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THE IMPACT OF SPINNING ACTIVITY ON HIGH SCHOOL STUDENTS

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Abstract: In the context of research into physical training and its effects on the human body, spinning exercises in cycling have been the subject of interesting and relevant studies. These workouts, characterized by medium to high intensity, attracted attention due to their ability to generate significant physiological responses**.** Research hypothesis: It is assumed that by regularly practicing spinning activity can optimize physical condition and increase effort capacity in a short time in high school students. The purpose of the paper is the effectiveness of spinning programs on the body of students proposed for research, namely optimizing physical condition and increasing muscle tone. Study objectives: Identifying spinning programs that correspond to the level of training of subjects; Identification of significant relationships between research variables by statistical calculation; Identifying significant differences between the groups proposed for the research The research was based on two groups: an experimental one consisting of 10 students aged 17 from Petru Rareș High School with one hour of physical education and sports in the school curriculum and a control group consisting of 10 students from the Sports High School with two hours of physical education in the school curriculum.

Introduction: According to research conducted in this area, it is argued that cycling spinning training, as a continuous form of medium to high intensity exercise, generates significant physiological responses [6]. These workouts are effective in meeting fitness requirements, improving cardiorespiratory functioning and energy expenditure. They are also suitable for those interested in improving or maintaining their cardiorespiratory capabilities [2]. It has been found that in environmental conditions where wind flows are lacking, such as in closed rooms intended for spinning training, more sweating occurs due to increased body temperature [7]. These workouts seem to be more effective in burning fat compared to outdoor cycling [5]. There is also a possibility of increasing cardiac biomarkers such as troponins and myoglobin following these exercises [10]. Research has shown that spinning workouts generate high caloric consumption [4]. Compared to workouts

with constant loads maintaining the same total intensity, it does not appear to influence metabolic and perceptual responses during training; However, spinning workouts potentiate post-exercise energy expenditure [6]. One study found that after a 45-minute spinning training session, participants' metabolic rate increased for an average of 14 hours and they burned about 190 calories in addition to their resting metabolic rate [1]. Usually, a regular spinning cycling session can result in a caloric intake of between 300 and 600 calories [9]. This estimate fits into the recommendations of the American College of Sports Medicine regarding the minimum amount of calories that should be burned during exercise to achieve the desired benefits. Various physical activities should generate a caloric intake between 700 and 2000 calories to be effective [8]. In the literature, some authors recommend other approaches to weight loss, such as reducing daily caloric intake by 500-1000 calories and gradually increasing moderate-intensity physical activity by at least 150 minutes per week to improve health [13]. According to studies conducted by the author [3], Adolescence is a crucial period in the development of individuals, characterized by significant changes at both biological and psychological and motor levels. During this period, puberty is the peak of physical growth, while the teenage stage is associated with intense mental and emotional development, helping to stabilize personality structures. Research data suggest that between the ages of 14 and 20, the adolescent brain is approaching its maximum maturity in terms of weight and development. At the same time, the process of ossification of different parts of the skull seems to be nearing completion. These findings provide a clear insight into the transition period of adolescence, highlighting the importance and complexity of bio-psychomotor development at this life stage. Spinning cycling workouts have been recognized for their beneficial effects on cardiorespiratory endurance and calorie consumption, being indicated for those interested in improving cardiovascular capabilities and burning calories.

Material-method: Research hypothesis: It is assumed that regular practice of spinning activity can optimize physical condition and increase effort capacity in a short time in high school students.

The purpose of the paper is the effectiveness of spinning programs on the body of students proposed for research, namely optimizing physical condition and increasing muscle tone.Study objectives: Identifying spinning programs that correspond to the level of training of subjects; Identification of significant relationships between research variables by statistical calculation; Identification of significant differences between groups proposed for research. Inclusion criteria: age, female, fit for physical effort and informed consent. Exclusion criteria: pupils who perform sports, pupils who have not given their consent to participate in the experiment. Organization and development of the experiment: The research was based on two groups: an experimental one consisting of 10 students aged 17 from Petru Rareș High School with one hour of physical education and sports in the

school curriculum and a control group consisting of 10 students from the Sports High School with two hours of physical education in the school curriculum. During two school modules: module 1 September-October, module 2 November - December 2023, the experimental group included two hours of spinning activity per week outside the physical education and sports lesson in the school program (1/week). The control group will carry out its physical education and sports lessons according to the curriculum of the Sports High School (2/week). In order to check the physical condition and to increase muscle tone, we proposed the following evaluation tests: Ruffier test; Standing long jump, Extensions of the trunch from facial decubitus, Lifting the torso from the dorsal position and Left squats with legs spread apart at shoulder level and hands at the nape of the neck. Research methods used: scientific documentation method, experimental method, observation method, mathematical-statistical method, test method and graphic method.

Table 1 Next we present a sample spinning training plan

Model-work plan-beginners level

Content	Examples of exercises on the bike
Heating part	Level 5 Watti 50-60-3 minute -from sitting position -pedaling Level 7 Watti 80-100-2minute -standing - pedaling
Fundamental part Arms-Level 10 si 12	Working time 30 minutes -20 reps from the up pedaling position, push-ups with wide grip on the handlebars -20 reps from the up pedaling position, push-ups with narrow grip on the handlebars
For trunk-Level 9 si 12	-From the up pedaling position, with the trunk bent forward, abdomen tense, execution time 30 seconds at 180 Watts - relaxation 10 seconds execution time 30 seconds at 180 Watts -From sitting position, pedaling at 130 Watts with left-right torso twist for 30 seconds
Feet- Level 7 si 9	itting position, pedaling at 90-100 Watts -From pedaling position Watts 110-130
Relaxation part- Level 1-3	-From sitting position, pedaling at 30-50 Watts - Exerciţii de respiratie la Level 1 Watti 10-25

Results: In the context of research, physical performance and evaluation, the Ruffier test and a number of other physical tests are an essential tool for assessing the ability and performance of female students. These tests were used to measure various aspects of physical ability, such as strength, endurance, coordination and agility of the students. For a more comprehensive and visual analysis of the results obtained in the study, we used tables and figures in graphical form.

Table 2 Statistical calculation of mean, standard deviation and coefficient of variability for the experimental group

Experimental group

	Ruffier test			Standing long jump			Extensions of the trunch from facial decubitus			Lifting the torso from the dorsal position			Genuflections		
	TI	TF	TI-TF	TI	TF	TI-TF	TI	TF	TI-TF	TI	TF	TI-TF	TI	TF	TI-TF
Averange	7.70	0.70	7.00	164.60	182.70	18.10	23.20	33.80	10.60	23.10	29.10	6.00	24.30	29.20	4.90
Standard deviation	2.13	0.61	1.86	3.96	1.60	4.60	2.52	0.93	2.99	1.97	1.16	2.13	0.86	1.11	1.24
Coefficient of variability	27.72	87.22	26.55	2.41	0.87	25.42	10.84	2.76	28.22	8.55	4.00	35.53	3.53	3.81	25.30

For the Ruffier test, the mean initial values are 7.70 and 0.70 for the final test, indicating a decrease in results over time. In the long jump from a static position, the initial average is 164,60 cm and 182,70 cm in the final test, showing an improvement of 18,10 cm. For facial trunk extensions, the initial average is 23.20 and 33.80 for final testing, showing an improvement of 10.60. As for lifting the trunk from the dorsal position, the initial average is 23.10 and 29.10 for the final test, indicating an increase of 6.00. Finally, for genuflections, the initial average is 24.30 and 29.20 for the final test, reflecting an improvement of 4.90. Standard deviation and coefficient of variability provide information on variability and consistency of data. Standard deviation is lower for the Standing long jump test and trunk lift from dorsal position, indicating less variation in the results of these tests.

Table 3 Statistical calculation of mean, standard deviation and coefficient of variability for the control group

Control group

	Ruffier test			Standing long jump			Extensions of the trunch from facial decubitus			Lifting the torso from the dorsal position			Genuflections		
	TI	TF	TI-TF	TI	TF	TI-TF	TI	TF	TI-TF	TI	TF	TI-TF	TI	TF	TI-TF
Averange	5	1.6	3.4	176.5	183.8	7.3	28.4	32	3.6	25.6	26.9	1.7	25.6	27.6	2
Standard deviation	0.74	0.87	0.63	2.50	1.85	1.60	1.14	0.95	1.14	0.97	1.24	1.05	0.76	0.87	1.04
Coefficient of variability	14.77	54.62	18.60	1.41	1.01	21.89	4.03	2.98	31.78	3.80	4.61	61.69	2.98	3.17	52.22

For the Ruffier test, the mean initial values are 5 and 1.6 for the final test, indicating an improvement in the results. In Standing long jump, the initial average is 176.5 cm and 183.8 cm in the final test, showing an improvement of 7.3 cm. For Extensions of the trunch from facial decubitus, the initial average is 28.4 and 32 for the final

test, highlighting an improvement of 3.6. For Lifting the torso from the dorsal position, the initial mean is 25.6 and 26.9 for the final test, indicating an increase of 1.3. For squats, the initial mean is 25.6 and 27.6 for the final test, reflecting an improvement of 2. The standard deviation is lower for the Standing long jump and Lifting the torso from the dorsal position tests, suggesting less variation in the results of these tests. the Standing long jump test and Lifting the torso from the dorsal have lower coefficients, indicating less variation in results.

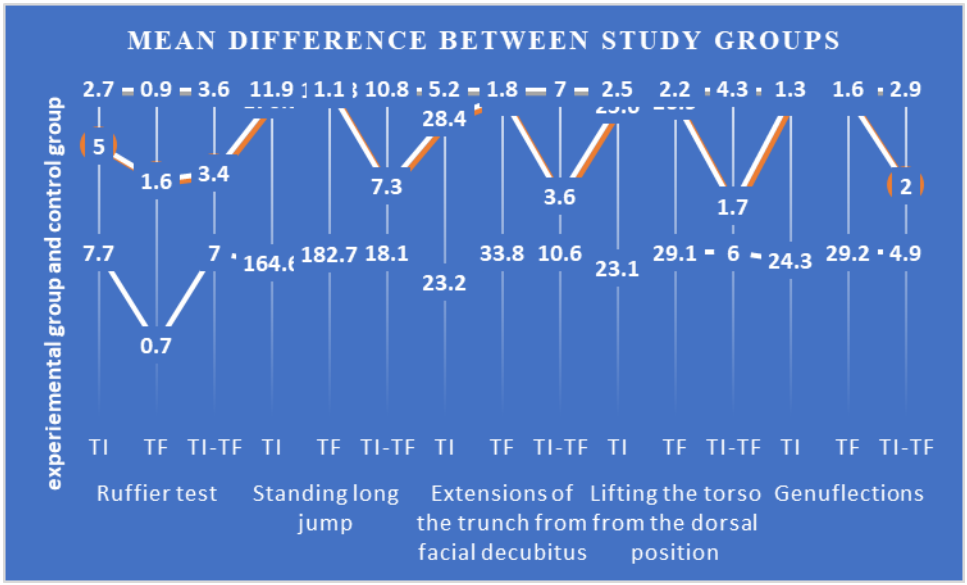

Fig. 1 The mean difference between the experimental group and the control group

Ruffier Test: Experimental group: 7.70 (TI) - 0.70 (TF) = 7.00; Control group: 5.00 (TI) - 1.60 (TF) = 3.40. The average difference between the two groups for the Ruffier test is 7.00 - 3.40 = 3.60. Standing Long Jump: Experimental group: 164.60 (TI) - 182.70 (TF) = 18.10; Control group: 176.50 (TI) - 183.80 (TF) = 7.30. The average difference between the two groups for the long jump is 18.10 – 7.30 = 10.80. Extensions of the Trunch from Facial Decubitus: Experimental group: 23.20 (TI) - 33.80 (TF) = 10.60; Control group: 28.40 (TI) - 32.00 (TF) = 3.60. The average difference between the two groups for this sample is 10.60 - 3.60 = 7.00. Lifting the Torso from the Dorsal Position: Grupul experimental: 23.10 (TI) - 29.10 (TF) = 6.00; Control group: 25.60 (TI) - 26.90 (TF) = 1.70. The average difference between the two groups for lifting the trunk from the dorsal position is 6.00 - 1.70 = 4.30. Genuflections: Experimental group: 24.30 (TI) - 29.20 (TF) = 4.90; Control group: 25.60 (TI) - 27.60 (TF) = 2.00. The average difference between the two groups for genophytes is 4.90 - 2.00 = 2.90. These mean differences indicate that, overall, the experimental group had more significant improvements in physical performance compared to the control group across all samples. Interpretation of these differences

shows that the specific spinning program may be associated with more substantial improvements in physical performance compared to the regular school schedule.

Table 4 Statistical calculation of the student test for the experiment group

	Experimental group														
	Ruffier test			Standing long jump			Extensions of the trunch from facial decubitus			Lifting the torso from the dorsal position			Genuflections		
	TI	TF	TI-TF	TI	TF	TI-TF	TI	TF	TI-TF	TI	TF	TI-TF	TI	TF	TI-TF
T.TEST	0.196			0.019			0.071			0.044			0.029		

Table 5 Statistical calculation of the student test for the control group

	Control group														
	Ruffier test			Standing long jump			Extensions of the trunch from facial decubitus			Lifting the torso from the dorsal position			Genuflections		
	TI	TF	TI-TF	TI	TF	TI-TF	TI	TF	TI-TF	TI	TF	TI-TF	TI	TF	TI-TF
T.TEST	0.196			0.007			0.021			0.007			0.012		

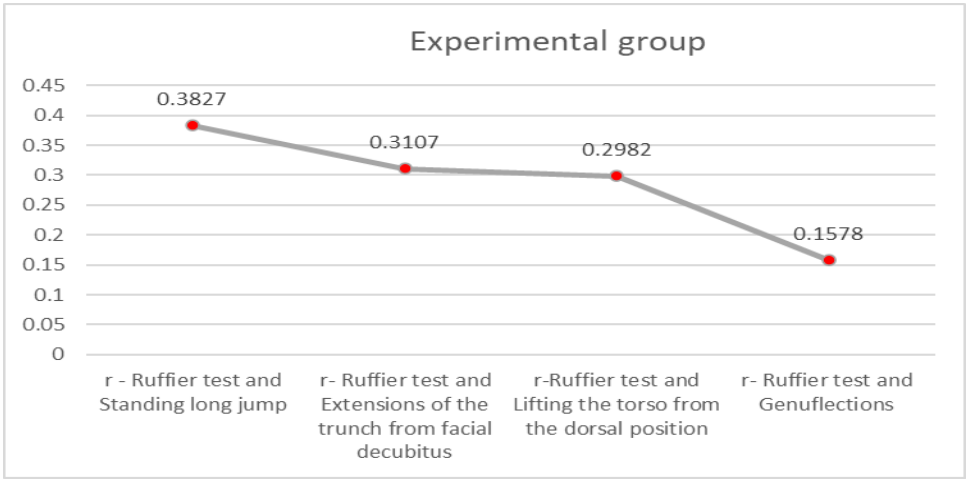

Fig. 2 Statistical calculation of the correlation between the Ruffier test and the other tests for the experimental group

For Ruffier test and Extensions of the trunch from facial decubitus, the correlation coefficient (r) of 0.3107 indicates a moderate positive correlation. This suggests a significant and moderate link between Ruffier test results and trunk extensions in facial decubitus. For Ruffier test and Lifting the torso from the dorsal position, the correlation coefficient (r) of 0.2982 shows a moderate positive correlation between

these variables. This result indicates a significant and moderate association between Ruffier test results and trunk lift from the dorsal position.

For Ruffier test and Genuflections, the correlation coefficient (r) of 0.1578 indicates a weak positive correlation between these variables. This result suggests a small association between the results of the Ruffier test and the number of Genuflections performed.

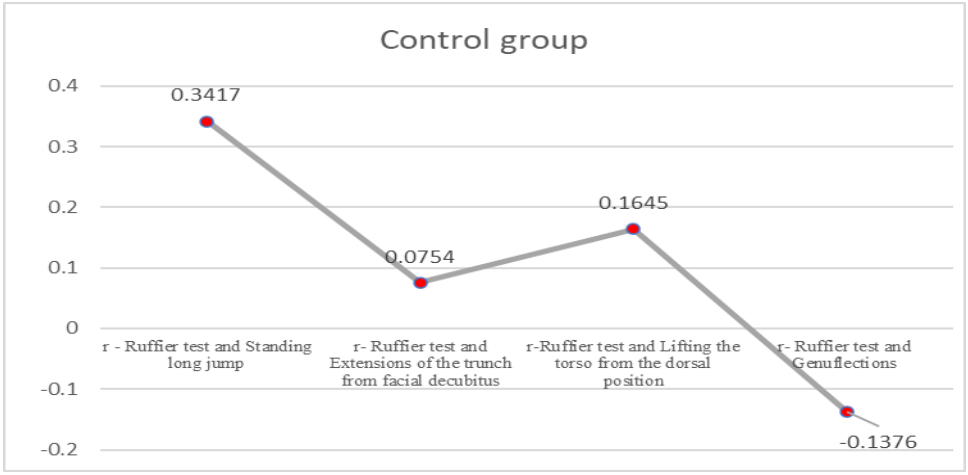

Fig. 3 Statistical calculation of the correlation between the Ruffier test and the other tests for the control group

For Ruffier test and Standing long jump, the correlation coefficient (r) of 0.3417 suggests a moderately positive correlation between these two variables. This indicates a significant, but not very strong, association between Ruffier test scores and Standing long jump. For Ruffier test and Extensions of the trunch from facial decubitus, the correlation coefficient (r) of 0.0754 indicates a very weak correlation between these two variables. This suggests little or no association between Ruffier test results and trunk extensions in facial decubitus. For Ruffier test and Lifting the torso from the dorsal position, the correlation coefficient (r) of 0.1645 indicates a weak positive correlation between these two variables. This suggests little association between Ruffier test results and trunk lift from the dorsal position. For Ruffier test and Genuflections, the correlation coefficient (r) of -0.1376 indicates a weak negative correlation between these two variables. This suggests a small but inverse association between Ruffier test scores and Genuflections.

Discussions: In a recent study, preferences for leisure-time physical activities are strongly influenced by the family's financial situation and health. The results indicate that most of the investigated persons orient their preferences towards various activities, such as aerobic and maintenance gymnastics, tennis, jogging, swimming, volleyball, karate, etc., including cycling [12]. Another study highlights the importance of engaging in moderate physical activity for at least 30 minutes on most days of the week. From a collective health perspective, common

activities such as walking or cycling can be essential forms of exercise for broad sections of the population [11].

Conclusions: Both groups showed significant improvements in physical performance in their tests. This suggests that both the activities in the experiment and the regular curriculum contributed to progress in athletic performance. Some tests showed less variation between initial and final results in the experimental group, suggesting greater consistency in athletic performance. Analysis of the data reveals that spinning activity had a positive and significant impact on participants' physical capabilities compared to the group that did not follow this form of exercise. The results indicate a significant difference in physical performance, supporting the effectiveness of spinning activity in improving overall physical capabilities compared to traditional physical education methods.

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