DEVELOPING THE HINGE PUSH UP ELEMENT SPECIFIC FORCE IN AEROBICS JUNIOR III ATHLETES

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Abstract: In aerobics every technical element requires certain parameters of conduct of the spatial design that must be achieved with the highest accuracy as the assessment of the content is determined by the shape execution. This requires good physical preparation because this is the proper implementation of technical support. The hereby paper aims to validate the work programs intended to interfere with objective stimuli on upper limb strength development, in order to improve the technique of execution of the "hinge push-up" element.
Conclusions.The applied work programs have positively impacted on the studied element execution technique, thus underlining the important role of physical training in support of technical elements.
Keywords: *Strength, aerobic gymnastic, execution.*

Introduction

Sports activities are conducted under a high level of functional capabilities of the body which ensures the space-time coordinates of motor movements specific to a technique required by sport branches regulations.

The body's energy reserve will ensure performance and support the training process. Thus the physical training factor is very important in the training effectiveness, ensuring the basis implementation of all its components.[1] The demanda the body is submitted to during workout are both physical and functional, the two mixing and supporting each other.

As a conditional capacity, strength has a high degree of trainability, the changes at this level leading to anatomic and physiologic transformation, activation of large organic functions and improvement of neuromuscular system properties [2].

We identify two ways of developing force that isby increasing the amount of muscle mass or by improving motor units synchronization, in which case the training with intensive tasks is the course of action represented by rapid contractions with different loads.

For aerobics this mode is preferable because although it requires a significant force, weight increase raises weight problems, reduces execution dynamics and disrupts the trajectories learned.

Any muscle tightness can have a positive effect only if the movement involves agonists and synergists muscles while the antagonists relax, requiring precise coordination between nerve impulses issued on different muscle groups, coordination formed on the basis of conditioned reflexes [3]. Following training a specialized nervous system capacity is achieved through which it can send a strong excitation and concentrated to the agonist muscles simultaneously inhibiting the antagonistic one.

Regarded as a conditional motor skill, it can be substantially improved through the training process if it has continuity, the methods used are suited to the objectives, the means chosen and their sequence follow the biological and pedagogical mentioned rules.

Thus we can distinguish between training for mass development, training based on distance sum increasing without decreasing the amount of power or force (with ranges), isometric and to increase acceleration. In relation to force - power training can follow mass increase with peak levels of force disregarding the speed of execution or aiming to increase speed performance based on its explosive power.

The parallel development of force with speed leads to an increase of power parameters understood as the work done in a unit of time, e.g. the body's ability to perform mechanical work due to energy released per unit time.

Power has manifestation forms determined by movement phases. We distinguished landing and reactive power, a major component in aerobics, absorbing shock, keeping a good balance determining further elements or other movements.

It is necessary to keep a balance between strength, speed and muscle mass. The relationship between strength and body weight expresses relative force. In direct expression through measurements in kg / force in cm^2, force is an absolute one. At an equally training degree, absolute strength increases with weight, and relative strength has an inverse variation. For this reason in all sports with body movement such as aerobics, relative force has greater significance, attributing efficiency to the efforts made.

The training process to increase relative strength will not aim at muscle hypertrophy, recommending small and medium loads, quick and explosive executed throughout the entire movement. After determining the type of force involved, work methods may be chosen in which basic parameters, intensity, volume, pauses and tempo will play a pivotal role.

To develop the kind of force-speed specific to aerobic gymnastics, factors which characterizes the way of manifestation, respectively during contraction, its peak time and the application of maximum force must be chosen. The report maximum force / time required to achieve them is the stability index force-speed, explosive power manifested immediately after the initial phase through four types: tonic-explosive used against some high resistance as is the case in aerobics, the maximum force is predominant; explosive-ballistic type; explosive-ballistic type characteristic to movements where the resistance to overcome is relatively low; quickly type needed when resistance is negligible.

Of course the force must also be developed ad in terms of muscle strength, without which efforts with endurance component cannot be sustained. The strength endurance axis comprises combination power-endurance, muscular strength on short, medium and long term, and each combination being specific to a particular sport. For aerobics, in which exercise has a short duration (1 minute and 30 seconds or 1 minute and 45 seconds), muscle strength should be brief but intense, the body accumulating over 12-15 mol / l, indicating lactase dominant energy system, reason for which we need a very solid aerobic endurance and anaerobic power.

Method

As a general purpose we proposed experimenting aerobic gymnastics specific means of action, depending on the particular age and physic, in order to improve the ability to easily execute Group A elements of difficulty, motor skills specific to such elements and assessing registered progress.

To conduct this research, we chose a group of 12 athletes from Deva Citadel School Sports Club, who practiced sport aerobics between 3-5 years. The experiment was conducted in 2014-2015 school year.

At the beginning of the school year, athletes were tested at: push-ups test, lying forward with support test and "hinge push-up" element execution, the latter being judged on their fidelity with grades from 5-10, where 10was the highest grade. After applying the means proposed, final testing was performed.

Difficulty is one of the essential criteria of assessment and tiebreak in aerobic exercises. Exercises must demonstrate a specific balance between aerobic movements (combination of high and low movements) and elements of difficulty [4].

Hinge Push up element is part of A difficulty Group (Dynamic Strength) Push-up family. This group of difficulty elements synthesizes movement family that are initiated and / or completed generally lying forward with support.

Elements of this family are made lying forward with support and specifically request arms extensor strength by overcoming and / or failure, and muscle groups that maintain the correct position, right, blocked of the body.

With its multiple presented choices, push-ups are always present in a full aerobic exercise, regardless of the test. Their difficulty degree is done according to the action element structure and support point number or position employed in action:

♦ 2 arms + 2 legs= 4 support points;
♦ 1 arm + 2 legs = 3 support points;
♦ 1 arm + 1 foot = 2 support points.

General characteristics:

- In the initial and final position of the push-up the elbows must be perfectly tense;
- Shoulders should form a square with the ground, the head in line with the spine, the back straight and the abdominal and back muscles contracted;
- During its downward movements, elbow flexion should limit the distance from the ground to the chest at 10 cm.

Description: *Hinge push up* - value 0.2 (push ups 4 phases: 1 - bending arms, 2 - the gravity centre moves to the back and forearms touch the ground; 3 - shoulders and centre of gravity return to its original position; 4- tense arms)

Methodical series no 1

- lying forward with support: alternative lifting of an arm forward or sideways;
- lying forward with support: Move forward or sideways arms only;
- lying forward, supported on his hands and knees: bending and stretching the arms;
- Support squat: passage forward lying supported by jumping and rebound;
- lying forward with support: leaning and bending the arms (push-ups).

Methodical series no 2

- sitting face to face with legs apart, hands grabbed his arms forward: bending and stretching alternate / simultaneous of the arms with resistance from the partner;
- sitting face to face with legs apart: raising and lowering the arms overcoming resistance from partner (bottom – lift forward, sideways, up, sideways or forward - lifting up, upper - lower front, sideways, down);
- an athlete lying forward with support and the other grabs his ankles and pulls him in front of the basin: forward, backward and sideways moves ("handmaid");

Methodical series no 3

- Stand with two dumbbells in your hands, arms twisting externally: bending and stretching the arms alternate / simultaneous;
- Stand with two dumbbells in your hands: raising and lowering the arms (front ways, sideways or up);
- Stand with arms up with two dumbbells in your hands: bending and stretching the arms back alternate / simultaneous;
- Staying with legs apart and arms forward with two dumbbells in your hands, torso slightly bent forward: bending and stretching the arms alternative / simultaneous;
- Staying with legs apart and arms forward with two dumbbells in your hands, torso slightly bent forward: raising and lowering the arms simultaneously sideways.

Methodical series no 4

- Stand with arms down, medicine ball between your palms: raising arms forward (up);
- Stand with arms down (forward), medicine ball between your palms: bending and stretching the arms, with the ball at your chest;
- Stand with arms up, medicine ball between your palms: bending and stretching the arms with the ball at the back of your head;
- Staying with your legs apart, torso slightly bent, arms down, medicine ball between your palms: bending and stretching the arms with the ball at your chest;
- Standing in pairs, face to face: throwing the medicinal ball with two hands, from one to the other, from the bottom (bottom side of the chest, from the back of the neck);
- Standing in pairs, back to back: throwing the medicine ball with two hands, from one to the other over the head.

Methodical series no 5

- lying forward supported on the bench: lateral movement of the arms;
- lying forward supported on the bench: alternative lifting the arms sideways / forward;
- lying forward supported on the bench: bending and stretching the arms (can be executed on 2-3 overlapping benches);
- sitting longitudinally on the bench, hands on the edge of the bench: bending the arms, lowering the basin to the soil and return (can be executed by alternatively raising / folding up the feet);
- lying forward supported by the tip of your toes on the bench: lateral movement of the arms;
- lying forward with support of the tip of your toes positioned on the bench: bending and stretching the arms.

Methodical series no 6

- Stand with the arms forward at 1m distance from the fixed scale: tilt your body forward catching the baseboard, bend your arms and stretch the mand go back (push and reject the baseboard);
- Standing on the second baseboard from the fixed scale, arms forward before the top baseboard seized: bending and stretching the arms;
- The same exercise, but moving the hands position with one baseboard below (from little to little) according to force and mobility athletes;
- Hung facing the fixed scale: step-down a slat at a time alternatively changing the hands hold;
- Same exercise can be done with your back towards the fixed scale.

Results

After subject testing before and after work programs implementing the following values were registered:

Table1.Results recorded for arm strength

No	Name	Push ups			Leaning forward with maintained support		
		Ti	Tf	Dif	Ti	Tf	Dif
1	C. B.	6	8	2	12"	15"	3"
2	M. A.	9	10	1	41"	48"	7"
3	C. I.	10	12	2	42"	50"	8"
4	D. D.	8	8	0	25"	27"	2"
5	T. D.	8	9	1	27"	30"	3"
6	T. P.	7	9	2	21"	25"	4"
7	Z. S.	10	13	3	49"	58"	9"
8	B. A.	5	7	2	13"	14"	1"
9	S. A.	9	9	0	33"	38"	5"
10	R. M.	11	12	1	44"	54"	10"
11	P. A.	9	11	2	43"	49"	6"
12	O. A.	8	9	1	24"	28"	4"
	rithmetic average	8,33	9,75	1,42	31,16"	35,5"	4,34"
	gree	5	7	2	12"	14"	2"
	inimum	11	13	2	49"	58"	9"
	Maximum						
		-5.451*			-6.269*		
		*p<0.05			*p<0.05		

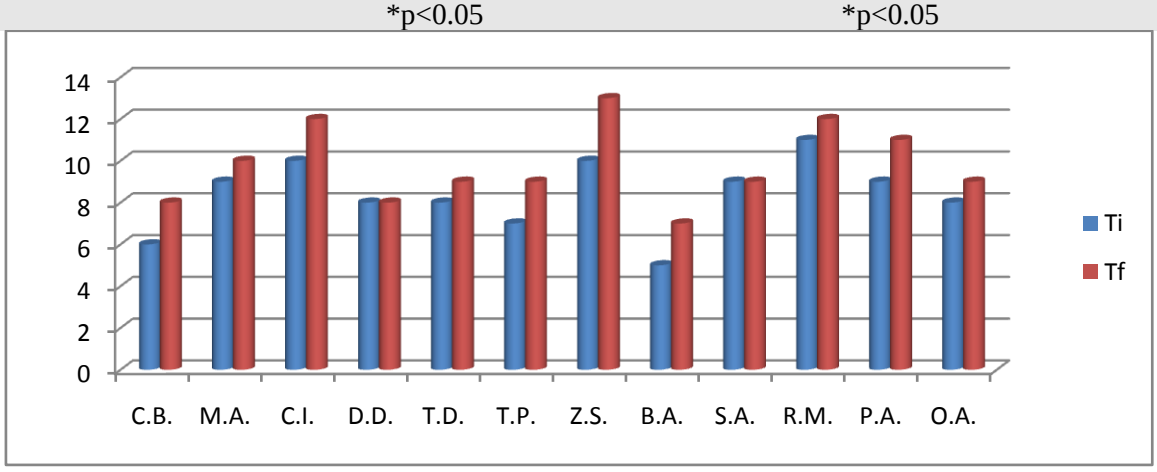

Fig 1.Graphic results at the push ups testing

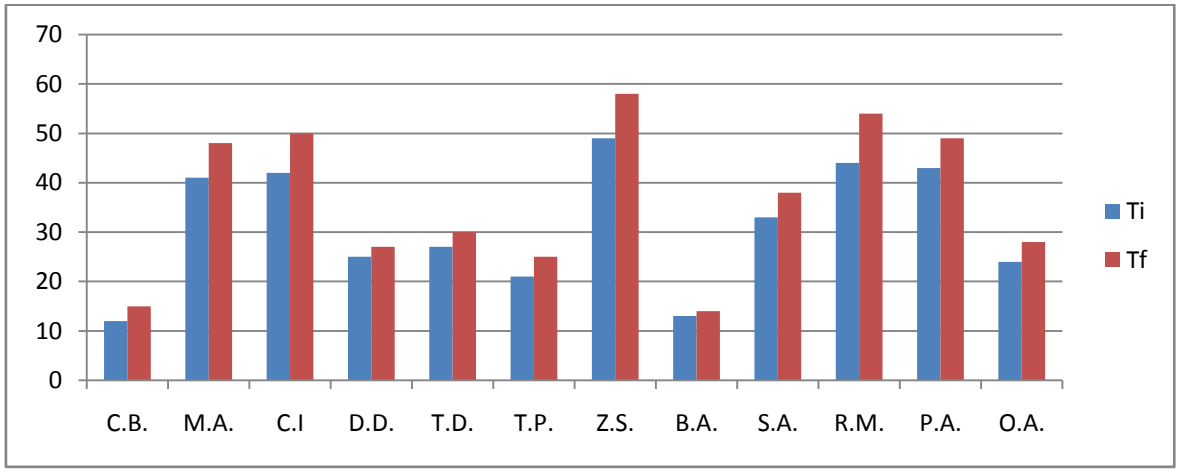

Fig 2.Graphic results at the testing Leaning forward with maintained support

Table 2. „Hinge push-up" element registered results

No	Name	Element registered		
		Ti	Tf	Dif
1	C. B.	6	8	2
2	M. A.	8	9	1
3	C. I.	7	9	2
4	D. D.	6	8	2
5	T. D.	7	9	2
6	T. P.	9	9	0
7	Z. S.	6	8	2
8	B. A.	6	8	2
9	S. A.	7	9	2
10	R. M.	7	8	1
11	P. A.	9	10	1
12	O. A.	8	9	1
	rithmetic average	',166 (1,11)	8,66(0,65)	
	:gree	6	8	
	:inimum	9	10	
	Maximum			
		-7.707*		
		*p<0.05		

Discussion

Analysing the data recorded at the level of force in he arms, there is evidence of arms bent from the position lying forward, a significant progress (p <0.05) between the two tests, the difference between the average degrees being 1.42 repetitions. In the second test, the difference between the average degrees is 4.34 ", a significant statistic difference at a threshold of p <0.05.

Significant improvements of strength in the arms following the implementation of the work programs have been seen in a much more accurate execution, research subjects registering higher values during final test of the hinge push / up element. Applying the T test for paired samples, there is a t-value of 7.707, a value that is statistically significant at p <0.05.

This confirms the fact that a good physical training may underlie successful execution of acts and technical actions. Learning any technique and revaluating it depends on the level of development of force. This motor quality largely determines the speed motor driving acts, helping to increase the number of repetitions, e.g. the resistance. Involved in increasing the speed of execution, it also influences the manifestation of other motor skills, specifically for aerobics, playing an important role in the development of coordination components.

Playing an important role in all the motor acts and actions, the force is a limiting factor of technical execution; an insufficient development being able to prevent efficiency and movement continuity, leading to delays in correct executions and fatigue that affects gesture accuracy. Therefore it is one of the predominant physical attributes of aerobic exercise that needs sufficient and necessary working time for technical training.

References

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[4]Codul de punctaj FIG (2013) (FIG point code)