

Quantitative differences of different impact on the development of basic motor status of children before puberty age

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Abstract

The main objective of this study was to determine the level of quantitative changes brought by the influence of different training of integrated nature. The programs were introduced in the educational process and they integrate the training of dynamic and static muscular endurance program with elementary stylized movement structures in Latin American and standard dances. Sample of subjects consists 32 students before puberty age 12 years old. Randomly divided into two subsamples, the 16 subjects who were treated in two differently structured programs. The experimental training of program lasted 6 weeks.

The first experimental group practiced the program consisted of Latin American dances (Samba, Cha - cha - cha and jive) and dynamic exercises to develop muscular endurance.

The second experimental group practiced the program consisted of the standard dances (English Waltz, Tango, Quickstep) and standardized exercise design. Monitoring changes was determined by testing the initial and final measurements. The results of discriminant analysis of initial and final measurements lead to the realization that both programs produced different quantitative effects in the variables that determine the basic motoric profile of boys and girls aged 12 years old.

Keywords: integrated training, dynamic and static muscular endurance, body shaping exercises, Latin American dances, standard dances, children

Introduction

"Dance can be defined as a form of musical experience through the rhythmic movements of certain developments and contributes to the artistic expression of the spiritual state of man. In dance man expresses his body in motion and the motion which spatially, temporal and dynamic forms " (Kostić, 2001).

It is proven that the successful performance of dance structures of all the essential motor skills to some degree (Bilić, 2005; Jocić, 1991; Kostić, 1994; Uzunović, 2004; Srhoj, Katic & Kaliterna, 2006; Hmjelovjec, I., Hmjelovjec, D., Redžić, 200). Demonstrated a significant effect of cognitive abilities and musical abilities to perform the dance structure and cognitive characteristics (Bonacin, 2004; Jocić, 1991; Kostić 1994, Kostić, Jocić & Uzunović, 1999). Also, the results of these studies indicate that certain skills and characteristics significantly affect the performance of dance structures (Blašković, 1979), as well as the success of the competitions in sport dance (Kostić, Zagorec, & Uzunović, 2004; Uzunović & Kostić, 2005). It is undisputed that the specific way to train certain dance disciplines can contribute to success in dancing, and the fact that it is necessary to develop motor skills in order to achieve the success of the dance.

This information confirms research in the field of dance training of (Kostić, 1997; Volgar, Kovač and Dečman, 2002; Šebić, 2008). Following the trends on the one hand when it comes to access multidisciplinary Research deficit problem and the results of the effects of residency training in character the author addressed the problem of this kind of research. This research is certainly connected to the unexplored area transformational effects of the various integrated programs (motor exercises + stylized movements) for the development basic motor performance in younger age categories of children. In line with these issues in this paper will test the hypothesis that was set to examine the effects of two different programs in a quantitative form. The expectations of the authors of this research are leaning on earlier findings from space effect transformation on the one hand and studying the impact of dance structures on the other hand (Zagorc and Jarc-Šifrar, 2000). Zagorc and Jarc-Šifrar, 2003). The emphasis has been placed in the assumptions is certainly the first program that integrates exercise for the development of dynamic and static muscular endurance with the potential elements of Latin American relation to another program. According to former debate is clearly visible Hypothesis: exercise program that integrates the repetitive nature and stylized movement structures of Latin American dances will cause much great-

er quantitative change in basic motor profile of the respondents. Since the programs are integrated nature where a good percentage are occupied by exercise stylized movement structures Latino-American and standard dance made a small section of the introductory notes understand the difference between these dances. For example, to perform the standard dances are typical steady movements, which have to be fused, liquefied, which is one of the characteristics of cold-blooded English temperament. The basis of the standard dances is a dynamic movement. In these dances there is no pronounced hip movements. Basic features of the standard dances: swing, dynamic and ease, form and beauty. The most attention in the standard dances are addressed to: the position of the foot (feet positions), the dance direction (alignment), the amount of turn (amount of turn), lifting and lowering (rise and fall) and against the bodily movement (contra body movement). Developments must have a line, form and aesthetic expression.

While on the other hand, in contrast to the standard Latin American dances, dances from the competition program are by nature wild, fast and temperamental. The character and temperament of Latin American dances fit the specifics of the people who created them. Dynamic and "alive" rhythms provide a wide range of dance expression which the English dance teachers formed in exactly prescribed movements and movements to the rhythm of a particular time, place and thus laid the foundations for today applicable techniques. Technique of Latin American dances includes 23 basic positions from which begins and ends with dancing figures. For all the Latin dances is characterized by movement in the pelvic area, a greater amplitude of movement to the position of the foot where the toes turn "box" or van.

Methods

This research was conducted on a sample of 32 students, and then the sample was divided randomly into two equal groups of 16 students aged 12 years. For the purposes of this study used the following tests of basic motor skills profile:

1. For assessment of the level coordination skills were used:
 - Steps to the side (MKOKUS)
 - Polygon backward (MKOPLN)
 - Bend, body twist, touch (MKOPZD)
 - Coordination with bat (MKOPL)
2. For assessment of the potential of muscular endurance:
 - Push-ups (MRSSKL)
 - Righting the body and back (MRSIST)
 - Raising the body (MRSPTL)
 - The deep squat (MRSDC)
3. For assessment of the level of balance and functional joint stability, the following variable was used:
 - Standing on one leg transversely on the bench with eyes closed (MRRAV) Standing on the bench for balance crosswise into two legs with eyes open (MRS2PN)
 - Flaningo-test (MRKFL)
4. Variables for assessment of stylized movement structures (Selected Dances)
 - Samba
 - Cha – cha – cha

- Jive
- English Waltz
- Tango
- Quickstep

The measurement was carried out in terms that are predetermined for the test in the morning, under the optimal temperature, but that is always carried out with the same timekeepers. Subjects were for research purposes divided into 3 groups of 70-10 students for effective testing. The sequence of measurements in conducting motor tasks is organized in a way that was almost eliminated the influence of fatigue arising after severe physical tests on the results of other tests. Timekeepers were previously familiar with the technique of performing the tests and the manner of recording the results using a one-day training. For tracking results are especially designed measurement list containing personal data of subjects. The study lasted six weeks. Three weeks have been reserved for the initial, control and final test.

The period in which is tested the transformation of muscle endurance training program lasted six weeks. Was applied to an experimental group.

The program has met the principle of progressive increase of the load and he's met through the increased volume of work. Differences in size of the volume of work was realized through differences in the first three in relation to the other three weeks (see Table 1).

Table 1. Basic parameters of six week training program the first experimental group

Basic parameters of the program	1-3 weeks	4-6 weeks
weekly frequency of training	3	4
Training volume	45 min	45 min
Number of exercises	3	4
Number of series	2-3	4-5
Number of repetitions	12-16	16-20
Retention time of contraction	10-12 sec	12-14sec
break between the series	45-60 sec	30-45 sec

Selection of content / exercise program is conducted with the principle of reciprocity and symmetry representation of exercises for all muscle regions. More specifically, the following exercises were selected for the development of dynamic muscular endurance: back squat, push-ups, abs and exercise for back, and for the development of static endurance were used strongholds such as: motors on the elbows, the back of the shoulder, and right and left side motors in the elbows.

Table 2. Structure of training (class) compared to the weekly frequency

Structure of training	1-3 Weeks	4-6 Weeks
Introductory-preparatory part	Warming up (cardio)-5min Preparatory exercises: Exercises for development of static muscular endurance (Table 2) 10 min	Warming up (cardio)-5min Preparatory exercises: Exercises for development of static muscular endurance (Table 2) and (Tabel 1-4-6 weeks) 10 min
Main part	Dances (Tabel 4)	Part A: Dances Part B: Exercises for development of dynamic endurance character (Table 2) and (Table 1-4-6 weeks) -15 min
Final part	Exercises to develop strength of dynamic-character (Table 2) 10 min Relaxation exercises 3 min	stretching exercises (static)

The structure of training (Table 2) is different from one hand the load and volume of work, and the other by the distribution of exercise for developing muscular endurance of the dynamic and static characters within parts of the training, specifically within the introductory-preparatory, main and final part of an hour. The clearest difference is seen in the

last three weeks where the distribution of fitness exercises is incorporated in main part of the class and it takes time a lot of space in apart of the set. By all parameters, the program is significantly different between control and experimental groups (see Tables 3 and 4)

Table 3. Elements of an integrated program of Latin American dances in the first experimental group

SAMBA	CHA-CHA-CHA	JIVE
Samba Whisks L and R	Chasse to L,Chasse to R	Basic in place
Samba walk(side)	Fan	Basic in fallaway
Stacionary samba walk	Hand to hand	American spin
Traveling Botafogo	Hockey stick	Change to hands behind back
Volta actions	Spot turn to L,spot turn to R	Change of place LtoR ,Change of place RtoL

Table 4. Fundamental parameters of six week training program other experimentalgroup

The main parameters of the program	1-3 weeks	4-6 weeks
Weekly frequency of training	3	4
Training volume	45 min	45min

Table 5. Structure of training (class) compared to the weekly frequency

Structure of training	1-3 Weeks	4-6 Weeks
Introductory-preparatory part	Warming up (cardio)-5min Preparatory exercises: shaping exercise, static character. 7-8 exercises, 10-12 min	Warming up (cardio)-5min Preparatory exercises: shaping exercise, static character. 7-8 exercises, 10-12 min
Main part	Dances (Tabel7)-20 min	Dances (Tabel7)-20 min
Main part	stretching exercises-5min (static)	stretching exercises-5min (static)

Table 6. Elements of an integrated program of standard dances with other eksperimentane grup

ENGLISH VALCER	TANGO	QUICKSTEP
Chase from promenade pision	Close promenade	Foward lock step
Natural turn	Open promenade	Natural spin turn
Natural spin turn	Progressiv link	Natural pivot turn
Reverse turn	Progressive side step	Progressiv chase
Whisk	Progressive side step reverse turn	Quarter turn to right

In this study the results obtained were analyzed in univariate level. More specifically, to test the hypothesis of normal distribution after analyzing the differences in the variables (effects of) between two time points (initial - final), was applied discriminant analysis (under the model differences). By applying discriminant analysis to determine more clearly the quantitative changes in the multivariate level.

Results

For interpretation of the results were used significant variables discriminate those explain particular percentage of variability. In order to interpret the differences, it is necessary to define any significant discriminant variable. The criterion for discriminant strength of the variables used was called. Wilks Lambda. variable, that is. given the structure of discriminant variables (functions). The obtained results of this paper are:

- c) results of the discriminatory function of the first experimental group and separate for boys and girls
- d) results of discriminant function in control groups and to separate for boys and girls

First experimental group - Boys

Table 7. Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	38,321	100,0	100,0	,987

Table 8. Wilks's Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	,025	31,210	11	,001

Table 9. Discriminative function structure matrix

	Function
	1
mkopl	-,373
mkopzd	,341
mrs2pn	,329
mrrav	,290
mkoplN	-,267
mkokus	-,259
mrkfl	-,203
mrsskl	,081
mrsdc	,069
mrsptl	,065
mrsist	,062

Table 10. Functions at Group Centroids

Group	Function
	1
1	-5,791
2	5,791

Tables 7.8, 9 and 10: The basic parameters of the discriminant function and its structure between initial and final measurements of motor variables

In the 7 and 8 tables we can see that there is an isolated canonical function, Static significant. In the entire system in the variables between the initial and final testing of the experimental group of subjects, clearly shows that there is a statistically significant difference Sig . = . 001, which indicates that the integrated training program affected the changing levels of coordination, balance and repetitive potential. Isolated discriminant-function was significant and high, and is explained with 98% of the total variability. The discriminative power .31 indicates a difference of results between two tests. This concluded that there was a quantitative difference between the initial and final testing of the applied variables in the subjects of the first experimental group. The displayed values represent the arithmetic mean of the initial and final measurements of variables that have contributed to significant changes in the coordination with the bat (MKOPL) -.373, Bend, body twist, touch (MKOPZD) .341, Standing on two legs crosswise on a bench with your eyes open (MRS2PN) .329, Standing on one leg crosswise on a bench with eyes closed (MRRAV) .290, Polygon backward (MKOPLN) .- 267, steps to the side (MOKUS) .- .259, Flamingo test (Merkel) .- .203rd.

First experimental group - Girls

Table 11. Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	43,292	100,0	100,0	,989

Table 12. Wilks's Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	Df	Sig.
1	,023	32,222	11	,001

Table 13. Discriminative function structure matrix

	Function
	1
mkopl	,372
mkopzd	-,361
mrs2pn	-,271
mkokus	,240
mrrav	-,210
mrsdc	-,131
mkoplN	,121
mrsskl	-,108
mrkfl	,107
mrsptl	-,098
mrsist	-,091

Table 14. Functions at Group Centroids

Group	Function
	1
1,000	6,155
2,000	-6,155

Tables 11, 12, 13 and 14 are basic parameters of the discriminant function and its structure between initial and final measurements of motor variables

From a canonical discriminant function we can see that in the entire system applied variables between the initial and final testing subjects of the experimental group, there was a statistically significant difference $Sig. = .001$, which indicates that the integrated program influenced the changes levels of of coordination, balance and repetitive potential. High value of variability and coefficient quantitative difference between the two measurements clearly point to the statement that there was a quantitative change in the motor profile of subjects under the influence of an integrated training program. The variables that contributed to significant changes in the Polygon backward (MKOPL), Bend, body twist, touch (MKOPZD), Standing on two legs crosswise on a bench with your eyes open (MRS2PN), Steps to the side (MKOKUS), standing on one leg crosswise on the bench with eyes closed (MRRAV).

The control group – Boys

Table 15. Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	64,194	100,0	100,0	,992

Table 16. Wilks's Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	,015	43,862	7	,000

Table 17. Discriminative function structure matrix

	Function
	1
Mrs2pn	,533
Mkopzd	,275
Mkokus	-,140
Mkopln	-,126
Mrrav	,096
Mrkfl	-,087
Mkopl	-,077

Table 18. Functions at Group Centroids

grupa	Function
	1
1,000	-7,495
2,000	7,495

Table 15, 16, 17 and 18 are Basic parameters obtained with the discriminant function and its structure between initial and final measurements of motor variables

The table above shows that the isolated one discriminative function was statistically significant. Very similar, as in the previously presented results of the first experimental group this iso-

lated Discriminative function was significant and high, and is explained with 99%. Discriminative power (.43) indicates that the difference found between the two tests. With this we can rightfully concluded that there was a quantitative difference between the initial and final testing of the variables used in subjects other experimental groups. The variables that contributed the most significant quantifiable changes are Standing on two legs crosswise on a bench with your eyes open (MRS2PN) .533, and a variablebend, zasuk, touch (MKOPZD) .275.

The control group – Girls

Table 19. Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	39,105	100,0	100,0	,987

Table 20. Wilks's Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	,025	38,761	7	,000

Table 21. Discriminative function structure matrix

	Function
	1
Mrs2pn	,507
Mkopzd	,493
Mkopl	-,306
Mrrav	,300
Mkokus	-,189
Mkopln	-,165
Mrkfl	-,095

Table 22. Functions at Group Centroids

grupa	Function
	1
1,000	-5,850
2,000	5,850

Table 19,20,21and 22 are Basic parameters of the discriminant function and its structure between initial and final measurements of motor variables

The presented results ar explaining a canonical function which shows that the entire system in the variables between the initial and final testing subjects second experimental groups, there is a statistically significant difference $Sig. = .000$. This fact justifies the applied integral program that is obviously influenced on changes inthe level of coordination and balance. The variables that contributed the most to the explanation of isolated canonical functions are: Standing on two legs crosswise on a bench with your eyes open (MRS2PN) .507,(MKOPZD) .493, (MKOPL) -. 306, and standing on one leg crosswise on the bench with-eyes closed (MRRAV) .300.

Discussion

The results of discriminant analysis applied in order to verify set hypothesis that was supposed to establish clear differences between the two applied programs of integral nature programs, more precisely, a very small percentage confirms the hypothesis only with boys. That percentage in terms of basic motor profiles it can be defined only for variables that estimate the basic coordination and balance performance in subjects. The results obtained with this analysis justify the programs and exercises selected because they meet the main goal in improving the quality of motor output in children before the puberty. However, the deeper answers to this outcome in the results certainly hiding in a very vulnerable period of development of the child, in the age of 12 years. During this period, boys and girls are entering in the sensitive stages of growth, and between them there is no great imbalance in motor output, especially in the exercise of muscular force in the way of quality and longevity of performance. What is very interesting and dominant value is that this research is fully justified an integrated approach to designing the program for the development of motor performance. This means specifically that the program to develop basic performance can be justified and often can be inserted in programs of stylized movements from a variety of dances. In this paper, these programs were included in the movements selected from Latin American dances and standard dances. The structure of movements through the dances obviously in one hand motility and psychological well works on anthropological development of children of this age.

The basic conclusion of this discussion would certainly need to go in the direction of the open support of integrated programs and teaching activities which are combinations of specific basic and stylized movements. This research, methodology, shaping of the programs, selection and monitoring of the program is a fundamental proof of these allegations. Using a stylized dance movements—certainly opens up new directions in integral planning and programming of kinesiology Operators, especially in children before puberty period of growth and development of the organism.

Coordination and equilibrium capacities are certainly the foundation of the motor profile of younger ages. All received canonical fiction isolated and their structures the best way to support this discussion. The results contained in the structure matrix shows the determination of variables that are explaining transformational effects of these integrated programs. In all groups of variables from the areas of coordination and balance are explaining and justify the application of such a shaped programs.

Conclusion

The Goal of this study was to test the practical application programs two of integral nature, their impact and the difference of the impact on the transformation and motor profiles of children before the puberty. Whether and in what extent the goal met? The answers to this questions are multiple. Results indicate following facts:

- integrated programs have their foundation and it is more contained in motivating children of this ages to develop their basic motor output and the development of their stylized movement through dance
- integrated programs have a universal character of the application, regardless of gender of children

- An integrated programs develops team spirit of teachers in the sensitive stages of child growth and development of the organism.

This research has not guaranteed to give answers to all questions, but the set of assumptions, display of the programs, check the hypothesis, the evidence who did not confirm the hypothesis, clearly with applicable results in practice, one can create new trendy issues of shaping questions, program of integral character, checking the existing curriculum, training, testing and motor profiles for each age class.

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