EFFECTS OF AEROBICS ON PHYSICAL FITNESS OF FEMALE UNIVERSITY STUDENTS IN PHYSICAL EDUCATION

EFEITOS DA AERÓBICA NA APTIDÃO FÍSICA DAS UNIVERSITÁRIAS EM EDUCAÇÃO FÍSICA

EFECTOS DEL AERÓBIC EN LA APTITUD FÍSICA DE LAS ESTUDIANTES UNIVERSITARIAS DE EDUCACIÓN FÍSICA

Original Article
Artigo Original
Artículo Original

Fu Limin[1]
(Physical Education Professional)
Cui Jinghui[2]
(Physical Education Professional)

1. Hebei Sport University, Shijiazhuang, Hebei, China.
2. Hebei Normal University, School of Physical Education, Shijiazhuang, Hebei, China.

Correspondence:
Cui Jinghui
Shijiazhuang, Hebei, China. 050024.
jinghuicui@hebtu.edu.cn

ABSTRACT

Introduction: Aerobic gymnastics will be implemented in several universities' physical education elective course schedules due to its unique advantages, including lower physical environment demands and rapid applicability. Objective: Study the effects of physical training with aerobic gymnastics on the physical fitness of female university students. Methods: The controlled experiment was performed on female undergraduate students of the physical education course at a university. The volunteers were divided into a control group, subjected to the existing aerobics teaching plan, and the experimental group, which practiced an enhanced program compared to the existing aerobics teaching plan. The competitive aerobics physical training method, along with a 30-minute physical training plan, was performed in each class. Another course design and organization were performed according to the existing teaching plan. Results: The mean score of the experimental group before the experiment was 45.22; 49.36 in the second week; 55.22 in the fourth week, 62.89 in the sixth week, 70.2 at the eighth week, and 76.73 at the end of 10 weeks of training. Conclusion: The aerobic physical training program proposed in this work presented a better effect on the fitness gain of female university students. ***Level of evidence II; Therapeutic studies - investigation of treatment outcomes.***

Keywords: Students; Universities; Physical Education and Training; Gymnastics.

RESUMO

Introdução: A ginástica aeróbica será implementada na grade de cursos eletivos de educação física em várias universidades devido a suas vantagens singulares que incluem menores exigências do ambiente físico e rápida aplicabilidade. Objetivo: Estudar os efeitos do treinamento físico com a ginástica aeróbica sobre a aptidão física das estudantes universitárias. Métodos: O experimento controlado foi executado em universitárias do curso de educação física de uma universidade. As voluntárias foram divididas em grupo controle, submetido ao plano de ensino de aeróbica existente; e o grupo experimental, que praticou um programa aperfeiçoado em relação ao plano de ensino de aeróbica existente. O método de treinamento físico em aeróbica competitiva, juntamente a um plano de treinamento físico de 30 minutos foi realizado em cada aula. Outro projeto e organização do curso foram realizados de acordo com o plano de ensino existente. Resultados: A pontuação média do grupo experimental antes do experimento foi de 45,22; 49,36 na segunda semana; 55,22 na quarta semana, 62,89 na sexta semana, 70,2 na oitava semana e 76,73 ao final de 10 semanas de treinamento. Conclusão: O programa de treinamento físico aeróbico proposto neste trabalho apresentou um melhor efeito sobre o ganho da aptidão física das universitárias. ***Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.***

Descritores: *Estudantes; Universidades; Educação Física e Treinamento; Ginástica.*

RESUMEN

Introducción: La gimnasia aeróbica será implementada en la programación de cursos electivos de educación física en varias universidades debido a sus ventajas únicas que incluyen menores exigencias del ambiente físico y rápida aplicabilidad. Objetivo: Estudiar los efectos del entrenamiento físico con gimnasia aeróbica en la aptitud física de estudiantes universitarias. Métodos: El experimento controlado se realizó en estudiantes universitarias del curso de educación física de una universidad. Los voluntarios se dividieron en un grupo de control, sometido al plan de enseñanza de aeróbic existente; y el grupo experimental, que practicó un programa mejorado en relación con el plan de enseñanza de aeróbic existente. El método de entrenamiento físico en aeróbic de competición, junto con un plan de entrenamiento físico de 30 minutos, se llevó a cabo en cada clase. El diseño y la organización de otro curso se llevaron a cabo de acuerdo con el plan de enseñanza existente. Resultados: La puntuación media del grupo experimental antes del experimento era de 45,22; 49,36 en la segunda semana; 55,22 en la cuarta semana, 62,89 en la sexta semana, 70,2 en la octava semana y 76,73 al final de las 10 semanas de entrenamiento. Conclusión: El programa de entrenamiento físico aeróbico propuesto en este trabajo presentó un mejor efecto en la ganancia de la aptitud física de las estudiantes universitarias. ***Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.***

Descriptores: *Estudiantes; Universidades; Educación y Entrenamiento Físico.*

DOI: http://dx.doi.org/10.1590/1517-8692202329012022_0721 Article received on 11/30/2022 accepted on 12/08/2022

INTRODUCTION

In the contemporary era, college students' diet and lifestyle are constantly changing, and their physical fitness is declining year by year, which has become a rule and normalization.[1] Therefore, it is important to focus on the physical development of college students, which is conducive to the development of the modernization of education and the goal of improving and establishing human resources to strengthen the country.[2] Aerobics is a very good aerobic exercise. It combines dance and gymnastics better through music. Now it has been widely promoted to physical education classes in many schools.[3] Aerobics is a kind of sport that can exercise the whole body. With the accompaniment of music, it can not only achieve the effect of shaping the body, but also can cultivate people's sentiments. While achieving the effect of fitness and bodybuilding, it can also improve the aesthetic ability, which is popular among college students.[4] Through physical training, this paper studies the complete set of aerobics movements in a relaxed and cheerful classroom atmosphere to achieve the effect of physical training, which can well stimulate college students' interest in sports.[5] According to the different experimental objects, according to their own characteristics to design related training content and training intensity, can improve the comprehensive physical fitness of college students. In order to improve the physical quality of students, change the traditional teaching mode, implement diversified teaching activities, and increase the elective teaching of various physical education courses, students can choose the courses they are interested in according to their own interests.[6] In the aspect of curriculum design, aerobics has become a course that will be set up in the elective courses of physical education in various schools because of its advantages such as less requirements for venues and faster entry.[7] This paper chooses female college students in aerobics elective class of a university to study the effect of physical training on aerobics performance.

METHOD

Table 1 shows the basic information of the two groups of female college students. The study and all the participants were reviewed and approved by Ethics Committee of Hebei Sport University(NO.2020HBSUTZ069). It can be seen from the table that the average age of the experimental group is 20.919 years old, the average height is 162.521cm, and the average weight is 53.753kg. The average age of the control group was 21.776 years, the average height was 166.166cm, and the average weight was 53.402kg. The basic conditions of the two groups of subjects are not different, which will not interfere with the experimental results.

The experiment was conducted in a controlled way. The control group was conducted according to the existing aerobics teaching plan, and its training program was consistent with the previous aerobics teaching. The experimental group improved the existing aerobics teaching plan, introduced the physical training method in competitive aerobics, combined with the actual situation of female college students, reduced the difficulty of movement, reduced the movement load, and designed an improved version of aerobics physical education plan. Other exercises of the experimental group and the control group in the aerobics elective course, such as aerobics action teaching, planning node arrangement, etc., were kept consistent, and only different programs were selected for physical training. A 30 minute physical training plan will be carried out in each class, and other courses will be designed and arranged according to the existing teaching plan, so as to achieve the goal of controlling variables.

Table 1. Overview of two groups of female college students.

Group	Experience group	Control group
Age	20.919±0.419	21.776±0.698
Height	162.521±2.666	166.166±3.243
Weight	53.753±5.496	53.402±2.096

RESULTS

Effect of physical training on college students' sports indicators

As shown in Table 2, the average running time of the control group within 50m before the experiment was 9.907s, which was shortened to 8.263s after the experiment; The average vital capacity before the experiment was 2248.762 ml, which was increased to 2876.836 ml after the experiment; The average running time of 800m before the experiment was 256.924s, which was shortened to 232.666s after the experiment; Before the experiment, the average number of sit ups was 27.559, and after the experiment, it increased to 48.469; Before the experiment, the average distance of standing long jump was 156.579 cm, and after the experiment, it rose to 186.132 cm; The average forward bending distance of the sitting body before the experiment was 4.889 cm, and it was 20.808 cm after the experiment. It can be seen from the comparison before and after the group that the existing aerobics fitness training can shorten the running time, improve the running speed and the core strength of college students, and has a certain role in improving the physical fitness of college students.

As shown in Table 3, the average running time of the experimental group within 50m before the experiment was 9.739s, which was shortened to 7.856 after the experiment; The average vital capacity before the experiment was 2221.132 ml, which was increased to 3282.884 ml after the experiment; The average running time of 800m before the experiment was 259.140s, which was shortened to 205.489s after the experiment; The average number of sit ups before the experiment was 27.967, which was increased to 54.584 after the experiment; The average distance of standing long jump before the experiment was 158.286cm, and it was increased to 205.628cm after the experiment; The average distance of forward bending of the sitting body before the experiment was 3.481 cm, and it was 21.578 cm after the experiment. It can be seen from the intra group comparison that the physical fitness training proposed in this paper can significantly improve the physical fitness related indicators of college students in the experimental group. It can

Table 2. The Effect of Aerobics Training on the Sports Indexes of College Students in the Control Group.

Test items of control group	Before experiment	After experiment	P
50m running time (s)	9.907±0.488	8.263±0.120	<0.05
Vital capacity (ml)	2248.762±384.820	2,876.836±251.866	<0.05
800m running time (s)	256.924±13.864	232.666±7.904	<0.01
Number of sit ups	27.559±4.769	48.469±4.786	<0.05
Distance of standing long jump (cm)	156.579±5.209	186.132±5.367	<0.05
Forward bending distance of sitting body (cm)	4.889±4.047	20.808±1.129	<0.05

Table 3. The Influence of Physical Training on the Sports Indexes of College Students in the Experimental Group.

Test items of control group	Before experiment	After experiment	P
50m running time (s)	9.739±0.558	7.856±0.209	<0.05
Vital capacity (ml)	2221.132±335.723	3282.884±161.785	<0.05
800m running time (s)	259.140±11.091	205.489±4.438	<0.01
Number of sit ups	27.967±5.691	54.584±2.348	<0.05
Distance of standing long jump (cm)	158.286±6.482	205.628±5.670	<0.05
Forward bending distance of sitting body (cm)	3.481±3.718	21.578±2.076	<0.05

be seen from the inter group comparison between the experimental group and the control group that the physical fitness training program proposed in this paper can improve the physical fitness indicators of college students better than the control group.

Effect of physical training on college students' FMS indicators

In order to explore the effect of related training on the sports risk mitigation of college students, the FMS index was selected as a test.

As shown in Table 4, the average score of the control group's squat test before the experiment was 1.539 points, which was improved to 1.923 points after the experiment, the average score of the hurdle step test before the experiment was 1.216 points, and the average score of the experiment after the experiment was 1.472 points, the average score of the straight lunge test before the experiment was 1.210 points, and the average score of the experiment after the experiment was 1.458 points, the average score of the shoulder flexibility test before the experiment was 1.292 points, and the average score of the experiment after the experiment was 1.595 points, and the average score of the initiative lifting test before the experiment was 1.539 points, After the experiment, it rose to 1.699 points. Before the experiment, the average score of body control push up test was 1.656 points. After the experiment, it rose to 1.691 points. Before the experiment, the average score of rotation stability test was 1.292 points. After the experiment, it rose to 1.595 points. Before the experiment, the average total score was 9.798 points. After the experiment, it rose to 11.427 points. The experimental results show that the existing aerobics training can improve the FMS test results of the control group of college students to a certain extent, and reduce the sports risk in the training process.

As shown in Table 5, the average score of the squat test of the experimental group before the experiment is 1.312 points, which is increased to 2.371 points after the experiment, the average score of the hurdle step test before the experiment is 1.216 points, which is increased to 1.933 points after the experiment, the average score of the straight lunge test before the experiment is 0.883 points, which is increased to 2.248 points after the experiment, the average score of the shoulder flexibility test before the experiment is 1.516 points, which is increased to 2.495 points after the experiment, and the average score of the active lifting test before the experiment is 1.421 points, After the experiment, it rose to 2.147 points. Before the experiment, the average score of body control push up test was 1.547 points. After the experiment, it rose to 2.359 points. Before the experiment, the average score of rotation stability test was 1.186 points. After the experiment, it rose to 2.383 points. Before the experiment, the average total score was 9.19 points. After the experiment, it rose to 15.925 points.

Through intra group comparison, it can be seen that the physical training proposed in this paper can optimize the FMS indicators of the experimental group of college students, significantly improve the total score, and greatly reduce the risk of sports injury during the exercise process. Through the comparison between groups, it can be seen that compared with the traditional aerobics training, the physical training optimized in this paper has a better effect of reducing risks, can more effectively reduce the occurrence of teaching accidents, and create a safe teaching environment for teachers and students.

Table 5. Effect of physical training on FMS indexes of experimental group college students.

Test items of control group	Before experiment	After experiment	P
Squat test	1.312±0.498	2.371±0.498	<0.01
Hurdle step test	1.216±0.679	1.933±0.662	<0.05
Straight Lunge Test	0.883±0.593	2.248±0.451	<0.01
Shoulder flexibility test	1.516±0.534	2.495±0.520	<0.01
Active lifting test	1.421±0.705	2.147±0.337	<0.05
Body control push up test	1.547±0.525	2.359±0.509	<0.01
Swivel stability test	1.186±0.682	2.383±0.493	<0.01
Total score	9.190±4.159	15.925±3.370	<0.05

Table 4. The Effect of Aerobics Training on the FMS Indexes of College Students in the Control Group.

Test items of control group	Before experiment	After experiment	P
Squat test	1.539±0.879	1.923±0.599	>0.05
Hurdle step test	1.216±0.679	1.472±0.523	>0.05
Straight Lunge Test	1.210±0.871	1.458±0.742	>0.05
Shoulder flexibility test	1.292±0.716	1.595±0.716	>0.05
Active lifting test	1.539±0.857	1.699±0.716	>0.05
Body control push up test	1.656±0.705	1.691±0.719	>0.05
Swivel stability test	1.292±0.723	1.595±0.716	>0.05
Total score	9.798±5.363	11.427±3.370	>0.05

DISCUSSION

In order to improve the ability of aerobics athletes to take in oxygen in muscle, we should not only pay attention to the ability training of aerobic function, but also continue to expand the training of anaerobic feeding ability. We can use the mode of gradually increasing difficulty of functional training as the training mode of athletes. Functional training takes core strength training as an important content. Its core part is the center of the body, which plays a very important role in coordinating the movement of the upper and lower limbs and transmitting strength. With the continuous development of competitive aerobics, the requirements for the core strength of athletes are also gradually improving. In the process of completing a whole set of movements, the center of gravity of athletes fluctuates greatly, which requires not only the core strength of athletes but also rapid explosive force. Therefore, in the daily training process, the training of the core can not be ignored. It is necessary to use some auxiliary equipment to train the core during the training process, so as to improve the strength of the core of athletes. This can maximize the core strength of athletes, and can complete some difficult and complex movements in competitive aerobics. Strength training also plays a very important role in the special quality training of competitive aerobics athletes. Competitive aerobics requires athletes to have strength, muscle explosive force and muscle endurance. Only such strong strength can ensure that athletes can successfully complete difficult movements, perform some skills, lift and other movements. Competitive aerobics also requires flexibility. With the constant change of competition rules, the training standards need to be more and more perfect, requiring athletes to have stronger competitive ability, which requires athletes to have good flexibility. As a new training system, functional training not only combines the traditional training mode and special training mode, but also fully displays the physical quality of athletes in the process of competition, and constantly improves the athletes' physical quality from general to special, and the quality score of completing difficult movements in competitive aerobics, In fact, to a certain extent, it depends on the flexibility of athletes. Beautiful and difficult movements require competitive aerobics athletes to constantly enhance their balance ability. Under unstable conditions, functional training for athletes can improve their balance ability and maintain stability in the competition.

CONCLUSION

Aerobics is an activity that can provide good experience for athletes of different sports levels. It is a popular course in the teaching of

sports elective courses, but the existing aerobics teaching courses are not effective enough, so it needs to be further optimized. This paper draws experience from the training program of professional competitive aerobics athletes, designs the aerobics physical fitness training program and conducts experiments. The results show that the aerobics fitness training program proposed in this paper is worth popularizing.

All authors declare no potential conflict of interest related to this article

AUTHORS' CONTRIBUTIONS: The author has completed the writing of the article or the critical review of its knowledge content. This paper can be used as the final draft of the manuscript. Every author has made an important contribution to this manuscript. FU Limin and CUI Jinghui: writing and execution.

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