

The effect of an equine assisted therapy (EAT) programme on children's occupational performance – a pilot study

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Abstract

Purpose – Equine-assisted therapy (EAT) uses the horse and its environment to achieve therapeutic goals as designed by an allied health professional (Taylor, 2010). The benefits of these interventions affect areas such as motor skills (Bass *et al.*, 2009; Silkwood-Sherer *et al.*, 2012), sensory processing (Ward *et al.*, 2013), learning, social interaction and socioemotional development (Bracher, 2000). It was felt that occupational therapists could offer valuable input in this area. This paper aims to investigate the impact of a specific six-week EAT programme on six participants' occupational performance.

Design/methodology/approach – Mixed methods were used in this pilot study, consisting of a pre- and post-design with two follow-up periods. Participants were aged between 5 and 10 years with a diagnosis of a visual impairment, and some had additional diagnoses. The Canadian Occupational Performance Measure (COPM) was administered to parents pre-programme, post-programme and approximately six weeks after the programme ceased. Additional information from notes that contained children's and parents' reports was analysed thematically.

Findings – Five of the six children were rated as having clinically significant changes in their occupational performance. Analysis of parents' and children's reports on their experience of the programme showed the main themes to be: peer interaction, taking on new challenges, feelings towards EAT and change.

Originality/value – Although there are many practitioners of EAT in Ireland, there is little research, and none was found in relation to the role of occupational therapists within this context. These results indicate that EAT may be effective in assisting some children to reach a variety of goals. This pilot study not only suggests that EAT is worth further research but also begins to explore the role of occupational therapy in this form of intervention.

Keywords Children, Equine assisted therapy, Occupational performance

Paper type Research paper

Introduction

This study was undertaken in a setting for children with sensory and other disabilities and used horses to complement therapy. As an occupational therapist with over 20 years' experience with horses, it was of interest that children seemed more willing to engage in



tasks that they may have otherwise avoided and reached some goals quicker in the equine environment. Much of the literature in this area focuses on the physical and sensory benefits of the horse; however, there appear to be further unexplained occupational-based gains.

There are many forms of equine-assisted therapy (EAT) carried out by different professionals with varying qualifications, but the role of occupational therapy is not well established. The occupational therapy department wanted to explore the effect of a structured group-based equine therapy programme among children who may be experiencing occupational dysfunction.

This EAT programme was created from a blend of therapy associated with the use of horses as well as specific knowledge and skills unique to occupational therapy. Using the movement of the horse to target motor skills and sensory processing linked with much of the research in relation to hippotherapy (Bracher, 2000; Henry and Sava, 2006). Comparable to therapeutic riding (Equine Facilitated Education and Therapy Association [EFETA], 2015), some basic riding exercises and pony games were drawn on to target attention, gross and fine motor skills. Personal development and responsibility were explored by using suitable horse care activities which linked to theories related to equine-assisted learning (EAL) (Bracher, 2000).

Although this therapist is not a qualified sensory integration therapist, the sensory integration frame of reference played a significant role in designing preparatory activities and sensory rich experiences on the horse (Parham *et al.*, 2007). This led to rollers being used in the sessions rather than saddles to ensure the children had more contact with the horse and facilitated increased movement of the pelvis. Most importantly, this programme was designed as a top-down, occupation-based intervention. All activities aimed to be meaningful and therefore motivating for the children, making this a complex multi-faceted intervention.

As therapists, many of us face the problem of delivering an effective intervention that will transfer to the children's everyday life on a long-term basis. Based on a review of the literature and personal experiences, it was queried whether occupational gains could be made with a structured group-based EAT programme. It was also thought that some gains may be beyond explanation of the physical benefits of the horses.

Literature review

According to Fine (2010), using an animal as a central part of intervention is known as animal-assisted therapy (AAT). There are many forms of AAT with various species (Henry and Sava, 2006). One of the more popular therapies in recent years is through the use of horses. However, the valuable effects of horses have been noted as far back as the ancient Greeks and Romans (EFETA, 2015). Different forms of equine-based therapy require different training and have different treatment objectives. Some of the most popular types of EAT in an Irish context appear to be therapeutic riding, EAL, equine-facilitated psychotherapy (EFP) and hippotherapy.

Therapeutic riding is one form of equine therapy that involves the use of mounted riding activities to help people achieve therapeutic outcomes (EFETA, 2015; Taylor, 2010). According to these sources, therapeutic goals are set by the qualified therapeutic riding coach. EFETA (2015) states that a therapeutic riding coach can have a background in equestrian coaching, in allied health professions or extensive equine experience. Funk and Smith (2000) investigated why the use of therapeutic riding was dominated by physical therapists rather than occupational therapists. They found that occupational therapists felt that they lacked knowledge in this area and time to pursue this treatment modality. Bracher's (2000) review of the literature found that therapeutic riding can motivate people with disabilities to reach their full potential and sensory processing goals.

Candler (2003) used the Canadian Occupational Performance Measure (COPM) to explore the effectiveness of a therapeutic riding summer camp for children with sensory modulation disorders. This study reported improvements in personally relevant occupational performance goals. Participants who engaged in a therapeutic riding programme demonstrated improvements in sensory integration, directed attention and social motivation (Bass *et al.*, 2009). A control study found that children with autism who participated in therapeutic riding made significant improvements in self-regulation behaviours as well as expressive language and motor skills (Gabriels *et al.*, 2012). Ward *et al.* (2013) found that therapeutic riding could help improve social interaction skills and sensory processing in children with autism. However, they noted that these gains were not sustained over time.

EAL is another form of equine therapy led by a specifically trained professional that uses non-mounted horse-related activities to provide informal education that builds transferable skills (EFETA, 2015). Trust, social skills and self-esteem can be effectively targeted in EAL (Bracher, 2000). EFP is a ground-based equine therapy focusing on one's mental health and human development facilitated by a trained psychotherapist (EFETA, 2015). Caring for the horses in this way is reported to develop transferable skills that positively affect personal and domestic activities of daily living.

Bracher (2000) stated that hippotherapy involves using a horse to target balance, muscle strength and control, particularly in relation to the pelvis and trunk. Hippotherapy is a form of equine therapy that can only be carried out by physical therapists, occupational therapists or speech and language therapists with sufficient practical experiences and who have completed a recognised hippotherapy course (American Hippotherapy Association, 2010). Henry and Sava's (2006) parent interview found that hippotherapy helped with the child's sensory regulation, ability to process instruction and desire to interact with others. Motor skills such as balance can have statistically significant improvements through the use of hippotherapy (Silkwood-Sherer *et al.*, 2012). Although Hamill *et al.* (2007) did not find significant improvements in the sitting balance of children with cerebral palsy, parents in this study continued to rate hippotherapy positively, reporting improvements that were not detected by the standardised measures. Cohn (2001) found that parents who perceived treatment as beneficial noted positive changes and suggested that improvements in social participations and changes in daily occupation be assessed to explore the effectiveness of an intervention.

EAT does not have a consistent definition across the literature and at times is used as an umbrella term for the different therapies associated with horses. Taylor's (2010) explanation of EAT being "treatment that incorporates equine activities and/or the equine environment [...] to achieve therapeutic goals as designed by a therapist (i.e. occupational therapist) is used for this study.

The purpose of this study is to explore the impact of a structured EAT programme facilitated by an occupational therapist on children's occupational performance. This pilot study aims to begin adding to the limited research in this area in an Irish context.

Methods

Research design

This pilot study used mixed methods using pre- and post-design with two follow-up periods, one immediately after the intervention and the other approximately six weeks after the termination of the intervention. As well as this, anecdotal evidence was gathered from a thematic analysis of clinical notes. The total duration of this project of each group was 12 weeks.

Ethics

Ethical approval was granted by the voluntary organisation's Ethics Committee. The gatekeeper provided the therapists with the list of parents of the children who met the relevant criteria and were both interested and available to take part in the research. Informed consent was obtained from the parents involved.

Due to the small population, additional measures were taken to ensure the participants' anonymity such as not directly linking the children's ages to their diagnoses or sex. Data collected were stored on password-protected computers, and codes were used instead of participants' names. Thorough risk assessments were carried out, including investigation into medical background to ensure there were no contraindications to participating in this intervention. Parents were advised to link with their children to explore whether they would like to engage in this programme. Both children and parents provided frequent feedback to ensure that they were happy to continue to participate. It was anticipated that there would be therapeutic benefits and all children who met the criteria in this service were offered the opportunity to participate.

Participants

A limited sample of ten children was identified from the service. These children were selected as they were previously identified by the team (i.e. therapists, teachers and parents) as having sensory processing and occupational performance difficulties. The gatekeeper phoned the parents directly and parents who expressed an interest were sent written information on the study and intervention. Parents were then invited to meet with the programme facilitator. Due to the time and access to transport, only six children participated in this study.

Structure of the programme

The duration of each session was approximately 1 h 30 min due to the time required to carry out the range of activities within the programme. Beforehand training of the equine staff took place. Each child had equine staff to lead the horse and a side-walker. A minimum of one occupational therapist facilitated the session. Due to limited resources, there were two groups of three children in this project.

The children were first introduced to the routine and rules using visual and tactile timetables. Children often requested the horse that they would like for the session. Basic stable work (e.g. mucking out) followed this, ensuring that there was the opportunity for proprioceptive input (e.g. pushing a heavy wheelbarrow). Children put on their riding equipment (e.g. hat, body protector and wet gear) at the equipment spot, and then they mounted their horses in the arena. On the horse, the children engaged in co-ordination and body awareness activities (e.g. Simon Says). Proprioceptive and vestibular input (e.g. trotting) was increased if deemed appropriate by the therapist. In the fields, the children participated in teamwork (e.g. relay races) and social interaction games. The children engaged in fine motor and attention activities (e.g. carrying a full cup of water over even ground) at the sensory trail. When they returned to the arena, the children dismounted and finished up with grooming and feeding the horses. To end the session, the children were facilitated to reflect on their own and their peers' achievements.

Before and after each session, the children rated their mood on 1-5 Likert scales (1 = very sad and 5 = very happy), depicted with enlarged sad to smiling faces or basic tactile mouth expressions for non-visual participants. This aimed to gather information on the children's moods before and after sessions. It enabled the facilitator to modify the sessions to maximise the children's engagement.

Each week, the structure remained the same with activities being adapted to support each child to meet their goals. Within this setting, a block of therapy ran within the academic timetable with one session per week for an average of six weeks. This programme mirrored the familiar therapy block of once a week for six weeks.

Canadian Occupational Performance Measure (COPM)

The COPM was designed to be client-centred and enable people to create meaningful goals based on their priorities from self-identified occupational performance issues (Townsend and Polatajko, 2007). The COPM has several strengths, as it has a broad focus, can be used with various populations and allows for individualised goals.

The COPM was administered to the parents; therefore, the goals were set and scored by parents. Parents can complete the COPM as part of the assessment process (Law *et al.*, 2004). The COPM was chosen to be completed by parents because the programme aimed to be fun for the children and to reduce the pressure to perform that can sometimes be associated with clinical tasks. Each parent was encouraged to prioritise three goals due to the time constraints of the intervention. Reducing the number of goals from the recommended five has been of benefit to other short-term interventions (Candler, 2003). Some valued goals were too large and needed to be broken down further; therefore, one parent set four goals, while the other set five.

Approximately one week before the programme, semi-structured face-to-face parent interviews were held using the COPM. Copies of the goals were sent home to parents. At the end of the six-week programme, semi-structured interviews were carried out over the phone with parents to review the COPM. This process was repeated in the same manner at the second follow-up.

Analysis

The COPM scores were assigned by parents on a scale of 1 to 10. The scores given for each goal were added, and the total was divided by the number of goals. To calculate the change in performance and satisfaction, the initial scores were first subtracted from the scores in performance and satisfaction at the end of the programme, and then the initial scores were subtracted from the second follow-up scoring. Clinical significance was determined if the change in performance or satisfaction score was greater than or equal to two (Candler, 2003; Law *et al.*, 2004). Statistical significance was not deemed valuable due to the small sample size.

A thematic analysis was also carried out on the clinical notes that contained children's and parents' reports. During sessions, interesting statements from the children were recorded. Similarly, during the semi-structured interviews with parents, statements were also recorded.

Results

At baseline, there were two males and four females participating in the study. The age range was from 5 to 10 years and the mean age was 8.3 years. All the children who participated in this study had a diagnosis of a visual impairment. Four of the six children had additional diagnoses including autism, brain injury and a diagnosis associated with a specific syndrome. There were no dropouts throughout the study.

Canadian Occupational Performance Measure (COPM)

Table I contains the participants' unique and varied goals, including areas such as peer interaction, dressing, homework, functional play and feeding by coping with mess.

Changes from the initial scoring to the first and second follow-ups are recorded in **Table II**.

At the first follow-up, three participants had clinically significant changes in performance and satisfaction scores. This indicates that the parents of these three participants noted visible and practical changes in the children's occupational performance. The mean change in performance was 3.03 and the standard deviation (SD) was 2.39. The mean change in satisfaction was 2.78 and the SD was 2.48.

At the second follow-up, four participants showed clinically significant changes in performance and satisfaction scores. Similar to the above, parents noted visible changes in occupational performance after the programme had terminated. The mean change in performance was 2.9 and the SD was 2.27. The mean change in satisfaction was 2.88 and the SD was 2.06.

Themes

Drawing on the anecdotal data four main themes emerged. The themes below transpired while the children were participating in sessions or the COPM was administered to parents. These themes are as follows:

Interaction with others. While on the horses, all of the children shouted greetings to their peers or asked questions about them. Parents reported incidents such as their children "wanting to know what others are doing" when they previously showed no interest in initiating conversation with unfamiliar children. Children and parents talked about visiting each other's houses and being "best friends". The children were heard using more socially acceptable phrases, for example instead of referring to a person as "her" in their company a child began saying "excuse me what is your name".

Taking on new challenges. One parent reported that their child who originally disliked water began requesting to water the plants at home. In sessions, this child was given the option to shelter from the rain, but the child opted to wear their wet gear and continue. Another child who initially declined offers to trot the horse reported that they were now "working up to 10 trots". A parent recalled their child telling them to "close her eyes" so that the child could complete a task by themselves and surprise their parent. At the first session, one child did not want to go near the horse's head in case "his teeth bite fingers off" and later suggested "hugging his neck" rather than feeding the horse. One child reported that they were "very brave" as they fed the horse.

Feelings towards equine-assisted therapy. One child arrived to the session after being absent from school as the parent reported that they "really wanted to come". Several parents reported that their children were talking about the horses at home and one stated that their child was "very enthusiastic" about the programme. Two parents noted that their children had recently begun withdrawing from other hobbies but continued to show interest in the horses. One parent felt that it was more than just riding, rather their child was responding to the routine and specific activities. Another parent stated that this gave their child a new interest as it had been hard to get them "into doing something other than Minecraft". One child stated that she loved the horses – "everything about them but especially the fizz of trotting". All parents reported that they would like their children to participate in this programme again.

Table 1.
Participants' COPM
goals

Participant 1	1. To participate in an activity that is of interest to their peers	2. To initiate putting on their clothes	3. To tolerate a small amount of water on their clothes
Participant 2	1. To listen and respond to instructions consistently with a maximum of two verbal prompts	2. To attend to their reading/homework for more than 5 min	3. To demonstrate an increased awareness of responsibilities (e.g. cleaning up after themselves)
Participant 3	1. To demonstrate an understanding of boundaries with others (e.g. to respect others' personal space)	2. To react appropriately and immediately to instructions related to safety (e.g. move away from the horse's rear)	3. To tolerate dirt on their hands appropriately (e.g. when working with the horses) and only need to wash them once after being dirty
Participant 4	1. To complete their homework in 30-40 minutes three of four days per week with adult support	3. To listen and respond to instructions eight of ten times with no additional prompting	4. To demonstrate increased confidence in activities that challenged their balance (e.g. transferring to and from the bath)
Participant 5	1. To initiate appropriate interaction with their peers	3. To engage in a colouring activity consistently for 10 min	5. To dress themselves with increased speed (e.g. from 20 to 15 min)
Participant 6	1. To orientate their clothes correctly four of five times with verbal prompting	2. To demonstrate increased safety awareness	4. To organise objects in space to enable them to carry, transport and relocate them accurately (e.g. when setting up for dinner)
			3. To sit/lie while listening to a preferred story for 10-15 min

When the children rated their feelings, four of these children reported feeling “really happy” (i.e. a five on the smiley face scale) after the session for a minimum of five of the six sessions. On three occasions, the children wanted to modify the scale to “super happy” or give a score of “100” or “155”. On nine occasions, the children gave lower scores before the session. One child reported that they initially scored low because they were “kind of sad because it was the last day”. There were four incidents of the child rating themselves lower after the session but these scores aligned with “Okay” or “happy” faces.

Change in the children. Two parents stated that there were “no dramatic changes” in their child, but these parents also reported “improvements” in the children’s occupational performance. Four parents described their child as being “calmer”. One parent reported that “everything is so settled” and they were “over the moon” with their child.

Discussion

According to the results of the COPM, this structured EAT programme showed clinically significant improvements in five of six participants. Parents’ scores showed three children with improvements in their occupational performance and satisfaction after the programme ended, and a total of four had clinically significant improvements in these at follow-up two (i.e. six weeks after the programme ended). This raises the question: are these occupational gains connected to participation in this programme and are gains sustained after the intervention has ceased? An experimental study by [Bachi *et al.* \(2011\)](#) found that ratings of general life satisfaction increased in the group that participated in EFP at the year follow-up, while the control group’s rating decreased.

These changes may have been due to an attitudinal change by the children (e.g. wanting to be more independent) and parents (e.g. understanding that their child was capable of improving). Another reason for possible improvements may be related to [Silkwood-Sherer *et al.*’ \(2012\)](#) findings that new movement patterns established on the horse enhanced functional abilities. One participant showed little to no improvement in their occupational performance rating. It is possible that this intervention was not suitable for this child. It is also queried whether some parents were biased towards getting additional or novel therapy for their children. The literature in this area has focused on the positive effects of mounted equine activities

Participant ID	Change in performance (Follow-up 1)	Change in performance (Follow-up 2)	Change in satisfaction (Follow-up 1)	Change in satisfaction (Follow-up 2)
Participant 1	+1.3	+3.3*	+1.3	+4*
Participant 2	+6*	+0.6	+6*	+1
Participant 3	+0.4	-0.3	+0.6	+0.3
Participant 4	+1	+2.6*	+1	+3*
Participant 5	+4.75*	+3.75*	+3.5*	+3*
Participant 6	+4.7*	+6.7*	+5*	+6*

Table II.
COPM Change in performance and satisfaction

Note: An * denotes a clinically significant change greater than or equal to 2

on regulating the sensory system (Bass *et al.*, 2009). There were certainly the opportunities for sensory regulation to occur during these sessions, and this could also contribute to children being able to learn new skills and increase their awareness of their environment.

Candler (2003) used the COPM and focused on occupations, as they related to an equine summer camp. In contrast, this study addressed occupational goals in an equine-based intervention that could also be applied to the children's daily life. Transferable skills that applied to activities of daily living were reported to derive from caring for a horse (Bracher, 2000). Interestingly, a variety of goals that contributed to areas such as peer interaction, feeding, dressing, productivity and leisure could be explored in this group setting and yield some preliminary positive results. Carriker (2013) stated that EAT can benefit a wide range of disabilities and that many aspects of an individual's life are affected, which could be applied to this study.

Based on anecdotal data, there were suggested developments in relation to social interaction and awareness. Three parents prioritised a goal related to this area; however, all of the children engaged with their peers or their parents reported to notice a change in this area. This may be compared to Gabriels *et al.*' (2012) study of children with autism that reported unexpected outcomes in relation to communication and interaction possibly due to the human-horse interaction. Other studies involving children with autism have reported improvements in social interactions (Bass *et al.*, 2009; Ward *et al.*, 2013). A parent's testimonial highlighted that hippotherapy helped her child with "reciprocity of interactions" (Henry and Sava, 2006).

At times, some fears and anxiety were reported to be present, but several children chose to engage despite these. For example, stating they would hug the horse's neck regardless of a reported fear of the horse biting. The researcher's original hunch was that children were willing to engage in new challenges in the context of EAT and the subjective data suggested that this may have occurred. According to Taylor *et al.* (2009), volition ranges from exploration to competence which involves the motivation to take on challenges. Their anecdotal data indicated a motivational change in children with autism who participated in hippotherapy.

Parents and children discussed their feelings about the horses or the related activities. Words such as "love", "enthusiasm" and "excited" were used. Carriker's (2013) qualitative study on EAT reported that eight parents specifically stated that their children "loved" their experiences. Several parents reported that their children had an interest in this area. It is possible that interest developed in this area due to the accessibility of riding for people with disabilities (Bracher, 2000). Hamill *et al.* (2007) stated that they felt a hippotherapy programme was worthwhile as parents wanted to continue with this. Parents in this study also reported to want their children to participate in the EAT programme again.

Gabriels *et al.* (2012) study found that parents reported that their children were "calm" the day of riding. Many parents acknowledge small changes in their children beyond occupational-based achievements, describing them as "different", "settled" or "calm". Again, it is queried whether information not captured in this study contributed to this change.

EAT can be analysed as both occupation as means and ends. Occupations by nature are meaningful and specific to the person (Trombly, 1995) which is what this EAT programme aimed to replicate. Funk and Smith (2000) asked the question as to why occupational therapists are not more involved in therapeutic riding and felt that

greater exposure to the benefits of this intervention may help motivate therapists to become more involved. By beginning to explore the possible application to occupational goals, we can better define and encourage occupational therapy involvement in this area.

Further research may help to determine whether occupational gains can be made using a structured group-based EAT intervention by replicating this study on a larger scale. Other studies offering sessions once a week have longer programmes from 10 to 16 weeks (Bass *et al.*, 2009; Gabriels *et al.*, 2012; Hamill *et al.*, 2007; Taylor *et al.*, 2009). It would be interesting to expand the number of sessions from 6 to 12 to explore the effect of increasing the duration. Alternatively, it may be useful to explore the effect of an intensive EAT programme with multiple sessions per week, similar to Candler's (2003) summer camp study. Qualitative data may better help understand the phenomena that continue to be unexplained by standardised measures. Ward *et al.* (2013) suggested that future research should explore parent and teacher reports in relation to social interactions. This project began exploring this possibility but a rigorous qualitative piece, including parent and teacher diaries would be of great value. Comparing an EAT intervention facilitated by an occupational therapist with a therapeutic riding intervention would also add to our understanding of the role of occupational therapy in this area.

Limitations

The small sample size and the children's varying and complex needs mean that these findings cannot be generalised and limit external validity. Parents' scoring may reflect changes only in parental perception, and additional measures would be necessary to quantify functional changes. Positive association may have been made with a novel therapy or the fact that children were engaging with what appeared to be a mainstream hobby away from the clinic setting.

The use of a control group would help define if the intervention itself was the agent of change. Comparing a group receiving an EAT intervention with other group-based activities or interactions with a different animal would be of value. Children involved in this study continued with other therapies they had been receiving for several years. Although it is possible that these influenced the results, it is unlikely as these therapies were consistent over a long period and did not report similar effects.

Even though this is a pilot study, it must be acknowledged that the data were collected from limited sources and is open to bias. It mostly relied on parent reports and interviews were not recorded; rather, data were extracted from clinical notes and reviewed by only one coder.

Conclusion

This study provides preliminary evidence that an EAT intervention may enhance some children's occupational performance. Children's and parents' reports suggest interaction skills and volition may also be impacted. Overall, EAT was viewed positively by all participants which is a consistent trend in the literature.

The areas explored in this study marry with many of occupational therapy values and beliefs. This author is in agreement with Bracher (2000) who felt that occupational

therapists have a lot to offer within this area and more evidence and education is required. In conclusion, this is an emerging area of practice in Ireland that could offer effective, transferable and long-lasting benefits using horse-related occupations to enhance an individual's everyday functioning.

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