Sports Science Communication

On the Role of Physical Education Programs in the Extracurricular Hours to Improve Physical Fitness for 14–15 Year Old Boys

Do Tan Phong*
Physical Education Department, Banking University, Ho Chi Minh City, Vietnam

ABSTRACT

This study aimed to find and evaluate an experimental approach to developing the strength of 14–15-year-olds in extracurricular fitness and health classes at the gymnasiums. Classes based on a circle training form, were held three times a week, taking into account the students' age-specific strength development and performing complex strength exercises and how they were used. The randomized method was used to select a group of students aged 14-15 years (60 participants) to participate in experimental classes in the school's physical education system (supplemental). The positive influence of the experimental program on the training and development of strength competencies (dynamic, static) of students (male) aged 14-15 in the context of supplementary physical education at school has been being established. By the end of the trial period, the number of students with "average" and "above average" physical health increased and the number of young men with "low" strength development levels decreased. The proposed test method increased the student's fitness level, as evidenced by the increase in the motor test score values. The value of the elastic index of young men increased by 20%, the speed was 12.48%, the endurance being 10.26%. The speed-strength was found to increase by 7.75%. The number of young men with "average" and "high" levels of the value of the motor test indicators also increased. It is concluded that the proposal of experimental methods to develop the physical capabilities of 14-15-year-old students in school gymnastics is highly effective and can be encouraged to improve the fitness and physical capacity of the students elsewhere.

KEY WORDS: STRENGTH CAPACITY, STRENGTH TRAINING, GYMNASTICS, PHYSICAL FITNESS.

INTRODUCTION

In recent years, an increasing number of students in Vietnam, and some other countries are interested in forms of extracurricular physical activity, (Thuc, 2019; Zori et al., 2018). This indicates a decrease in motivation for traditional forms of classroom organization and the need to modernize physical education in educational institutions (Andrieieva et al., 2020). One of the forms of organizing advocacy activities according to the student's choice is supplementary physical education, (Dugnist, et al., 2020).

Article Information:*Corresponding Author: thuchus@gmail.com
Received: 18/03/2021 Accepted after revision: 5/06/2021
Published: 30th June 2021 Pp- 544-548

Article DOI: http://dx.doi.org/10.21786/bbrc/14.2.15

In this regard, in our opinion, the mission is to develop methods and technologies to develop the strong competencies of high school students in physical education, sports in sports, and sports groups. Physical enhancement is essential. This issue has not been fully addressed in the scientific literature, which reduces the effectiveness of 12th-grade capacity development training sessions. A certain level of strength development is required in all major sports. In young men, a high degree of strength development is a prerequisite for successful service in the military, (Thuc,2018; Roman 2018). Meanwhile, according to various studies, about 80% of young men and women, after graduating from high school, have low physical characteristics.

Improving health and developing healthy lifestyle habits are priorities in the physical education of

young people in many different countries (Karol and Reineke, 2020). Reduction Youth advocacy activities in recent decades in several countries (Olafsdottir et al., 2016) and physical educational performance (Hortigüela et al., 2015). Therefore, the issue of youth actively participating in physical training and sports is one of the State's policy priorities in many countries. Research on physical culture shows that physical development, one of the main motor qualities of a child's body, has a significant impact on overall physical development. This fact shows the need to improve the effective educational and referral process technology and curriculum for regular and extracurricular activities that develop the strong competencies of high school students. Scientific literature analysis has shown that a lot of material has been accumulated on the choice of media and methods to develop the strengths of high school students. Physical training of students is done in many forms of physical education (regular, extracurricular). The research purpose of the topic is to find and evaluate an experimental method to develop physically effective 14-15-year-old students during class time in the practice room.

Table 1. Contents of the program to develop male strength abilities with the use of exercise equipment

	Basic exercises	Sets per exercise	Amount of repetition	Loading (kg)
1 st day (Monday; from 15-00 till 16-30.)	Alternate standing dumbells curl with hand supination	2	20	8
	Standing row	3	10-12	35
	Alternate standing dumbells curl with the neutral position of hand «hammer»	2	20	8
	Abdominal raise from the support position on elbows on bars	3	10	Sole weight
	Walk (6 min.) on a treadmill 1	1	-	Sole weight
	Lat pulldown	4	8	50
2nd day (Wednesday; from 15-00 till 16-30)	Dig-up on the bars	3-4	4-5	Sole weight
	Lying tricep extension on a horizontal bench	4	12	25
	Lifting the torso from the supine position	3	15-20	Sole weight
	Pec deck in «Butterfly» training simulator	2-3	12-15	30
	Standing lateral raise with dumbells	4	10-12	8
	Walk (6 min) on a treadmill	1	-	Sole weight
3rd day (Friday; from 15-00 till 16-30)	Push-ups	3	20	Sole weight
	Leg extension in a training device	3	10-12	50
	Superextention (hyperextention)	3	12-15	Sole weight
	Walk on a treadmill	1	-	Sole weight
	Squats (front squat, overhead squat, back squat)	4	10-12	20
	Leg curl in a training device	3	12-15	30

MATERIAL AND METHODS

A randomized method was used to form a 14-15-year-old group of 60 people to practice in the school gym using an experimental approach to improving strength. Before and after the pedagogical experiment, the male students' endurance abilities were assessed by dynamic endurance tests: pull-up on a high crossbar, (times); pull-over, (times); dig-up on the bars, (times); lifting the torso from the supine position, (times/min); standing long jump, (cm); throwing a 3 kg stuffed ball with two hands sitting from behind the head, (cm).

Static strength tests were performed: exercises needle, (s); bun (Ball), (s).; half-squat, (s); plank, (s); handgrip and deadlift dynamometry tests (kg). Motor tests were used to assess speed, endurance, speed and strength abilities, and flexibility: running 100 m, (s); running 1500 m, (min, s); jumping rope 30 sec, (times); leaning forward from a standing position with straight legs on a gymnastic bench, (cm). The training sessions are held in 4 phases, three times a week, for 90 minutes, from August 2019 to March 2020. Fitness is selected to suit individual teenagers' possibilities. Classes follow the circular method of training. In the main part of the unit, students are asked to do groups of local and regional empirical exercises with recommendations Table 1).

In the early stage (first 2 months), circular exercise is used to strengthen the musculoskeletal system and increase the functioning of the male body, as well as to provide a basis for increased load. The impact intensity is 40-45% of the maximum, the number of repetitions in the approach – 15-25 for the basic development of endurance, number

of stations – 6-12, number of rounds – 1- 3. The work phases are arranged as follows: 15 seconds. – work, 45 seconds. – rested; 15 seconds – work, 30 seconds. -rested; 30 seconds. – work, 30 seconds. – rested. For the next 2 months (phase II), we used intensive alternate training methods to develop strength with local exercises. At this stage, the load intensity is 50-65% is the maximum, the working time in each exercise is 15-30 seconds, the number of repetitions in the approach is 8-12 reps. The interval between approaches is 50-90 seconds, the station number is 4-10, and the lap number is 1-2.

In the third stage, to increase the load intensity and the differential effect on the lagging muscle groups, the successive series method is used. When doing exercises with local weights, we use weights 50-70% maximum, increasing the number of approaches and repeating with a 40-60 second resting interval. When doing area exercises, you should do 2-4 repetitions 12-15 repetitions with a pause between sets of 60-120 seconds. In the final stage IV, a combination of circular and repetitive exercise methods was used to produce distinct effects on muscle groups. The young men perform 2-3 series of exercises at stations 4-6. (World Medical Association Declaration on Helsinki, 2013). Consent from the boy's parents to conduct the survey. To statistically analyze the obtained results, the applications of software Microsoft Excel and SPSS 20.0. were used.

RESULTS AND DISCUSSION

After the experiment, the boys showed statistically significant increases in all indicators of dynamic and static strength, handgrip, and deadlift dynamometry (Table 2).

Table 2. Young men's strength indicators values before and after the experiment (M±SD)

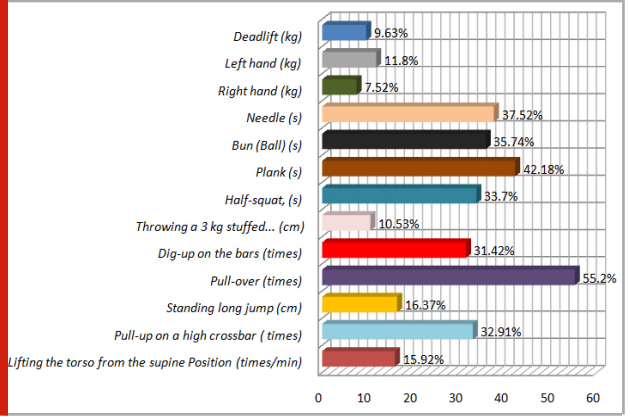
Tests		Indicators				t	P	(W%)
		Before the experiment (M±SD)		After the experiment (M±SD)				
Dynamic strength Position(times/min)	Lifting the torso from the supine	42.2	4.96	49.5	5.21	2.28	<0.05	15.92
	Pull-up on a high crossbar (times)	8.2	3.52	11.43	4.22	2.49	<0.05	32.91
	Standing long jump (cm)	184.5	7.22	217.4	6.52	3.06	<0.05	16.37
	Pull-over (times)	1.6	1.39	2.82	1.73	2.26	<0.05	55.20
	Dig-up on the bars (times)	7.94	3.42	10.9	4.25	2.31	<0.05	31.42
	Throwing a 3 kg stuffed ball with two hands sitting from behind the head (cm)	258.2	3.75	286.9	4.45	2.82	<0.05	10.53
Static strength	Half-squat, (s)	52.3	4.12	73.5	4.38	2.45	<0.05	33.70
	Plank (s)	29.78	2.46	45.7	2.98	2.31	<0.05	42.18
	Bun (Ball) (s)	38.6	2.87	55.4	2.95	2.01	<0.05	35.74
	Needle (s)	40.4	3.56	59.06	4.23	2.45	<0.05	37.52
Dynamometry	Right hand (kg)	38.89	2.86	41.93	3.59	2.44	<0.05	7.52
	Left hand (kg)	34.38	4.68	38.69	4.97	2.28	<0.05	11.80
	Deadlift (kg)	156.45	4.31	172.28	4.98	2.56	<0.05	9.63

The highest value (55.20%) of the increase in the young men's dynamic strength was set in the test Pull-over (time). The lowest value (10.53%) of the increase was in the test Throwing a 3 kg stuffed ball with two hands sitting from behind the head (cm). The values of the static force indicators increase exceeded 35% of the initial level. The values of the increase in handgrip and deadlift dynamometry indicators were about 9%.At the end of the trial, the number of young adults with a growth rate is shown in (Fig 1). The experimental method of training strength abilities had a positive impact on the students' physical fitness (Table.3), as evidenced by significant changes in the indicators values in all motor tests.

The indicators of youth mobility increased by 20%, speed by 12.48%, endurance increased by 10.26%, and speed and strength increased by 7.75%.The number of young men with "medium" and "high" mobility test scores has increased. The number of young men with a 'low' degree of the 'speed' index decreased from 17 (56.67%) to 5 (16.67%), the number of young men with a 'moderate' degree increased from 13 (43.33%) to 19 (63.33%) and

The "high" rate was from 0 (0%) to 6 (20%).The number of students with "low" levels of endurance development decreased twice (from 9 to 4), and three young people with "high" levels of endurance appeared. Number of young men with an 'average'. The level of development of endurance remains unchanged.

Figure 1. The number of young men with different levels of dynamic and static strength development before and after the experiment (%)



Results of the speed and endurance test showed that after the trial, the number of young men with a "high" level of fitness quality increased 3 times (from 4 to 12). The number of young men who have a «medium» speed endurance does not change. Young men with "low" qualifications were not registered. After the trial, the number of young men with a "high" flexibility index tripled, and the number of young men with an "average" increased by 12.5%. No young male with a "low" level of flexibility is registered.

The search for new and improved traditional approaches to increase the efficiency of fitness classes for students continues to be relevant (Kolumbet, & Dudorova, 2016; Natal'ya et al., 2020) It confirms the importance of research. choose ours. Since students' motivation for generally accepted methods of physical activity is still low (Drachuk et al., 2018), some researchers propose organizational methods. is different from the student's physical education. Researchers have proposed to use time-based intensive training (Yessica Segovia & David, 2020) and fitness technology (Valery Zhamardiy, et al., 2020) more widely in school physical education. Increasing physical activity, in addition to regular fitness classes, has a positive impact on students' physical health (Talovic et al., 2015), according to data from our study.

Table 3. Students' physical condition tests indicators' values before and after the experiment (M±SD)

Physical condition tests	Before the experiment (M±SD)		After the experiment (M±SD)	t	P	W%	
Running 100 m (s)	14.98	3.22	13.22	3.19	2.28	<0.05	-12.48
Running 1500 m (min, s)	7.58	4.36	6.84	3.89	2.39	<0.05	-10.26
Jumping rope 30 sec. (times)	62	3.75	67	3.65	3.15	<0.05	7.75
Leaning forward from a standing position with straight legs on a gymnastic bench (cm)	9	6.23	11	7.09	3.26	<0.05	20.00

The results of using the proposed program to develop strength for boys aged 14-15, using exercise equipment showed that by the end of the trial, the number of students with average physical health had ups and downs among young people, as there was a 'low' level of power development. Using the circle exercise method in the proposed program we tried to enhance male strength, which was found to increase along with the motor and emotional density of the participants of the classes, making them varied and enjoyable. We believe that one of the reasons that increase the mobility, static, and strength of the arms and body is the value of the indices in the motor tests at the end of using our test method. The proposed increase is an increase in young men's physical motivation associated with an additional form of extracurricular physical education. This is consistent with survey results of Hispanic students, studying 1-2 years in secondary education institutions. They point out in their survey of important temporal activities outside of the classroom, regarding a growing interest in this form of a physical education organization (Zorio et al., 2018).

Other researchers especially recommend spending significant time on extracurricular physical activity (Codina et al., 2016), which increases not only the physical but also the mental as a result. other authors observed. an increase in the indicators of students' cognitive and physical functions (Berrios et al., 2017). This statement is consistent with data obtained by other researchers like that of Natal'ya et al, (2020). We believe that researching capacity development in the physically complementary learning environment of students is a promising direction of the program to enhance the fitness of modern students.

CONCLUSION

The experimental method we have developed and tested to assess the physical capacity of 14-15-year-old boys using exercise equipment in the supplementary physical education system at school has become a useful method, which has significance in enhancing students' mobility and stillness of hand development and measuring dynamics. At the end of the test, an increase in the values of the indexes of the motor tests in terms of speed, general endurance, speed endurance, and active flexibility of the spine has been found. The proposed program to develop the competencies and endurance of 14-15-year-old males expands theoretical knowledge in the field of physical and sports education and it can be introduced for use in institutions other than physical education.

Conflict of Interest: The author state that there is no conflict of interest.

Ethical Clearance Statement: The Current Research Work Was Ethically Approved by the Institutional Review Board (IRB) of University, Ho Chi Minh City, Vietnam.

REFERENCES

Andrieieva O., Yarmak O., Palchuk M., Hauriak O., Dotsyuk L., Gorashchenco A., Kushni I., & Galan Ya. (2020). Monitoring the morphological and functional state of students during the transition from middle to high school during the physical education process. Journal of Physical Education and Sport, Vol 20 (3), pp 2110 – 2117.

Berrios-Aguayo, B., Latorre-Román, P. Á., & Pantoja-Vallejo, A. (2017). Asociación entre la práctica deportiva familiar y la habilidad cognitiva del alumnado. Revista Electrónica de Investigación y Docencia (REID), 17, pp 79-92

Codina, N., Pestana, J. V., Castillo, I., & Balaguer, I. (2016). Ellas a estudiar y bailar, ellos a hacer deporte: Un estudio de las actividades extraescolares de los adolescentes mediante los presupuestos de tiempo. Cuadernos de Psicología del Deporte, 16(1), pp 233-242

Drachuk, S., Bohuslavska, V., Pityn, M., Furman, Y., Kostiukevych, V., Gavrylova, N., Salnykova, S., & Didyk, T. (2018). Energy supply capacity when using different exercise modes for young 17–19- year-old men. Journal of Physical Education and Sport, 18 (1), pp 246-254.

Dugnist, P. Y., Milkhin, V. A., Romanova, E. V., & Peregudova, T. M. (2020). High-speed power training of students in physical education and sport classes. Health, Physical Culture and Sports, 2(18), 149-158. Retrieved from http://journal.asu.ru/zosh/article/view/7904 doi: https://doi.org/10.14258/zosh(2020)2.16

Hortigüela Alcalá, D., Pérez-Pueyo, Á., Moncada-Jiménez, J. (2015). An analysis of the responsibility of physical education students depending on the teaching methodology received. Journal of Physical Education and Sport, 15(2), pp 202-207.

Karol Görner, & Alexa Reineke. (2020). The influence of endurance and strength training on body composition and physical fitness in female students. Journal of Physical Education and Sport, Vol 20 (3), pp 2013–2020.

Kolumbet, A.N., & Dudorova, L.Yu. (2016). Correction of physical education program for technical higher educational establishment girl-students on the base of their health indicators. Physical Education of Students. 20(6), pp 18-25.

Munir Talovic, Ifet Mahmutovic, Eldin Jeleškovic, Denis Sedic, Haris Alic, Rasim Lakota, Šemso Ormanovic, Nedim covic, & Emir Mustafovic. (2015). Quantitative changes of specific motor abilities of students under the influence of regular and additional activitiesin sport and physical education. Port Science International scientific journal of kinesiology, 8 (2), pp 34-37

Natal'ya M, et al,.(2020). Program for improving strength abilities of 16–17-year-old students in the additional physical education system, Journal of Physical Education and Sport, 20(5), pp 2796 – 2802.

Olafsdottir, A.S., Torfadottir, J.E., & Arngrimsson, S.A. (2016). Health Behavior and Metabolic Risk Factors Associated with Normal Weight Obesity in Adolescents. PLoS ONE, 11 (8). doi: https://doi:10.1371/journal.pone.0161451

Roman, Markovic. (2018). Effectiveness of the complex movement program of physical training for professional soldiers. Journal of Physical Education and Sport, 18(3), pp 1773-1778.

Thuc DC, (2019). Building The Model Of Recreational Sports Club For Students Of An Giang University, Vietnam, ijmhs, vol. 9, no. 4, pp 384-394.

Thuc DC (2018). The Effect of Physical Activities on Biological Age Parameters of Females from 17 to 18 Years Old. Journal of Sports Research, 5(1): 7-11. DOI: 10.18488/journal.90.2018.51.7.11

Valery Zhamardiy, Olena Shkola, Hanna Tolchieva, & Volodymyr Saienko. (2020). Fitness technologies in the system of physical qualities development by young students. Journal of Physical Education and Sport, 20 (1), pp 142 – 149.

Yang, C.B., & Dong, M.K. (2017). A Study of the correlation between teachers' teaching styles and students' participation motivation in the physical education. Journal of Baltic Science Education, 16(2), pp 199–206

Yessica Segovia & David Gutiérrez (2020). Effect of a game-based high intensity interval training program on body composition in primary education: comparison of the Sport Education model and traditional methodology. Journal of Physical Education and Sport, 20 (2), pp 791- 799.

Zorio, Ferreres, A., Alguacil, M. Y., & García-Pascual, F. (2018). Analysis of the opinion on physical education in high schools and the extracurricular sports practice of students and their personal environment. Journal of Physical Education and Sport, 18(3), pp 1646 – 1653.