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Case reports

Presentation of the "Step-by-step in communication" equine-assisted therapy intervention program for children with autism

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ABSTRACT

The objective of this paper is to present the "Step-by-step in communication" equine-assisted speech-language-hearing rehabilitation program to treat language impairment in children. The program was developed in three stages: literature analysis, pilot application, and clinical analysis. The literature was analyzed by searching, reading, and discussing articles and books on the topic, published up to 2018. After this stage, the first version of the program was developed. This version addressed: participants' language assessment, application of 10 sessions, monitoring and record of activities in each session, participants' reassessment, and adjustment of techniques and activities. The clinical analysis took place after the pilot application with the following procedures: analysis by three judges, revision of the approach by the authors, and development of the final version of the "Step-by-step in communication" program, comprising eight theme modules with 24 sessions, and based on four main pillars, which are applied in equine-assisted therapy activities. Each pillar has specific objectives and strategies. The activities aim at formal (semantic and morphosyntactic) and pragmatic aspects of language. Their theoretical/practical framework is grounded on functional grammar, and the strategies are based on equine-assisted therapy experiences that open the way for communication.

Keywords: Equine-Assisted Therapy; Autism Spectrum Disorder; Language; Communication; Speech, Language and Hearing Sciences

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INTRODUCTION

Equine-assisted therapy is a comprehensive therapeutic method that uses equines in an interdisciplinary approach encompassing health, education, and horse-riding for the biopsychosocial development of people with disabilities[1]. The team of professionals selects the animal based on its physical and psychological characteristics and the patient's needs and therapeutic objectives, and hence each professional works in their field of knowledge. The modality normally takes place in a motivating therapeutic setting, providing the individual with outdoor activities and a variety of natural stimuli[2].

The differential in this complementary treatment is the horse, providing equine activities to develop a therapeutic interaction between the animals and the patients who practice equine-assisted therapy[2]. Such an interaction is therapeutic and has proven to open the way for communication between patients and therapists, while therapists can mediate and count on the relationship gradually developed between individuals receiving therapy and the horses[2,3].

Openness to communication is triggered by action mechanisms peculiar to the treatment with horses, which have not yet been fully clarified. It is understood that the psychological and emotional aspects involved in the relationship between humans and horses can positively change behaviors. When this relationship is used in a therapeutic process, it facilitates social interactions between humans[4].

Besides this relationship, there is the rhythmic horseback movement experienced by the rider at different controllable speeds. This movement is responsible for greater activity in brain areas essential to stages involved in communicative situations[5,6]. Moreover, the enriched environment can facilitate learning and is socially stimulating[2].

A systematic review and meta-analysis study on the effects of equine-assisted therapy in children with autism shows increasingly present scientific evidence on communicative aspects in research – although these studies give priority to the motor and emotional aspects[7]. Although most of these studies have good results, they are mainly restricted to social behavior analysis of subjects with autism in equine-assisted therapy[7], and therefore communication is more superficially addressed. Nevertheless, some studies indicate an increased number of words per minute and new words[8], improved executive functioning[9], and increased verbal and gestural communication initiated by the children[3]. This provides initial support to develop future research.

Despite the growing interest in inserting children with autism in equine-assisted therapy[7], we did not yet find in the literature any papers with enough details that would enable their replication and furnish proven evidence of their effectiveness with high methodological rigor. Hence, it is important to develop a test for a specific rehabilitation method to meet the actual communicative needs of children with autism.

Thus, this study aimed at proposing a speech-language-hearing rehabilitation program for children with autism, named "Speech-language-hearing and equine-assisted therapy: Step-by-step in communication".

CASE PRESENTATION

This research was approved by the Research Ethics Committee of the College of Ceilândia at the University of Brasília, Brazil, under CAAE 14946819.8.0000.8093 and evaluation report number 3.473.484. All participants signed an informed consent form. The program was developed based on three stages: literature analysis, pilot application, and clinical analysis.

The literature analysis used the following procedures:

a) Electronic and manual search for original studies published through July 2019, whose participants were children with autism, the intervention was equine-assisted therapy, and the results addressed communication.
b) Electronic search in databases: Clinical Trials, LILACS, PubMed, and Web of Science, using a search strategy developed with the terms "equine-assisted therapy", "hippotherapy", "autism", "autism spectrum disorder", and "communication".
c) Manual search of references in the selected articles;
d) Inclusion of three articles that approached the topic in question;[3,8,9]
e) Analysis of included articles;
f) Development of the initial version of the therapy program, considering the most frequent techniques in the literature and their specific objectives. Program activities were initially developed by regularly consulting two speech-language-hearing therapists (others than the researchers), a physical therapist, an equestrian, and a psychologist of the National Equine-Assisted Therapy Association.

The pilot application was based on the following procedures:

a) Pilot application of the first 10 equine-assisted therapy sessions (out of the 24 in the program) with 10 participants. It was approved by the Research Ethics Committee (CAAE: 14946819.8.0000.8093), and its preliminary results have been reported[10,11].

b) Adjustments in the techniques and objectives of the initial version of the program.

The final version of the program resulted from the literature analysis and pilot application and was submitted to clinical analysis with the following procedures:

a) Post-application activity analysis by three speech-language-hearing judges. They were instructed to consider the characteristics and difficulties found in the pilot application (in which they participated) and revise the usability of proposed activities;

b) Proposal revised by the two researchers;

c) Development of the final version of the "Speech-language-hearing and equine-assisted therapy: Step-by-step in communication", with 24 sessions.

RESULTS

The Step-by-Step Communication Program was structured as a protocol to be used in equine-assisted therapy sessions. Its main objective is to provide therapists with a model of activities and strategies for communication and language rehabilitation in children with autism aged 2 to 10 years. The treatment protocol is organized into 24 sessions with 10 to 16 activities each. The sessions are distributed into eight thematic modules, as shown in Figure 1.

The program has four main pillars, which are present in all sessions, namely: 1) the relationship with the horse as the center of the equine-assisted therapy; 2) the main focus on facilitating communication; 3) therapy planning based on functional grammar[12], with combined pragmatic, semantic, and syntactic approach during activities; 4) opportunities for children to engage in spontaneous activities.

The first pillar is related to all aspects involving the relationship between the patients and the horse. Children may feel different emotions by drawing near the animal, petting and riding it, and then saying goodbye at the end of the session, including initial fear, and then the joy and pleasure of touching and riding it[13].

Figure 1. Module structure of the "Step-by-step in communication" program

The second pillar refers to the concept of communication as an interaction between two individuals to reach objectives, using the horse as a facilitator. The horse will not necessarily be an interlocutor, but its movements and behaviors impact the children. These moments must be used to potentialize the therapist/patient communicative process.

The third pillar admits that equine-assisted therapy activities must be organized and carried out based on adequate context to develop semantic objectives. According to activity context and content, the patient must make morphosyntactic choices to establish communication. The following are some of the strategies used to this end: 1) context: washing the horse; 2) content: learning the parts of the animal body; 3) form: using the preposition "of" (the hoof of the horse, etc.) and the pronoun "its" (its hoof, etc.). Each module has an initial direction, but the specific objectives are defined according to each participant's assessment, as shown in Chart 1.

The fourth pillar is directly related to the therapists' strategies, which must always be based on focal stimulation, allowing patients to take the initiative and restart the conversation. If the patient does not respond to the said strategies, the activity with that objective must resort to imitation. In the last case, physical support must be used to complete the activity proposed by the therapist.

DISCUSSION

The main objective of "Speech-language-hearing and equine-assisted therapy: Step-by-step in communication" is to provide a structured equine-assisted therapy program aimed at the formal (semantic and morphosyntactic) and pragmatic aspects of the language. The theoretical/practical framework was grounded on functional grammar[12] and experience-based strategies[14]**.** Considering that the speech-language-hearing sciences have studied little about equine-assisted therapy so far[8,15], this initial proposal can support speech-language-hearing practices in equine-assisted therapy centers.

The best results focused on language development are reported in a randomized clinical trial[8]. Intervention intensity was 10 sessions distributed over 2 weeks, one session per weekday, from Monday to Friday. This can be a difficult approach in the context of most treatments in Brazilian equine-assisted therapy centers because most users' socioeconomic conditions can prevent

Chart 1. Example of module subdivision

MODULE 1 – EXPERIENCING EQUINE-ASSISTED THERAPY		
Module sessions and general themes	**General objectives**	**Examples of strategies**
Session 1: Welcoming and Horsemanship	I. Presenting the environment, people, and rules of the equine-assisted therapy center. II. Approaching children and families to the horse.	I. Developing a notebook for each child with the family's help. Sticking pictures of the people and settings on the notebook. As the notebook is developed, specific objectives must include the presentation of the team, place, and rules. II. Walking about the center, presenting the place. The experience must include specific contextualized objectives related to semantics and morphosyntax, according to the child's assessment. III. While still on the ground and in an appropriate place, each family must be individually introduced to the horse. The interaction between the child, horse, and equestrian at this moment must include mutual attention, conversation with eye contact, and semantic expressions of physical (e.g., parts of the horse) and emotional aspects (feelings related to the moment).
Sessions 2, 3, 4: Discovering the equine-assisted therapy	I. Helping patients experience all initial psychomotricity and emotions involved in introducing them to the horses: physical and emotional contact with the horse. II. Semantics: Introducing a semantic field related to equine-assisted therapy. III. Morphosyntax: Allowing patients to use morphosyntactic structures according to assessment results. IV. Pragmatic functions, experiencing them according to assessment results; choosing pragmatic functions. Interactive, instrumental, and heuristic functions can be more easily experienced in the module.	I. Introducing the horse that will be with the child throughout the therapeutic process, naming the animal to increase verbal expression, and petting and greeting it to enable the use of pragmatic functions. Allowing the child to ride the horse or guide it from the ground, according to their preference. II. Presenting the material used in the equine-assisted therapy sessions, such as helmet, saddle, saddle blanket, stirrup, bridle, and tack. The level of grammar to be used and encouraged must be based on the child's assessment. III. The horse may be instructed to walk only after the child's verbal command. The complexity of the verbal production is recruited according to assessment results. E.g., "Walk, horse", "Now, let's walk, horse". Phrase use must be encouraged to develop more complex grammar structures to reach morphosyntactic objectives. IV. Different session activities are suggested for each pragmatic function. Interactive example: therapists must create a routine with greetings and goodbyes to the horse at the beginning and end of each session. Instrumental example: therapists must place the helmet where the child cannot reach it, allowing them to ask the others for what they want.
Observation on the specific grammar objectives: in all objectives exemplified above, the mediator must consider the state of the child's linguistic expression and comprehension to use strategies compatible with their grammar use. For instance, the general objective in Module 1 (approaching children and families to the horse) can be addressed in three different cases: • Nonverbal child, or who preferably expresses themselves vocally: the communication must be based on gestures, isolated words, or very short phrases. Phrases such as "Look, the hook of the horse", reinforcing with "The hoof", "Touch the belly", and "Touch the tail" are examples of experiences adapted to the child's grammar level. • A child who expresses and understands objects and their characteristics: the communication between the mediator and the child must go beyond naming and address physical characteristics. Phrases such as "Look, the hoof of the horse. It's big!", "Touch the belly of the horse. It's warm!", "Touch the tail of the horse. It's long!". • A child who expresses and understands the relationship between events: the communication between the mediator and the child must be more encompassing. For instance, they can make comparisons such as "Look at the hoof of the horse. Look at your feet. Are they the same or different? What are they like?"		

their commute to the therapy setting so many times a week.

An important limitation of the program is the lack of activities and strategies for other aspects of speech-language-hearing therapy that may be impaired in children with autism (e.g., speech and oral-motor function).

Experimental studies – such as case studies, case series, and randomized clinical trials – are needed to obtain robust scientific evidence of the effectiveness of both equine-assisted therapy and the program in the rehabilitation of communicative and linguistic aspects of children with autism. These data, along with those of other studies, can help families and therapists choose the most appropriate therapies to reach therapeutic objectives for children with autism.

FINAL CONSIDERATIONS

The "Speech-language-hearing and equine-assisted therapy: Step-by-step in communication" program has eight thematic modules, totaling 24 sessions. Activities were specifically planned per session and must follow the order suggested in the program. The whole program was organized and developed based on the context found in the various equine-assisted therapy centers in the country, thus enabling its replication. It offers support to future equine-assisted therapy practices involving children with autism and their various communicative difficulties. However, its therapeutic effectiveness needs to be studied with experimental research.

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REFERENCES

1. Brasil. Lei nº 13.830, de 13 de maio de 2019. Dispõe sobre a prática da equoterapia. Diário Oficial da União. 2019 Maio14;91(1):4.
2. Martin RA, Graham FP, Taylor WJ, Levack WMM. Mechanisms of change for children participating in therapeutic horse riding: a grounded theory. Phys Occup Ther Pediatr. 2018;38(5):510-26.
3. Malcolm R, Stefan E, Pickersgill M. 'It just opens up their world': autism, empathy, and the therapeutic effects of equine interactions. Anthropol Med. 2018;25(2):220-34.
4. Scopa C, Contalbrigo L, Greco A, Lanatà A, Scilingo EP, Baragli P. Emotional transfer in human-horse interaction: new perspectives on equine assisted interventions. Animals (Basel). 2019;9(12):1030.
5. Chen CCJJ, Crews D, Mundt S, Ringenbach SDR. Effects of equine interaction on EEG asymmetry in children with autism spectrum disorder: a pilot study. Int J Dev Disabil. 2015;61(1):56-9.
6. Zhu X, Suarez-Jimenez B, Zilcha-Mano S, Lazarov A, Arnon S, Lowell AL et al. Neural changes following equine-assisted therapy for posttraumatic stress disorder: a longitudinal multimodal imaging study. Hum Brain Mapp. 2021;42(6):1930-9.
7. Trzmiel T, Purandare B, Michalak M, Zasadzka E, Pawlaczyk M. Equine assisted activities and therapies in children with autism spectrum disorder: A systematic review and a meta-analysis. Complement Ther Med. 2019;42:104-13.
8. Gabriels RL, Pan Z, Dechant B, Agnew JA, Brim N, Mesibov G. Randomized controlled trial of therapeutic horseback riding in children and adolescents with autism spectrum disorder. J Am Acad Child Adolesc Psychiatry. 2015;54(7):541-9.
9. Borgi M, Loliva D, Cerino S, Chiarotti F, Venerosi A, Bramini M et al. Effectiveness of a standardized equine-assisted therapy program for children with autism spectrum disorder. J Autism Dev Disord. 2016;46(1):1-9.
10. Pedra AC, Nobre FC, Couto-Vale D, Rodrigues MM, Celeste LC. Equoterapia e intervenção fonoaudiológica: análise da evolução linguística via pés rítmicos. In: Anais científicos do 27th Congresso Brasileiro e do 5th Congresso Íbero Americano de Fonoaudiologia [homepage on the internet]; 2020 Oct 7-10; Sociedade Brasileira de Fonoaudiologia; 2020. Available at: https://www.sbfa.org.br/plataforma2020/trabalhos-consulta.

11. Ramos MEV, Benito AL, Pedra AC, Nobre FC, Rodrigues MM, Celeste LC. Análise dos atos comunicativos em crianças com transtorno do espectro autista após intervenção em equoterapia. In: Anais científicos do 27th Congresso Brasileiro e 5th Congresso Íbero Americano de Fonoaudiologia [homepage on the internet]. 2020 Oct 7-10; Sociedade Brasileira de Fonoaudiologia; 2020. Available at: https://www.sbfa.org.br/plataforma2020/trabalhos-consulta.
12. Halliday MAK, Matthiessen MIM. Halliday's introduction to functional grammar. 4th ed. London: Routledge; 2014.
13. Hemingway A, Carter S, Callaway A, Kavanagh E, Ellis S. An exploration of the mechanism of action of an equine-assisted intervention. Animals (Basel). 2019;9(6):303.
14. Smith-lock KM, Leitao S, Lambert L, Nickels L. Effective intervention for expressive grammar in children with specific language impairment. Int J Lang Commun Disord. 2013;48(3):265-82.
15. Wood WH, Fields BE. Hippotherapy: a systematic mapping review of peer-reviewed research, 1980 to 2018. Disabil Rehabil. 2021;43(10):1463-87.