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Musical accompaniment in training as a factor in optimizing the psychophysiological state of young rugby players aged 16-17 years

Kalinicenko V.E.[1], Kozina Zh.L.[1], Ahmad M. Ayaz[2], Polishchuk S.B.[1], Chuprina O.I.[1], Seryy A.V.[1], Kolman O.Ya.[3], Ivanova G.V.[3], Kudryavtsev M.D.[3,4,5,6]

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Аннотації. Калініченко В.Є., Козіна Ж.Л., Ахмат М. Аяз, Поліщук С.Б., Чуприна О.І.., Сірий О.В., Кольман О.Я., Іванова Г.В., Кудрявцев М.Д. Музичний супровід на тренуваннях як фактор оптимізації психофізіологічного стану юних регбістів 16-17 років. *Мета:* виявити вплив застосування музичного супроводу на тренуваннях на психофізіологічні функції регбістів 16-17 років. *Матеріал.* У дослідженні взяли участь 20 регбістів з спортивного клубу «ХТЗ» (16-17 років), 10 спортсменів увійшли в контрольну групу, 10 в експериментальну групи. Експеримент проводився протягом двох місяців в підготовчому періоді на етапі спеціалізованої базової підготовки. Експериментальна група тренувалася з музичним супроводом. На початку і в кінці експерименту проводилося психофізіологічне тестування. Застосовувалися наступні тести: визначалися показники простий і складної реакції в різних режимах подачі сигналів, показники працездатності і нервової системи. Визначалися міжгрупові і внутрішньогрупові відмінності по проведеним тестам. *Результати.* Побудова навчально-тренувального процесу в регбі із застосуванням музичного супроводу тренувальних занять зробило позитивний вплив на психофізіологічний стан атлетів. У представників експерміентальної групи в тесті «Реакція вибору, кількість помилок» результат достовірно покращився (p <0,05). Після проведення експерименту контрольна і експериментальна групи стали достовірно відрізнятися між собою. Аналогічні дані були отримані в тестах «Час реакції вибору в режимі зворотного зв'язку» і «Психічна стійкість по тесту Шульте». Отримані дані свідетелствують про доцільність застосування музичного супроводу на тренуваннях юних регбістів для оптимізації псіхофізіологічского стану. *Висновки.* Розроблена методика застосування музичного супроводу є ефективним, доступним і надійним засобом поліпшення психофізіологічного стану регбістів 16-17 років. Застосування музичного супроводу позитивно впливає психічну витривалість, швидкість реакції в різних режимах подачі сигналу, стійкість і силу нервової системи.

Ключові слова: *регбі; музика; витривалість; сила; підготовленість*

Калиниченко В.Є., Козина Ж.Л., Ахмат М. Аяз, Полищук С.Б., Чуприна А.И., Серый А.В., Кольман О.Я., Иванова Г.В., Кудрявцев М.Д. Музыкальное сопровождение на тренировках как фактор оптимизации психофизиологического состояния юных регбистов 16-17 лет. *Цель:* выявить влияние применения музыкального сопровождения на тренировках на психофизиологические функции регбистов 16-17 лет. *Материал.* В исследовании приняли участие 20 регбистов из спортивного клуба «ХТЗ» (16-17 лет), 10 спортсменов вошли в контрольную группу, 10 в экспериментальную группы. Эксперимент проводился в течение двух месяцев в подготовительном периоде на этапе специализированной базовой подготовки. Экспериментальная группа тренировалась с музыкальным сопровождением. В начале и в конце эксперимента проводилось психофизиологическое тестирование. Применялись следующие тесты: определялись показатели простой и сложной реакции в различных режимах подачи сигналов, показатели работоспособности и нервной системы. Определялись межгрупповые и внутригрупповые различия по проведенным тестам. *Результаты* Построение учебно-тренировочного процесса в регби с применением музыкального сопровождения тренировочных занятий оказало положительное воздействие на психофизиологическое состояние атлетов. У представителей эксперментальнои группы в тесте «Реакция выбора, количество ошибок» результат достоверно улучшилось (p<0,05). После проведения эксперимента контрольная и экспериментальная группы стали достоверно отличаться между собой. Аналогичные данные были получены в тестах «Время реакции выбора в режиме обратной связи» и «Психическая устойчивость по тесту Шульте». Полученные данные свидетелствуют о целесообразности применения музыкального сопровождения на тренировках юных регбистов для оптимизации психофизиологического состояния. *Выводы.* Разработанная методика применения музыкального сопровождения является эффективным, доступным и надежным средством улучшения психофизиологического состояния регбистов 16-17 лет. Применение музыкального сопровождения положительно влияет психическую выносливость, скорость реакции в различных режимах подачи сигнала, устойчивость и силу нервной системы.

***физическая подготовка, здоровый способ жизни, работники банков, физическая активность*.**

Purpose: to reveal the influence of the use of musical accompaniment in training on the psychophysiological functions of rugby players of 16-17 years of age. *Material.* Twenty rugby players from the sports club "KhTF" (16-17 years) took part in the study, 10 athletes entered the control group, 10 entered the experimental group. The experiment was carried out for two months during the preparatory period at the stage of specialized basic training. The experimental group was trained with musical accompaniment. At the beginning and at the end of the experiment, psychophysiological testing was conducted. The following tests were used: the parameters of a simple and complex reaction in various modes of signal feeding, indicators of efficiency and the nervous system were determined. Intergroup and intra-group differences in the tests were determined. *Results.* The construction of the training and training process in rugby with the musical accompaniment of the training sessions had a positive effect on the psychophysiological state of the athletes. In representatives of the experimental group in the "Response of choice, the number of errors" test, the result was significantly improved. After the experiment, the control and experimental groups became significantly different. Similar data were obtained in the tests "Response time of choice in the feedback mode" and "Mental stability according to the Schulte test". The obtained data testify to the advisability of using musical accompaniment in the training of young rugby players to optimize the psychophysiological state. *Conclusions.* The developed method of using musical accompaniment is an effective, accessible and reliable means of improving the psychophysiological state of 16-16-year-old rugby players. The use of musical accompaniment positively affects mental endurance, the reaction rate in various modes of signal delivery, stability and strength of the nervous system.

rugby; music; endurance; force; preparedness

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Introduction.

Rugby presents high requirements for endurance, strength, speed, mental endurance, etc. (Aslett, Van der Merwe, & Kruger, 2017; Brown, Viljoen, Lambert, Readhead, Fuller, Van Mechelen, & Verhagen, 2015; Cheng, Pegg, & Stebbins, 2016). The manifestation of these physical qualities requires a high level of psychophysiological state of the players. There are various means of activating the psychophysiological state of athletes, which are based on the activation of the minds of athletes (Kozina, et. al., 2005; 2008; 2015; 2017).

One of the means of creating a positive background in training is the use of music. A number of studies have been carried out on the influence of music and sports on the body. So, Cabane Hille Lechner (2016) found that children who are engaged in music or sports, show better results in their studies. The highest rates in studies were found in children who were engaged in both music and sports. However, Cizek, Kelly, Kress, Mattfeldt-Beman (2016) note that music lessons alone require certain energy costs. But the use of music as a means of increasing the level of physical activity and performance was confirmed at the physiological level by Clark, et al. (2016). The authors have shown that music can promote behavioral change with increased commitment and participation. Based on the analysis of the activity of different parts of the brain while listening to music, the authors concluded that the effectiveness of using music in programs aimed at increasing the level of physical activity of people.

Therefore, it can be assumed that the use of music will have a beneficial effect on the psychophysiological state of athletes.

Currently, studies are being conducted aimed at studying musical stimulation in the athletic performance of athletes. Aslett, Van der Merwe, & Kruger (2017) indicate that listening to music by rugby players before training and competition is related to the concept of musical experience as an innate human ability. Listening to music activates a sense of common well-being. For the players, a sense of well-being is the basic condition for happiness and optimism. Achievement and maintenance of this state is based on the emotional qualities of musical sound patterns, as well as on powerful, socially arranged senses of songs. Subsequent states of mind reflect a sense of happiness through the integration of experience in sports and music. A study of the authors of the training process of rugby players showed that listening to music is an informal, individual activity. The feeling of personal isolation that it causes is a prerequisite for creating a focus of controlled energy, a state of mind for effective training and competitive activities in rugby. The widespread informal application of this strategy by rugby players points to an officially underrated psychological resource. In connection with the data obtained, the authors recommend a wider inclusion of music in the training programs of rugby players. In the context of this study, it is relevant to study the impact of the use of music directly in the training process of rugby players on various aspects of preparedness.

Elvers, Steffens (2017) also showed a positive impact of the use of music in the training process of athletes in game sports. The authors found that listening to music improves the players' self-esteem and their ability to take risks, but does not affect the accuracy of the actions. However, the most effective is listening to music, which is individually suitable for each athlete. This is due to the synchronization of rhythms when performing exercises and rhythms of music. In other studies (Khazdozi, Bahari, Ashayeri, 2017), it was also revealed that in playing sports (for example, handball), listening to music during a warm-up is most influential, but does not affect listening while playing.

The influence of music on the performance of athletes is explained by the following physiological mechanisms. When listening to music, a part of the brain called the nucleus accumbens (pleasure center) is activated (Ferguson, & Philipenko, 2016, Ferriss, 2016). which produces dopamine - a hormone that affects the mood. It is located in the "ventral tegmental area" (VTA). All this is part of the "reward system" of the brain.

From the point of view of evolution, nature enjoys listening to music rather complicated. Creative activities, in particular music, help a person to "synchronize" in the society, including improves joint work. And this was important for the survival of man as a species. Music has a beneficial effect on the performance of boring and monotonous tasks (Freitag, Kirkwood, Scharer, Ofori-Asenso, & Pollock, 2015; Goehr, 2011; Gottstein, 2012; Hallett, Lamont, 2017; Karageorghis, Terry, & Lane, 1999).

Therefore, one can assume that it is possible to increase trenirovannosti can be used with music in the training process in rugby.

The purpose of the work is to reveal the influence of the use of musical accompaniment in training on the psychophysiological functions of rugby players of 16-17 years.

Communication of work with scientific programs, plans, themes.

The study was conducted according to:

• research work, which was financed from the state budget of the Ministry of Education and Science of Ukraine for 2013-2014. "Teoretiko-methodical bases of application of information, pedagogical and medico-biological technologies for formation of a healthy way of life" (State registration number 0113U002003)

• research work, which was financed from the state budget of the Ministry of Education and Science of Ukraine for 2015-2016. "Teoretiko-methodical bases application of means of information, pedagogical, medical and biological orientation for impellent and spiritual development and formation of a healthy way of life" (State registration number 0115U004036)

• research work, which is funded by the state budget of the Ministry of Education and Science of Ukraine for 2017-2018. "Teoretiko-methodical bases of application of information, medico-biological and pedagogical technologies for realization of individual physical, intellectual and spiritual potential and formation of a healthy way of life" (State registration number 0117U000650).

Material and methods.

Participants.

Twenty rugby players of the junior team of the sports club KhTZ (16-17 years old) took part in the study; 10 athletes entered the control group, 10 - in the experimental group. Distribution of athletes in groups was conducted randomly. The groups created were identical in terms of physical fitness and psychophysiological indicators ($p > 0.05$).

Organization of the study.

The experiment was conducted from September 25, 2017 to December 22, 2017 in the preparatory period at the stage of specialized basic training.

To determine the psychophysiological state of athletes in the first and last week of the experiment, psychophysiological indices were recorded using the computer program "Psychodiagnostics". The following parameters were fixed (Korobeynikov, et.al., 2011; 2016; 2017; Kozina, Prusik, Görner, Sobko, Repko, Bazilyuk, ... Korol, 2017; Kozina, Iermakov, 2015):

Complex indicators on the speed of a simple visual-motor reaction (mean of 30 attempts (ms), the standard deviation (ms), the number of errors); duration of exposure (signal) - 900 ms;

Complex indicators of a complex visual-motor reaction of selecting 1 element from three and selecting two elements from three (mean value of 30 attempts (ms), standard deviation (ms), number of errors); duration of exposure (signal) - 900 ms;

Complex indicators of a complex visual-motor reaction to the selection of two elements of three in the feedback mode, i.e. As the response time changes, the signal delivery time changes; "Short version" is carried out in the feedback mode, when the duration of exposure changes automatically depending on the response of the subject: after the correct answer, the duration of the next signal is reduced by 20 ms, and after the wrong one - increases by the same amount. The range of the signal exposure change during the test subject's operation is within 20-900 ms with a pause between exposures of 200 ms. The correct answer is to press the left (right) mouse button while displaying a certain exposure (image), or during a pause after the current exposure. In this test, the time to reach the minimum exposure of the signal and the time of the minimum exposure of the signal reflect the functional mobility of the nervous processes; the number of errors reflects the strength of the nervous processes (the lower these parameters, the higher the mobility and strength of the nervous system). The duration of the initial exposure is 900 ms; the amount of change in the duration of the signals with correct or erroneous responses is 20 ms; pause between the presentation of signals - 200 ms; the number of signals is 50. The indicators are fixed: the average value of the latent period (M), ms; standard deviation value (σ), ms; number of mistakes; time of test execution, s; minimum exposure time, ms; time of exposure to the minimum exposure, sec.

Complex indicators of a complex visual-motor reaction to the selection of two elements of three in the feedback mode, i.e. As the response time changes, the signal delivery time changes; "Long version" is carried out in the feedback mode, when the duration of exposure changes automatically depending on the response of the subject: after the correct answer, the duration of the next signal is reduced by 20 ms, and after the wrong one - increases by the same amount. The range of the signal exposure change during the test subject's operation is within 20-900 ms with a pause between exposures of 200 ms. The correct answer is to press the left (right) mouse button while displaying a certain exposure (image), or during a pause after the current exposure. In this test, the time to reach the minimum exposure of the signal and the time of the minimum exposure of the signal reflect the functional mobility of the nervous processes; the number of errors reflects the strength of the nervous processes (the lower these parameters, the higher the mobility and strength of the nervous system). In addition, the total time of the

test reflects a combination of strength and mobility of the nervous processes. The duration of the initial exposure is 900 ms; the amount of change in the duration of the signals with correct or erroneous responses is 20 ms; pause between the presentation of signals - 200 ms; the number of signals is 120. The indicators are fixed: the average value of the latent period (M), ms; standard deviation value (σ), ms; number of mistakes; time of test execution, s; minimum exposure time, ms; time of exposure to the minimum exposure, sec.

The indicators of mental working capacity were also determined according to the Schulte test. In this test, the subject needs in the 5X5 tables of 25 digits (from 1 to 25) arranged in random order, in order to mark the numbers from 1 to 25. After passing the first table, the second with a different order of digits immediately appears, and so on. In total, the subject passes 5 tables. Fixed the running time on each table of five (min.), The work efficiency as the arithmetic mean of the running time on five tables (min.).

The control and experimental groups were trained on the same programs 5 times a week for 1.5-2 hours. Each training was followed by a special warm-up, including exercises for flexibility on the spot and special exercises in motion, for 15 minutes. On each training in the main part of the exercise also used exercises that contain techniques (hitting the ball, catching and transferring the ball, hitting). The duration of these exercises was 20 minutes. Twice a week, training was practiced in the gym with special simulators, as well as with the use of a bar. This training lasted 1 hour. After the gym, athletes went on to study tactical interactions. Once a week, a cross run of 30 minutes was used. After the cross run of the athlete went to the technical and tactical training. Group tactical exercises were applied at each training session for 30 minutes. At each training a two-way play lasting 30 minutes was used. After the game, aerobic exercises and exercises were used to stretch the muscles and ligaments.

The experimental group was trained with musical accompaniment. Warm-up (15 min), cross-country running (once a week for 30 min), hitting the ball, catching, running in (20 min), in the gym with shells (2 times a week for 1 hour) in the experimental group with personal headphones. Each athlete listened to music, which he considered most appropriate for him at the moment.

Group exercises using tactical interactions were performed without headphones. Music was included for all athletes. For this purpose, portable speakers were used. When performing group exercises, the experimental group was separated from the control group. The control group trained on another field. Before the game began at the end of the workout, the athletes also individually listened to one track in the headphones.

For individual listening in headphones, athletes used their favorite music. For group sessions, we selected tracks that all subjects liked. Most of the pieces of music represented postgraduate, alternative rock, alternative metal, hard rock and nu-metal. All these directions are characterized by the presence of melodic inserts in the general background of bass tones, a variety of techniques sounding the guitar, non-standard sound transitions, etc. Thus, young athletes often chose rock. At the present stage, there are various opinions about the influence of music of the "rock" style on a person. Rock music was originally created by the rebels. The nature of rock music reflects the state of the psyche, when a person overcomes something. That is why it is often used in the voice acting of films, when it is shown how a person overcomes what obstacles on the verge of survival. Therefore, rock music contributes to increased heart rate and blood pressure. Such a situation a person can not support constantly. However, when people need to overcome obstacles, people often use rock music. So often in the gyms you can hear exactly rock music. Psychologists consider the influence of such music positive, especially on adolescents, who help to cope with the difficulties of the transitional age, reduces stress, depression. Rock gives the teenager an opportunity to forget about the pressure that is being felt by others around him, about his problems. Use rock music carefully, because a person can not always be in a position to overcome obstacles. It can cause depletion of the nervous system.

Since rugby is a physically difficult sport (Huggins, 2011, Hutchinson, 2000, King, et.al., 2015), which requires the development of all types of endurance: power, anaerobic-glycolytic, general, etc., it can be assumed that rock music in training will help athletes overcome negative feelings associated with the need to endure high physical exertion. In addition, the age of 16-17 years of athletes is the age when the teenager is in a state of struggle, both internal and external.

Proceeding from the above, we decided to allow athletes to apply musical accompaniment of the "rock" style in individual and group order.

Statistical analysis.

The digital material obtained during the research was processed using traditional methods of mathematical statistics. For each indicator, the arithmetic mean X, the standard deviation S (standard deviation), the standard error (m), the

reliability of the differences between the parameters of the initial and final results, as well as between the control and experimental groups by the t-test of the Student with an appropriate level of significance (p).

Mathematical processing of data was carried out using programs for processing the results of scientific research Microsoft Exel "Data Analysis", SPSS. Differences were considered significant at a significance level of p <0.05.

Results.

The construction of the rugby training process in using the musical accompaniment of training sessions has had a positive effect both on the level of special physical and technical readiness of the players, and on their psycho-physiological state.

Regarding the psychophysiological state, it should be noted that the representatives of the experimental group in the test "Reaction of choice, the number of errors" the result has significantly improved (p <0,05), and in the control group, on the contrary, the result has significantly deteriorated (p <0,05) (Table 2). After the expert, the control and experimental groups began to differ significantly (Fig. 1).

Similar data were obtained in the tests "Response time of choice in feedback mode" (Fig. 2, Table 1, 2) and "Mental stability according to Schultt test" (Fig. 3, Table 1, 2). The athletes of the experimental group showed significant improvement (p <0.001, p <0.05), and athletes in the control group - a significant deterioration (p <0.01) of the test results. Experimental and control groups did not differ from each other until the experiment was performed (p> 0.05). After the experiment, the experimental and control groups significantly differed (p <0.001, p <0.05) according to the results of these tests (Figures 2, 3).

The number of errors when performing the test on the rate of reaction of choice indicates the quality, such as stability, endurance of the nervous system, which is also an indicator of the strength of the nervous system. Based on the data obtained, one can conclude that the athletes of the experimental group as a result of the use of musical accompaniment in classes increased the stability of the nervous system and its strength. In the control group, the decline in these indicators can be explained by the fact that the experiment was conducted in the beginning of the training season, and adaptation changes have just begun in the body. This causes inconsistency of the work of various systems of the body, including, and nervous, which explains the increase in errors in the athletes of the control group when passing the test on the rate of reaction of choice.

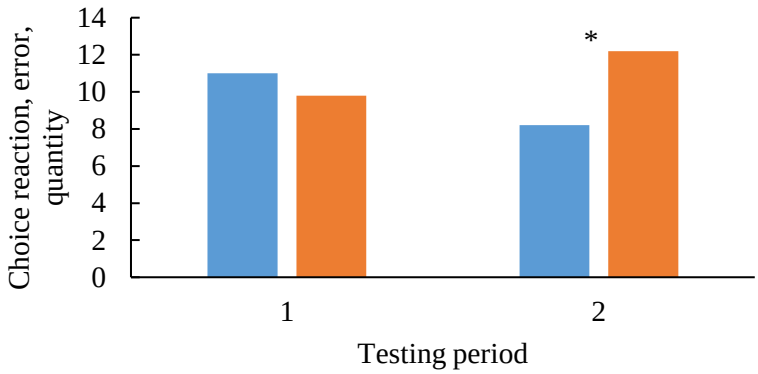

Fig. 1. Results of the test "Response of choice, errors" by athletes of the experimental and control groups before and after the experiment:

1 – before the experiment, 2 – after the experiment;

- experimental group;
- control group

* - the differences are significant at p<0,05

It should be noted that athletes of the experimental group, the beginning of the training season did not have a negative effect on the psycho-physiological state. One can conclude that the use of musical accompaniment at the training contributed to the coherence of the work of different systems of the body and increase the strength and stability of the nervous system.

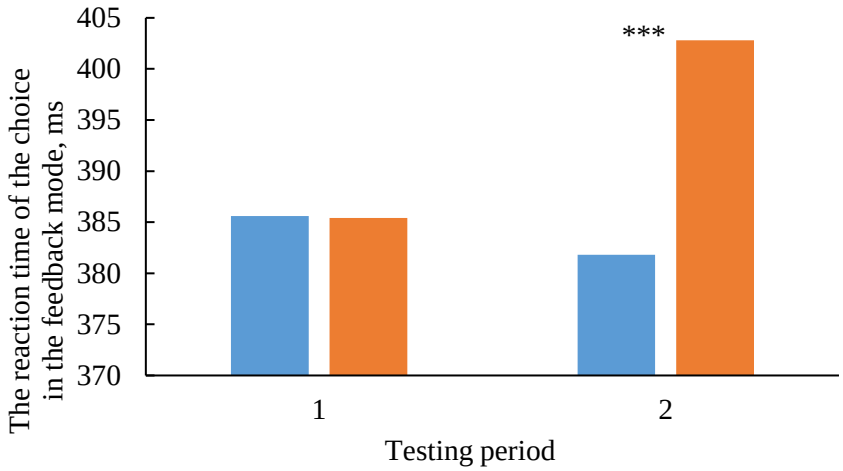

Fig. 2. Results of the test "Response time of choice in feedback mode" by athletes of the experimental and control groups before and after the experiment:
1 – before the experiment, 2 – after the experiment;
- experimental group;
- control group

*** - the differences are significant at p<0,001

The test "Response time of choice in feedback mode" reflects the slowness and mobility of the nervous system, and the "Mental resistance of the Schultt test" reflects the endurance of the nervous system. It is also an indicator of the strength of the nervous system. It is determined that the use of musical accompaniment primarily affects the strength and stability of the nervous system.

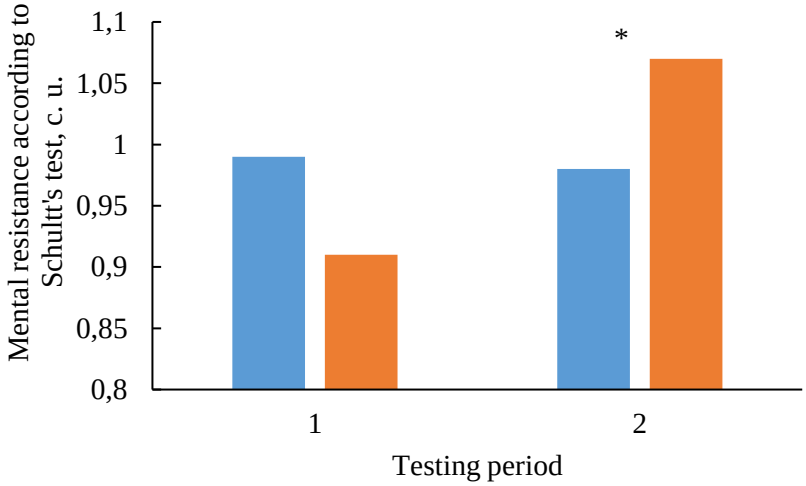

Fig. 3. Results of the test: "Psychological stability of the Schulte test" by athletes of the experimental and control groups before and after the experiment:
1 – before the experiment, 2 – after the experiment;
- experimental group;
- control group

* - the differences are significant at p<0,05

Table 1

Indicators of the pyo-physiological state of young rugby players of the control group before and after the experiment (n=10)

Name	Group	Statistical Displays				
		$\bar{x}$	S	m	t	p
Time of simple reaction, ms	CB	360,20	28,65	9,06	3,20	0,00
	CA	327,80	14,26	4,51		
Simple reaction, error, quantity	CB	0,20	0,42	0,13	1,50	0,15
	CA	0,00	0,00	0,00		
Time of simple reaction, mean square deviation, ms	CB	2,77	0,02	0,01	1,50	0,15
	CA	2,76	0,00	0,00		
The time of the reaction of choice, ms	CB	447,80	18,15	5,74	-1,44	0,17
	CA	462,00	25,33	8,01		
Reaction of choice, errors, quantity	CB	9,80	2,15	0,68	-2,78	0,01
	CA	12,20	1,69	0,53		
The time of the reaction of choice, the mean square deviation, ms	CB	3,41	0,18	0,06	-2,82	0,01
	CA	3,65	0,19	0,06		
The reaction time of the choice in the feedback mode, ms	CB	385,40	15,25	4,82	-2,32	0,03
	CA	402,80	18,18	5,75		
Reaction selection in feedback mode, errors, number	CB	23,80	1,23	0,39	4,03	0,00
	CA	20,40	2,37	0,75		
The response time of the choice in the feedback mode, the mean square deviation, ms	CB	3,80	0,16	0,05	-0,55	0,59
	CA	3,83	0,10	0,03		
Reaction selection in feedback mode minimum exposure time, ms	CB	336,00	15,78	4,99	-0,28	0,78
	CA	340,00	42,16	13,3		
Reaction selection in feedback mode, total test run time, p	CB	89,20	2,15	0,68	-2,12	0,05
	CA	92,00	3,59	1,14		
Reaction selection in feedback mode, exit time to minimum exposure, p	CB	69,60	13,70	4,33	1,13	0,27
	CA	62,80	13,14	4,15		
Dynamic choice reaction for 60 s (Ermakov test), quantity	CB	87,40	9,37	2,96	-0,16	0,88
	CA	88,20	12,81	4,05		
Dynamic choice reaction for 60 s (Ermakov's test), errors	CB	1,42	1,43	0,45	0,00	0,99
	CA	1,40	1,07	0,34		
The work time on Table 1 in the Schult test, s	CB	34,80	6,51	2,06	0,84	0,41
	CA	32,00	8,30	2,62		
The work time on Table 2 in the Schult test, s	CB	41,40	9,25	2,93	2,37	0,03
	CA	37,66	15,84	5,01		
Time worked on table 3 in the Schult test, s	CB	35,40	7,26	2,30	2,13	0,05
	CA	38,60	7,04	2,23		
The work time on Table 4 in the Schult test, s	CB	45,20	18,23	5,76	2,76	0,01
	CA	38,20	6,91	2,18		
The work time on table 5 in the Schult test, s	CB	44,60	18,92	5,98	1,74	0,10
	CA	33,00	9,24	2,92		
Efficiency of the Schultt test (c.u.)	CB	39,76	10,25	3,24	1,84	0,08
	CA	32,36	7,50	2,37		
Degree of training on the Schultt test (c.u.)	CB	0,89	0,08	0,03	-1,88	0,08
	CA	1,00	0,16	0,05		
Mental Stability Test by Schult (c.u.)	CB	1,10	0,09	0,06	1,27	0,09
	CA	1,07	0,04	0,04		

Note: CB - control group before experiment; CA - control group after experiment

Table 2

Indicators of the pyo-physiological state of young rugby players of the experimental group before and after the experiment (n=10)

Name	Group	Statistical Displays				
		$\bar{x}$	S	m	t	p
Time of simple reaction, ms	EB	400,00	68,68	21,7	2,13	0,04
	EA	342,40	50,78	16,1		
Simple reaction, error, quantity	EB	1,00	1,15	0,37	0,00	0,99
	EA	1,00	1,63	0,52		
Time of simple reaction, mean square deviation, ms	EB	2,82	0,06	0,02	-0,05	0,96
	EA	2,82	0,09	0,03		
The time of the reaction of choice, ms	EB	470,80	15,43	4,88	2,47	0,02
	EA	453,80	15,40	4,87		
Reaction of choice, errors, quantity	EB	11,00	1,49	0,47	4,12	0,00
	EA	8,20	1,55	0,49		
The time of the reaction of choice, the mean square deviation, ms	EB	3,52	0,15	0,05	3,97	0,00
	EA	3,27	0,13	0,04		
The reaction time of the choice in the feedback mode, ms	EB	385,60	16,58	5,24	0,40	0,69
	EA	381,80	24,72	7,82		
Reaction selection in feedback mode, errors, number	EB	23,80	0,79	0,25	5,12	0,00
	EA	21,20	1,40	0,44		
The response time of the choice in the feedback mode, the mean square deviation, ms	EB	3,85	0,14	0,04	0,45	0,66
	EA	3,83	0,09	0,03		
Reaction selection in feedback mode minimum exposure time, ms	EB	340,00	37,71	11,9	1,22	0,24
	EA	320,00	35,28	11,2		
Reaction selection in feedback mode, total test run time, p	EB	89,00	2,40	0,76	0,39	0,70
	EA	88,40	4,30	1,36		
Reaction selection in feedback mode, exit time to minimum exposure, p	EB	65,00	20,22	6,39	0,74	0,47
	EA	59,80	9,37	2,96		
Dynamic choice reaction for 60 s (Ermakov test), quantity	EB	88,80	11,30	3,57	-1,15	0,27
	EA	94,40	10,51	3,32		
Dynamic choice reaction for 60 s (Ermakov's test), errors	EB	1,00	1,33	0,42	0,88	0,39
	EA	0,60	0,52	0,16		
The work time on Table 1 in the Schult test, s	EB	35,60	4,84	1,53	2,27	0,04
	EA	32,00	1,33	0,42		
The work time on Table 2 in the Schult test, s	EB	39,80	5,22	1,65	0,71	0,49
	EA	35,20	19,86	6,28		
Time worked on table 3 in the Schult test, s	EB	36,40	5,36	1,69	0,79	0,32
	EA	34,20	8,31	2,63		
The work time on Table 4 in the Schult test, s	EB	34,60	3,98	1,26	0,78	0,31
	EA	32,60	7,07	2,24		
The work time on table 5 in the Schult test, s	EB	49,80	12,75	4,98	2,07	0,04
	EA	39,20	9,96	3,15		
Efficiency of the Schultt test (c.u.)	EB	39,24	4,16	1,31	-0,34	0,74
	EA	35,04	6,64	2,10		
Degree of training on the Schultt test (c.u.)	EB	0,90	0,04	0,01	-0,77	0,33
	EA	0,91	0,01	0,04		
Mental Stability Test by Schult (c.u.)	EB	0,99	0,11	0,03	0,27	0,09
	EA	0,98	0,04	0,05		

Note: EB - experimental group before experiment; EA - experimental group after experiment

Discussion.

The hypothesis of this study on the positive influence of music on rugbystops' training was confirmed by the increase in the speed of complex reactions, the strength and mobility of the nervous system.

We explain the effectiveness of musical accompaniment by the fact that when using tools that activate the limbic system, namely, this kind of means is music, the body operates more economically by the addition of endorphins and the general influence of specially selected music, which is the basis of concentration on overcoming difficulties and performing hard work . Because of this, the athlete can perform more intensive work, and, moreover, recover faster after loads. Except for the mentioned action, application of musical support to athletes brings more pleasure than training "on a template", and therefore it is more effective. Listening to the music in the training process, when exercising, they could perform them longer, rather, for example: in running the tired signal that went into the brain, partly blocked by music, it distracted athletes from fatigue, and he could run more and more quickly ; Performing enthusiasm, the subjects made them more rigidly, overcame their fear, could do 2-3 times more repetitions in exercise.

It is entirely natural that a person achieves higher results when he is engaged in pleasure and concentrates on overcoming difficulties in performing hard work, which is the training process in the rugby for the development of special endurance. Therefore, the effect of using musical accompaniment was quite substantial even within three weeks.

In other tests, there were no significant changes. Therefore, we can conclude that the use of musical accompaniment primarily affects the strength and stability of the nervous system.

The developed technique of application of musical accompaniment is an effective, accessible and reliable means of improving the efficiency of the training process of rugby players aged 16-17 years. Mainly, this technique affects mental endurance, the reaction rate in different signaling modes, the strength and strength of the nervous system. All these qualities of the nervous system are required for success in all situational sports, among others, and in rugby.

The findings are consistent with studies on the psychophysiological mechanisms of the influence of music on performance (Aslett, Van der Merwe, & Kruger, 2017; Brown, Viljoen, Lambert, Readhead, Fuller, Van Mechelen, & Verhagen, 2015; Cheng, Pegg, & Stebbins, 2016). The effectiveness of the use of musical accompaniment, we explain by the fact that with the use of funds that activate the limbic system, the body works more economically through additional isolation of endorphins and the general influence of specially selected music. This helps to concentrate on overcoming difficulties and doing hard work. Due to this, the athlete can perform work with greater intensity, and, in addition, recover faster after loads. Confirmed also the data of Aslett, Van der Merwe, Kruger, 2017, Elvers, Steffens, 2017; Hallett, Lamont, 2017; Khazdozi, Bahari, Ashayeri, 2017) that the use of musical accompaniment to the athletes themselves brings more pleasure than training "by template", and therefore is more effective.

In our study, the positive influence of music on the psychophysiological state of athletes was revealed. The data obtained by us argue and quantify the effectiveness of using music during warm-up and during exercises aimed at developing strength, general and special endurance of rugby players. Thus, the data obtained by us are new in comparison with the data of other authors.

The technique of hanging up a music channel with a spoiler is effec- tive; it is efficient, accessible, and superfluous, thanks to the efficiency of the training process of regents 16-17 rock. The head ranks, given the method vplyvaє psihichnu vitrivali, shvidkist retsiiї in the riznyh modes of giving a signal, stikisti and force nervovoyї sistemi. All the components of the nervous system are obovvjazkimi for uspishnosti at vsih situatsionnyh types of sports, in numbers, and in regby.

Conclusions

1. The technique of musical accompaniment on trainings of rugby players of 16-17 years has been developed and its implementation in practice of the initial training process is grounded;

2. The influence of the accompaniment of music on the psycho-physiological state of rugby players of 16-17 years is determined.

3. The positive influence of the use of art on the quality of the training process of young rugby players 16-17 years is determined. The method of musical accompaniment offered in the work allows for a short period of time to effectively increase the mental performance of rugby players aged 16-17 years.

Conflict of interest. The authors state that there is no conflict of interest.

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