

Possible effective use of Kangoo Jump complexes during the physical education of young students.

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Abstract: The article is devoted to the search of the new, modern and effective methods for conducting the physical education classes for the students. The effectiveness of these methods is determined by an increase in the level of the development of the basic physical qualities and an increase in the volume of the motor activity of those who are engaged in it. The possibility of using the Kangoo Jumps exercise complexes on the physical education classes with the female students with an experience in aerobic exercise is considered. In the course of the studies a significant ($P < 0,05$) increase in the rates of the girls' development of speed and endurance using Kangoo Jumps was found. The indices of the development of the muscle strength and flexibility in the experimental and control girls' groups increased slightly. The average body weight of the girls under study did not undergo significant changes during the study. You can recommend Kangoo Jumps exercises for the physical activity to people who have experience in step aerobics.

Key words: Students; physical education; physical activity; fitness aerobics; Kangoo Jumps; step aerobics; functional state.

Introduction

It is generally agreed today and the specialists say that regular physical activity has a positive effect on the level of physical and mental health of the schoolchildren and students and it allows to the young people to improve their academic achievement (Donnelly, Hillman, et al., 2016; Shook, 2016). The studies show that students with a high level of physical activity demonstrate higher academic achievement than their fellow students who do not exercise regularly (Pellicer-Chenoll, Garcia-Masso, Morales, et al., 2015). Unfortunately, the recent scientific studies show that most of today's young people (60-75%) do not meet the health requirements in terms of the required level of the daily physical activity (Armstrong, 2012). This is primarily due to a lack of knowledge and an underestimation of the role of physical activity in preserving the health of the modern students (Keating, et al., 2009). The article deals with the results of the student surveys which indicate that the level of their daily physical activity and the level of theoretical knowledge about maintaining health are low (Sultoni, et al., 2017). However, the scientists note that the level of the theoretical and practical preparedness of many teachers in matters related to the inclusion of fitness components in the program of physical education with the students is insufficient (Eastham, 2009). The lack of daily physical activity of the modern youth is a rather negative fact as physical activity is one of the main means of preventing obesity (Salimin, Elumalai, Shahril, et al., 2015). Moreover, the physicians note a significant increase in the number of the young people who have indicators of the excessive body mass index or obese (Gaetano, 2016; Peshkov, & Sharaykina, 2014). All conditions should be created for the modern young people to spend most of their free time in active movement rather than in front of their computer screens to successfully combat these diseases (Kudryavtsev, Kramida, & Osipov, 2016). However, the level of motivation of the modern students for active and regular exercise is rather low (Osipov, Vonog, Prokhorova, et al., 2016). The dissatisfaction of the majority of the students with the standard programs of physical education of young people in schools is revealed. Therefore, the experts believe that the quality physical education programs for the trainees should contribute to the formation of young people's need for active movement (Bott, & Mitchell, 2015). The need to introduce changes in the standards of higher education that are associated with the increase in the overall level of the culture of health of the students and university professors and the increase in the level of motor activity of the participants in the educational process is underlined by the various scientists (Osipov, Kudryavtsev, Fedorova, et al., 2017, Iermakov, Cieřlicka, & Muszkieta, 2015).

We can say about the need to develop new and high-quality physical education programs faster for the young people that allow them to maintain the optimal level of the motor activity and contribute to increasing the motivation of the modern youth for the regular exercise as the specialists pay attention to it (Ennist, 2017, Osipov, Starova, Malakhova, et al., 2016; Mayorga-Vega, et al., 2016). Besides, the Russian specialists note that today in the most Russian universities there is a need to form a stable need for the physical activity among the female students (Trukhachev, Osychenko, & Skripkin, 2015). Furthermore, C. Ennist believes that the use of

sports and dance movements will contribute significantly to improving the quality of the physical education programs (Ennist, 2017). The experts note that the youth-friendly types of fitness will help to avoid the development of cardiovascular diseases, mental disorders, obesity and disorders of musculoskeletal functions of the young people regardless of their sex (Liusnea, 2016, Ghorbani, et al., 2014, Bahram, Akkasheh, & Akkasheh, 2014; Fomenko, O., 2014).

Today, in many Russian universities the physical education takes the form of sports specializations (Osipov, Vonog, Prokhorova, et al., 2016). The specialists recommend an aerobic for the girls training sessions predominantly. There is a reliable dynamics of the positive effect of the regular aerobic exercise on the level of physical development, functional state and psycho-emotional state of the practitioners (Yarmak, Galan, Hakman, et al., 2017). The most consistent with these recommendations is the specialization - fitness aerobics. Besides, the studies have shown that regular fitness aerobics classes contribute to improving the level of the preparedness of the female students for their future work (Vapaeva, Osipov, & Guralev, 2013). In addition, a high level of motivation of girls for fitness aerobics was discovered (Ružbarská, & Bečáková, 2016). The young girls believe that different dance movements will help to improve their physical attractiveness (Petrova, Pronina, Baron, et al., 2016). One of the most popular areas of fitness aerobics for the female students is step aerobics (Trukhachev, Osychenko, & Skripkin, 2015). It is a well-known fact that this type of fitness aerobics is the performance of dancing combinations (ligaments) on the step-platforms of the various heights with the simultaneous movements of hands and body (Barybina, et al., 2012). At the same time, the new types of fitness for the young people which will help to improve the quality of physical education of the students. According to the authors of the article one of these kinds is Kangoo Jumps. This kind of physical activity is the performance of various movements in special shoes - Kangoo Jumps boots.

The main attention of specialists is now paid to the search for Kangoo Jumps which is a system of exercises recommended for usage by the different age groups of the population since it has been proven to reduce the negative impact on diarthroses when performing jump exercises in Kangoo Jumps boots (Oliveira, et al., 2014). It has been proven that jumping in Kangoo Jumps boots has a positive effect on the isokinetic strength of the bone mass of the lower extremities of the body (Nicholson, Norris, et al., 2008). There are studies that prove the effectiveness of using Kangoo Jumps to increase the level of psychological well-being and reduce the symptoms of the depression and anxiety (Baltaretu, 2015). Moreover, the specialists in the field of medicine also recommend Kangoo Jumps of the physical exercises for the people of different ages with the condition of compliance with the requirements for a certain setting of the feet when jumping (Dimitru, 2014). It should be noted that the implementation of Kangoo Jumps movements can cause some difficulties for the beginners and people who do not have an experience in aerobics. The difficulties can be related to the problem of keeping a stable balance in Kangoo Jumps boots and performing some dance moves. The optimal effect from the exercises of Kangoo Jumps can get people who already have had an experience in Kangoo Jumps boots or engaged in fitness aerobics for a long time.

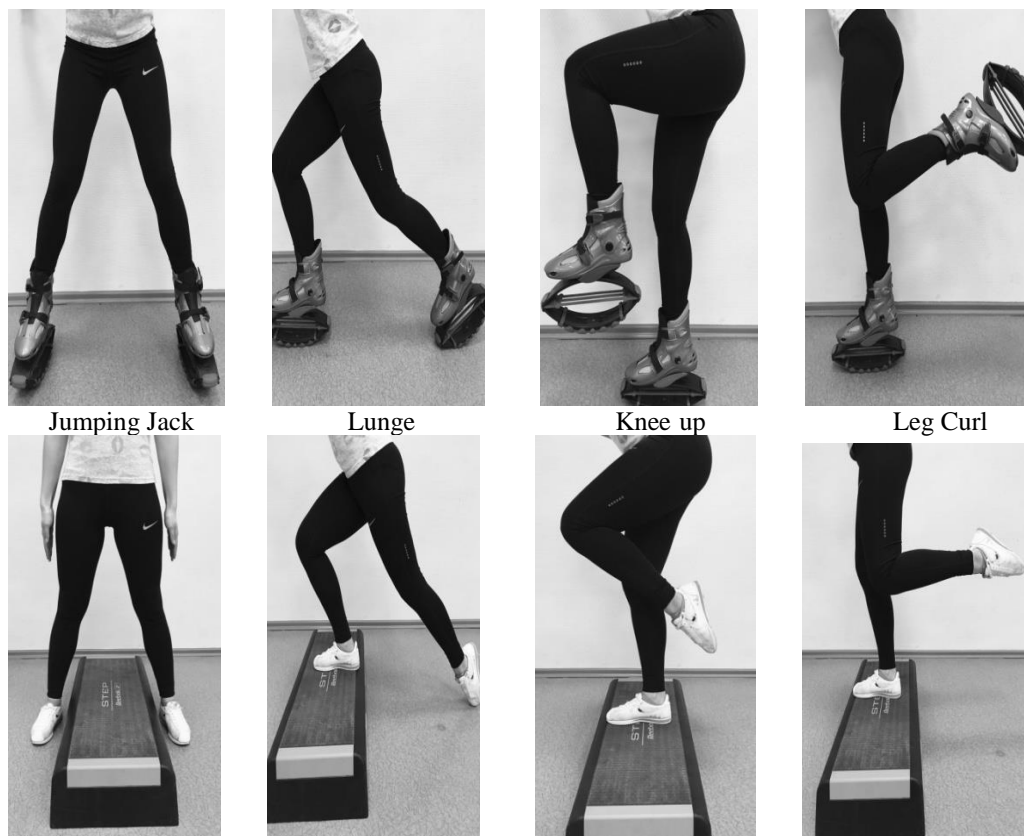
Noticeable that the authors suggested it is possible to improve the quality of fitness aerobics classes with female students when using Kangoo Jumps exercise complexes for the girls who have an experience in step aerobics. The purpose of the research is to identify the possibility of effective application of Kangoo Jumps complexes on the physical education classes with the female students in comparison with other types of fitness (step aerobics).

Material & methods

Perhaps we should also point out the fact that the research was conducted on the basis of the Siberian Federal University (SFU) - one of the largest universities in the Russian Federation. The research period was during 1 academic year (2016-2017). Thirty girls-students took part in the studies. The age of the studied students was between 19-20 years. All the girls had no contra-indications for the physical training and sports and underwent a medical examination at the SFU clinic. All the examinees attended classes on the physical culture in the framework of sports physical education of the individual on the basis of students studying various sports and fitness. The female students studied step aerobics. Besides, the step aerobics classes with students are based on learning the combinations of basic steps with the musical accompaniment. The experts often say that an increase in the speed of the musical accompaniment, a change of the step height of the step-platforms, the involvement of combinations of steps of active movements with dumbbells of the different weights – 0,5 kg and higher are used to increase the intensity of the load (Beliak, & Zinchenko, 2014). The duration of fitness aerobics is between 60-70 minutes and twice a week. The students were divided into 2 equal groups. Group number 1 continued studies on the step-aerobics. Group number 2 was invited to conduct classes using the Kangoo Jumps exercises. The training sessions for the students of both groups consisted of a warm-up (5-10 minutes), the main part of the session (25-30 min), strength training (10-15 min) and a set of exercises aimed at improving flexibility (10 min). Such methodical construction is recommended by the different specialists. Moreover, the experts say that training sessions should last no more than 60 minutes. At this time, there is a warm-up - 10 minutes, aerobic training - 30-35 minutes, strength training - 10-15 minutes (Mustedanagić, Bratić, et al., 2016). It should be

noted that the warm-up, strength training and exercise complexes are aimed at developing the flexibility of the female students of both groups and were conducted in the same way. In the main part of the group number 1 (Step-aerobics) the girls were conducted classes on step-platforms and the female students from the group number 2 (Kangoo Jumps) were used Kangoo Jumps boots.

The basic movements from the step aerobics and Kangoo Jumps: Jumping Jack, Lunge, Knee up, Leg Curl are presented on the pictures below.



However, the test tasks were used to assess the level of the physical development of girls. The development of the muscle strength was estimated by the number of push-ups from the floor. Another good thing is the development of flexibility which was assessed by the results of the test - tilt forward sitting with the touch of the floor with their hands. Furthermore, the endurance indicators were determined by the results of overcoming the distance - 2000 m for a time. The development of speed-strength abilities was evaluated based on the results of overcoming the subjects distance - 100 m. The test-step - ergometry was used to assess the level of functional preparedness of girls. This test is the performance by the subjects of climbing on the steps of the different heights. In our case, the height of the step-platform was 33 cm. The ascent rate was set by a sound signal oriented to performing 120 ascents per minute. The test time is about 3 minutes. After the test, the girls determined the time period for restoring the cardiovascular system using the methodology of pulseometry. The pulse reading was determined immediately before the test, immediately after the end of the load and at each minute of the recovery period.

Moreover, the statistical analysis of test results was carried out with the help of automated programs for determining the reliability and statistical significance of the research results. In our studies we used the SPSS20 program. The reliability and statistical significance of the results was determined using the Mann-Whitney U-test. This test is a reliable tool for determining the reliability of differences in the values of the investigated parameters in small samples of the subjects.

Results

It is clear from these observations that the authors of the article suggested that the results of tests of the level of development of the basic physical qualities of the female students studied at the beginning of the research did not allow revealing significant differences in the level of physical and functional preparedness of the girls. The indicators of the development of physical strength, speed, flexibility and endurance of the female students of the studied groups were approximately the same.

At the end of the study, significant ($P < 0,05$) differences in the level of development of rapidity and endurance between the groups were found. The female students of the group №2 (Kangoo Jumps) showed the best results in the special control tests dedicated to the evaluation of the development of these indicators. For the students of this group the time to overcome the distance of 100 m reliably ($P < 0,05$) decreased on average from $16 \pm 0,48$ seconds to $15 \pm 0,26$ seconds. The time to overcome the distance of 100 m decreased only slightly from $16 \pm 0,96$ to $16 \pm 0,29$ seconds in a group 1 of the female students (Step aerobics). The time to overcome the distance of 2000 m for the female students of group No. 2 (Kangoo Jumps) significantly ($P < 0,05$) decreased on average from $11 \pm 0,43$ to $10 \pm 0,25$ minutes. The time to overcome this distance decreased only slightly from $11 \pm 0,87$ to $11 \pm 0,46$ minutes in group 1 of the female students (Step aerobics).

Moreover, the testimony test of the step-ergometry was approximately equal in the students of both groups at the beginning of the study. On average, the recovery time after the exercise for the girls was $3,51 \pm 0,57$ minutes. At the end of the study, the recovery time for the girls from the Kangoo Jumps group was significantly ($P < 0,05$) decreased from $3,52 \pm 0,07$ to $3,47 \pm 0,02$ minutes. The recovery time after a specific load for the girls from group No. 1 (Step aerobics) decreased slightly from $3,51 \pm 0,08$ to $3,49 \pm 0,06$ minutes but the differences in the results are not reliable. At the end of the study, there was no significant increase in the physical strength and flexibility of the female students in both groups compared with the data obtained at the beginning of the study. The results of the tests allow us to state that the level of development of the physical strength and flexibility of the girls under study is approximately the same.

It was revealed that the body mass index of the students of both groups during the period of the study increased only slightly in the girls group 1 (Step aerobics) from $53 \pm 0,74$ to $54 \pm 0,62$ kg and practically did not change in the girls group 2 (Kangoo Jumps). On the average, at the beginning of the study the body weight of girls from this group was $53 \pm 0,79$ kg and at the end of the studies was $53 \pm 0,75$ kg.

The results of the evaluation of the level of development of the basic physical qualities of the girls being who have been studied are presented in Table 1.

Table 1. The dynamics of indicators of the physical development and functional readiness of the female students who have being studied.

№	Indicators	Group № 1 (Step-aerobics)		Group №2 (Kangoo Jumps)	
		The beginning of the research	The ending of the research	The beginning of the research	The ending of the research
1	Physical strength	18±1,3	18±1,6	18±1,5	18±1,8
2	Speed	16±0,96	16±0,29	16±0,48	15±0,26*
3	Health-related fitness	11±0,87	11±0,46	11±0,43	10±0,25*
4	Dorsal spine mobility	20±0,34	20±0,48	20±0,47	20±0,69
5	Step-ergometry	3,51±0,08	3,49±0,06	3,52±0,07	3,47±0,02*
6	Body weight	53±0,74	54±0,62	53±0,79	53±0,75

Note – accuracy: * - $P < 0,05$

Discussion

Nevertheless, the scientists recommend that when planning the physical exercises to focus on the development of physical strength of the young men and the development of functionality (endurance) of the girls (Prusik, et al., 2013). At first glance, the fitness aerobics will be the best kind of physical activity for the female students (Fomenko, E., 2014). Unfortunately, the specialists note that due to the insufficient initial level of the functional preparedness of the majority of the female students it is recommended to use high-intensity occupations only in a rather limited amount. Increasing the pace of music and increasing the height of step-platforms is possible only for the training of the student sports teams of the fitness aerobics (Bryukhanova, et al., 2013). Most of those who have insufficient level of the physical and technical preparedness perform only a simplified program of dance movements. According to the simplified programs, the girls perform only basic steps without adding hand movements and climbing the step-platform (Barybina, et al., 2012). Thus, the level of functional fitness of the most girls attending aerobics classes at the universities is not significantly increased. The students should be invited to attend the additional classes with aerobic physical exercises to increase the level of functional preparedness. It has been revealed that the young people attending only compulsory physical education classes demonstrate significantly lower rates of cardiovascular development than their peers who attend additional physical education and sports or have a higher level of daily physical activity (Beets and Pitetti, 2005). At the same time, only a few female students can afford additional classes in fitness clubs. The relationship between the level of physical activity of the modern young people and the socio-economic status of their parents has been revealed (Finger, et al., 2014).

According to the scientific recommendations of health professionals each person should perform exercises for the development of all muscle groups about 2 or 3 times per week (Moses, et al., 2017). G. DeSimone states that the exercises should be aimed at the muscles of the upper and lower parts of the body: hands, shoulders, chest, press and leg muscles (DeSimone, 2016). The programs of various types of fitness

aerobics allow you to include both as the fitness training sessions so and the strength training and training to develop their flexibility. Therefore, the methodology used in the studies for Kangoo Jumps is in accordance with the modern scientific recommendations. The experts believe that the exercises include exercises for the development of all muscle groups, intense aerobic effects, exercises that promote the development of flexibility and mobility of the diarthroses. Besides, the scientists note that the assessment of the quality of teaching physical culture should be based on measuring the indicators of muscle strength, endurance, flexibility and functional status of the cardiovascular system (Chen, Mason, et al., 2016). Properly organized classes of Kangoo Jumps fully contribute to the development of these qualities of the students. Therefore, the use of Kangoo Jumps basic exercises allows improving the quality of the conducted classes.

Thus, it should be noted that the Kangoo Jumps boots are a rather significant obstacle to the application of Kangoo Jumps in the physical education of students. It is the large financial costs of buying and maintaining Kangoo Jumps boots that inhibit the massive spread of this fitness program in the educational institutions (Cosma, et al., 2015). Also the high cost of this footwear interferes with the scientific research in the field of studying the shock load on the diarthroses with fast walking, running and jumping (Pereira, Avila, & Palhano, 2015).

Conclusions

To draw the conclusion, the specialists in the field of health and physical education of the population claim that today it is necessary to search for the new, quality programs for the physical education of the schoolchildren and students in the period of their education. It should be noted that these programs should be based on evidence-based methods and provide the necessary physical activity to maintain a high level of health. According to the scientific recommendations, the programs should include exercises for all muscle groups which have a cardio-strength orientation and can be used 2-3 times per week. Thus, the authors believe that the program of physical activity of the female students on the basis of Kangoo Jumps movements fulfills all these requirements. Besides, a significant increase in the rates of development of speed and endurance of the female students who performed Kangoo Jumps complexes was found compared to the female students who were engaged in the step-aerobics. The exercises of Kangoo Jumps in combination with other types of cardio-strength training can be effectively used in the process of physical education of the student youth.

Conflicts of interest - If the authors have any conflicts of interest to declare.

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