

IMPROVING ARTICULAR MOBILITY AND THE BALANCE IN CHILDREN OF 11-12 YEARS THROUGH SPECIFIC DANCE ELEMENTS

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Summary

In order to accomplish this study, both classical ballet elements were performed, such as posture elements performed at the bar and mid-hall, as well as the sports dance ones (dances from the Latin-samba and cha-cha sections, respectively the standard section – Viennese waltz). We considered these elements to be the most effective way to improve joint mobility and balance in children aged 11-12. The present study aimed at valorizing the body language for the reception and expression of the musical and choreographic message in affective and aesthetic states, essential in choreographic art. In addition to aesthetic posture, the grace and knowledge already acquired in the art of dance, improving articular mobility and balance, was an important criterion in setting up future dance choreographies and genres to be performed.

Introduction:

Dance, as a form of non-verbal communication, influences the formation of children's personality through the development of psychomotor, intellectual and emotional skills in an artistic, aesthetic and affective way. The degree of motor expressiveness and interpretation of a choreographic composition is closely related to the stage of development of a child's motor skills and coordination qualities. The level of rendering of some aesthetic motor actions and a high degree of expressiveness is directly influenced by the quality of motor skills acquired during the lifetime. In the achievement of harmonious, supple, precise movements, the development index of articular mobility and balance has an important role.

To be able to perform certain elements of the dance, the interpreter must develop a good flexibility. Achieving a good balance is equally important in achieving complex motor actions. Weight distribution

correctly during the performance of dance steps, expressing precision and naturalness in motion. Studies have shown that these two motor skills are much easier to learn at a younger age. That is why both joint mobility and balance must be given a special interest in dance lessons.

It is known that articular mobility is a skill that is gaining hard and is quickly lost, especially in the lower limbs. To prevent this, it is recommended to perform some regular gymnasts using exercise programs specially designed for this purpose. Otherwise, the degree of artistic exposure of choreographic compositions will be hampered because "low elasticity prolongs the time of the acquisition of driving actions, favors accidents, decreases performance, decreases execution quality and reduces the developmental index of other motor skills" (Badiu T. 2001) .

In order to improve these indices essential in the execution of any artistic act with accuracy, naturalness and refinement, we have chosen a range of means from both classic ballet, such as bar-shaped body elements in the bar and in the middle of the gym, as well as dance in sports from the latino - samba and cha - cha sections, respectively the standard section - Viennese vals). These means we considered to be most effective for improving joint mobility and balance in children aged 11-12.

Material-Method:

Study hypothesis

It is assumed that the implementation of specific means of classical ballet and sports dance will improve articular mobility and balance in the 11-12 age group.

In order to confirm or refute this hypothesis, we chose a mixed group of 14 children aged between 11 and 12, respectively 8 girls and 6 boys, children attending the Sports Dance Circle at the Children's Palace in Suceava. The experiment took place its dancing hall during February - May 2018, the students having a weekly dance session.

In the case of this group, during every session, a greater emphasis was placed on improving articular mobility and balance, since, in addition to posture, grace and the knowledge gained previously, these indices were an important criterion for being promoted in more advanced classes as a level.

Promotion at a higher level is based on a summative assessment consisting of a representation given by each student at the end of each year or semester.

During each class, the main purpose was to valorize the bio-psycho-motor potential, to practice the communication in the specific terms of the discipline with both the group colleagues and the teacher, to develop each student's artistic side and the personality traits favorable to the group integration.

Table no 1 Model: IMPROVING ARTICULAR MOBILITY AND BALANCE

Minimum equipment:

- musical background;
- a dance floor with mirrors session/week and a wall bar; min.
- floor and carpet suitable for the specifics of the room;
- audio-video equipment, CDs, DVDs;
- costumes appropriate to the repertoire.

Level: beginners

Age category : 11-12 years

Number of hours : one

Length of the session : 90 min.

LESSON TIMES / DURATION	LESSON CONTENT
Part I 15 ' Organizing the group of students Preparing the body for effort Selective influencing of the locomotor apparatus	-aligning, greeting, attendance; -checking the posture; -verifying the health status; announcing lesson themes; - movement variations: walking: - on tips; on the heel, a pointed stretched out step; pointed bent step: - forward, lateral; high step; lunge step: - forward; lateral; turns with successive steps; balance positions; simple pirouettes with leg in passé; channés; etc. the dancing technique : * position of arms I-VII, position of legs I-II, III-IV-V; position of the body: front, back, diagonal, profile; positions on the bar: front, side;

Part III 15 '	executing the combinations of steps taken during the dance lesson;
Verification of acquired knowledge	performing various recreational dances (e.g. rock'n' roll, Chocolate, Dolls, etc);
The recovery of the body after the effort	performing various movements of arms and legs (extensions, swings, bends, etc.) - breathing movements;
Organized conclusion of the lesson	assembly, alignment; Observations and comments on the lesson; - appreciations, directions for the next class; greeting and organized leave of the dance hall.

The programs we used complied with the age specifics of the experimental group. Both the approached dances and the means of performance-interpretation were appropriate to the understanding capacity and the psychomotor development level of the young people in the experiment group.

Results:

The tests we used in the experiment for a more objective assessment of the registered parameters were 5 tests, 3 for articular mobility testing and 2 for balance testing. These tests are part of the "Hettinger System" (Manole V., Manole L., 2009).

"Hettinger System" - Testing of articular mobility and balance:

1. *Mobility of the spine*: From the standing position with closed legs, the bending of the trunk is carried forward with the laying of the palms on the ground. The score is awarded as follows:
 - reaching the ground with the palms - 10 pts.;
 - touching the soil with your fingers - 8 pts.;
 - touching the soil with the fingertips - 6 pt.;
 - less than 2 cm between the fingers and the ground - 5 pts.;
 - 3-5 cm distance between fingers and soil - 4 pts.;
 - 6 to 10 cm distance between fingers and soil - 3 pts.;
 - 11-15 cm distance between fingers and soil - 2 pts.;
 - over 15 cm distance between fingers and soil - 1 pt.;
2. *Coxofemoral mobility*: From the sitting position with the legs stretched on the ground, the trunk is bent simultaneously with grasping one leg with both hands and pulling it towards the head

so that the haluces touch the nose (observations: the leg will be bent from the knee joint). The score is awarded as follows:

- touching the nose - 5 pts.;
- less than 5 cm between haluce and nose - 4 pts.;
- distance of 5-10 cm between haluces and nose - 3 pts.;
- 10-20 cm distance between haluces and nose - 2 pts.;
- over 20 cm between haluces and nose - 1 pt.;

The test is done for both legs/feet, awarding points for the best attempt.

3. *Shoulder mobility*: From the standing position with legs slightly apart, a hand is carried over the head to the opposite shoulder blade and held with the other hand (attempt to overlap the hands behind). The score is awarded as follows:

- fingertips are exceeded - 5 pts.;
- fingertips touch - 4 pts.;
- less than 5 cm between toes - 3 pts.;
- 5-10 cm distance between toes - 2 pts.;
- over 20 cm between toes - 1 pt.;

4. *Upper limb balance - dynamic balance*. From the sitting position with a bent arm, forearm forward (90 ° angle), the other one next to the body: place a 40-50 cm baton in the palm facing upwards and execute its left and right balancing by counting 21, 22, 23 etc. (each number being the equivalent of one second). Action ceases only when the baton falls from the palm. The score is awarded as follows:

- balancing the baton for more than 12 sec. (over number 32) - 5 pts.;
- balancing the baton for 10-12 sec. - 4 pts.;
- balancing the baton for 7-9 sec. - 3 pts.;
- balancing the baton for 4-6 sec. - 2 pts.;
- balancing the baton for less than 3 seconds. - 1 pt.;

The test is done for both arms, awarding points for the best attempt.

5. *Balance in the lower limbs - dynamic balance*: From the position standing on one leg, in front of a towel placed on the

ground, the towel is clamped with the toes of the free foot and lifted at 90 ° with the towel being held for 1-2 seconds. The action will be repeated 5 times, each successful test being scored 1 point.

Table no 2 Evolution of articular mobility indices and balance in experimental group - INITIAL / FINAL TESTS:

No .	Surname and first name	Age	Spinal mobility		Coxofemoral mobility		Shoulder mobility		Upper limb balance		Balance at the lower limbs	
			I	F	I	F	I	F	I	F	I	F
1	RC	11	8	10	4	5	4	5	4	5	4	5
2	AS	12	10	10	5	5	5	5	5	5	5	5
3	AA	11	6	8	3	4	4	4	3	5	3	4
4	SA	11	5	8	3	4	3	4	4	5	4	5
5	TD	12	8	10	4	5	3	4	4	5	4	4
6	SS	12	4	6	3	3	3	3	4	4	4	5
7	SA	11	8	10	4	5	4	5	5	4	5	4
8	EG	12	10	10	5	5	4	5	3	4	4	5
9	CE	12	6	8	4	4	3	4	4	5	3	4
10	ŞA	11	8	10	4	5	4	5	4	4	4	5
11	ID	12	5	6	3	4	3	3	3	4	4	4
12	BA	11	6	8	3	4	3	4	4	5	4	4
13	NŞ	12	3	6	3	4	2	3	3	4	3	4
14	RM	12	6	8	4	5	3	4	4	5	4	5
X		10.57	6.64	8.42	3.71	4.42	3.42	4.14	3.85	4.57	3.92	4.5
S		0.51	2.09	1.60	0.72	0.64	0.75	0.77	0.66	0.51	0.61	0.51
Cv		4.43	31.58	19.02	19.55	14.59	22.04	18.59	17.18	11.23	15.67	11.53
t		-	2.53		2.74		2.47		3.18		2.65	
p		-	p <0.05		p<0.05		p<0.05		p<0.01		p<0.05	

After performing the final tests we can observe (table no.2) that all subjects had superior values to those from the initial tests on all trials, except for subject no. 2 which since the initial testing has shown that it has a very good balance and mobility.

Table no. 3 Evolution of the spinal mobility indices in the two tests (initial-final):

SPINAL MOBILITY	Arithmetic mean X	Diff. between means	Standard Deviation (S)	Coefficient of variability (Cv)	Student Test (t)	Test t (Fisher's table)	Significance threshold (p)
Initial measurements	6.64	1.78	2.09	31.58	2.53	2.15	P<0.05
Final measurements	8.42		1.60	19.02			

As can be seen in Table no.3, there is a considerable difference between the arithmetic mean of the initial tests and the arithmetic mean of the final tests. This difference of -1.78 demonstrates that the specific means implemented have had a favorable impact on the optimization of articular mobility and balance.

Regarding the coefficient of variability, it can be observed that the degree of dispersion is a weak representative, which indicates the low homogeneity of the group (the initial tests values being of 31.58, respectively 19.02 at the final ones).

The Student Test calculated from the two tests is 2.53, which compared to the significance threshold $p < 0.05$ of the Fisher table (in our case 2.15) denotes that there are significant differences between the first and second tests.

Table no. 4 Evolution of indexes for co-femoral mobility in both tests (initial and final):

COXOFEMORAL MOBILITY	Arithmetic mean (x)	Diff. between means	Standard deviation (S)	Coefficient of variability (Cv)	Student Test (t)	Test t (Fisher's table)	Significance threshold (p)
Initial measurements	3.71	0.71	0.72	19.55	2.74	2.15	p < 0.05
Final measurements	4.42		0.64	14.59			

As can be seen in Table no. 4, there is a considerable difference between the arithmetic mean of the initial tests and the arithmetic mean of the final tests. This difference of -0.71 demonstrates that the specific means implemented have had a favorable impact on optimizing articular mobility and balance.

Regarding the coefficient of variability, it can be observed that the degree of dispersion is medium, which indicates a representative homogeneity of the group (the values of the initial tests being 19.55, respectively 14.59 at the final ones).

The Student Test calculated from the two tests is 2.74, which compared to the significance threshold $p < 0.05$ of the Fisher table (in our case 2.15) denotes that there are significant differences between the first and second tests.

Table no. 5 Evolution of shoulder mobility indices of the two tests (initial - final):

SHOULDER MOBILITY	Arithmetic mean (x)	Diff. between means	Standard deviation (S)	Coefficient of variability (Cv)	Student Test (t)	Test t (Fisher's table)	Significance threshold (p)
Initial measurements	3.42	0.72	0.75	22.04	2.47	2.15	p < 0.05
Final measurements	4.14		0.77	18.59			

As can be seen in Table no.5, there is a considerable difference between the arithmetic mean of the initial tests and the arithmetic mean of the final tests. This difference of -0.72 demonstrates that the specific means implemented have had a favorable impact on the optimization of articular mobility and balance.

Regarding the coefficient of variability, it can be observed that the degree of dispersion is medium, which indicates a representative homogeneity of the group (the values of the initial tests being 22.04 and 18.59 at the final ones respectively).

The Student Test calculated from the two tests is 2.47, which compared to the significance threshold $p < 0.05$ of the Fisher table (in our case 2.15) denotes that there are significant differences between the first and second tests.

Table no. 6 Evolution of upper limb balance indices for the two tests (i/f):

UPPER LIMB BALANCE	Arithmetic mean (x)	Diff. between means	Standard deviation (S)	Coefficient of variability (Cv)	Student Test (t)	Test t (Fisher's table)	Significance threshold (p)
Initial measurements	3.85	0.72	0.66	17.18	3.18	2.15	p < 0.01
Final measurements							

measurements	4.57		0.51	11.23			
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As can be seen in Table no. 6, there is a considerable difference between the arithmetic mean of the initial tests and the arithmetic mean of the final tests. This difference of -0.72 demonstrates that the specific means implemented have had a favorable impact on the optimization of articular mobility and balance.

Regarding the coefficient of variability, it can be observed that the degree of dispersion is small, indicating a strong representative homogeneity of the group (the values of the initial tests being 17.18 and 11.23 at the final ones respectively).

The Student Test calculated from the two tests is 3.18, which compared to the significance score $p < 0.01$ in the Fisher table (in our case 2.15) denotes that there are significant differences between the first and second tests.

Table no.7 Evolution of lower limb indices for the two tests (initial - final):

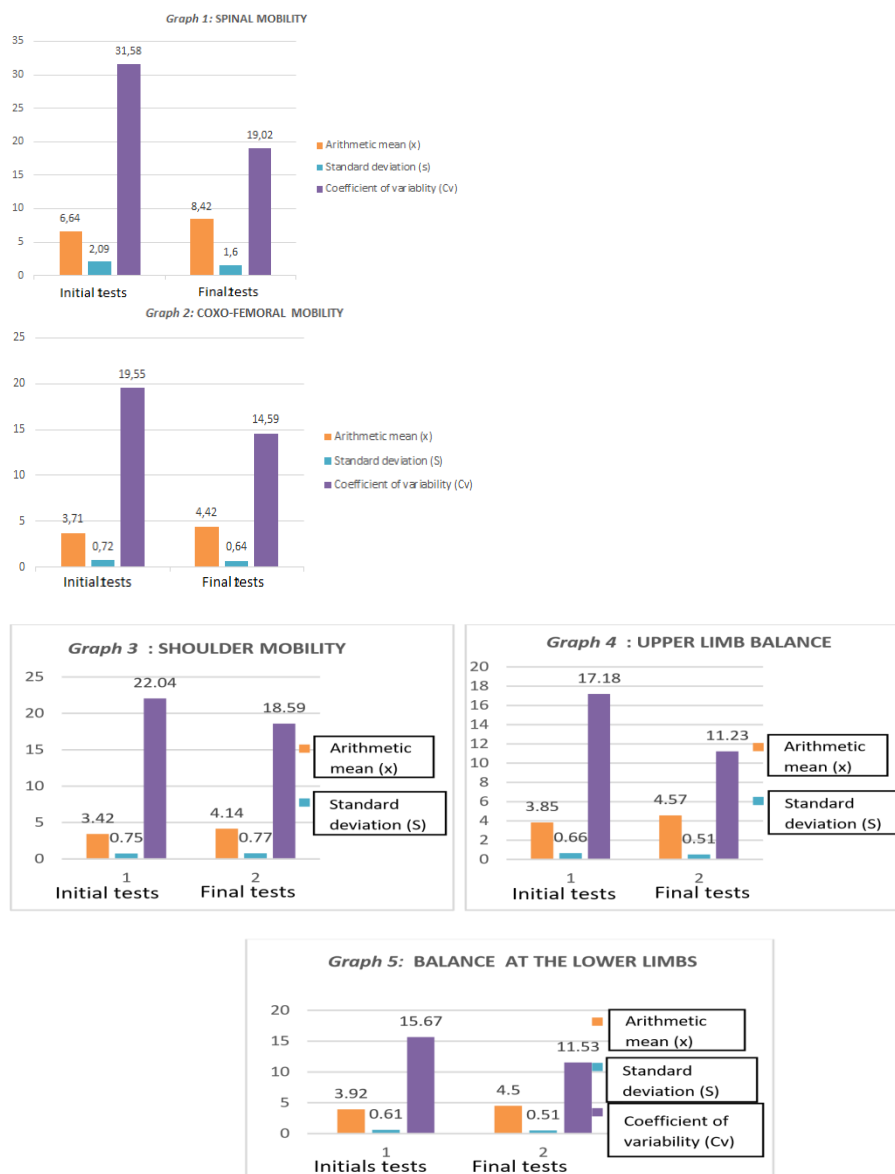
BALANCE AT THE LOWER LIMBS	Arithmetic mean (x)	Diff. between means	Standard deviation (S)	Coefficient of variability (Cv)	Student Test (t)	Test t (Fisher's table)	Significance threshold (p)
Initial measurements	3.92	0.58	0.61	15.67	2.65	2.15	$p < 0.05$
Final measurements	4.5		0.51	11.53			

As can be seen in Table no.7, there is a difference between the arithmetic mean of the initial tests and the arithmetic mean of the final tests. This difference of -0.58 demonstrates that the specific means implemented have had a favorable impact on optimizing articular mobility and balance.

Regarding the coefficient of variability, it can be observed that the degree of dispersion is small, indicating a strong representative homogeneity of the group (the initial tests being of 15.67 and 11.53 at the final ones).

The Student Test calculated from the two tests is 2.65, which compared to the significance threshold score $p < 0.01$ in the Fisher table (in our case 2.15) denotes that there are significant differences between the first and second tests.

Graphs no.1-5 Graphical representation of statistical indicators on articular mobility and balance:



Conclusions / Discussions:

- Implementing the most effective means of dancing can create higher indices of balance and articular mobility in children aged 11-12;

- The choice of certain elements specific to dance, based on age peculiarities, understanding capability and psychomotor development level, can successfully increase these indices;
- Both dance sport and classical ballet can effectively contribute to valorizing the bio-psycho-motor potential of students, to the development of each student's artistic side and to personality traits that are favorable to group integration;
- Because it is an ideal leisure activity to spend time in a pleasant way, the improvement of these indices during dancing sessions was made with pleasure and ease;
- Existence of considerable progress between the two tests shows that the specific means chosen have had a beneficial impact on optimizing articular mobility and balance, which confirms the study hypothesis.

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ÎMBUNĂTĂȚIREA MOBILITĂȚII ARTICULARE ȘI A ECHILIBRULUI LA COPIII DE 11-12 ANI PRIN ELEMENTE SPECIFICE DANSULUI

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Cuvinte cheie: mobilitate articulară, echilibru, potențial, dans sportiv, balet clasic;

Rezumat:

Pentru realizarea acestui studiu, s-au abordat atât mijloace din baletul clasic, precum elementele de ținută corporală executate la bară și la mijlocul sălii, cât și din dansul sportiv (dansuri din secțiunea latino - samba și cha-cha; respectiv secțiunea standard – vals vienez). Aceste elemente le-am considerat a fi cele mai eficiente pentru îmbunătățirea mobilității articulare și a echilibrului la copiii cu vârsta cuprinsă între 11 - 12 ani. Studiul de față a avut ca scop valorificarea limbajului corporal pentru receptarea și exprimarea mesajului muzical și coregrafic în stări afective și estetice, esențiale în arta coregrafică. Pe lângă ținuta estetică, grația și cunoștințele deja dobândite în arta dansului, îmbunătățirea mobilității articulare și a echilibrului, a reprezentat un criteriu important în stabilirea viitoarelor coregrafii și genuri de dans abordate.