Team gymnastics and its impact on the cognitive and motor sphere of students

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Abstract

Objective of the study. The purpose of this work is to establish how the inclusion of team–building gymnastics elements in the daily routine affects the cognitive and motor functions of students.

Methods and structure of the study. In the course of the work, the relationship between the characteristics of team gymnastic exercises and fluctuations in biometric indicators of cognitive-motor activity of 54 students (average age 18.5±1.6 years) assigned to the main medical group for physical education was studied. The participants were divided into experimental (n = 23) and control (n = 21) groups.

Results and conclusion. The results of the study confirm the potential benefits of using team-building gymnastics in students' daily lives. The introduction of emotionally intense aerobic exercises performed in a team into the educational process helps restore mental and physical productivity, improves overall well-being and adjusts the optimal mode of psychophysiological activity of students.

Keywords: *team gymnastics exercises, school day, cognitive activity, motor activity, cognitive-motor activity, recovery of working capacity.*

Introduction. Team gymnastics, as a sport, includes acrobatic elements, free group exercises and gymnastic jumps on a mini trampoline. In group exercises, as a rule, rhythmic gymnastics objects are used – balls, rings, clubs, ribbons [5]. Each exercise is performed for 1.5 minutes with musical accompaniment. The number of gymnasts performing is from 6 to 12 people.

The means of team gymnastics can be used for the purpose of physical development, increasing motor activity and maintaining mental and physical performance of students of higher educational institutions [2, 3]. Team gymnastics programs are based on certain principles of physical education: - the principle of wellness orientation, which determines the strengthening of health and compliance of exercises with age, adaptive capabilities and individual characteristics of students; - the principle of gradually increasing the load and difficulty of exercises at an accessible difficulty level; - the principle of systematic training, which determines the formation of needs and habits in collective forms of physical activity; - the principle of comprehensive harmonious physical development; - the principle of a positive psycho-emotional state in the process of performing team gymnastics exercises, achieved by the involvement of students in active musical and rhythmic activities; - the principle of coupled formation of group interaction skills.

The complexes of team gymnastics exercises belong to small forms of physical education in higher education institutions, which have significant restorative potential and are a means of psychoemotional relief [1]. Due to the high emotionality and compactness of the event, team gymnastics complexes fit seamlessly into the student's school day schedule [6]. At the same time, they have not found sufficient application in the structure of the weekly schedule of student life [4].

An a priori study of the features of the educational process in universities allowed us to formulate the assumption that the use of team gymnastics exercises in the school day schedule increases psycho-emotional stability, physical and mental performance, and improves interpersonal relationships in the educational team.

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The set of exercises performed as part of the team included: - floor exercises, jumping on two and one legs, bends, turns, symmetrical and multidirectional movements with two hands, simultaneous claps with jumps, balance on toes, on one leg, "swallow", etc.; - ball exercises: throwing, catching and tossing the ball from hand to hand, turns with the ball; - exercises with a gymnastic stick: turns, bends with holding the stick with one or two hands alternately; - jumping on a mini trampoline. Team gymnastics exercises were conducted for 10 minutes with musical accompaniment and daily intervals of classes for 3 months of training.

The control and measuring methods included: a study of the state of health (according to medical records, during a conversation with a medical professional); diagnostics of the reaction to physical activity (PWC_{170} test, measurement of heart rate, blood pressure); the level of psychoemotional stability (SAN technique, reaction to a moving object, tapping test, correction tests for attention stability, test differentiation and reproduction of muscular efforts); testing of physical qualities (flexibility and mobility in joints; static balance test).

The data obtained was processed using statistical analysis methods in the STATISTICA 6.0 program.

Results and conclusion. Initially, the regressive dynamics of the indicators of the central, motor and vegetative functions of students, specific for educational activity, was revealed. The use of small forms of classes in the form of team gymnastics during the school day leads to a systemic upsurge in the transformation of the compensatory functionality of preventive physical education in the segments of health saving and adaptive stimulation (see the table).

The choice of team gymnastics exercises is due to the lack of physical activity during the school day and forms positive processes for improving students' mental performance. The positive dynamics of psychomotor functions is associated with a rational approach to the students' daily routine, a harmonious alternation of educational workload and periods of active rest as part of the gymnastics team. The use of aerobic emotional exercises determines the rhythmic functioning of the body's systems in an optimal mode.

The structure of team gymnastics complexes contains tools aimed at reducing mental fatigue under the influence of training load. The content of team gymnastics focuses on the diverse use of physical culture tools, methods, and organizational forms as the most effective tool for maintaining students' mental and physical performance during the school day.

The resources used by the team of funds expand the possibilities of restoring mental functions and improving the current physical condition. Due to the amplitude-frequency alternation of mental and physical activity, a tendency is achieved to improve the perception of muscle effort (decrease in error by 21.6±3.8%; $p<0.05$), the index of nervous system efficiency according to the tapping test (up to 54.6±2.3, by 12.6%; $p<0.05$).

Indicators of cognitive and motor activity of students

Indicator	Average competence assessment score		p
	EG	CG	
Differentiation and reproduction of muscle effort, % error	34,6±2,3	53,7±4,2	<0,05
NS Efficiency Index (tapping test)	54,6±2,3	53,7±4,2	<0,05
Attention stability, score	34,8±3,7	33,7±4,1	<0,05
SAN, score	6,4±0,7	4,8±0,5	<0,05

High efficiency of selective recovery of reduced intellectual functions is achieved by regulating the processes of fatigue and urgent recovery in the ratio of mental loads and aerobic movements. The validity of team gymnastics during the school day is confirmed by an improvement in attention stability to 34.8±3.7 and overall SAN tone to 6.4±0.7 points.

The sequence of application of team gymnastics exercises shows the possibilities of self-organization of the system, which expands the resources of students' physiological resistance to academic stress.

Conclusions. The results obtained prove the prospects of using team gymnastics in the students' school day mode. The integration of emotional aerobic exercises performed as part of a team into the schedule of educational activities stimulates the restoration of mental and physical performance, increases the overall tonic state and sets the optimal rhythm of the students' psychophysiological functions.

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