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OPTIMIZATION OF BALANCE AND FLEXIBILITY THROUGH THE RATIONALIZATION OF METHODS IN THE EDUCATIONAL PROCESS FOR PRIMARY SCHOOL STUDENTS (AGES 6-10)

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ABSTRACT. Introduction: In physical education lessons, the proper rationalization of methods targeting psychomotor components will lead to improved coordination, perception, and analysis of body movements and the movements of its various parts in their interaction. A rationalized training system applied in teaching can prevent the phenomenon of insufficient or excessive exercise, promoting the standardized performance of exercises, which plays an important role in students' physical and mental health. **Objective:** The general objective of this study is the rationalization of specific methods aimed at optimizing balance and flexibility in the instructional process for students aged 6-10 years. **Methods:** The Flamingo Test was used to determine lower body balance, and the Sit and Reach Test was used to measure flexibility. **Results:** The results of this study revealed significant differences in balance and flexibility performance among students in grades 1-4, both by gender and overall. The Mann-Whitney and Wilcoxon tests were used to evaluate these differences. For balance on one leg, p-values ranged from 0.003 to 0.75, indicating significant differences in some classes, particularly in grades 1 and 2. Flexibility, measured through jumping tests, showed significant differences in grade 2 (p=0.011) and grade 1 (p=0.032). These findings suggest the need for personalized interventions in balance and flexibility training to optimize physical development at these ages. **Conclusions:** Proper structuring of exercises, based on a detailed assessment

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of each student's individual needs, facilitates improvements in balance and flexibility. This is reflected in both student performance and physical activities, having a positive impact on the overall educational process.

Keywords: *Balance, Flexibility, students, psychomotor skills*

REZUMAT. Optimizarea echilibrului şi flexibilităţii prin raţionalizarea metodelor în procesul educaţional la elevii din ciclul primar (vârsta 6-10 ani). **Introducere:** În lecţiile de educaţie fizică, o raţionalizare adecvată a metodelor care vizează componentele psihomotorii va duce la îmbunătăţirea coordonării, percepţiei şi analizei mişcărilor corpului şi ale diverselor sale părţi în interacţiunea lor. Un sistem de antrenament raţionalizat aplicat în predare poate preveni fenomenul de exerciţiu insuficient sau excesiv, promovând realizarea standardizată a exerciţiilor, aspect ce joacă un rol important în sănătatea fizică şi mentală a elevilor. **Obiectiv:** Obiectivul general al acestui studiu este raţionalizarea metodelor specifice orientate către optimizarea echilibrului şi a flexibilităţii în procesul instructiv-educativ pentru elevii cu vârste cuprinse între 6-10 ani. **Metode:** Testul Flamingo a fost utilizat pentru a determina echilibrul membrelor inferioare, iar testul Sit şi Reach a fost folosit pentru măsurarea flexibilităţii. **Rezultate:** Rezultatele acestui studiu au evidenţiat diferenţe semnificative în performanţa echilibrului şi a flexibilităţii în rândul elevilor din clasele I-IV, atât pe gen, cât şi în ansamblu. Testele Mann-Whitney şi Wilcoxon au fost utilizate pentru a evalua aceste diferenţe. Pentru echilibrul pe un picior, valorile p au variat între 0,003 şi 0,75, indicând diferenţe semnificative în unele clase, în special în clasele I şi II. Flexibilitatea, măsurată prin teste de săritură, a arătat diferenţe semnificative în clasa a II-a (p=0,011) şi clasa I (p=0,032). Aceste constatări sugerează necesitatea unor intervenţii personalizate în antrenamentele de echilibru şi flexibilitate pentru optimizarea dezvoltării fizice la aceste vârste. **Concluzii:** Structurarea adecvată a exerciţiilor, pe baza unei evaluări detaliate a nevoilor individuale ale fiecărui elev, facilitează îmbunătăţiri ale echilibrului şi flexibilităţii. Aceasta se reflectă atât în performanţele elevilor, cât şi în activităţile fizice, având un impact pozitiv asupra procesului educativ în ansamblu.

Cuvinte-cheie: *Echilibru, Flexibilitate, elevi, abilităţi psihomotorii*

INTRODUCTION

1. Rationalization of Means for Optimizing Balance in the Instructional Process for Primary School Students (Ages 6-10)

Faigenbaum et al. (2002) confirm that the duration of effort can be a safe and effective conditioning parameter for children. Moreover, by regularly focusing on the development of muscle strength, an improvement in body composition can be observed. An increasing number of boys and girls are participating in programs aimed at developing muscular strength, power, and endurance in physical education

classes and after-school programs. All movements involve mobilizing the body's energy resources to achieve both mental effort (attention, memory, imagination) and muscular effort. The field of physical education and sports builds its specificity only in relation to physical effort as an adaptive complex that produces multiple effects on the human being. According to Lazăr (2020), understanding effort is important in the conduct of physical education lessons, in the choice of exercises, volume, and intensity. Effort tests evaluate the cardiorespiratory response to a given effort, allowing the functional assessment of the individual.

The body's response to effort varies depending on age, gender, nutritional status, ambient temperature, body position, and work capacity. Mas & Riera (2018) demonstrated that movement can improve the cognitive development of structures related to attention, memory, perception, language, and thinking, which will help in interpreting concepts such as space, time, and speed. Furthermore, the systematization of body development facilitates the emergence of motor and cognitive skills and also leads to an expansion in the acquisition of emotional and affective content.

The dosing of effort, program objectives, methods and means used, as well as involvement in other physical activities that must be considered, will lead to long-term improvement in motor qualities. It is recommended that students be offered programs for developing conditional, intermediate, and coordinative capacities to optimize psychomotor components.

Keating (2003) highlighted that, in addition to debates regarding the effectiveness of evaluating physical abilities in young people, it is equally important to acknowledge the existence of other test batteries. Moseichuk et al. (2020) identify coordination abilities as innate to the formation of motor function, which determines their compliance with ergonomic requirements for performing motor tasks. Additionally, certain kinematic and dynamic parameters allow for the selection of the best ways to solve motor problems, while minimizing energy sources.

In physical education lessons, the correct rationalization of means for acting on psychomotor components will determine improvements in the level of coordination, perception, and analysis of the movements of one's own body and its various parts in their interaction. Furthermore, Skitnevskiy et al. (2018) supported that during effort, students improve their coordination of movements, muscle strength, action speed, flexibility, fatigue tolerance, the vestibular system's ability to adapt to acceleration tasks, static and dynamic balance, attention, memory, emotional stability, determination, and courage.

The rationalized training system applied in teaching can avoid the phenomenon of insufficient or excessive exercise, promoting the standardized performance of exercises, which plays an important role in both the physical and mental health of students.

2. Study Objectives

2.1. General-Objective

The general objective of this study is the rationalization of specific methods aimed at optimizing balance and flexibility in the instructional process for children aged 6-10.

2.2.Specific-Objectives

The specific objectives pursued in the current study are:

1. Analysis of current evaluation methodologies for balance and flexibility.
2. Implementation of a specific methods program to optimize balance.
3. Implementation of a specific methods program to optimize flexibility.

3. Research Instruments

In this stage of the study, the subjects from grades 1-4 underwent two tests to determine the development of balance and flexibility. The test batteries applied were:

a) The Flamingo Test– to assess the balance of the lower body,

b) The Sit and Reach Test – to assess flexibility.

4. Research Methodology and Implementation of Intervention Strategies

THEMES, PURPOSE AND OBJECTIVES FOR A-I-II-III-IV-A CLASS. FLEXIBILITY DEVELOPMENT (PASSIVE /ACTIVE STRETCHING)

Table 1. Research methodology and implementation of intervention strategies for developing flexibility

		CLASS 1	**CLASS 2**	**CLASS 3**	**CLASS 4**
EX.1	**OBJECTIVES**	- Holding the knee to the chest for 10 seconds. - Keeping the knee extended on the supporting leg.	Maintaining the position on each foot for 10 seconds without bending the knee.	-Holding the position for 10 seconds without bending the knee. -Gradual lowering of the hands from the slat as much as mobility allows, with the knees stretched.	- Holding the position on each foot for 10 seconds. -Maintaining the lower limbs at an angle of 90°.

		CLASS 1	CLASS 2	CLASS 3	CLASS 4
	PURPOSE	- Development of the musculature of the lumbar area - Development of the musculature of the posterior part of the thigh (biceps-femoral) -Developing the elasticity of the inguinal ligament - Stretching of the femoral right muscle - Stretching of the large buttock muscle	- Development of the musculature of the lumbar area -Development of the posterior thigh muscle (biceps-femoral, gastrocnemian, semitendinos, etc.) - Stretching of large, medium, small fezier muscle -Mobility at the level of the coxo-femoral joint.	- Development of the musculature of the lumbar area - Development of the posterior thigh muscle (biceps-femoral, gastrocnemian, semitendinos, semi-mebranous) - Stretching of large, medium, small fezier muscle - Mobility at the level of the coxo-femoral joint.	-Development of the posterior thigh muscle (biceps-femoral, gastrocnemian, semitendinos, etc.). - Stretching of the large, medium, small fezier muscle. - Mobility at the level of the coxo-femoral joint.
	DESCRIP-TION OF THE EXERCISE	From the dorsal decubitus, the hands grab the right knee, the other lower limb is with the knee stretched out and the heel on the ground with holding for 10 seconds on bent knee. Runs on each lower limb 3 times.	From sitting with the right left leg bent with the sole glued to the inner part of the thigh, the other lower limb stretched out with the foot in the flexion, the, have the task of maintaining the position on each lower limb for 10 seconds.	From sitting with the lower limbs and the back glued to the fixed scale, they will execute bending of the trunk by grasping the slat and holding in position with the knees stretched. The descent from the slat into the lath will be achieved gradually.	From dorsal lying down with the lower limbs at an angle of 90°, the legs in flexion, (the heel pushes the opposite leg towards the ground), the knees stretched, the arms near the body. It will execute holding on each foot for 10 seconds.

		CLASS 1	CLASS 2	CLASS 3	CLASS 4
EX. 2	**OBJECTIVES**	Holding the position on each lower limb for 10 seconds without bending the knees.	Keep the knee partner lying on the lower leg elevated and on the ground for 10 seconds.	-Holding the position for 10 seconds without bending the knee. -To manage to grab hands.	- Twisting the trunk on the bent knee. -Holding the position for 10 seconds alternately on each foot.
	PURPOSE	- Development of the musculature of the lobar area Development of the posterior thigh muscle (biceps-femoral, gastrocnemian, semitendinos, etc.) - Stretching of large, medium, small fezier muscle	-Development of the posterior thigh muscle (biceps-femoral, gastrocnemian, semitendinos, ischiogambieri, etc.) - Stretching of large, medium, small fezier muscle - Development of the coxo-femoral joint muscle	- Development of the musculature of the lumbar area - Development of the posterior thigh muscle (biceps-femoral, gastrocnemian, semitendinos, semi-mebranous) -Stretching of the large, middle, small fezier muscle - Mobility at the level of the coxo-femoral joint -Mobility at the shoulder joint.	- Stretching of the tensor muscles of the broad fascia - Stretching of large, medium, small fezier muscle - Mobility at the level of the coxo-femoral joint. - Development of the back muscles
		From standing with the legs spread out more than the shoulder level the trunk performs	The exercise is carried out with the partner. The first pupil is in the dorsal decubitus position with	On pairs of sitting facing each other with their feet close, sole in the sole with the partner, knees	From sitting with the right lower limb stretched forward, the foot in flexion, the other

		CLASS 1	CLASS 2	CLASS 3	CLASS 4
	DESCRIP-TION OF THE EXERCISE	a forward bend, the students have the task of maintaining for 10 seconds the position on each leg.	a lower limb on the ground with the knee stretched, the arms near the body and the other lower limb is raised vertically with the help of the partner. The other partner is positioned between the lower limbs of his colleague. The pupil has the task of lifting the lower limb to the maximum point of mobility, holding one hand the knee outstretched and the other pressing on the tip of the foot (the foot being in flexion). The pupil who is in the dorsal decubitus position has the task of maintaining without the help of the partner the knee stretched on the passive foot and the raised tip. During this time, the person who is on the ground must be in a relaxed position.	stretched, arms extended forward, the two have the task of bending the trunk forward, the two have the task of bending the trunk forward, to grab hands with his colleague and help each other maintain the position with the bent torso and chest as close to the thighs as possible.	execute a pass over the support leg with the sole on the ground and the bent knee. The trunk makes a twist outward (on the bent leg), the left hand on the ground, and the other pushes the knee inward. This exercise is performed 3 times on each lower limb.

		CLASS 1	CLASS 2	CLASS 3	CLASS 4
			It will hold for 10 seconds on each leg and will later change with his colleague. This exercise will be repeated 3 times.		
EX. 3	**OBJECTIVES**	Keeping your hands on your ankles for 10 seconds without bending your knees.	- Holding the position for 10-15 seconds. -Collaboration between the two partners.	Holding the position for 10 seconds with the torso bent.	-Holding the position for 10 seconds with your knees stretched and keeping your hands at the ankle level - Maintaining the position with the chest as close to the thigh level as possible.
	PURPOSE	- Development of the musculature of the lobar area -Development of the posterior thigh muscle (biceps-femoral, gastrocnemian, semitendinos, etc.) - Stretching of large, medium, small fezier muscle	-Development of the posterior thigh muscle (biceps-femoral, gastrocnemian, semitendinos, ischiogambieri, etc.) - Stretching of large, medium, small fezier muscle - Development of the coxo-femoral joint muscle Development of the lumbar muscle	-Development of the flexibility of the lower limbs Flexibility of the back muscles -Flexibility of the shoulder joint	- Stretching of the tensor muscles of the broad fascia -Stretching of the large, middle, small fezier muscle - Mobility at the level of the coxo-femoral joint.

		CLASS 1	CLASS 2	CLASS 3	CLASS 4
			-Elasticity of the gracilis muscle, tailor - Elasticity of the inguinal ligament.		- Development of the back muscles
	DESCRIP-TION OF THE EXERCISE	From sitting with their legs close and bending the trunk, students have the task of maintaining the position for 10 seconds.	The exercise is carried out with the partner. From sitting, legs spread out, knees stretched, feet in flexion. One of the two students has the task of grabbing the partner's hands and helping the executor to perform the bending of the trunk to the maximum point of his mobility through a extension of the trunk. This exercise is done alternately.	In pairs one before the other at a distance of 1 m, the legs spread out more than the shoulder level. Students place their hands on the shoulders of the partner and execute a bending of the trunk simultaneously with pressure on the shoulder joint. This exercise will be repeated 3 times with holding for 10 seconds.	2 By 2, one of the students is in the sitting position with the lower limbs stretched out, the feet in flexion and the back of each student will be a pupil to help him in the execution of the movement of bending the trunk with the holding of the hands at the ankle level and maintain the correct position, the, with your back straight. It has the task of progressively pushing the torso of the partner forward to the limit of mobility. This exercise is performed 2 times for 20 seconds per student.

		CLASS 1	CLASS 2	CLASS 3	CLASS 4
EX. 4	**OBJECTIVES**	Keep the sitting position with your feet close for 10 seconds without bending your knees.		Holding the position for 10 seconds with the torso bent.	
	PURPOSE	- Development of the musculature of the lobar area -Development of the posterior thigh muscle (biceps-femoral, gastrocnemian, semitendinos, etc.) - Stretching of large, medium, small fezier muscle - Development of the coxo-femoral joint muscle		-Development of the flexibility of the lower limbs. -Flexibility of the back muscles	
	DESCRIP-TION OF THE EXERCISE	From sitting with their feet close, the students are tasked with performing the bending of the torso with keeping their hands on their ankles until the moment the chest touches the thighs.		In pairs the back to the back, the legs spread more than the shoulder level, the arms around the body. Students perform a bending of the trunk at the same time as grasping the hands between the lower limbs.	

		CLASS 1	CLASS 2	CLASS 3	CLASS 4
				This exercise will be repeated 3 times with holding for 10 seconds.	
EX.5	**OBJECTIVES**			- Holding the position for 10 seconds on the executing foot. -To reach with your hands at the top of your foot.	
	PURPOSE			Development of the posterior thigh muscle (biceps-femoral, gastrocnemian, semi-tendinos, semi-mebranous). -Flexibility of the musculature of the lumbar area.	
	DESCRIP-TION OF THE EXERCISE			Individually, in support on one knee, the other lower limb stretched forward with the knee stretched out and the foot in flexion. It will hold the position for 10 seconds. It will run alternately on both lower limbs and repeat the exercise 3 times.	

In the intervention plan for developing flexibility in primary school classes (grades I-IV), a structured algorithm was used based on the principles of progression, individualization, and adaptation to the age and motor development level of the students. The algorithm was designed to ensure the correct sequence of exercises, starting with simple positioning and coordination exercises and progressing to more complex exercises that involve the simultaneous development of muscular strength and joint flexibility.

Basic Principles

Progression: The exercises were structured from simpler to more complex to allow students to gradually adapt to the imposed requirements and avoid muscle and joint overexertion.

Adaptability to the students' age: The exercises were designed to fit the specific motor needs of each age group, taking into account the natural development of motor skills in primary school classes.

Individual pace: The intervention plan allowed each student to progress at their own pace, ensuring a flexible framework in which each method (exercise) could be adapted based on individual mobility and strength.

Biomechanical efficiency: Each exercise was designed to develop flexibility, strength, and coordination by maintaining biomechanically correct postures, minimizing the risk of injury.

The intervention plan was structured so that each exercise would meet the specific needs of each class, aiming for the simultaneous development of flexibility and muscular strength through a phased approach adapted to the age and physical preparation level of the students.

The rationalization of the proposed physical exercises had as its primary objective the development of each student's maximum potential through progressive and differentiated adaptation of the methods used according to the specific characteristics of each class (1-4).

This approach allowed for the alignment of physical development objectives with the capabilities and developmental level of each age group, ensuring harmonious and effective growth in muscular development and joint flexibility. Thus, the rationalization of the means for each class was designed according to the motor abilities of the children, long-term objectives, and the requirements for harmonious muscular development, successfully creating an effective intervention plan tailored to the needs of each developmental level.

THEMES, PURPOSE AND OBJECTIVES FOR A-I-II-III-IV-A CLASS. DEVELOPMENT OF STATIC BALANCE

Table 2. Research methodology and implementation of intervention strategies for the development of static balance

		CLASS 1	CLASS 2	CLASS 3	CLASS 4
EX. 1	**OBJECTIVES**	- Maintaining balance throughout the exercise on the support foot - Coordination of upper limbs	- Maintaining balance on the support leg throughout the exercise - Realization of the movement of bending the knee on the support leg.	- Maintaining the position in equilibrium for a duration of 30 seconds on the support leg. -The realization of the two forms of the bird, offered with two hands from the bottom and rolled with one hand on the ground without the appearance of imbalance on the support leg.	-Realization of the transmission of the ball from man to man at the same time as touching the ground on the executing foot - Develop concentration during and after ball transmission to avoid multiple imbalances throughout the exercise.
	PURPOSE	-Development of static balance -Concentration development	-Development of balance -Concentration development	-Development of balance -Concentration development	-Development of balance -Concentration development
		Students are placed on 3 columns in support on the leg tight, the first student in each column having two balls. At the sound signal the first student transmits the balls simultaneous	Students are grouped 4 to two gymnastics benches with the shoulder tight and straight on the direction in support on the left leg. To the right of the bank are placed next to each subject a copet. The task of the exercise is to	Students are placed 2 facing each other at a distance of 2m, in support on the right foot with a handball. The pupil in possession of the ball has the task of bending the trunk simultaneously with the bending of the knee on the supporting leg making the	The collective is placed on the length of the gymnastic bench, one behind the other, in support on the left leg, the other knee being raised. The first student will hold the ball at the chest level with two hands and at the sound signal it

		CLASS 1	CLASS 2	CLASS 3	CLASS 4
	DESCRIP-TION OF THE EXERCISE	ly to the side by extending the arms from man to man until the last student and after the last student received the balls will transmit them back through the same way, students remaining throughout the exercise in support on the left foot. After the first series they will change the support leg. This exercise will be repeated 2 times.	achieve with the executing foot the touch of the cover simultaneously with the bending of the knee on the support leg, returning to the initial position with the knee raised maintaining the balance on the foot on the bench. They will perform 2 times the movement of descent on the right foot and 2 times on the foot clench with the support on the opposite foot, the mats being moved to the opposite side.	ball rolling with the opposite hand of the partner, the other student will wait for the ball all in support on the right foot. The person who receives the ball has the task of lifting the ball off the ground by the movement of bending the trunk and knee on the support leg following the lift to balance and maintain knee raised on opposite foot.	has the task of achieving the tip of the foot on the ground of the executing lower limb while bending the knee on support leg and raising arms with the ball in hand up. The second pupil behind him is tasked with receiving the ball from the first student when he is performing the ground touch on the executing lower limb. This exercise will be completed the moment the ball reaches the last student. They are tasked to maintain their balance on the support leg after each ball transmission until the object reaches the last in the column. After completing the exercise they turn face to face in the opposite direction realizing the transmission of the ball from the last student to the first

		CLASS 1	CLASS 2	CLASS 3	CLASS 4
					changing and the support leg. ***The student who for 30 seconds had more than 3 imbalances on the gymnastic bench will receive additional tasks, tasks that help to improve the static balance.***
EX. 2	**OBJECTIVES**	- Maintaining balance throughout the exercise on the support foot -Coordination of the upper limbs with the executing lower limb	- Maintaining balance on the support leg throughout the exercise - Keeping the knee stretched on the support leg	- Maintaining the position in equilibrium for a duration of 30 seconds on the support leg. -Coordination of partners in the exchange of materials for a duration of 30 seconds without the occurrence of multiple imbalances on the support foot.	Developing concentration to avoid multiple imbalances during the exercise.
	PURPOSE	Development of static balance	-Development of static balance -Concentration development	Development of static balance	-Development of static balance -Development of concentration and attention

		CLASS 1	CLASS 2	CLASS 3	CLASS 4
	DESCRIP-TION OF THE EXERCISE	Students are placed on 3 columns in support on the leg tight, with the right arm stretched sideways and the other raised. At the first sound signal they have the task of bending the trunk at the same time as bending the knee on the support leg with touching the ground. At the second sound signal have the task of returning to the original position. Repeat the exercise 2 times on each leg.	Students are grouped 2 face to face with each other at a distance of 1m in support on the left foot. Before the right foot each subject has a cover. They have the task of changing the mats between them by pushing forward towards the partner with the right foot, following to pull the opposite quilt towards them, obliquely returning the inner to the final position with the knee raised, the right, repeating without stopping 3 times these movements with the executing foot.	The students are placed 2 facing each other at a distance of 1m, in support on the left foot with a ridge before the right foot. On the signal of the teacher the two students push into the same quilt without fully leaning on it, towards his partner, then maintaining the position of balance in support on the left foot, the, the other lower limb being with the knee raised. After the thrust of the bucket they have the task of bringing the opposite dome to the right, from the place where it was originally positioned by pulling it to the right foot, subsequently achieving a balanced position throughout the exercise. After each movement performed, the students have the task of keeping the knee high on the right	Students are grouped 2 times before each other with a bobath ball. The student in possession of the ball will be in support 30 seconds on the standing foot and 30 seconds on the right foot. The other partner after the teacher's signal has the task to execute with both hands, alternately pushing the ball in different directions to force him to unbalance. After the exercise, the roles will change. ***The student who for 30 seconds had more than 3 imbalances will receive additional loads, tasks that help to improve the static balance, strength in the lower limbs, and, development of abdominal muscles and development of flexibility.***

		CLASS 1	CLASS 2	CLASS 3	CLASS 4
				lower limb, permanently maintaining balance on the left foot. They are tasked to perform the exercise in support for 30 seconds on a lower limb without the occurrence of multiple imbalances during execution.	
EX. 3	**OBJECTIVES**	- Maintaining balance throughout the exercise on the support foot -Coordination of the upper limbs with the lower ones	To execute the movement of lowering the lower limb from the back simultaneously with the passing of the ball with two hands from below, ensuring the maintenance of body stability on the foot on the bench and synchronized coordination of movements during the ball bird.	- Maintaining the position in balance with the knee raised after each touch of the mat. - Spreading the mats on the previous, postero-lateral and postero-medial direction with the foot without the occurrence of imbalances on the support leg.	To be able to maintain their balance after the exercise task is performed.
	PURPOSE	-Development of static balance -Development of attention	-Development of balance -Development of concentrated attention - Segmental coordination	-Concentration development -Development of static balance	Development of static balance

		CLASS 1	CLASS 2	CLASS 3	CLASS 4
	DESCRIP-TION OF THE EXERCISE	The collective is placed in a circle at an arm length in support on the right leg. The second student in the band will be positioned in a circle. At the teacher's sleepy the students will raise the circle from the ground by performing the simultaneous bending of the trunk and knee on the supporting leg by passing over them, they will also place the circle of the next participant on the ground by the same way of execution. Each student is tasked to execute the same principle of execution 3 times.	Students are grouped 4 to two gym benches facing each other in support on the left foot at a distance of 1.5m with a handball. The task of the exercise is to carry out the passing of the ball offered from below with two hands to the partner positioned facing him following that after the bird to perform a bend of the knee on the leg tight, the, the other leg of the lower limb performing a touch of the soil without fully allocating the weight on it, returning to the final position vigorously pushing into the foot on the bench. Alternatively work, each subject having the same task after the bird. They will perform 2 times the movement of	The students are seated inside the 3 horns oriented in the trunk in support on the left foot. On the signal of the teacher they have the task of performing with the executing foot the thrust of the thighs on the previous 3 directions, postero-lateral and postero-medial, maintaining balance with the other lower limb with the knee raised after each movement executed on each direction. After pushing the mats, they have the task of bringing them to their original position (in the triangle) without placing the executing foot on the ground or completely leaning on the mats.	The students are placed on the length of the gymnastic bench, one behind the other, in support on the left leg, the other knee being raised, the arms stretched sideways. At the indications of the teacher, the students have the task of performing with the lower right limb touching the ground with the tip of the foot by moving the cross back together with bending the knee on the support leg (left) returning in final position with knee raised.

		CLASS 1	CLASS 2	CLASS 3	CLASS 4
			descent on the right foot and 2 times on the foot they gather with the support on the opposite foot 8 touches of soil each later will change the groups on the gymnastics bench.		
EX. 4	**OBJECTIVES**	- Improve balance control on the support leg -Developing coordination and response to dynamic changes - Improve collaboration and manipulation technique			
	PURPOSE	-Development of static balance -Development of concentrated attention			
	DESCRIP-TION OF THE EXERCISE	The students are placed 2 facing each other in support on the left leg, arms extended forward and a circle on both sides. Each of them has the task			

		CLASS 1	CLASS 2	CLASS 3	CLASS 4
		of controlling the object through the push-pull movement forcing the partner to lose control over the balance on the support leg for 20 seconds. After that time of work they will change the support leg performing the same task without making contact with the ground on the free foot.			

Algorithmization of the intervention plan for the development of static balance in primary classes I-IV has taken into account principles for developing static balance in students from grades I-IV. The plan was structured based on specific objectives, each adapted to the physical and cognitive development level of the children. Therefore, I implemented a set of exercises that gradually addressed the complexity of the requirements, emphasizing the maintenance of balance on the supporting leg, coordination of the limbs, and concentration.

Basic principles of the intervention plan

Graduality: Exercises have been designed to progress from simple to complex exercises, allowing students to develop their skills in a controlled and effective way.

Adaptability: Each exercise has been tailored to meet the individual needs of students, given their varying physical abilities.

Collaboration: Many of the exercises were structured to encourage intercollegial interaction, which not only improved motor skills but also developed their social skills.

The implementation of this intervention plan for the development of static balance in primary classes I-IV not only facilitated the improvement of physical abilities, but also contributed to the formation of algorithmic approaches, ensuring a coherent progression of exercises, adapted to the needs of each group of students.

The rationalization of exercises aimed at developing static balance was carried out in order to maximize the potential of each class of students, adapting the activities to their specific needs and skills. Each class had clear goals, defined on the basis of students' motor and cognitive capabilities, which allowed for a personalized and effective approach. They were also performed through a detailed analysis of each class, taking into account the specificity of age, the level of physical development and the ability to concentrate students. This approach allowed not only the development of static balance, but also the formation of motor skills essential for future physical activities.

RESULTS

In the study, we assessed the performance of I-IV students in 2 tests that contain 2 different samples, differentiated by the codes that appear in the table below. So we have the test:

1. FLAMINGO test
2.SIT AND REACH test

1. Results obtained in Class I – Girls - Boys

Table 3. Characteristics and characterization of variables between GE and GC girls and boys in Class1

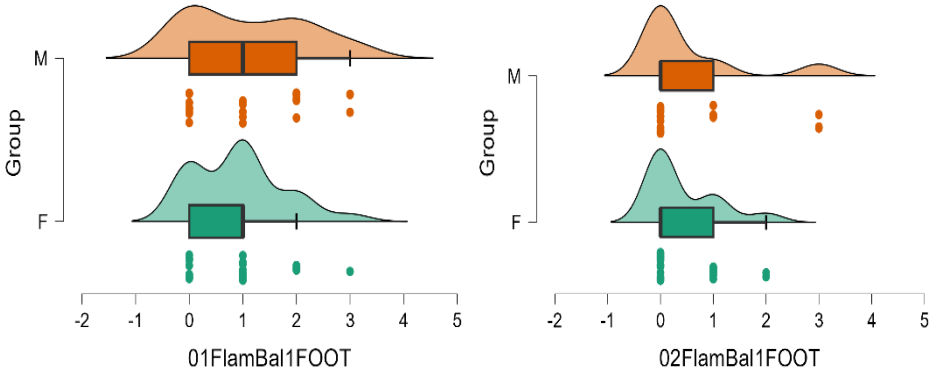
CHARACTERISTIC	Class 1	Class 1	Class 1	Mann-Whithey
	all	F	B	
VARIABLE	mean (standard deviation)	mean (standard deviation)	mean (standard deviation)	p-value
01FlamBal1FOOT	0.9 (1)	0.9 (0.7)	1 (1.3)	0.606
02FlamBal1FOOT	0.1 (0.3)	0.1 (0.4)	0.1 (0.3)	0.853
p-value (Wilcoxon)		0.003	0.064	
01SARFLEXIBILITY	5.6 (5.1)	5.4 (5.8)	5.8 (4.2)	0.629
02SARFLEXIBILITY	8.8 (4.5)	9.5 (5.1)	7.8 (3.6)	0.286
p-value (Wilcoxon)		0.032	0.682	

Table 4. District of Median and Quartile for Class 1 Student Group Variables

CHARACTERISTIC VARIABLE	median [Q1 - Q3]	median [Q1 - Q3]	median [Q1 - Q3]
01FlamBal1FOOT	1 [0 - 1]	1 [0.3 - 1]	0 [0 - 2]
02FlamBal1FOOT	0 [0 - 0]	0 [0 - 0]	0 [0 - 0]
p-value (Wilcoxon)			
01SARFLEXIBILITY	6 [1 - 8]	5 [1.3 - 6.8]	7 [2 - 9.5]
02SARFLEXIBILITY	9 [7 - 11]	9 [7 - 10.8]	8 [5.5 - 10.5]
p-value (Wilcoxon)			

1.1. Results from the FLAMINGO balance test (01FlamBal1FOOT – 02FlamBal1FOOT)

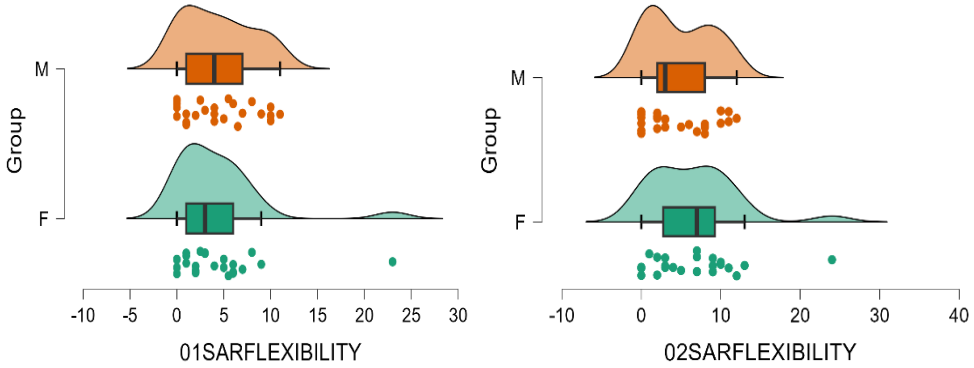
The Wilcoxon test values (p) indicate the statistical significance of the observed differences between the two groups: In the first test session, the difference between girls and boys is significant (p = 0.003), which suggests the existence of notable differences in performance in the girls' group; compared to that of boys, the difference being statistically insignificant (p = 0.064), indicating an increase in value from the girls and boys group and in the third test session. We cannot confirm the same for the Mann-Withney value the differences are insignificant in both groups (p=0.606) and (p=853) respectively.



Graph 1. Distribution of FlamBal1FOOT variable (FLAMINGO BALANCE TEST) at time 1 and 2 by group membership. (GE = experimental group, GC = control group).

1.2. SIT AND REACH test results for flexibility measurement (01SARFLEXIBILITY – 02SARFLEXIBILITY)

In the study, we also assessed the flexibility development test for both girls and boys, using two distinct sets of Mann-Withney and Wilcoxon measurements for. The Wilcoxon test indicated a significant p-value of 0.032 in the girls' group in terms of differences between groups, while for the boys' group value p=0.682, suggesting that the differences are not statistically significant. The results for the Mann-Witney value indicate that there are no statistically significant differences between girls and boys in terms of flexibility (p > 0.05 for both measurements). However, there are variations in the level of flexibility reported between the two groups.



Graph 2. Distribution of SARFLEXIBILITY variable (SIT AND REACH) at time 1 and 2 by group membership. (GE = experimental group, GC = control group).

1.3. Results obtained in Class II – Girls - Boys.

Table 5. Characteristics and characterisation of variables between GE and GC girls and boys in Class 2

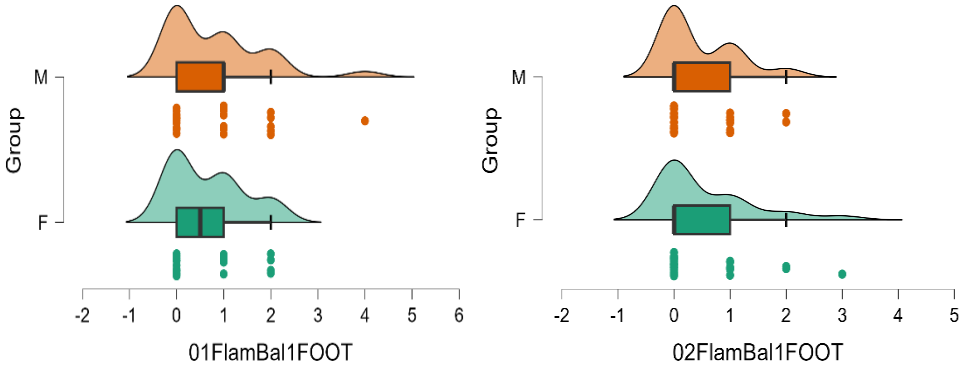
CHARACTERISTIC	Class 2	Class 2	Class 2	Mann-Whithey
	all	F	B	
VARIABLE	mean (standard deviation)	mean (standard deviation)	mean (standard deviation)	p-value
01FlamBal1FOOT	0.6 (1)	0.4 (0.8)	0.7 (1.1)	0.75
02FlamBal1FOOT	0.1 (0.3)	0.1 (0.3)	0.1 (0.4)	0.86
p-value (Wilcoxon)		0.004	<.001	
01SARFLEXIBILITY	3.5 (5)	5.6 (6.1)	1.6 (2.9)	0.037
02SARFLEXIBILITY	4.8 (5.2)	7.3 (6.5)	2.6 (2.6)	0.011
p-value (Wilcoxon)		0.007	0.014	

Table 6. District of Median and Quartile for Class 2 Student Group Variables

CARACTERISTIC VARIABLE	median [Q1 - Q3]	median [Q1 - Q3]	median [Q1 - Q3]
01FlamBal1FOOT	0 [0 - 1]	0 [0 - 0.3]	0 [0 - 1]
02FlamBal1FOOT	0 [0 - 0]	0 [0 - 0]	0 [0 - 0]
p-value (Wilcoxon)			
01SARFLEXIBILITY	1.5 [0 - 4.8]	3 [1.8 - 8.5]	0 [0 - 1.8]
02SARFLEXIBILITY	3 [1 - 8]	8 [1.8 - 10]	2 [1 - 3]
p-value (Wilcoxon)			

1.4 Results from the FLAMINGO balance test (01FlamBal1FOOT – 02FlamBal1FOOT)

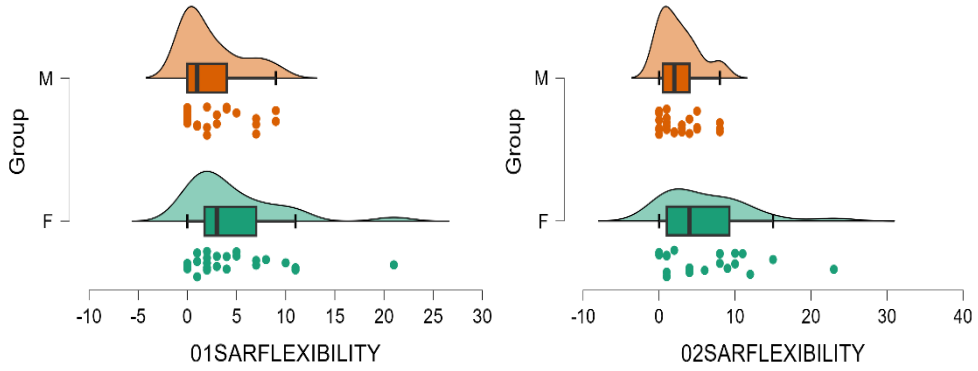
The p-values obtained from the Wilcoxon test indicate the statistical significance of the observed differences between the groups: For the two groups tested (GE-GC), the p-value being 0.004 and <.001, respectively, which suggests a statistically significant difference between girls and boys. These results demonstrate important variations in the performance of girls and boys in the indicators assessed, finding later that Mann-Withney values are above the materiality threshold of 0.05, (p=0.75 - p=0.86).



Graph 3. Distribution of FlamBal1FOOT variable (FLAMINGO BALANCE TEST) at time 1 and 2 by group membership. (GE = experimental group, GC = control group).

1.5. SIT AND REACH test results for flexibility measurement (01SARFLEXIBILITY – 02SARFLEXIBILITY)

The statistical analysis was performed using the Wilcoxon test to determine the significance of observed differences between groups. P-values from the Mann-Withney variable (0.037 and 0.011) indicate that there are significant differences in the flexibility performance of girls and boys for both tests. The Wilcoxon test results confirm these differences with p-values of 0.007 and 0.014, emphasize the statistical significance of the results.



Graph 4. Distribution of SARFLEXIBILITY variable (SIT AND REACH) at time 1 and 2 by group membership. (GE = experimental group, GC = control group).

2. Results obtained in Class III – Girls - Boys

Table 7. Characteristics and characterisation of variables between GE and GC girls and boys in Class 3

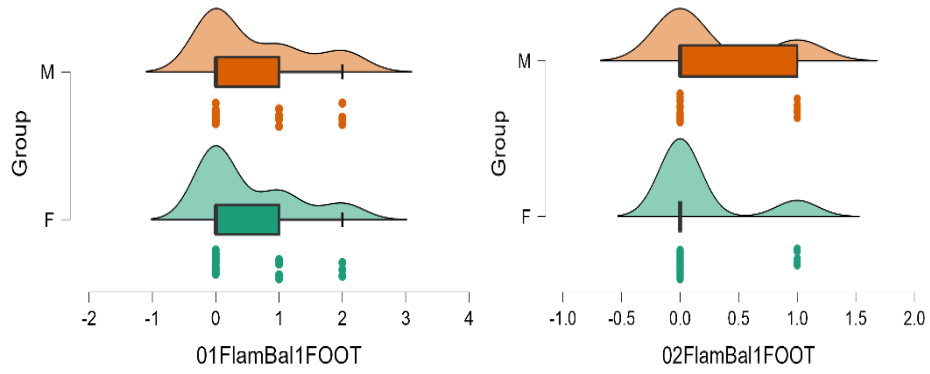
CHARACTERISTIC	Class 3	Class 3	Class 3	Mann-Whithey
	all	F	B	
VARIABLE	mean (standard deviation)	mean (standard deviation)	mean (standard deviation)	p-value
01FlamBal1FOOT	0.2 (0.4)	0.1 (0.4)	0.3 (0.5)	0.678
02FlamBal1FOOT	0.1 (0.3)	0.1 (0.3)	0.2 (0.4)	0.352
p-value (Wilcoxon)		<.001	0.002	
01SARFLEXIBILITY	5.3 (6.3)	7.3 (7.1)	2.4 (3.2)	0.1
02SARFLEXIBILITY	8 (6.2)	9.2 (7.3)	6.3 (3.7)	0.422
p-value (Wilcoxon)		0.078	0.004	

Table 8. Characteristics and characterisation of variables between GE and GC girls and boys in Class 3

CHARACTERISTIC VARIABLE	median [Q1 - Q3]	median [Q1 - Q3]	median [Q1 - Q3]
01FlamBal1FOOT	0 [0 - 0]	0 [0 - 0]	0 [0 - 0.8]
02FlamBal1FOOT	0 [0 - 0]	0 [0 - 0]	0 [0 - 0]
p-value (Wilcoxon)			
01SARFLEXIBILITY	3 [0 - 9]	4 [2 - 11.5]	1.5 [0 - 3]
02SARFLEXIBILITY	6 [3 - 10]	7 [3 - 12.5]	6 [3.3 - 7.8]
p-value (Wilcoxon)			

2.1. Results from the FLAMINGO balance test (01FlamBal1FOOT – 02FlamBal1FOOT)

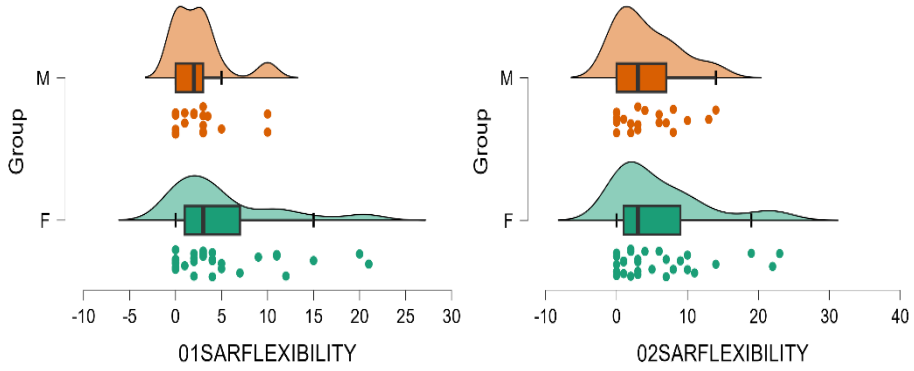
Statistical analyses suggest that there are statistically significant differences between girls and boys of class 3 according to the Wilcoxon test that demonstrate the differences in values for the two genders being at a materiality threshold of < 0.05 (p-value=<.001-GIRLS) respectively (p-value=0.002-BOYS). Subsequently, the p-values obtained from the Mann-Withney test for the test indicator suggest a statistically insignificant difference between girls and boys. These results demonstrate important variations in the performance of girls and boys in the indicators assessed, finding later that Mann-Withney values are above the materiality threshold of 0.05, (p=0.678 and p=0.352 respectively).



Graph 5. Distribution of FlamBal1PICIOR variable (FLAMINGO BALANCE TEST) at time 1 and 2 by group membership. (GE = experimental group, GC = control group).

2.1.1. SIT AND REACH test results for flexibility measurement (01SARFLEXIBILITY – 02SARFLEXIBILITY)

Statistical analysis using the Wilcoxon test to compare the performance of girls and boys in the flexibility test reveals non-significant statistical differences, with the Mann-Whitney p-value being above the materiality threshold of 0.05. These results underline the importance of separate data analysis by gender, since the significant differences observed in boys (Wilcoxon p-value = 0.004) following the flexibility test, at a statistical significance threshold of $p < 0.05$, are not reflected in the group of girls, where the significance level exceeds this threshold of 0.05 (0.078 for girls).



Graph 6. Distribution of SARFLEXIBILITY variable (SIT AND REACH) at time 1 and 2 by group membership. (GE = experimental group, GC = control group)

3. Results obtained in Class 4 – Girls – Boys

In this study, we looked at the performance of class 4 students (girls and boys) on two separate tests, differentiated by codes. The purpose of this analysis was to investigate whether there were significant differences in the performance of girls and boys in these tests using non-parametric Wilcoxon and Mann-Withney testing methods.

Table 9. Characterisation and characterisation of variables between GE and GC girls and boys in Class 4

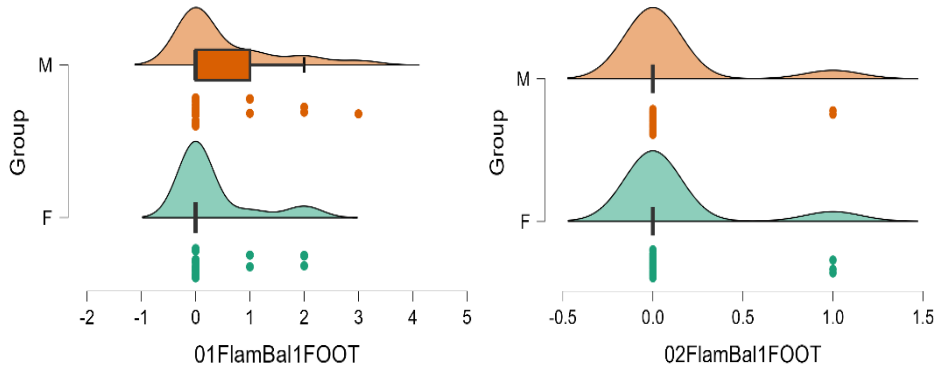
CHARACTERISTIC	Class 4	Class 4	Class 4	Mann-Whithey
	all	F	B	
VARIABLE	mean (standard deviation)	mean (standard deviation)	mean (standard deviation)	p-value
01FlamBal1FOOT	0.4 (0.7)	0.2 (0.6)	0.6 (0.9)	0.399
02FlamBal1FOOT	0 (0)	0 (0)	0 (0)	0.897
p-value (Wilcoxon)		<.001	<.001	
01SARFLEXIBILITY	4.1 (4.4)	3.7 (4)	4.4 (5)	0.11
02SARFLEXIBILITY	5.7 (5.3)	5.6 (5.3)	5.7 (5.7)	0.134
p-value (Wilcoxon)		0.06	0.167	

Table 10. District of Median and Quartile for Class 4 Student Group Variables

CHARACTERISTIC	median [Q1 - Q3]	median [Q1 - Q3]	median [Q1 - Q3]
VARIABLE			
01FlamBal1FOOT	0 [0 - 0]	0 [0 - 0]	0 [0 - 1]
02FlamBal1FOOT	0 [0 - 0]	0 [0 - 0]	0 [0 - 0]
p-value (Wilcoxon)			
01SARFLEXIBILITY	3 [0.8 - 5]	2 [1 - 5]	3 [1 - 5]
02SARFLEXIBILITY	4.5 [2.8 - 6.5]	4 [3 - 7]	5 [2 - 6]
p-value (Wilcoxon)			

3.1. Results from the FLAMINGO balance test (01FlamBal1PICIOR – 02FlamBal1PICIOR)

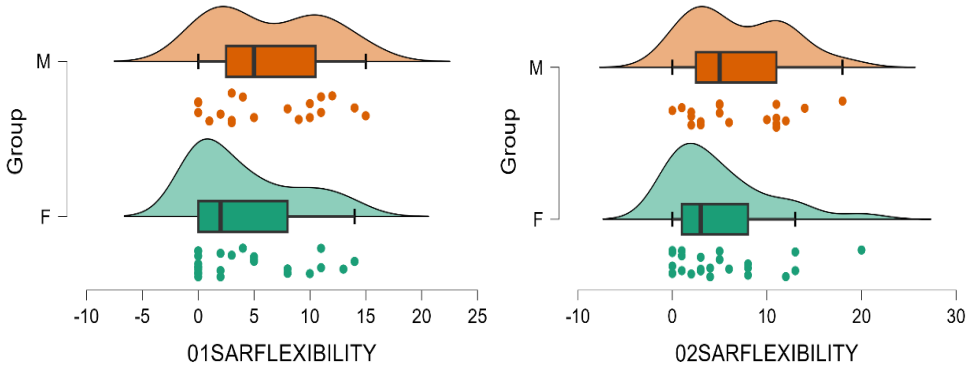
The balance test on one leg suggests the existence of significant differences in performance achieved by girls and boys at a materiality threshold (<.001) Of the Wilcoxon variable concluding that following the Mann-Withney variable there are no statistically significant differences between the groups in terms of the result obtained (p=0.399), respectively (p=0.897) the materiality threshold being over (0.05).



Graph 7. Distribution of FlamBal1FOOT variable (FLAMINGO BALANCE TEST) at time 1 and 2 by group membership. (GE = experimental group, GC = control group)

3.2. SIT AND REACH test results for flexibility measurement (01SARFLEXIBILITY – 02SARFLEXIBILITY)

The comparative analysis of the two tests did not reveal statistically significant differences between girls and boys of class 4. Both for the first and second tests, the p-values obtained from Wilcoxon (girls p-value=0.06 and boys p-value=0.167 respectively) and Mann-Withney (p=0.11 and p=0.134 respectively) suggest that the variations observed on average and the standard deviation do not they are large enough to conclude that there are real differences between the groups. This indicates a similarity in the level of flexibility between girls and boys at this age, according to the measurements made.



Graph 8. Distribution of SARFLEXIBILITY variable (SIT AND REACH) at time 1 and 2 by group membership. (GE = experimental group, GC = control group)

CONCLUSIONS

1. Based on the observed developments, educational interventions through specific physical exercises appear to be effective in improving both flexibility and balance in primary school students. The results indicate the need to adapt the exercises to the specific characteristics of each class and gender, with special attention to girls' flexibility and general balance.

2. The p-values from the Wilcoxon tests highlight a general improvement in performance during successive evaluations, particularly in flexibility tasks, where statistically significant differences are observed in most classes. This demonstrates the effectiveness of the proposed physical activities within the intervention plan, contributing to the improvement of motor skills.

3. Proper structuring of exercises, based on a detailed assessment of each student's individual needs, facilitates the improvement of both balance and flexibility. This is reflected not only in the students' performance but also in the physical activities, having a positive impact on the overall educational process.

4. In general, no significant differences were identified between boys and girls regarding one-leg balance across all classes. The p-values from the Mann-Whitney tests indicate the absence of statistically significant differences between genders (with minor exceptions in Grade 2). This suggests that balance development is comparable between boys and girls at the analyzed ages.

5. Grades 1 and 2 showed tendencies for better results than older grades (3 and 4) in maintaining one-leg balance, possibly indicating a greater importance of developing this skill at younger ages.

6. Girls tend to score higher than boys in terms of flexibility across all grades, but the differences are not always statistically significant (p-values vary), particularly in Grades 2 and

7. The Wilcoxon tests suggest a general improvement in flexibility from the first to the second test, indicating the effectiveness of the intervention program in developing flexibility among children.

Author contributions

In this research, ***Tiberiu Silviu Puta*** made a significant contribution to the implementation of strategies for optimizing psychomotor components. Through an innovative and well-founded approach, he recommended the use of effective methods and tools integrated into the intervention process, which facilitated the improvement of psychomotor skills. His expertise was essential in developing a solid theoretical and practical framework aimed at optimizing psychomotor performance, adapted to the needs of subjects from various age groups and skill levels.

Carla Silvia Băloi (Puta) played an important role in implementing the intervention plan within physical education lessons at the primary school level. She was also actively involved in the data collection process, contributing to the statistical analyses necessary to support the research conclusions.

Simona Petracovschi made a significant contribution to this study through the implementation of the intervention plan and the data collection process. She also participated in conducting the statistical analysis, ensuring the accuracy and relevance of the results. Her efforts were crucial to the success of this research study.

Acknowledgments

I would like to express my deep gratitude to the educational institution and the legal tutors of the students for their constant support in the implementation of the intervention plan. Constructive collaboration and active involvement were key factors in the development of this educational approach, which focuses mainly on the development and well-being of students.

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