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Original article

System of physical-sports activities to develop basic motor skills in children with dyslexia

Sistema de actividades físico-deportivas para desarrollar habilidades motrices básicas en niños con dislexia

Sistema de atividades físico-esportivas para desenvolvimento de habilidades motoras básicas em crianças com dislexia

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ABSTRACT

Dyslexia is a learning disorder that affects children's ability to read, write and process information appropriately. It has traditionally been believed that in the school context, educational psychologists are in charge of dealing with this disorder and trying to improve it. However, it has been shown that physical activities can, in a conscious and organized way, contribute significantly to treating this condition. That is why the objective of this work was to propose a system of physical-sports activities to contribute to the treatment of dyslexia in students of the "Francisco de Orellana" single-teacher school, in Páztaza, Ecuador. To achieve this purpose, empirical methods such as observation, survey, interview, as well as different tests that were applied to determine the veracity of the dyslexic condition were used. After corroborating the difficulties found in the diagnosis and the potential consulted in the theoretical references on the subject, a system of physical-sports activities was developed that were included in the work sessions of the Physical Education teacher and had the support of the teachers, directors and parents, as well as a satisfactory level of practical acceptance, which significantly influenced the improvement of these students' learning difficulties and their relationships with their classmates.

Keywords: physical-sports activities, dyslexia, children

RESUMEN

La dislexia es un trastorno del aprendizaje que afecta la capacidad de los niños para leer, escribir y procesar información de manera adecuada, tradicionalmente se ha creído que en contexto escolar son los psicopedagogos los encargados de lidiar con este trastorno y tratar de mejorarlo. Sin embargo, se ha demostrado que las actividades físicas pueden, de forma consciente y organizada, contribuir de modo significativo a tratar esta condición. Es por ello que el objetivo de este trabajo fue proponer un sistema de actividades físico-deportivas para contribuir al tratamiento de la dislexia en alumnos de la escuela unidocente "Francisco de Orellana", en Páztaza, Ecuador. Para lograr este propósito, se utilizaron métodos empíricos tales como la observación, la encuesta, la entrevista, además de diferentes pruebas que se aplicaron para determinar la veracidad de la condición disléxica. Después de corroborar las



dificultades encontradas en el diagnóstico y de las potencialidades consultadas en los referentes teóricos sobre el tema, se elaboró un sistema de actividades físico-deportivas que se incluyeron en las sesiones de trabajo del profesor de Educación Física y tuvieron el apoyo de los profesores, directivos y padres, así como un satisfactorio nivel de aceptación práctica, lo que influyó significativamente en el mejoramiento de las dificultades en el aprendizaje de estos alumnos y la relación con sus compañeros de clase.

Palabras clave: actividades físico-deportivas, dislexia, niños.

RESUMO

A dislexia é um distúrbio de aprendizagem que afeta a capacidade das crianças de ler, escrever e processar informações de maneira adequada. Tradicionalmente, acredita-se que, no contexto escolar, os psicólogos educacionais são os responsáveis por lidar com esse distúrbio e tentar melhorá-lo. Contudo, foi demonstrado que as atividades físicas podem, de forma consciente e organizada, contribuir significativamente para o tratamento desta condição. Por isso o objetivo deste trabalho foi propor um sistema de atividades físico-esportivas para contribuir no tratamento da dislexia em alunos da escola monoprofessora "Francisco de Orellana", em Paztaza, Equador. Para atingir este objetivo, foram utilizados métodos empíricos como observação, inquérito, entrevista, bem como diversos testes que foram aplicados para determinar a veracidade da condição disléxica. Após corroborar as dificuldades encontradas no diagnóstico e as potencialidades consultadas nos referenciais teóricos sobre o tema, foi desenvolvido um sistema de atividades físico-esportivas que foram incluídas nas sessões de trabalho do professor de Educação Física e contaram com o apoio dos professores, diretores e pais, bem como um nível satisfatório de aceitação prática, o que influenciou significativamente na melhora das dificuldades de aprendizagem desses alunos e no relacionamento com os colegas.

Palavras-chave: atividades físico-esportivas, dislexia, crianças.



INTRODUCTION

It is common to understand that there is a close relationship between language development and physical activity. It has been an irrefutable reality that since the primitive community, man needed to establish a system of signs and codes, which gradually became a common language, to facilitate the collective hunting of huge animals. This hunt was based on physical activity that was accompanied by a group strategy and supposedly could have been more difficult without the help of language.

The above is not only based on the relationship that tells the story, but also on the physiological side; it has been proven that exercise alters the biology of the brain in ways that make it more malleable and receptive to new information, a process called plasticity (Rodríguez, *et al.*, 2020). This process makes it possible for people to use exercise to memorize, retain and understand new vocabulary.

According to the organic coordination of the body, to stimulate mental work, the body must be put into systematic movement (Mendes and Rinaldi, 2020); however, physical activity is not only recommended for those who have all the conditions to establish an adequate language, but also for those who do not have it due to life's complexities. In that case, authors such as Gómez *et al.* (2019) propose a group of methodological actions to contribute to the inclusion of schoolchildren with language disorders, such as:

- Pay attention to the individual differences of each student, depending on their disorder.
- Promote an environment of communication.
- Offer guidance precisely and repeat it as many times as necessary.
- Work on breathing exercises that respond to the needs of schoolchildren, according to the characteristics of the disorders.
- Stimulate oral language, based on the adult language model.
- Avoid explanations or conversations in the midst of loud noises.
- Work on rhythm and body expression.



- Do not interrupt the student when he is speaking and do not speak for him, to stimulate oral communication.
- Use games that encourage oral communication during class, which involve telling stories, continuing incomplete sentences, answering questions, establishing similarities and differences. (Pp.93-94)

On the other hand, the work of Avendaño *et al* (2020) stands out with studies on motor skills, language development and dermatoglyphic characteristics in children. The results suggest that in a population of children with specific language disorders, they not only present lower and deficient performance in the domain of language, but may also present reduced control of motor skills; the research provides background to understand the nature and development systems in childhood, specifically, in the interaction between language processing and motor skills, in these children.

The most consistently reported deficits in children with dyslexia are those in gross motor skills, specifically balance and postural tasks, and this is due to the known involvement of the cerebellum in balance skills.

It is important to keep in mind that both dyslexia and motor disorders can vary in severity and affect in different ways. Both disorders can interfere with academic performance and daily activities, but with appropriate support and intervention strategies, people with dyslexia and motor disorders can learn to overcome challenges and reach their full potential.

In the studies of Cantó *et al.* (2020), a Physical Education (PE) model is presented that contributes to the treatment of motor and intellectual disabilities and within the latter, a group of activities is proposed that improve the situation of children with language disorders. In the intervention with students, it is important to take into account, in general, the following aspects:

- The state of health related to the level of physical fitness.
- General and psychomotor maturational development.
- Psychosocial skills, character and personality.



- Cognitive impairment and language disorders.
- The capacity for initiative and self-control.
- Tendency to avoid failure more than to achieve success. (pp. 96)

When consulting intervention strategies towards the language sphere in inclusive PE, Richardson *et al.* (2021) presents very complete research, especially if the treatment method for this disorder is the discourse route. This work seeks to lead the educator towards a progressive treatment of children with language disorders, according to a classification of models: 1) the medical model, 2) social, 3) socio-relational, 4) human rights, and 5) super script, all based on a study framed in the sociocultural context of the United Kingdom.

The aforementioned models constitute a general vision to address the disability associated with language, within adapted PE. In general, the medical model is the one that is linked to an organic disability, whether it is an individual or biological pathology: damage to the spinal cord or cerebral palsy. The social model is a standard built by the systematic patterns of exclusion in the barriers of today's world and the role of the educator is to overcome these barriers and achieve the unity of the group, based on the inclusion criteria.

The socio-relational model is a discourse model that bases disability as a form of social oppression that prevails among unaffected and deteriorated groups in the environment, attributed to sexist, homophobic and other disruptive tendencies for humanity.

The discourse based on the human rights model comes from the approaches of the United Nations convention on the rights of people with disabilities, and finally, the super script model is a behavioral inspiration, especially for physical trainers or trainers who use super hero adjectives to motivate or respond to the emotional and communicative needs of children with language disabilities, generally associated with motor or intellectual limitations.

Navarro *et al.* (2021) consider the relationship between physical culture and language development, this is a study with eight teachers and two speech therapists who worked with students with temporary special educational needs, diagnosed with specific language



disorder, to treat them from the articulation between pedagogical and specialized work; the results corroborate that the specialists have good methodological management regarding the specific needs of students with this disorder, but they do not have a defined teaching strategy, and from this, adapt the didactic categories as a solution to this problem.

The approach of PE as a way to contribute to the treatment of dyslexia is carried out from the dialectical relationship between physical exercise and language, it is essentially in this scenario that this relationship assumes its primary role in the educational sector, above all, due to the level of influences it can exert on the improvement of language. Hannell (2005) examines the relationship between dyslexia and PE and how these teachers adapt their teaching methods; in addition, it offers different perspectives and proposes specific strategies and approaches to support students with this disorder.

It is highly recommended to consider the methodological guidelines proposed by Rodríguez (2012), among the ideas, it is noted that the educator must:

Stand lateral to the line of movement during the execution of coordination exercises, observing the synchronization of arms and legs, besides, he/she can also move next to the child, paying attention to coordination if you consider it necessary. Give the children a reasonable amount of time to organize their thoughts and carry out the exercise. Guide the exercise in pairs, so that the partner, whether he or she does not have symptoms of dyslexia or has symptoms but has mastered the exercise, can tell you precisely how to move. Guide the exercises at a slow pace, walking and gradually increasing them. (p.6)

If it is followed the line of physical exercise as therapy for speech and language, the work of Peña (2014) offers a group of guidelines on how to improve dyslexia in children during exercise sessions, which demand a high level of psychomotor skills, including These exercises or activities stand out:



Identify figures in the same or different positions, recognize incomplete figures, make colors, access cut-outs, plot games, nonsense, give instructions, organize jumbled words, color and cut out parts of the body, indicate parts of the body according to right and left, cut out, coloring and cutting out parts of the body, differentiating right and left on the plane, tying shoelaces, buttons that sprout and bloom, representing the world upside down, playing with plasticine, practicing dances and rhythmic sequences, dramatizing stories, create motor story, establish circuits (benches, chairs, hoops). Practice mirror play, conceive constructions, make necklaces, present baskets. (pp. 37)

In the context of PE, Suarez and Marco (2014) state that the lack of physical activity can negatively affect the development of written language and that motor disability hinders reading skills. Consequently, the PE professional can intervene in motor development by addressing the physical, social, affective and cognitive aspects. Gutierrez et al. (2022) provide conceptual ideas that generalize the characteristics of this disorder for a possible accurate intervention at the hands of the Physical Culture professional; however, they do not specify it to this branch, but in general to the pedagogical sphere. Among some of its results are:

- In terms of knowledge about the characteristics of this disorder, there is a significant imbalance, since more development is estimated in countries such as the United States and the United Kingdom.
- There is no clear idea about the origin of dyslexia, at the same time that the eradication of this disorder with the passage of time and therapeutic influences becomes a myth.
- In most educational centers, there are limited inclusive work plans that treat this disorder, within general education.
- -In the diagnosis applied in this research it is revealed that the majority of students (pedagogues in training) consider that this disorder does not begin at an early age and this constitutes a limitation, since being aware of this reality achieves better results in practice or the practice of the profession.



Based on the references addressed, the objective was to propose a system of physical-sports activities to contribute to the treatment of dyslexia in students of the "Francisco de Orellana" single-teacher school, in Pastaza, in Ecuador.

MATERIALS AND METHODS

This study used a mixed research design that combined quantitative and qualitative methods to obtain a complete understanding of the impact of the physical-sports activity system on the development of motor skills in students with dyslexia. Additionally, the phylogeny of educational interventions and strategies was explored and how these practices have evolved over time to improve support in the educational environment.

Data collection instruments:

1. Analysis and writing test: A reading and writing analysis test (TALE) was applied in order to evaluate motor skills and detect the population with dyslexia rates, it consisted of several tests aimed at students enrolled in the "Francisco de Orellana" single-teacher school (Table 1)

The test applied was the following:

Table 1. - Test applied. Tale

Write record	
ac	Ble
believe	op
gÑ	Dri
tar	An
pta	Z.E.
potato	Sunday
belly	rastapi
machine	dromedary
dish	library
chocolate	grass



1. 1. This is the example of the dictation that was used for the students to complete the information

- a) There are many books in the school library.
- b) In the main suburbs of the city, there are uninhabited houses.

Time:

Dictation

Time:

Spontaneous writing

Time:

Read log

Read log (Table 2).

Table 2. - Reading letters

Reading	Mistake	Reading	Mistake	Reading	Error	Lectura	Error
J		j		K		k	
F		f		Ñ		ñ	
D		d		C		c	
H		h		A		a	
S		s		RR		rr	
G		g		V		v	
O		o		E		e	
LL		ll		N		n	
W		w		Yo		Yo	
I		l		x		x	
CH		ch		R		r	
T		t		OR		or	
b		b		Q		p	
M		m		Z		z	
V		v		Q		q	



Time:

Observations:

Syllable reading (Table 3).

Table 3. - Syllable reading

Reading	Mistake	Reading	Mistake
pla		Blah	
op		bar	
ac		lib	
cro		dri	
gil		ed	
you		gro	
lu		op	
tar		pru	
din		at	
tro		bra	

Time:

Word Reading (Table 4).

Table 4. - Word Reading

Word	Reading	Mistake	Word	Reading	Mistake
mother			Mountain		
Baby			Dragon		
bed			Ladder		
grandfather			witch		
frog			shoe		
cabbage			opast		
afo			land		
potato			Gypsy		
milk			iraptavale		
father			cupboard		
Ñar			blood		
crown			game		
bag			school		
balcony			clock		



never	write
carnation	sponge
Anglican	construction worker
tapestry	machine
yesterday	marcromine
summer	spring
Brush	rastapi
kitchen	begin
belly	noon
man	adjective
Sunday	fraglame

1. 2 Oral reading test

In the Middle Ages, the servant had multiple and diverse obligations towards his "master"; The main ones can be classified in this way:

- a) The servant had to work for free two or three days a week on the land and fields whose products belonged exclusively to the "master" or "lord." When the harvest season came, some extraordinary days were stipulated, which were called "of grace," in which the servant had to abandon his own tasks in order to harvest for the "lord." On urgent occasions he could be required to supply the manor with firewood from the mountain, or to repair the royal road.
- b) The servant had to pay certain taxes usually "in kind." Thus, on certain festivals it was supposed to contribute a dozen capons or a few bushels of grain to the pantry of the manor house.

Time:

1. 3 Reading compression test

- a) The village was made up of a few poor-looking cabins with wooden walls and a roof of branches. The landscape, on the other hand, was the most beautiful imaginable. The town was surrounded by the green of the palm trees and the blue of the sea. A



calm blue sea adorned with the white foam of the waves or the sail of some distant ship.

The boats were waiting on the beach for the pearl fishers. They all had a bag and a knife strapped to their waist. At dusk they would return with their bags full of sea sponges, and, if they were lucky, also some pearls, for which they would get a lot of money in the city. His work was difficult and risky. They had to descend into the depths of those beautiful blue waters.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

The old train is now in a museum. A spacious, warm, clean, well-kept room. He no longer goes out to work, the period of celebrations and commemorations has already ended. Now he is there quietly waiting for the sunset to arrive, because at that time his friends come to visit him. First, a ray of sunlight between the windows, the caress of the wind, the goldfinch, the swallow, which makes its nest in a small space in the tender.

Time:

2. Oral reading test

That row of moving little black dots are ants. They are very busy. They have to take advantage of the summer and gather supplies for the dark days of winter. In summer they collect all the food they can and put it in their nest.

Time:

Observations:



2. 1 Reading comprehension

Pedro, the bus driver, is a tall man with blonde hair. His eyes are as blue as the sky. But his hands are always dirty because he gets stained with bus grease. Even though he washes himself with alcohol every day, the grease never disappears. He wears a cap and a uniform so as not to dirty his suit.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

3. Parent Survey: a structured survey was used to evaluate the level of parents' knowledge about dyslexia. The survey included questions about their understanding of dyslexia and its interaction with the physical-sports activity system. Procedure. A survey was applied regarding knowledge about the motor skills of each of their children, in order to collect data and then analyze it.

3.1 Survey of single-teacher school personnel. The survey was distributed to teachers, to identify possible signs of dyslexia in the single classroom environment and their knowledge of how to adapt pedagogical practices to support these students. It was sought to understand their perception of the challenges associated with dyslexia and the successful strategies they have implemented.

3.2 Survey of PE teachers. The survey was distributed to nine PE teachers of different educational levels, with questions addressing familiarity with the term "dyslexia", the training received, the identification of specific signs in the context of physical activities, and the use of resources and collaboration with specialists.



Evaluation of motor skills. Application of the TALE test to a sample of 10 students enrolled in the "Francisco de Orellana" Single-teacher School.

4. Observation and qualitative interviews. Direct observations of PE classes were carried out to determine the type of activities and exercises carried out. Direct observation was made of the completion of the test and semi-structured interviews with students and parents to explore perceptions and experiences.
5. Data analysis. The quantitative data from the survey were analyzed with descriptive (direct observation and interviews) and comparative statistical techniques to evaluate parents' knowledge, and the data from the motor skills tests, using appropriate statistical tests to determine if there are significant differences before and after the intervention. Qualitative data from interviews and observations were analyzed using content analysis to identify patterns and emerging themes.

Ethical considerations. Informed consent was obtained from the parents and confidentiality of the data was guaranteed. All relevant ethical guidelines were followed and approval was sought from the research ethics committee, according to the institution's regulations.

Characterization of the population and the sample. Single-teacher schools, also known as single-grade schools or rural schools, represent an essential and often underestimated component of the educational system. These institutions, located mainly in rural or remote areas, operate with a single teacher in charge, where multiple degrees coexist in the same space. Despite their apparent simplicity, single-teacher schools play a crucial role in the education of communities far from urban centers, providing access to basic education for students who may otherwise be marginalized from the sector for more than twenty years, currently has 14 legally enrolled students (Table 5).



Table 5. - Number of boys and girls for each grade.

First EGB		Second EGB		Fourth EGB		Fifth EGB		Sixth EGB		Seventh EGB		TOTAL	
F	M	F	M	F	M	F	M	F	M	F	M	F	M
1	2	0	1	1	0	1	2	1	1	3	1	7	7
Total students												14	

Procedure for determining dyslexia in students. All students enrolled in the "Francisco de Orellana" single-teacher school, who have different ages and school levels, were taken into account for the selection. In addition, a group of parents were considered, specifically, we worked with a sample of 10 parents, in order to extend the data collection (Table 6).

Table 6. - Age record for each child

N.	Name and last name	Age	Year Egb
01	Student 1	5 years	First
02	Student 2	5 years	First
03	Student 3	5 years	First
04	Student 4	7 years	Second
05	Student 5	7 years	Room
06	Student 6	9 years	Fifth
07	Student 7	8 years	Fifth
08	Student 8	10 years	Fifth
09	Student 9	10 years	Sixth
10	Student 10	11 years	Sixth
11	Student 11	12 years	Seventh
12	Student 12	12 years	Seventh
13	Student 13	12 years	Seventh
14	Student 14	12 years	Seventh



Origin. The "Francisco de Orellana" single-teacher school has an enrollment of 14 students: seven of each sex, 10 parents and one regular teacher. It is located in the Province of Pastaza, Puyo parish, at km 2 ½ road to Tena, right bank of the Curaray road km 10, in a neighborhood with around 200 inhabitants, dedicated to agriculture and livestock.

RESULTS AND DISCUSSION

After applying the tests described, the following difficulties detected in students with dyslexia were declared (Table 7).

Table 7. - Characteristics that define the student as dyslexic.

No.	STUDENTS	DEGREE	DIFFICULTIES
1	Student 5	Fourth	Difficulty in reading. He does not process the information received through reading. Difficulty executing a dictation. Omission of letters.
2	Student 6	Fifth	Incorrect spelling of words. Short-term memory (ability to retain and remember sets of numbers and letters). Difficulty identifying rhyming words. Difficulty processing global words.
3	Student 7	Fifth	Difficulty reading and writing correctly. Writing errors. Failures in processing and phonological awareness. Reduced attention span and short-term memory. Failures in visual word processing.
4	Student 8	Fifth	Writing errors. Difficulty in laterality. Pronunciation problems. Failures in visual word processing.
5	Student 9	Sixth	Incorrect spelling of words. Short-term memory (ability to retain and remember sets of numbers and letters). Difficulty identifying rhyming words. Difficulty processing global words.
6	Student 10	Sixth	Difficulty reading and writing correctly. Writing errors.



			Failures in processing and phonological awareness.
7	Student 11	Seventh	Difficulty in reading. It does not process the information received through reading. Difficulty executing a dictation. Omission of letters.
8	Student 12	Seventh	Omission of letters. Letter confusion. Difficulty executing a dictation.
9	Student 13	Seventh	Difficulty executing a dictation. Writing errors.
10	Student 14	Seventh	Writing errors. Difficulty reading and writing correctly. Problems gripping the pencil correctly.

From the teaching point of view, they stated that among the causes of the onset of dyslexia was the lack of systematized didactic procedures to attend to students from different years of basic education in the classroom, a complex process when working with several years at the same time, so it was not always possible to develop fine and gross motor skills in first-year students.

The act of taking a pencil and drawing a line on a sheet of paper is considered simple for those who have all the conditions to achieve it; however, it becomes a challenge for those whose motor activity has presented difficulty, which is why the motor coordination problems present in students with dyslexia became a precondition for the intervention process, through activities such as drawing, recognition and modeling of letters and words of different sizes and in different directions, tracing on different planes and use of a sandbox, among others.

Another element was the improvement of eye-hand coordination so necessary for reading, the association of words and images, as well as the resolution of tasks that require fine motor coordination, including handwriting. As the motor activity was stimulated, in an intentional and developmental manner in the student it was possible to attenuate the negative effects of the expressions of dyslexia that they presented. Of 14 legally enrolled students, 10 had dyslexia problems, 71.42 %, diagnosed at the following ages:



Table 4. - Diagnosed students and ages

No. of children	Names and surnames	Age
1	Student 5	7 years
2	Student 6	9 years
3	Student 7	8 years
4	Student 8	10 years
5	Student 9	10 years
6	Student 10	11 years
7	Student 11	12 years
8	Student 12	12 years
9	Student 13	12 years
10	Student 14	12 years

As a result of the surveys applied to parents, it was confirmed that they have very limited knowledge to develop motor skills and improve the dyslexic condition of their children.

Observation and qualitative interviews showed that: in the classes observed, no intentional exercises were detected to treat possible dyslexia in the students. The interviews confirmed, 95%, that teachers know little about the characteristics of this disorder and the measures to follow to help improve it. 97.5% of teachers, not only PE teachers, are unaware of strategies that allow the inclusion, particularly of students with dyslexia and, secondly, to promote the development of motor skills from the PE class. The PE classes were carried out for the general average, without conceiving special exercises to treat dyslexia, this is the essential reason that motivated the authors to propose a system of physical-sports activities to mitigate this problem, and favorably influence their treatment according to the theoretical references consulted.





Fig. 1. - Graphic representation of the system of physical-sports activities

This system has been transferred in its structure of relationships proposed by Partidas (2014) on a system of physical-recreational activities, to resolve a group of deficiencies based on the lack of knowledge and practice in PE classes; there are points of coincidence between this research and the one presented, since in this case not only the parents are unaware of how to treat dyslexic children, but also the teachers.

To understand this system, a summary explanation was made in parts. In the diagnosis, theoretical, empirical and statistical methods were applied that demonstrated the need to work with dyslexic students and weaknesses and strengths were inventoried. A study was carried out on significant references of this disorder treated in PE classes, as well as in pedagogical environments, to facilitate teacher intervention.

The contents of this system were based on a philosophical, sociological, pedagogical and didactic conception. Within the philosophical conception, the tendency or class position of those who need to put this system into practice was not analyzed, but rather an attempt was made to offer a logical-rational explanation to the problems related to inclusive education. From a sociological perspective, it is necessary to understand that the principle of application of the system is not simple, since even with the schooling of current society,



there remain stigmas and stereotypes of people and institutions that are not sensitized or collaborate with dyslexic children, but must work for the need to establish everyone's cooperation and mutual understanding.

Within the pedagogical content, the unison work of the faculty was highly significant, in order to educate to encourage moral values such as tolerance, solidarity, camaraderie and responsibility at the core of inclusive training. In the didactic context, it is necessary to understand that the educational influence for dyslexic students cannot be imposed, but rather flexible, natural and coherent with the strengths offered by the subjects and the interdisciplinary unity between them; so that the responsibility of dyslexic students does not fall only on the educational psychologist, but above all on the faculty teachers.

As part of the objectives, the general objective was to propose a system of physical-sports activities that, through the motor skills taught in the PE class, improve the living conditions and academic development of students with dyslexia. This general objective was supported by several specific objectives, which included the planning, execution and control of activities as part of the PE class.

To achieve the objectives, the teacher used descriptive, narrative, and illustrative methods, accompanied by dictation techniques, manual activities, cutting, paying tokens, coloring images, among others, and media such as educational games, cards, books, the blackboard and the voice; in addition to the use of different materials such as sheets, scissors, colors, glues and audiovisual technology, to the extent possible.

The forms of teaching organizations focused on differentiated practical classes, ideal in this case and, as the student progresses, one can think about implementing independent work, based on the results of the diagnosis and the school-parent collaborative basis.

At the center of the system it is included the activities category, accompanied by the physical element, from the work of physical capacities such as speed, endurance, flexibility, strength and balance; in the PE class, the student receives the first approaches to sport, from the practice of athletics, soccer, volleyball, basketball and develops physical capacities.



In light of the references consulted, it is suggested that activities be inserted that guide the student to:

- Promote an environment of communication.
- Work on breathing exercises that respond to the needs, according to the characteristics of the disorders.
- Use games that stimulate oral communication during class, which involve telling stories, continuing incomplete sentences, answering questions and establishing similarities and differences.
- Stand lateral to the line of movement during the execution of coordination exercises, observe the synchronization of arms and legs, move next to the student and pay attention to coordination if considered necessary.
- Give students a reasonable amount of time to organize their thoughts and carry out the exercise.
- Guide the exercise in pairs, so that the partner, whether he or she does not have symptoms of dyslexia or has symptoms but has mastered the exercise, can indicate precisely how he or she should move.
- Guide the exercises at a slow pace, walk and progressively increase the pace.

Assessment of the preliminary impact of the system, based on the application of a survey. To obtain feedback on the impact of the system, a survey was applied to determine the degree of acceptance of students and teachers, on a Likert scale from 0 to 5 where the values define: as poor - 0, very positive - 5 and fair - 3, the results were:

- 98 % showed satisfactory criteria regarding the introduction of the activity system.
- 90 % understood, at level 4, the fundamentals and operating structure of the system.
- 98 % of the teachers thought the system's activities were very viable, feasible and measurable in the PE class.



In general, in the PE classes where the activities of this system were articulated, most of the motor skills were developed to prepare the student to carry out actions related to reading and writing.

When making a comparison with research referring to the treatment of students with dyslexia through motor activities, the work of Gómez et al stands out. (2019) that requires a system that articulates all the influences and components from an organized structure based on an integration of knowledge, and some recommendations are selected and adjusted to the context of dyslexic students.

The studies by Venancio *et al.* (2023) address a qualitative, longitudinal, experimental case study, in which a 10-year-old girl, with a closed diagnosis of mixed-type dyslexia, whose deterioration was in auditory and visual capacity, received some exercise sessions. psychomotor skills and an improvement was experienced in their reading and writing abilities. For their part, Quintana *et al.* (2023) focus on school learning, given their pathology or life condition in the relationship that these dyslexic students have, this work seeks to minimize school exclusion and marginalization within the training process, which is generated in the different educational environments.

Salazar *et al.* (2021) apply the didactic exercise of reading and writing to the peculiarities that dyslexic students have in making mistakes or delaying in learning these learning skills. These authors confirm that the more accurate the evaluation processes are, the more tools are available to develop an intervention strategy. However, unlike the aforementioned studies, the research presented demonstrates the high pedagogical, didactic, physiological and therapeutic value that PE has to correct the difficulties faced by students with dyslexia.

CONCLUSIONS

In the presented work, topics related to neurodevelopmental disorders and their mitigation from psychomotor skills and physical activity were addressed, specifically in the cases of children with dyslexia. The study was undertaken in a single-teacher school characterized



by having a high number of students with dyslexia, and considering the lack of knowledge on this topic, a system of physical-sports activities was proposed that effectively and scientifically address the problem.

The proposed system demonstrated its effectiveness by contributing significantly to the correction of reading-writing habits in dyslexic students in the context of the PE class, with a good level of acceptance, and sets guidelines for continuity in doctoral studies.

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The author declares that there are no conflicts of interest.

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The author is responsible for writing the work and analyzing the documents.





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