

THE EFFECTS OF THE ADDITIONAL WORK PROGRAMME IN GYMNASTICS IN REGULAR PHYSICAL EDUCATION CLASS ON SOME MOTOR ABILITIES

(Research note)

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Abstract

Population from which the sample was taken from consists of 64 subjects from elementary school students in Nis, male, ages 10 and 11 ± 6 months. From such a defined sample, two subsamples were formed: the first sub-sample of 32 subjects, in addition to the regular physical education of two hours per week, it consists of two additional hours per week with additional classes of gymnastics (experimental group participants); second subsample of 32 respondents, included four times a week, regular physical education (control group). The main objective of the research was to determine the influence of the regular physical education in relation to the classes with additional classes of gymnastics in the transformation processes of some of the dimensions of motor abilities (explosive strength, repetitive strength, and segment speed). To assess these abilities, nine motor tests were applied. Processing of the data obtained from these tests, using multivariate analysis of covariance showed that at the end of the experimental procedure, the final compared to the initial measurement, the experimental group of respondents, compared to the control group, achieve better results in the treated motor abilities.

Keywords: *students, Kinesiology experiment, explosive strength, repetitive strength, segment speed, multivariate analysis of covariance*

INTRODUCTION

Working with the youngest ages of gymnasts is one of the most delicate and the most vulnerable period in their possible successful sporting career. Exercises on the exercise equipment and on the ground and require precision in the execution of certain movements and connecting the well-established order. Some gymnastic exercises, such as skip and acrobatic exercises develop courage and determination.

The study of the consequence of the process of exercise on the human body is one of the major concerns of sports science (Milanović, 2007).

Previous research has clearly established that certain processes of exercise have a significant influence on the changes of various human abilities and motor abilities. Planning, programming, implementation and control and evaluation of the transformation process, are the

main factors in the teachers' work.

In order for these factors to be effective, one of the basic conditions are reliable and meaningful information about the changes that are caused by these factors.

Analysis of the effects specifically programmed under the influence of the training process is increasingly the subject of scientific research (Hraski, 1996; Bompa, 2006; Markuš, 2006; Pržulj, 2007; Furulija, 2010).

In order for the effects of the training to be successfully analyzed, it is important to satisfactorily resolve the issues of programming and control of the training process and the choice of methodological procedures that are appropriate to the problem being analyzed.

The main objective of the research was to compare the impact of the existing regular physical education classes and additional programmed work out in the gym in that class on the motor abilities: explosive strength,

repetitive strength and segment speed with elementary school students.

METHODS

Population from which the sample was taken from consists of 64 subjects which are elementary school students in Nis, male, aged 10 and 11 ± 6 months.

From such a defined sample two sub-samples are formed. The first subsample consisted of 32 subjects. It was covered with a two-hour weekly regular physical education and two hours of additional classes of gymnastics. The second subsample also was composed of 32 students. It was covered with four hours per week regular physical education classes. The first sub-sample represented more of an experimental group, and the second a control group. Working in both groups was continued for four months.

Before the beginning of teaching after completing her four-month in both groups, the nine tests of motor abilities were applied: explosive strength, repetitive strength, and fermentative speed. Tests were selected on the basis of guidelines and recommendations in the research of Karelia and associates, (1975).

For the assessment of explosive strength tests were applied: standing long jump (MSDM), triple jump (MTRS) and five jumps (MPTS). To assess repetitive forces tests were applied: raising troops for 30 seconds. (MD30), mixed pull-ups (MMZG) and squats (MČUČ). To assess the segment speed, tests were applied: hand tapping (MTAP), foot tapping (MTAN) and tapping your feet on the wall (MTPZ).

The data obtained from the tests applied at the beginning and at the end of the four month teaching period for students, were analyzed by using a multivariate analysis of covariance.

Working in the experimental group in teaching physical education and gymnastics, is based on the application of the following motor exercises for developing explosive strength: the high jump and long jump from the squat, lateral, zigzag, back and the similar;

rhythmic leaps raising swinging leg with different amplitude; both feet jumping over small obstacles, jumps on the legs of different heights; exercises of both legs and one leg jumps; jumping from foot to foot, high and low skip; Several variants of jumps with the jumping rope; jumps across low obstacles (both feet and one foot); Jumping in place to raise your knees to your chest, and the similar.

Exploring the efficiency of regular physical education lecturing in the control group was achieved on the basis of implementation of the existing curriculum for student's age defined by this study. The structure of programs for teaching students in this group had a predominantly transformational character of the development of anthropological characteristics and increases the level of technical and tactical abilities of the respondents.

RESULTS

Table 1 shows the results of multivariate analyzes of covariance between the experimental and control groups at the final measure, indicating that there is a statistically significant intergroup differences in motor abilities, as Wilk's Lambda is .112, which Ra's F-approximation of 9.85 gives a significant difference in the level of $Q = .01$. Accordingly, in the applied system of motor abilities in statistically significant differences

Table 2 shows the univariate analysis of variance

Table 1. Multivariate analysis of covariance of motor abilities between the experimental and control group of students

| Wilks' Lambda | Rao's R | Q |
|---------------|---------|------|
| .112 | 9.85 | .000 |

Legend: Bartlett's test value (Wilks' Lambda), Rao's R and significance level (Q)

Table 2. The significance of differences between the weighted arithmetic mean of motor variables of experimental and control group of students in the analysis of covariance

| Variables | Mean (experimental group) | Mean (control group) | F-ratio | Q |
|-----------|---------------------------|----------------------|---------|------|
| MTAN | 29.42 | 24.20 | 5.82 | .000 |
| MTAP | 38.67 | 33.72 | 6.82 | .000 |
| MTAZ | 24.25 | 19.80 | 4.95 | .006 |
| MSDM | 164.83 | 153.46 | 7.82 | .000 |
| MTRS | 495.60 | 450.34 | 6.95 | .000 |
| MPTS | 764.72 | 682.45 | 3.82 | .034 |
| MD30 | 21.20 | 17.14 | 5.65 | .000 |
| MMZG | 12.57 | 9.90 | 2.95 | .070 |
| MČUČ | 15.30 | 11.25 | 6.22 | .000 |

Legend: mean of the experimental group (Mean (ek), mean of the control group (Mean (ko), F-test value (F-ratio) and significance level (Q)

tests of motor abilities by comparing the results of arithmetic means of the experimental and control groups at the final measurement. Based on the coefficients of F-relations and their significance (Q) can be concluded that the statistically significant difference at .01 level of seven motor tests was determined. In one test (MPTS) the difference is statistically significant at the .05 level. Only in one test (MMZG), the difference was not statistically significant at the .01 level.

DISCUSSION AND CONCLUSION

The study showed that the experimental group in relation to the control group achieved statistically significant better results in all tests with which motor abilities were assessed - segment speed: hand tapping (MTAP), foot tapping (MTAN) and tapping your feet on the wall (MTPZ). This group also achieved significantly better results in the two tests (standing long jump - MSDM and triple jump - MTRS), three applied the test to assess explosive strength. The situation in the experimental group, coincides with the tests which evaluated the repetitive force. It achieved statistically significant better results in two out of three tests applied (lifting troops for 30 sec. - MD30 and squats - MČUČ) for assessing repetitive forces.

Thus, in a general sense, the respondents of the experimental group that were treated with a two-hour weekly regular physical education and two hours extra lectures in gymnastics, more significantly, improved his motor viability (segmentary speed, explosive power, and repetitive forces) than control subjects who were treated with four weekly hours of regular physical education classes.

Among other reasons for these results, it can be assumed that the methods applied and the means of motor exercises in gymnastics in the experimental group increased their ability to activate motor control faster and more complete, allowing increased activity of agonist muscles, and thus there was a positive and statistically significant changes of motor abilities.

Greater number of researchers (Mironović 1977; Mišigoj Duraković, 2007; Aleksić & Mekić 2010; Pržulj & Cicović, 2010) agree that the increase in the level motor abilities and traits is most appropriate if the work load corresponds to the biological and psychological characteristics of the body of participants in sports activities. In addition, the researchers point out that when choosing the content of the training operation it is essential to know the importance of each exercise or the training complex of training activities in response to certain motor abilities.

Better results in motor abilities are statistically achieved in the experimental group compared to the control group, incurred as a result of proper dosing, distribution and control of applied load according to the authentic needs of participants. In this way, there have been positive changes in the body and creation of appropriate adaptation processes in the experimental subjects group.

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