INTERNATIONAL SEVEN JOURNAL
OF HEALTH RESEARCH
ISSN: 2764-9415

Physiotherapeutic intervention in autistic children with hypotonia: Approaches, benefits and therapeutic perspectives

DOI: 10.56238/isevjhv2n6-005
Receipt of originals: 06/10/2023
Publication Acceptance: 11/24/2023

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ABSTRACT
Autism is a pervasive developmental disorder that can be identified before the age of three. The main characteristics of behavior are repetitive and stereotyped, limitations in activities and interests, impairment in verbal and nonverbal language development, and quantitative deficits in interaction and communication. The objective of this study is to describe physical therapy intervention in autistic children with hypotonia: approaches, benefits and therapeutic perspectives. It is characterized by a Systematic Literature Review. Physical therapy intervention has been shown to provide substantial benefits for autistic children with hypotonia. This includes improvements in muscle strength, hand-eye coordination, balance, and posture. In addition, physical therapy can contribute to the improvement of respiratory function and mobility, making it easier for children to participate in daily activities.

Keywords: Physical therapy, Hypotonia, Autism, Autism spectrum.

1 INTRODUCTION

Autism is a disease that has been studied for about 60 years and was first described in 1943 by Dr. Leo Kanner (MARTINS, GÓES, 2018). It is a pervasive developmental disorder that can be identified before the age of three. The main characteristics of behavior are repetitive and stereotyped, limitations in activities and interests, impairment in the development of verbal and

nonverbal language, and quantitative deficits in interaction and communication (SEGURA, NASCIMENTO, KLEIN, 2017).

Symptoms vary with everyone. One of the defining characteristics of autism may be the inability to develop relationships with peers (BAGGIO *et al.* 2021). Usually, the individual's perception of the existence of others is easily compromised. As for communication, there may be delayed or non-development of speech (MARTINS, GÓES, 2018).

However, for those who can speak, there may be a marked decline in the ability to initiate or maintain a conversation with the use of stereotyped and repetitive language. The behavior, interests, and activities of autistic people are often limited (MARTINS, GÓES, 2018). Individuals may insist on the same and show resistance or pain when faced with mundane changes. Stereotyped movements include the hands (clapping, snapping fingers) or the entire body (rocking, leaning, or swaying the body). Postural abnormalities may also be present, such as walking on tiptoe (AMERICAN PSYCHIATRIC ASSOCIATION, 2016).

According to Coelho, Iemma, and Herrera (2016), children with autism appear normal, but about 50% have an intelligence quotient below 50%. Its manifestations develop over time. The most prominent characteristic of autistic people is the lack of a natural tendency to bring together parts and information to form a whole, with central meaning and coherence. Families should be informed about their children's behaviour and how they can help, thus reducing the stress of living together (LONDON *et al.* 2020).

Clinically, the physical and mental condition of the individual is compromised, increasing the need for care and thus increasing the degree of dependence on parents and/or caregivers. Behavioural problems are difficulties that hinder the integration of autistic children into their families and schools, during adolescence and among adults in the community (ALMEIDA; SNOW, 2020). Autistic people have difficulty interacting with other people, they do not share their feelings, interests, emotions, this makes them unable to distinguish between different people and hardly share their feelings, their attention to objects or events, they do not naturally focus their visual attention and may not even be able to attract the attention of other people to perform certain activities together (STINS; EMCK, 2018).

Almeida and Neves (2020), report that including the components of executive function that contribute to autism symptoms, particularly in social communication, is crucial for the development of effective activities targeting regulatory, administrative, as well as basic behavioral symptoms. Although there is no cure, in the case of autism, early diagnosis and prompt intervention

will help reduce the risk of chronic diseases, increase the chances of treatment, and minimize many symptoms (BAGGIO *et al.* 2021).

Therefore, the objective of this study is to describe the physical therapy intervention in autistic children with hypotonia: approaches, benefits, and therapeutic perspectives. It is known that Autism Spectrum Disorder (ASD) is a disorder marked by neurodevelopmental impairment, that is, a set of deficits that presents three types of degrees: mild, moderate and severe, being a chronic condition. And in this context, physiotherapy becomes essential to obtain greater independence in their daily activities and an improvement in their neuropsychomotor development. Thus, this article brings as a Guiding Question (QN): what is the importance of physical therapy intervention in autistic children with hypotonia: approaches, benefits, and therapeutic perspectives?

2 METHODS

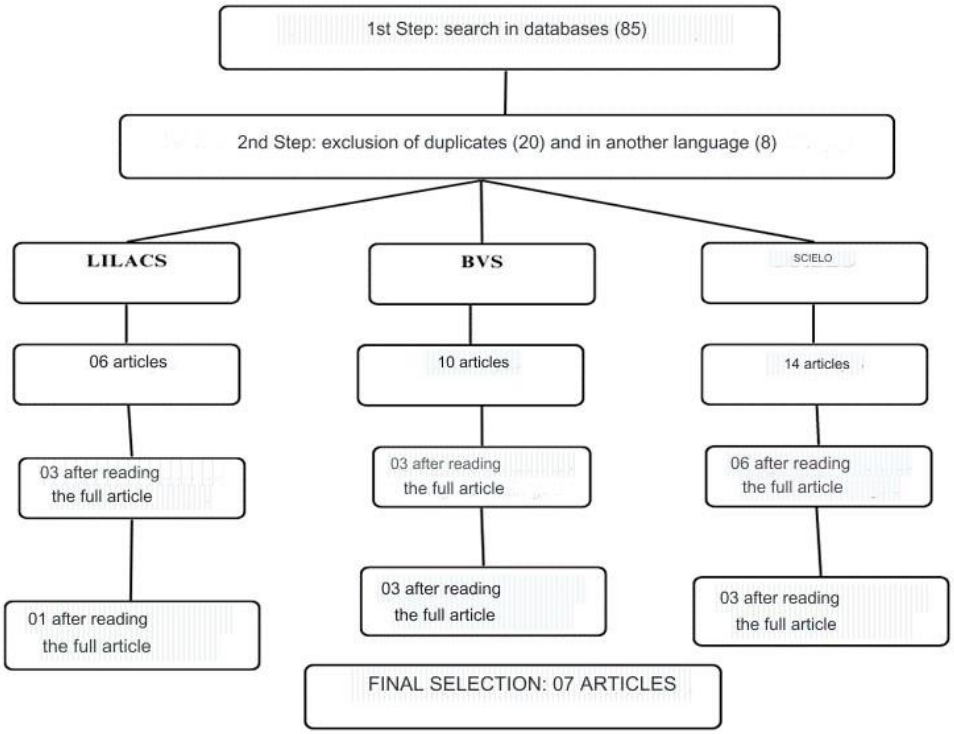
The present study is characterized by a Systematic Literature Review. Systematic reviews identify a set of completed studies that address a particular research question and evaluate the results of these studies to evidence conclusions about a body of knowledge (HULLEY *et al.,* 2015). In health, as reported by Hulley et al. (2015), unlike other ways of reviewing the literature, the systematic review uses an objective approach to identify all relevant studies, demonstrate the characteristics and results of eligible studies and, when appropriate, calculate a summary estimate of the overall results.

A survey of national studies addressing physical therapy intervention in autistic children with hypotonia was conducted. The search for national research was carried out in data portals available on the web: Latin American and Caribbean Health Sciences Literature (LILACS), Virtual Health Library (VHL) and the Scientific Electronic Library Online (SciELO). We chose to search these portals because they index health studies that are evaluated by scientific committees before their publication. These are libraries that offer search services through reference databases, with publications in several languages, scientifically reliable and easily accessible.

The search for national studies was initially carried out with the combination of the following Boolean descriptors and operators: "Physiotherapy*" and "Hypotonia*" and "Autism" *or* "Autism Spectrum". The inclusion criteria to compose the results were: articles in the Portuguese language and in the period from 2017 to 2023 with a scenario in the physical therapy intervention of children with ASD and that answered the guiding question of the study. Exclusion criteria were: duplicate articles, unavailable in full, monographs, ordinances, annals and theses. In this stage of

the integrative review, the objective was to prepare a document that would contemplate the main results of the analysis of the data selected in the sampling.

Figure 1 - Selection of articles by search strategy in the databases. Brazil.



Source: author, 2023.

3 RESULT AND DISCUSSION

The search in the databases resulted in 7 articles that supported the discussion. Of these, 03 articles came from the SCIELO database, 01 from LILACS and 03 from the VHL. The selected publications were identified according to: article title, author, year, objective, type of study, and results (Chart 1).

Chart 1 – Characterization of the articles selected for analysis, according to order, title, author, year, objective, type of study, and result, Brazil, 2016-2023, (n=7).

Article Title	Author/ year	Objective	Type of study	Result
Physical Therapy Intervention in Autism Spectrum Disorder	Barros et al., 2021	To study in the literature the effects of physical therapy intervention on autism spectrum disorder.	Integrative literature review	Children with autism may have developmental delays, impaired motor skills, and postural problems, and that some of these problems are explained by the presence of repetitive and stereotyped movements.
The importance of physical therapy intervention in motor disorders in children with autism spectrum disorder (ASD).	Santana, 2021	To show the benefits obtained in terms of motor skills of children with autism after the application of the techniques that are part of psychomotor skills.	This is a correlational, cross-sectional, quantitative study.	Psychomotor physiotherapy is a favorable form of treatment for the improvement of the clinical signs that are part of this disorder.
Physical therapy intervention in Autism Spectrum Disorder (ASD): an integrative review	Santos; Pereira; Souza, 2023.	To point out the possible physical therapy interventions for patients with ASD, highlighting their deficits in cognitive, motor, affective-emotional and social development and how physical therapy could influence the evaluation of neurological patients and the appropriate treatment plan.	Descriptive, exploratory, qualitative research, through document analysis.	These studies report that the earlier the diagnosis and physical therapy support, the better the outcome and quality of life of these children, although a more in-depth discussion on the subject and on ASD is necessary.
The Benefits of Physical Therapy on Functional Independence in Children with Autism Spectrum Disorder	Prates et al., 2019	Highlight the benefits of physical therapy for children with autism spectrum disorder and define therapeutic means to promote functional independence in children with ASD	This is a descriptive, qualitative study.	Physiotherapy is very important in the early intervention of ASD, especially in sensory and motor stimulation, positively interfering in the development and improvement of quality of life, allowing the individual to have better adaptive responses to their environment.

The Impact of Physical Therapy Intervention in Children With Autism	Silva; Vilarinho, 2022.	Analyze the benefits of physiotherapy in the daily life of the autistic, its positive impacts of advances and improvements, and its points of difficulty	Exploratory , descriptive, qualitative research.	A good physical therapy intervention can help in the treatment of this syndrome with the use of protocols aimed at improving the patient's motor function, improving their quality of life.
The contribution of physical therapy to the motor development of children with autism spectrum disorder	Santos; Mascarenhas ; Oliveira, 2021.	To systematically review the literature on the role of physical therapists in motor development in children with autism spectrum disorder.	Qualitative, exploratory and descriptive research.	The analyzed studies affirm that physical therapy contributes to the improvement of motor skills in children with autism, assisting in coordination skills and preventing limitations in the execution of functional activities.
Role of physical therapy in motor development in children with autism spectrum disorder (ASD).	Rodrigues, 2021.	To identify the contributions of Physical Therapy on Motor Development in children with ASD.	This is an observational, descriptive, cross-sectional narrative study.	Physiotherapy has a satisfactory role where it is possible to observe the importance of using physiotherapy in motor coordination, lifestyle habits and social interaction of children diagnosed with autism spectrum disorder.

SOURCE: authors, 2023

The study by Rodrigues (2021) shows in patients with ASD some abnormalities in motor control, delay in motor development, muscle hypotonia, abnormal positioning and attitude, and stereotyped movements. Other motor symptoms are described by Silva and Vilarinho (2022), such as reduced fine and gross motor coordination, agility, strength, grasping of objects, abnormalities in gait and gestures, among others. Santos, Mascarenhas, and Oliveira (2021) show that static balance, laterality, and the notion of reversibility may be impaired.

Thus, it causes damage to the development of static and dynamic balance, laterality, gross and fine coordination (PRATES et. al. 2019), the notion of reversibility and asymmetry of movement, which form the primary basis for obtaining autonomy and cognitive learning. In most cases, they may also present changes in muscle tone, manifesting as hypotonia; resulting in changes in the spine (scoliosis), which is one of the indications of deleterious postural control and adjustment

Thus, motor physiotherapy is very important in the treatment of hypotonia and often impacts interaction and social interaction, connecting relationships and improving communication (SANTOS; MASCARENHAS; OLIVEIRA, 2021). The task of physiotherapy is to investigate, assess and determine the goals and behaviors of children with ASD and, taking into account the child's special characteristics and difficulties, to develop specific and diverse treatment methods to improve the child's motor cooperation, i.e., body control (PRATES et. al. 2019).

Therefore, autism is an unknown disorder that directly affects the neuropsychomotor development of the child, manifesting itself in early childhood (BARROS et al., 2021). Some children develop lifelong movement difficulties, which can be relieved with physical therapy ((SANTOS; PEREIRA; SOUZA, 2023).

Treatment of children with ASD with physical therapy shows that prospective treatment initiated in childhood can increase functional independence. This is especially true when the prognosis is worse due to the coexistence of multiple symptoms ((SANTOS; PEREIRA; SOUZA, 2023). Physical therapy follow-up of children with autism is important not only to improve the quality of life daily, but also to improve the results of motor development and social interaction, leading to an improvement in the lifestyle of the child and people with ASD.

Physical therapy treatments and education for children with ASD are important because of the motor difficulties they encounter during their developmental stage. Treatments have been successful in improving and decreasing the level of severity of their poor muscle control, which has resulted in many other consequences and influences when they grow. Physical therapists should engage in play where they can teach children to have confidence and comfort in their bodies. This will lead to better outcomes in the future for many children with ASD (PRATES et. al. 2019).

Physical therapists use a wide variety of techniques and interventions to help an individual with autism get the most out of their movements. Some of these techniques include (PRATES et al, 2019) manual therapy, therapeutic exercise, hippotherapy – therapeutic riding, aquatic therapy, recreational therapy, and general games.

Physiotherapy covers several areas that achieve the goals of treatment, benefiting the neuropsychomotor development of ASD, the various treatment modalities give opportunity and possibilities, benefiting the treatment plan (BARROS et al., 2021). The physiotherapist should explore their creative side in autistic patients, the game therapy method is based on the interaction with virtual games, facilitating the therapy process, in this bias, technology is a facilitating tool

and of great importance, being beneficial to patients with ASD ((SANTOS; PEREIRA; SOUZA, 2023.

The physiotherapy professional has the role of combining the exercise of his work with his sensitivity and relational subtlety. Rodrigues (2021) shows that the physiotherapist should consider everything he has studied and knows about normal development and ways to optimize it to reach better levels, in the case of autistic people, also knowing the abnormal aspects that interfered with their development.

The autistic child needs someone who understands him, who teaches him to dream, to laugh, who can improve his existence for himself and for others, trying to experience his body, who has the feeling that the body is a separate object, the autistic child has a great difficulty understanding his body as a whole, having difficulty with his body scheme, which can lead to anguish and panic and this is where the physiotherapist comes in as a fundamental role in helping you understand yourself, better stimulating the parts of the body and its capacities (RODRIGUES, 2021).

As physiotherapy focuses on movement problems that cause functional limitations, it is very indicated in the treatment of autism, where children with this disorder often have motor difficulties, such as sitting, walking, running, and jumping (BARROS et al., 2021). Rodrigues (2021), shows that physiotherapy also helps in the lack of muscle tone, balance and coordination, acting within postural corrections, gross motor coordination in controlling the improvement of balance, reducing unwanted patterns, helping to keep the trunk firm and promoting muscle stretching.

The physiotherapist can contribute to patients with Autism Spectrum Disorder by improving their functional limits, according to Barros et al., (2021), and also improves symmetry, postural control, among others. Through the various physiotherapy methods that can be used, ASD patients improve their independence, functional aspects and quality of life. (SANTOS and GIGONZAC, 2018).

One of the methods is hippotherapy, which uses the horse's movements in order to involve the patient's motor, sensory, and cognitive systems, and with this, the physiotherapist can, combined with the technique, achieve therapeutic goals, being able to prevent, treat, rehabilitate, and improve the development of the autistic person through the use of the horse (SANTOS; MASCARENHAS; OLIVEIRA, 2021).

There are also activities carried out in the water, which, according to Santos, Mascarenhas and Oliveira (2021), help to improve motor and social aspects, where these aspects are stimulated

through the resistance that water provides during physical activity and through the motivation that the patient has to interact with the therapist.

The treatment done in water brings great benefits to the health of children with autism, in addition to improving motor coordination, relieving muscle pain, bringing relaxation, balance and improving sleep quality (BARROS et al., 2021). Dancing is also an activity that can be employed by the physiotherapist, it brings many benefits, such as emotional, physical, cognitive, and social interaction improvement, which are crucial points for autism sufferers, as they present obstacles that prevent them from having good interaction and communication and dance therapy appears as a good tool that allows a better integration, acting on the physical, mental and cognitive, allowing people with autism to achieve complete well-being (SANTOS; MASKS; OLIVEIRA, 2021).

Another therapeutic form that can be used by the physiotherapist is game therapy, which is a form of therapy that uses virtual reality with games, and is able to motivate patients in relation to their rehabilitation (SANTOS; MASKS; OLIVEIRA, 2021). Virtual reality technology is coming into its own with immense potential. In the treatment of ASD. Cynotherapy is also a new technique and involves the use of dogs that mediate and facilitate the entire therapeutic process. This resource is used in several areas involving health and, among them, physiotherapy (BARROS et al., 2021).

Intervention programs include the use of techniques capable of promoting communication, socialization and adaptive behavioral skills, thus minimizing stereotyped behaviors that demonstrate aggressiveness. Currently, there is little evidence of specific motor treatments and interventions for autistic people, and there is a scarcity of articles evidencing these treatments (BARROS et al., 2021).

The monitoring of autistic children by physiotherapists is important to increase the quality of life in their daily routine functions, as well as to the evolution of the results of motor development and social interaction, which, consequently, lead to an improvement in the lifestyle of patients with ASD (BARROS et al., 2021).

4 CONCLUSION

Physical therapy intervention in autistic children with hypotonia is a valuable approach that offers significant benefits and presents promising therapeutic prospects. After analyzing various research and clinical practices, the following can be concluded:

Physical therapy intervention has been shown to provide substantial benefits for autistic children with hypotonia. This includes improvements in muscle strength, hand-eye coordination, balance, and posture. In addition, physical therapy can contribute to the improvement of respiratory function and mobility, making it easier for children to participate in daily activities.

Therefore, physical therapy intervention not only positively influences motor skills, but also has a significant impact on the quality of life of autistic children. Improving one's ability to move around and engage in everyday activities can increase independence and self-esteem, contributing to better emotional well-being.

In light of this, physical therapy must be adapted to the specific needs of each autistic child, taking into account their level of hypotonia, age, interests, and abilities. This requires a thorough assessment and the implementation of personalized treatment plans. As research and understanding of autism continues to advance, new physical therapy approaches and therapeutic strategies are being developed. The combination of traditional methods with innovative techniques, such as virtual reality, promises to open up new therapeutic possibilities.

Physiotherapy intervention should be integrated into a multidisciplinary treatment plan. Collaboration between physical therapists, occupational therapists, speech pathologists, psychologists, and other professionals is critical to addressing the physical, cognitive, and social aspects of autism comprehensively.

In summary, physical therapy intervention plays an important role in improving the quality of life of autistic children with hypotonia. The personalization of treatments, collaboration between professionals, and the constant search for innovative approaches are essential to achieve more effective results and promote the optimal development of these children. As research and clinical practice continue to evolve, new therapeutic perspectives will emerge, offering hope and continued progress in the treatment of autism. The need for further studies on the subject is highlighted.

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