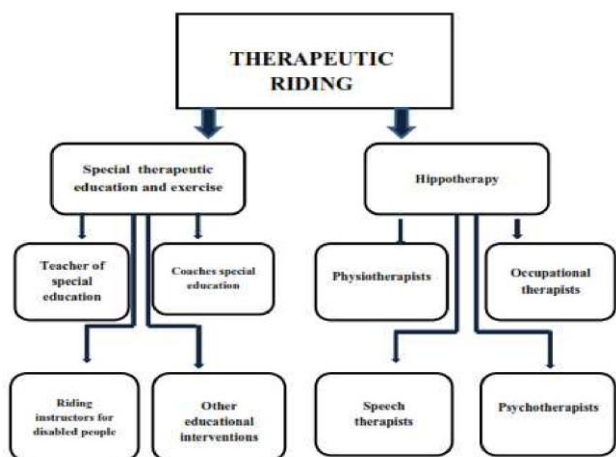


Figure 1: Greek Therapeutic Riding Model

A comprehensive qualitative paper of Debusse, Gibb and Chandler was the first study that investigated the perspective of users of hippotherapy of different ages and their parent's views were clearly identified.² They found that hippotherapy normalizes the muscle tone, improves trunk control, walking ability, daily activities and increases children's confidence. Debusse, Chandler and Gibb had earlier published a qualitative research which examined the physiotherapists' perspective on the effects of hippotherapy between Germany and Britain.⁶ They demonstrated that while German physiotherapists seemed to be working with better trained horses than their UK colleagues, there were agreements among physiotherapists from both countries about the beneficial effects of hippotherapy. In addition, a meta-analysis of Zadnikar and Kastrin showed that hippotherapy improves postural control and balance in children with CP.⁷ However, the small size of the included Randomized Control Trials (n=8) provided limited external validity, thus it is difficult to generalize Zadnikar and Kastrin's findings.⁸ Hehl, Giuliani and Lewis determined that the movement pattern of children with CP had improved after 12 weeks of hippotherapy, suggesting improvements in trunk stability and postural control.⁹ However, this study has limited external validity due to the small sample size (n=2).

Although Cerebral Palsy is the most common physical disability in childhood¹, little research has addressed the parents' views of a child with CP who is used to attend a hippotherapy. Parental presence and attendance is vital for the most effective rehabilitation of their children. According to Novak, Cusick and Lannin, parents acquire a better understanding of their child's special needs and information about the progress of the therapy on their children.¹² To be parents of a child with CP represents an additional challenge in the family's daily life and includes tasks other than those associated with being parents of a healthy child. Parents describe a position of great responsibility 24 hours a day and a constant struggle to get the best health care and medical treatment for their children. They could see children's progress in daily life, socializing and their psychological state.¹³

Therefore, the aim of the present study was to investigate the expectations of the long term effects of hippotherapy on Greek children with CP from parents' perspective through qualitative research. This study may be beneficial for

families who have children with CP and for health professionals who work with this clinical population. Furthermore, this study may develop new insights concerning the Greek Hippotherapy Model from the parents' view. To improve the delivery of pediatric care, health care providers need to know what children and their parents need, expect, and experience.¹⁴ Health care professionals need to be aware of the important relationship between the parents' health and well-being and the child's disability and caretaking demands.^{13,15}

METHODS

Study design

A qualitative design was chosen to allow in-depth exploration of parents' perspectives of the effects of hippotherapy on children with CP. Interviews can provide rich and in-depth understanding of social and personal matters that are relevant to health care settings.¹⁶ To that end, semi-structured interviews were conducted.

Sample and recruitment

This study used non probability sampling. Purposive sampling was used in order to select parents who have things to report concerning the research aim of this study; about the impacts of hippotherapy on their children, who have cerebral palsy.

Fourteen parents with 14 children were at one facility which offers hippotherapy services in Athens (Greece) at the time when the study was conducted. The inclusion criteria of the parents were to have: (a) children with diagnosed CP from the medical/physician personnel, (b) children from the age of 4 to 18 years old, (c) children who received hippotherapy from a specialist qualified hippotherapy clinical specialist once a week at least in the previous three months^{2, 9, 17} and (d) to be from both genders. The exclusion criteria were: (a) parents who did not have children with diagnosis of CP and (b) children's experience in hippotherapy from 2 years and more. According to the inclusion and exclusion criteria, the sample of participants was 10 parents of 10 children with CP. All 10 parents agreed to participate in the study. The mean age of children was 12 years old (SD=4.66). Users' experiences of hippotherapy were ranged in duration from 14 weeks to 1 year. Their level of ability based on the Gross Motor Function Classification System (GMFCS); level III (n=6; age 4 to 18), level IV (n=3; age 6 to 10) and level V (n=1; age 17). Six out of ten children had quadriplegia, while three out of ten had diplegia and only one child had hemiplegia. All

demographic details of the 10 children are illustrated in Table 1. The GMFCS was used only as description after selection. This sampling strategy in this qualitative study recruited participants to ensure that the voice of people with relevant knowledge/experience is being heard.^{2, 18, 19}

TABLE 1 Demographical characteristic of children

| | Interviewee | GMFM (Levels) | Age (child) | Types of cerebral palsy (child) | Duration attending hippotherapy |
|--------------|-------------|---------------|-------------|---------------------------------|---------------------------------|
| Interview 1 | Mother | Level IV | 17 | Spasticity/Quadriplegia | 17 weeks |
| Interview 2 | Mother | Level III | 6 | Ataxic/ Quadriplegia | 1 year |
| Interview 3 | Father | Level III | 4 | Spasticity/Diplegia | 12 weeks |
| Interview 4 | Father | Level III | 6 | Athetoid/ Quadriplegia | 17 weeks |
| Interview 5 | Mother | Level IV | 16 | Spasticity/Quadriplegia | 3 months |
| Interview 6 | Mother | Level III | 7 | Spasticity/ Diplegia | 16 weeks |
| Interview 7 | Mother | Level III | 17 | Spasticity/ Diplegia | 17 weeks |
| Interview 8 | Mother | Level III | 16 | Athetoid/ Quadriplegia | 12 weeks |
| Interview 9 | Mother | Level IV | 10 | Spasticity/ Quadriplegia | 14 weeks |
| Interview 10 | Mother | Level V | 17 | Spasticity/Quadriplegia | 6 months |

Concerning the facilitation of the interviews, two senior physiotherapists made a appointments or emailed to invite parents, who met the inclusion criteria, in order to take part in the study. Participation was not mandatory and a consent form was signed as soon as participants committed to the study. Parents' overall contribution not only has been valuable in terms of data collection, but also contributed to task of improving the management of the program.²⁰ The sampling was designed firstly to ensure that the voices of people with relevant knowledge or experience were being recruited and secondly to satisfy the specific needs of this study.^{19,20} In qualitative research it is not desirable to use a random sample.¹⁹ Therefore, the present study used purposive sampling and not probability sampling. Purposive sampling used to select parents who have things to report about the impacts of hippotherapy on their children.

Data collection and analysis

Ten face-to-face interviews of semi-structured format took place with the participants were conducted at the Greek Scientific Association of Therapeutic Riding and Hippotherapy (GSATRH) and more specifically at the in Varibobi Riding Club in Athens, Greece. An interview topic guide was used to conduct the study (appendix 1). Furthermore, 30 minutes approximately were needed to complete each interview. The procedure consisted of six stages. Furthermore, introductory closed questions were used only for demographic details. Written notes and a digital voice recorder were used to collect the data from the respondents. The interviews

were tape-recorded in authors' mother-tongue language (stage 1).

The interviews were transcribed verbatim by the author (stage 2). The author came into contact with the respondents through face to face meetings (stage 3). Respondents were asked to validate the interview transcript. Parents read their own interview transcript, and they had the opportunity to underline the word "agree" or "disagree" in the written interview transcript; in case that they "disagreed" they had the opportunity to provide comments. After that, each validated transcript was organized by using qualitative methods to identify parents' perspectives. The data were analyzed and coded using different colors. Inductive, thematic analysis to identify prominent themes was conducted on the parental responses in the transcripts (stage 4).

Thematic analysis helps to organize and structure the data that accumulate from the transcription of the semi-structured interviews.¹⁹⁻²¹ Thematic analysis was conducted on the parental responses to the questions. Firstly, the interview transcripts were read through and notes were made throughout the reading on general themes on the margins in order to obtain a general sense of the information and to reflect on its overall meanings.²² Afterwards, coding process by topics and issues of relevance to the parents were identified, based on similarities and differences, by marking and categorizing key words and phrases; each different theme colored with a different highlighter.^{20,21} Eventually, five principal themes with their subthemes were identified.

Pamphlets formatted to include a brief summary of the main themes that included themes and subthemes, were given to respondents via email or in person meetings in order to provide feedback. These pamphlets had been developed from the analysis of their transcript. Each validated pamphlet was sent back to the researcher, again with the help of the hippotherapy specialist. The pamphlets included only the comments of the individual respondents. The original pamphlet was amended to include the new respondents' comments (stage 5). The themes and subthemes together with illustrated examples are explored in the results section which is the final stage (stage 6). Although the study was conducted in Greek language, examples for the result section included quotations which were taken from a word by word translation into English. The authors spoke both Greek and English language. The use of

quotes also highlights the fact that there was no ambivalence about what parents wanted to express (see diagram 1).

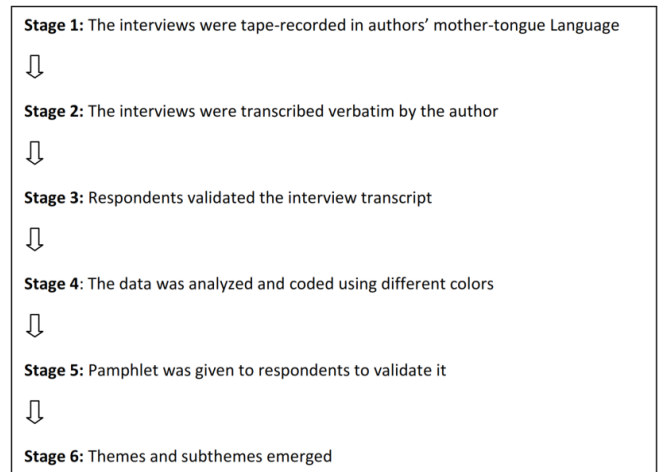


Diagram 1: Procedure of data collection

Ethical considerations

The study was ethically approved by the Sheffield Hallam University Ethics Committee; UK. Additionally, ethical approval was confirmed in the form of a letter of approval/research approval certification from the Greek Scientific Association of Therapeutic Riding and Hippotherapy.

RESULTS

Five main themes were identified through the participants' interviews: Theme 1, "improvements in quality of life"; Theme 2, "drivers for hippotherapy"; Theme 3, "the importance of child and therapist relationship-cooperation"; Theme 4, "families' sacrifices"; and Theme 5, "further suggestions". The different issues emerged when the content of the main themes was organized into systems of subthemes, which describe what the parents focus on. Figure 2 summarizes the themes and subthemes.

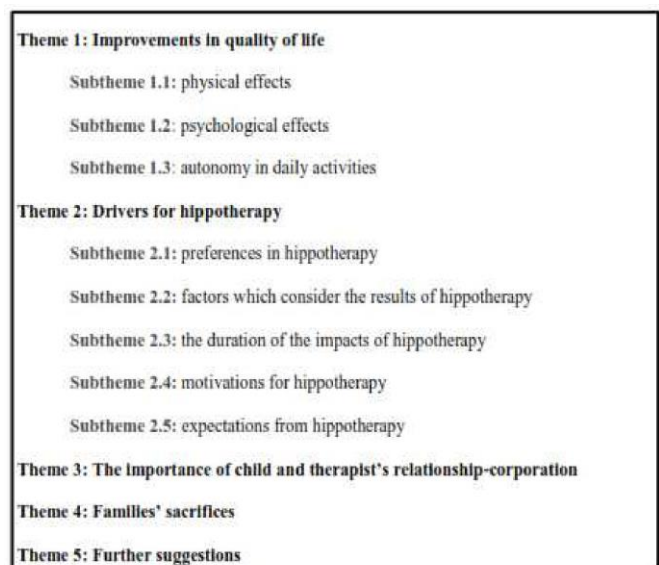


Figure 2. Themes and subthemes

Theme 1: Improvements in quality of life

Hippotherapy had positive physical and psychological effects on their children, while no negative impacts were mentioned.

Subtheme 1.1: physical effects. All parents identified the beneficial physical effects of hippotherapy. They all commented that hippotherapy improved balance, trunk and posture control, standing and walking ability, and that it regulated the muscle tone of their child. A mother of a 17-year old boy with spastic quadriplegia shared:

"His balance has improved a lot, he controls his legs, hands and body; he has greatly improved his trunk, his head... the small movements of his hands as well... you can see the improvement of the child, how he stands, how he sits, how he moves, how he eats We took steps, starting from the entrance, we started with 2 meters which we gradually increased over time and then at the final moment before stopping, we started from the door leaving the crutches and he would come alone (8 - 10 meters) without any help" (Interview 7).

Subtheme 1.2: psychological effects. Hippotherapy influences positively the psychological and emotional state of the child. Parents stated that hippotherapy increases the child's self-confidence, happiness and contributes to his/her socialization. A parent reported that:

"It is a feeling of serenity and peace. He is not only doing exercise, because when he is on the horse he feels strong, stronger than us, he feels he can be compared to us, you can see that as he improves, he feels confident about himself, it fulfills him, it gives him the courage to continue, to not have a psychological complex problem with society, to not have a problem with whoever he is with" (Interview 8).

Many participants also commented that hippotherapy offers a sense of freedom, as the main feeling, to their children. A mother of a 17-year-old boy with spastic quadriplegia revealed:

"Hippotherapy offers free movement, he feels free. Hippotherapy is like a car. You have a different feeling when you drive, when you undertake it, and you have a different feeling when someone else drives you; here he feels like a leader and he is satisfied, and it gives him the courage to live along with others" (Interview 7).

Subtheme 1.3: autonomy in daily activities: Hippotherapy had improved the daily activities of the child and this contributed to his/her overall autonomy. One participant highlighted:

"The small movements of his hands have improved; he can unbutton his shirt as well as eat and drink

water on his own. He also goes to the bathroom and is self - reliant. He unbuttons his shirt which he had never done before. At first, he used to break the buttons...clumsily pull them. Now he can get dressed with less difficulty. He can wear heavy clothing but he cannot get fully dressed with easy, how he uses the computer...He writes a Word Document on a computer very quickly which he hadn't done before or how he used to eat and how he eats now, small movements each time, at first he couldn't take off his jacket. Or for instance roll his chair. Now, he is autonomous, he takes a taxi and goes anywhere he wants and the drivers help him" (Interview 7).

Theme 2: Drivers for hippotherapy

Subtheme 2.1: preferences in hippotherapy. The type of horse's movement and of treatment was two crucial issues for the parents. A mother of a 17-year-old boy with spastic quadriplegia reported:

"We assume that Alexander accepts it, because he doesn't feel pressure to do it. He gets tired because when we go home, he is tired for half an hour, but [while he is on the horse] he doesn't realize it. That is, it is not like pulling his hand and feeling pain. It is different; it is not only due to the environment and the contact with nature, but it is the type of therapy itself that calms him without him being pressured to do something. He follows the movement of the horse's body and that is very good for his therapy. Very good"(Interview 1).

Participants also commented that the outdoor environment in combination with the contact of the animal, the horse, were their preferred aspects of hippotherapy. This is how a mother of a 6-year-old girl with athetoid CP introduced the topic of preferences:

"I like it very much that it is in an open area and... she is in contact with nature. It is not closed in as physiotherapy clinics, in a surrounding among buildings. I like hippotherapy a lot, the specific inside area and the outside area" (Interview 2).

The education and the relationship with the hippotherapy clinical specialists were among the parents' favorite elements of the therapy. Noticeable were the words:

"The therapists at this hippotherapy center know their work very well. As I have noticed, they choose the appropriate program for each child" (Interview 2).

The hippotherapy specialists' team plays an important role in preferences of parents. A mother said:

"The team is very good and that is the reason why you see me here [hippotherapy centre] and why I continue coming."(Interview 7).

Subtheme 2.2: factors which influence the results of hippotherapy. Most parents commented that, the age of the child, the impairment level of the child, how often the child attended hippotherapy and the willingness of the child were factors which influence hippotherapy's results. One mother reported:

"The willingness of the child itself; if he isn't willing to do as much as I would like him to do nothing can be done. He is willing to improve, to become better" (Interview 7).

Parents reported that hippotherapy specialists were focusing on each child (child-centered approach) which was a critical factor. One of them said:

"The outdoor environment, the horse, the method and from what the therapist has told me, the horses are special; not all horses are suitable for these children" (interview 5).

Subtheme 2.3: the duration of the impacts of hippotherapy. Regarding the duration of the impacts of hippotherapy, the results were controversial. Half of the parents stressed that the impacts of hippotherapy will remain for a long time, because the positive effects have been "built" within the child. A mother of a 7-year-old boy with spastic quadriplegia pointed out:

"I don't believe that the benefits will be lost. There are some things that I believe are recorded in children's memories, so the positive effects, I believe, will always exist" (interview 6).

The other half of the parents expressed that it would be difficult to maintain the impacts of hippotherapy, if the child stops doing hippotherapy. As one respondent put it:

R: *I don't know, it seems it will be difficult for it to remain*

AL: *Do you believe it will be lost?*

R: *Yes, I believe that the spasticity will start again*

AL: *What happened when you had stopped for a year?*

R: *Muscular atrophy, difficulty in movement and not moving with ease as now" (Interview 7).*

Interesting was that all parents expressed their conviction that the treatment with hippotherapy 'will never finish'. One mother pointed out:

"I don't believe that the program of therapy has an end."(Interview 2).

Subtheme 2.4: motivations for hippotherapy. Many respondents reported that they had been

disappointed by conventional physiotherapy and they wanted something new. One respondent stated:

"I had been disappointed by all the methods of physiotherapy clinics. We wanted to see something else" (interview 2). "The motive was that he had gotten bored of the physiotherapy sessions (that is: the classical methods), of years of repetitive exercises... to be able to do something that is not a lesson, not in a room..." (Interview 1).

Most of the respondents agreed that the impairment in combination with their willingness provide physical and psychological improvement for their children were the main motivations to start and to continue to attend hippotherapy. One mother pointed out:

"I wanted to see improvement in my child because of his problem; this was my motivation [to start hippotherapy]" (Interview 10).

Subtheme 2.5: expectations from hippotherapy. All parents stated that their children improved as time passed and, although each child is unique and according to one mother "every situation is unique" (interview 8), their children to improve even more. Although some of the children had already achieved some level of autonomy, many respondents expected through hippotherapy to provide their children more autonomy in their future lives, to live independently. A father of a 6-year-old boy expressed:

"If we die, what will happen to our child? Could he live alone?" (Interview 3). "Autonomy is our purpose" (Interview 7).

A few respondents revealed to the researcher that they did not have great expectations because of the condition of their child; however, the main points of parents' expectations are summarized with these words:

"It should be as beneficial as possible, because those children are unpredictable...one organism behaves differently than another and, even if the problem is similar, it is never the same" (Interview 4).

Theme 3: The importance of child and therapist's relationship-cooperation

All parents highlighted the importance of the relationship between child and hippotherapy specialist. The professionalism and the training of the hippotherapy specialist according to the Greek Hippotherapy Model may promote trust. hippotherapy specialists as a health professionals, make themselves available and offer their time by listening parents.

Therefore, this relationship affects the child and provides better results. A mother commented:

[The relationship-cooperation between child and therapist is] "perfect, we always discussed the problems with the hippotherapy specialist. I would tell him what I wanted and the hippotherapy specialist had his way of persuading the child to discuss it with him; he [child] trusts the hippotherapy specialist" (interview 7).

Theme 4: Families' sacrifices

All respondents expressed that hippotherapy is an expensive treatment. However, they believed in the effectiveness of hippotherapy and they reported that hippotherapy is worth it. They preferred to cut down on other expenses than stop hippotherapy: "we continue doing hippotherapy, despite of the price, because we believe in it... the grandma and the grandfather [of the child] contribute to its cost as well" (interview 9). A noticeable example came from the mother of a boy with spastic quadriplegia:

"It is worth being deprived of personal things to help your child. I have left my job and I give him a lot of motivation, because he was also mentally handicapped" (Interview 7).

However, only one father expressed a different opinion in relation to the people who work in hippotherapy:

"It's not expensive generally, but it is relatively cheap in regards to the people who work here and the quality of treatment that is provided...is relatively cheap, but compared to the incomes here it becomes expensive" (Interview 3).

Theme 5: Further suggestions

All respondents agreed that they would suggest hippotherapy to other families who have children with CP. Generally, their future recommendations for hippotherapy in Greece included: greater responsibility, better organization within the teams and more hippotherapy centers which will include physiotherapy, occupational therapy and not only in big cities, but also in other towns. Additionally, they asked for better state welfare through government grants for hippotherapy to be part of the public health care, in order to reduce its high cost for each session. Furthermore, it would be beneficial if they had an indoors space for hippotherapy in the winter. One respondent reported:

"I think it would be very good if the costs of hippotherapy were covered by the government, because in this way it would be more affordable for us as well as other families which now cannot afford

it. If a state grant was offered, it would be very beneficial for all parents who have children with CP" (Interview 10).

Although the study was conducted in the Greek language, the above cited quotations are taken from a word by word translation into the English language. The use of quotes demonstrates that there was no ambivalence about what parents wanted to express.

DISCUSSION AND CONCLUSION

Nowadays, there is a growing body of research indicating the beneficial effects of hippotherapy.^{2,3,7,9} The Greek Hippotherapy Model may promote a multidisciplinary rehabilitation as part of a holistic approach that is addressed to children with CP. Hippotherapy focused on children and it includes different specialised professionals by physiotherapy, occupational therapy and speech or language pathology therapy who promote the overall health of children with CP at the same time. Furthermore, parents are an important information source concerning the long-term effects of hippotherapy on children with CP because they are familiar with all special needs of their children and they have their own opinion about the changes that the hippotherapy brings at their child's life.

This research points out the physical benefits and especially the motor learning effects. All participants reported that hippotherapy improved balance, trunk and posture control, and it normalizes muscle tone. The three-dimensional, reciprocal, movement of a walking horse differs from other physiotherapy interventions.^{2,6,11,23} Sterba describes in detail the physiological mechanism of the horse's movement; hippotherapy facilitates and improves co-contraction, joint stability, weight shift, and postural control. Equilibrium responses have been outlined as a result of improving motor learning of children with CP.²⁴ The user's centre of gravity is displaced, promoting anticipatory and feedback postural control.²⁴ Hippotherapy provides a unique challenge for the user to maintain balance on the horse.⁶ Green, Mulcahy and Pountney stated that trunk control is an important condition for the upper limb function.²⁵ By gaining trunk and posture control, a child is able to use his upper limbs for reaching and grasping. Thus the findings of this research support the idea that the motor learning effects influence the daily activities of each child and his/her overall quality of life. The multidimensional movement of the horse

provides systems-wide impact human neurophysiology.

In the matter of the psychological benefits, all parents reported a sense of freedom as a main result of hippotherapy for their children. The majority of respondents stated unambiguously that hippotherapy influenced and increased their children's self-confidence; the children feel "strong" and have the feeling that they can cope with their lives and they gain hope. These results support Debusse, Gibbs and Chandler,² findings which reported that children and adults, who attend hippotherapy have the "sense of achievement" as well as Snider et al,¹¹ results concerning the increase of self-esteem and of motivation for the users. Hence, the impact of hippotherapy and the feeling of "empowerment" are the most obvious positive psychological effects of attending hippotherapy. Based on those benefits, parents' expectations from hippotherapy are to watch their children achieve autonomy in their future lives in order to live independently without them.

This study also points out the main parents' drivers for hippotherapy which is the outdoor activities with the interaction with the horse which is the main difference between hippotherapy and conventional physiotherapy. These results are in agreement with Snider et al,¹¹ and Debusse, Gibb, and Chandler,² who characterized hippotherapy as a "natural and community setting" which includes community, day care and outdoor activities for children and adults with CP. Furthermore, because hippotherapy practice, occurs in natural environments, the gains for children with CP were meaningful and functional.¹² In combination with the psychological effects of hippotherapy, therapy in a natural environment promotes the child's participation in community and social life⁴ and stimulates the socialization of the child which is a key element for the "best practice" in paediatric rehabilitation.²⁶

Parents explained that the effects of hippotherapy should be measured one or two years after attending hippotherapy. There has not been any previously published study examining the impacts of hippotherapy after the end of hippotherapy sessions. Additionally, there has not been any previously research investigating whether the positive effects of hippotherapy remain when children abstain from hippotherapy for a long period. Besides, the majority of the respondents reported that the major changes and the best positive effects were clear-cut at the end

of the six months of attending hippotherapy. Thus, future research should investigate in more depth when hippotherapy's impacts become clear-cut and what happens after the therapy is terminated.

Parents meet different groups of allied health professionals and they feel uncertain whether they have the appropriate training or experience for their children. This study provides new insights into the relationship-cooperation between the clinical specialist in hippotherapy, the parents and the child. The results show that the professionalism of hippotherapy specialists, as health professionals, and the communication between hippotherapy specialists and parents may promote better rehabilitation results. Parent-therapist collaboration promotes the parents' satisfaction which is recognized to affect intervention adherence.¹² Parents were satisfied in terms of changes in child function and demonstrated adherence in terms of hippotherapy program continuity. It seems that parents adhere to a hippotherapy program and recognized the critical effective role that they play as a partner in the provision of therapy. Additionally, the parents' satisfaction reported in this study may have emanated from the fact that they were aware that all therapists who had treated the children in this study had to complete a two-year education and training in hippotherapy in Greek Association of Hippotherapy and Therapeutic Riding Trainers (GAHTRT) in order to practice hippotherapy. The two-year training program of GAHTRT includes introduction to equine skills, how to teach a horse to long line as well as introduction to basic handling skills. Additionally, the training program includes basic and advanced hippotherapy treatment principles. The courses take place 2 days a week each month for two years. The program is designed for physiotherapists, occupational therapists, speech therapists, psychiatrists and psychologists. However, future studies should investigate in more depth the parents' compliance in hippotherapy sessions. Additionally, due to the lack of studies in a field of professionalism of hippotherapy specialists around the world, additional research should be conducted to confirm these results.

Cerebral palsy requires considerable medical resources and places significant economic burden on health care policy. There are several reports on the economic burden or lifetime cost of CP including health care, social care and productivity costs.^{27,28} However, there are no reports on the cost in all countries according to the physiological

types of CP or the extent of involvement. The respondents at this research reported that hippotherapy is not a too expensive treatment, but with regards to the financial crisis is hard to afford it, although they highlighted that hippotherapy was worth its money. Further research is recommended to investigate how it is possible to reduce the high-cost of hippotherapy, promoting at the same time hippotherapy of high quality.

Future research is recommended in order to provide a clear definition of the term hippotherapy. A definition clear and approved by a world organization as well as a clarification concerning the therapists eligible to work as hippotherapy specialists, are not only fruitful but also necessary. Additionally, a comprehensive investigation that includes different hippotherapy models may provide valuable information for all the specializations who work on the field of hippotherapy. This future global definition of hippotherapy and a specific hippotherapy model may contribute to the professionalism and qualification of hippotherapy specialists around the world. The Greek Hippotherapy Model may be integrated with the World Health Organization's (WHO) International Classification of Disability, Function and Health, which focuses on (a) treating the symptoms to maximize the overall health of children and (b) changing the therapeutic intervention programs from a "consequences of disease" classification to the concept of "states of health".²⁹ Future endeavors' should examine the content of the Greek Hippotherapy Model theoretically and clinically.

The limitations of the present study should be taken into account. The present study did not use investigator triangulation including multiple observers to record and describe participants' views. However, throughout the process of collecting and managing the data, we used different strategies to data management (transcribed interviews and notes from parents) as a way for maintaining an audit trail which does help to reduce bias. In terms of interpretive validity, member validation or "member checking", through pamphlets was used.¹⁸ Also these pamphlets included only the comments of the individual respondents were given back to respondents via email or face to face meetings with the support of the therapeutic riding center in order to provide feedback. This process was done to address the potential bias. In particular, through participants' feedback, we hoped to capture their "authentic" experiences to retain control of data analysis and writing (researcher

reflexivity).³⁰ The methodological challenge for the present study was the impact of translation of the study findings. Marshal and Rossman stated that there are no "simple strategies" for addressing the issues associated with translation from one language to another.³¹

This study provides valuable information about parents' experience when their children attend a hippotherapy program. Parents report that hippotherapy is a therapeutic intervention strategy which improves children's daily activities and independence, because the movement of the horse could be manipulated in many ways to address an extremely broad range of system impairments as well as the motor and sensory input is coupled and highly organized. The professionalism and qualification of hippotherapy specialists influence positively the results of hippotherapy. The relationship-cooperation between hippotherapy specialist and child is also a significant factor. The horse in combination with the outdoor activity is the major motivating factor for parents to improve children's feeling of empowerment and socialization.

Acknowledgments

I would like to thank the staff members of the Scientific Association of Therapeutic Riding and Hippotherapy and especially all the families who took part in this research. Their support was vital during the process and completion of this research.

Declarations on interest

The authors report no declarations of interest

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Citation

Athanasia Laiou, Anna Christakou, & Vaios Kaminiotis. (2015). IMPACTS OF HIPPO THERAPY ON CHILDREN WITH CEREBRAL PALSY FROM PARENTS' PERSPECTIVE: A QUALITATIVE RESEARCH. *International Journal of Physiotherapy*, 2(6), 947-957.

Appendix 1: Topic guide interview

A. The impact of hippotherapy in children with CP

1. Have you noticed any positive effect on your child since they he started hippotherapy?
2. Do you feel that there are any negative impacts of hippotherapy on your child?
3. What is your opinion about the cost of the hippotherapy service?
4. What do you like best and least in hippotherapy?
5. What motivated you to have your child start hippotherapy?
6. What urged you to have your child complete the hippotherapy programme?
7. What urged your child complete the hippotherapy programme?
8. What is the relationship-collaboration between your child and hippotherapists?
9. Do you believe that this relationship-collaboration between your child and hippotherapists affects the child's attention? If yes, in which way?
10. What, in your experience, are the main impacts of hippotherapy?
11. Which factors do you believe have influenced the results of hippotherapy?
12. For how long do you believe that the effects of hippotherapy will remain in your child?

B. Previous experience

1. In which way does hippotherapy, in your experience, differ from other physiotherapy methods used to treat your child, in terms of technique? -Please explain.

C. Expectations of hippotherapy from parents

1. What do you expect to happen in your child during hippotherapy?
2. What do you expect to happen in your child after the end of the hippotherapy?

D. Suggestions for the future of hippotherapy

1. Would you suggest hippotherapy to other families who have children with cerebral palsy?
2. How do you dream of the future of hippotherapy in Greece? Do you have any suggestions to make?
3. Would you like to mention anything else or is there anything else you think I should know about your child's experience from hippotherapy?

Thank you very much for your participation in this study!