

EFFECT OF BALANCE TRAINING ON AEROBICS TEACHING FOR UNIVERSITY STUDENTS



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EFEITO DO TREINAMENTO DE EQUILÍBRIO NO ENSINO DE AERÓBICA PARA UNIVERSITÁRIOS

EFFECTO DEL ENTRENAMIENTO DE EQUILIBRIO EN LA ENSEÑANZA DEL AERÓBIC A ESTUDIANTES UNIVERSITARIOS

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ABSTRACT

Introduction: Among the known benefits of aerobics gymnastics are flexibility, motor coordination improvement, weight loss, and balance improvement. The balance capacity is very important for aerobics students, and it is believed that introducing a complementary protocol can bring greater benefits to the performance of its practitioners. **Objective:** Explore the effects of balance training on university students practicing aerobics. **Methods:** A 9-week experiment was conducted employing 100 college aerobics students. The volunteers were divided into two groups without statistical differences. Balance training was added to the experimental group, while the control group remained with daily teaching practice. **Results:** The push-up score increased from 2.27 ± 0.45 to 2.73 ± 0.46 , the body rotation score was from 1.87 ± 0.35 to 2.40 ± 0.51 , and the squat score was from 2.53 ± 0.52 to 3.03 ± 0.30 . While the aerobic ability of college students in the experimental group was effectively improved, no significant changes were observed in the control group data. **Conclusion:** Balance training can effectively improve college students' ability, leading to improvement in teaching aerobics to college students. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

Keywords: Physical Education and Training; Gymnastics; Postural Balance; Students.

RESUMO

Introdução: Entre os benefícios da ginástica aeróbica conhecidos estão a flexibilidade, aprimoramento da coordenação motora, perda de peso, e a melhora no equilíbrio. A capacidade de equilíbrio é muito importante para os estudantes de aeróbica e acredita-se que a introdução de um protocolo complementar possa trazer maiores benefícios no desempenho de seus praticantes. **Objetivo:** Explorar os efeitos do treinamento de equilíbrio em estudantes universitários praticantes de aeróbica. **Métodos:** Uma experiência de 9 semanas foi realizada empregando 100 estudantes universitários de aeróbica, os voluntários foram divididos em dois grupos sem diferenças estatísticas. Ao grupo experimental foi adicionado um treino de equilíbrio, enquanto o grupo de controle permaneceu com a prática de ensino cotidiana. **Resultados:** A pontuação no push-up elevou-se de $2,27 \pm 0,45$ para $2,73 \pm 0,46$, a pontuação da rotação corporal foi de $1,87 \pm 0,35$ para $2,40 \pm 0,51$, e a pontuação em agachamento foi de $2,53 \pm 0,52$ para $3,03 \pm 0,30$. Enquanto a habilidade aeróbica dos estudantes universitários no grupo experimental foi efetivamente aperfeiçoada, não foram observadas alterações significativas nos dados do grupo de controle. **Conclusão:** O treinamento de equilíbrio pode efetivamente melhorar a habilidade dos estudantes universitários, conduzindo à melhoria do processo de ensino de aeróbica para universitários. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores: Educação Física e Treinamento; Ginástica; Equilíbrio Postural; Estudantes.

RESUMEN

Introducción: Entre los beneficios conocidos de la gimnasia aeróbica están la flexibilidad, mejora de la coordinación motora, pérdida de peso, y el progreso en el equilibrio. La capacidad de equilibrio es muy importante para los alumnos de aeróbic y se cree que la introducción de un protocolo complementario puede aportar más beneficios en el rendimiento de sus practicantes. **Objetivo:** Explorar los efectos del entrenamiento del equilibrio en estudiantes universitarios que practican aeróbic. **Métodos:** Se realizó un experimento de 9 semanas en el que participaron 100 estudiantes universitarios de aeróbic, los voluntarios se dividieron en dos grupos sin diferencias estadísticas. Se añadió entrenamiento de equilibrio al grupo experimental, mientras que el grupo de control permaneció con la práctica docente diaria. **Resultados:** La puntuación de la flexión de brazos aumentó de $2,27 \pm 0,45$ a $2,73 \pm 0,46$, la puntuación de la rotación corporal fue de $1,87 \pm 0,35$ a $2,40 \pm 0,51$, y la puntuación de la sentadilla fue de $2,53 \pm 0,52$ a $3,03 \pm 0,30$. Mientras que la capacidad aeróbica de los estudiantes universitarios del grupo experimental mejoró eficazmente, no se observaron cambios significativos en los datos del grupo de control. **Conclusión:** El entrenamiento del equilibrio puede mejorar eficazmente la capacidad de los estudiantes universitarios, lo que conduce a la mejora del proceso de enseñanza del aeróbic para estudiantes universitarios. **Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.**

Descriptor: Educación y Entrenamiento Físico; Gimnasia Equilibrio Postural; Estudantes.



INTRODUCTION

The teaching process of aerobics is an important part of all physical education teaching. It not only requires students to improve their skills and skills in aerobics, but also needs to improve their participation under the guidance of all teachers.¹ In order to enable students to actively acquire calisthenics knowledge and develop physically and mentally in the teaching process of calisthenics, it is also necessary to continuously improve students' ideological and moral character and aesthetic awareness. Only by constantly following every principle and rule in the process of aerobics teaching can we complete the task in all teaching.²

Equilibrium can also be divided into three types: stable equilibrium, unstable equilibrium and random equilibrium. Dynamic and static balance are also two main training methods. If there is no external force, people's body will maintain static balance and can keep the body in a stable state.³ If the original body balance of aerobics athletes is broken under the action of external forces, then athletes need to constantly improve their sports knowledge to maintain a new balance. This ability is called dynamic balance. Of course, there are many factors that affect balance training. The most important factors are cerebellar dysfunction, visual impairment, and the decline of muscle endurance.⁴ In the training of balance ability, if the joint proprioception of aerobics scholars is not enough, it is necessary to strengthen the stimulation of postural reflex so as to improve the pathological changes of nervous system and other organs. At any time, the balance ability of aerobics trainers needs to start from static training.⁵ The purpose is to train the balance ability in each standing position. In order to adjust the training posture for the scholars themselves, each time they stand, they need to change from multiple groups to single groups, and gradually reduce the training support surface. In the process of training, the body focus of aerobics scholars will gradually be carried out from low to high in order.⁶ In the dynamic balance training, aerobics athletes need to pay attention to protect themselves, and coaches should also explain all the training items to the students before the training starts, so as not to make the scholars feel fear, and also not to produce fatigue. Through a series of research experiments, this paper further discusses whether the teaching effect of college students' aerobics can improve their balance ability.⁷

METHOD

Research object

The subjects of this study are 100 college aerobics students. The experimental period is 9 weeks. Before the experiment, the physical indicators of the students participating in the experiment have been accurately measured. The study and all the participants were reviewed and approved by Ethics Committee of Jinzhong University (NO.JZUST056Z). The physical quality of the 100 subjects is not significantly different, and their physical indicators meet the standards of this experiment. The aerobics students who participated in this experiment did not have any professional balance ability training before. During the experiment, the subjects kept the same working time and eating habits as usual.

Experimental method

In this experiment, 100 college students participating in the experiment were randomly divided into two groups: the experimental group and the control group. During the experiment, the members of the experimental group were trained in balance ability, while the control group was only trained in normal aerobics. During the experiment, the balance ability of the experimental object was continuously measured through the eight-point star offset balance, including the balance ability index data of eight directions on the left and right feet.

RESULTS

Effect of balance ability training on college students' balance ability

By measuring and comparing the left foot support of college students in the experimental group and the control group, the details are shown in Table 1.

Before the experiment, the front orientation of the left foot support in the control group was 69.472 ± 7.384 , and after the experiment, the data changed to 75.023 ± 9.700 . Before the experiment, the right front orientation of the left foot support in the control group was 76.478 ± 8.500 , and after the experiment, the data changed to 80.883 ± 8.815 . Before the experiment, the right orientation of the left foot support in the control group was 89.165 ± 6.994 , and after the experiment, the data changed to 94.194 ± 7.533 . Before the experiment, the right rear orientation of the left foot support in the control group was 99.687 ± 6.464 , and after the experiment, the data changed to 108.335 ± 8.780 . Before the experiment, the rear orientation of the left foot support in the control group was 109.480 ± 9.382 , and after the experiment, the data changed to 113.822 ± 10.413 . Before the experiment, the left rear orientation of the left foot support in the control group was 99.111 ± 14.144 , and after the experiment, the data changed to 103.666 ± 8.704 . Before the experiment, the left orientation of the left foot support in the control group was 76.963 ± 14.516 , and after the experiment, the data changed to 81.894 ± 9.859 . Before the experiment, the left front orientation of the left foot support in the control group was 62.752 ± 7.074 , and after the experiment, the data changed to 66.753 ± 6.692 .

By comparing the specific data changes of the balance ability of college students in the experimental group and the control group, as well as the P value difference standard, it can be seen that the P value of each index in the experimental group is less than 0.05, indicating that the difference of each index in the experimental group after the balance ability training is significant. Especially the rear orientation and left rear orientation of the left foot support. Although there are differences in the indicators of the control group, they are not as obvious as those of the experimental group. Therefore, it can be concluded that the balance ability training has an obvious effect on improving the left foot support of aerobics college students.

As shown in Table 2, the changes of various indicators of the right foot support of the experimental group and the control group before and after the experiment.

Table 1. The influence of balance ability training on college students' balance ability -- left foot support.

Position	Before experiment	After experiment	p
Experience group			
Front	66.975±7.131	77.110±7.601	0.0237
Right front	74.756±6.942	83.918±8.418	0.0222
Right	86.893±7.611	96.991±8.886	0.0221
Right rear	98.493±7.889	113.045±9.260	0.0139
After	109.379±9.849	118.866±9.258	0.0073
Left rear	100.475±9.629	106.999±9.563	0.0033
Left	72.169±7.871	82.248±11.431	0.0289
Left front	61.739±8.108	67.817±7.482	0.0191
Control group			
Front	69.472±7.384	75.023±9.700	0.0186
Right front	76.478±8.500	80.883±8.815	0.0156
Right	89.165±6.994	94.194±7.533	0.0229
Right rear	99.687±6.464	108.335±8.780	0.0044
After	109.480±9.382	113.822±10.413	0.0286
Left rear	99.111±14.144	103.666±8.704	0.0226
Left	76.963±14.516	81.894±9.859	0.0006
Left front	62.752±7.074	66.753±6.692	0.0045

Table 2. The influence of balance ability training on college students' balance ability -- right foot support.

Position	Before experiment	After experiment	p
Experience group			
Front	63.728±7.607	76.397±9.242	0.0180
Right front	65.183±9.040	71.880±9.956	0.0254
Right	73.766±7.939	85.104±15.379	0.0287
Right rear	97.100±9.121	107.423±12.516	0.0223
After	109.989±9.491	116.619±10.403	0.0118
Left rear	102.040±8.810	110.133±9.129	0.0293
Left	82.407±7.617	91.487±8.138	0.0120
Left front	70.400±8.745	80.681±8.690	0.0015
Control group			
Front	64.078±6.513	71.155±9.730	0.0072
Right front	62.955±5.684	67.701±10.434	0.0159
Right	78.461±8.944	82.457±9.896	0.0207
Right rear	96.354±8.062	106.056±11.497	0.0155
After	109.582±7.014	114.621±10.281	0.0144
Left rear	102.999±9.320	107.297±6.978	0.0009
Left	83.007±10.180	90.579±8.994	0.0200
Left front	73.692±4.716	79.010±7.591	0.0058

Before the experiment, the front orientation data of the right foot support in the control group was 64.078 ± 6.513, and after the experiment, the data changed to 71.155 ± 9.730. Before the experiment, the right front orientation data of the right foot support in the control group was 62.955 ± 5.684, and after the experiment, the data became 67.701 ± 10.434. Before the experiment, the right orientation data of the right foot support in the control group was 78.461 ± 8.944, and after the experiment, the data became 82.457 ± 9.896. Before the experiment, the right rear orientation data of the right foot support in the control group was 96.354 ± 8.062, and after the experiment, the data changed to 106.056 ± 11.497. Before the experiment, the rear orientation data of the right foot support in the control group was 109.582 ± 7.014, and after the experiment, the data changed to 114.621 ± 10.281. Before the experiment, the left rear orientation data of the right foot support in the control group was 102.999 ± 9.320, and after the experiment, the data became 107.297 ± 6.978. Before the experiment, the left orientation data of the right foot support in the control group was 83.007 ± 10.180, and after the experiment, the data became 90.579 ± 8.994. Before the experiment, the left front orientation data of the right foot support in the control group was 73.692 ± 4.716, and after the experiment, the data changed to 79.010 ± 7.591.

Through the P value difference standard, we can see that the P value of all data in the experimental group is less than 0.05, and the P value of the data in the left front direction is less than 0.01, which is very significant. Therefore, it can be seen that the effect of right foot support in the experimental group has been significantly improved after the balance training, while the data of the control group without any balance training has not changed significantly.

Balance ability training improves college students' aerobics ability

As shown in Table 3, the specific changes of various data indicators of the experimental group and the control group before and after the experiment.

According to the difference standard of P value, it can be seen that the indexes of aerobics ability of college students in the experimental group have changed significantly, P value is less than 0.05, and close to 0.01, while the data in the control group have changed, but the change is not obvious. Therefore, it can be concluded that the balance ability training can effectively improve the calisthenics ability of college students.

Improving the effect of balance ability training on college students' aerobics teaching

As shown in Figure 1, it is the change of college students' usual classroom test results, which shows the specific effect of balance ability training on college students' aerobics teaching. It can be seen that the index change of the experimental group after the balance ability training is very obvious, while the data change of the control group is relatively flat. From this, it can be concluded that the balance ability training can greatly improve the teaching effect of college students' aerobics.

DISCUSSION

Through the balance ability training, the trainer can quickly achieve the desired effect. The risk factors of static exercise and slow exercise are relatively low. Static exercise mostly refers to flat support and horse step, while slow exercise mainly refers to Taijiquan exercise. These two exercises have slow effect, and it requires aerobics students to have enough perseverance. During the training process, it is necessary to master the correct movement essentials, otherwise it will hurt the students' knees. If there is no need to increase the time and difficulty of aerobics training, then learners need to maintain certain movements for a long time. Safety can only be guaranteed after gradual adaptation. When the trainers rotate the medicine ball, they need to expand the sponge pad to ensure enough area to prevent falling. After each exercise,

Table 3. Balance ability training improves college students' aerobics ability.

Option	Before experiment	After experiment	p
Experience group			
From lying on your back in 60 seconds	61.061±2.391	67.826±2.607	0.0061
Back up in 60 seconds	55.591±2.028	60.936±1.700	0.0284
60 seconds left waist up	45.067±2.189	49.195±2.211	0.0154
60 seconds right waist up	43.655±2.687	49.766±1.728	0.0294
Hurdling score	2.423±0.567	2.877±0.355	0.0197
Push-up score	2.272±0.459	2.736±0.465	0.0176
Body rotation score	1.878±0.355	2.403±0.517	0.0179
Squat score	2.532±0.527	3.039±0.300	0.0013
Control group			
From lying on your back in 60 seconds	60.812±4.639	65.912±4.308	0.0173
Back up in 60 seconds	54.831±3.476	58.081±3.685	0.0143
60 seconds left waist up	44.562±2.288	46.078±1.909	0.0188
60 seconds right waist up	44.153±2.494	46.849±2.247	0.0262
Hurdling score	2.545±0.756	2.627±0.527	0.0141
Push-up score	2.272±0.459	2.487±0.535	0.0294
Body rotation score	1.998±0.122	2.151±0.348	0.0050
Squat score	2.532±0.527	2.786±0.459	0.0011

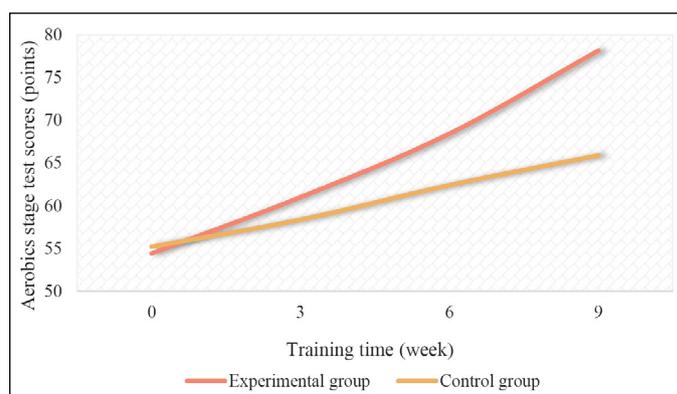


Figure 1. The effect of balance ability training on college students' aerobics teaching.

proper exercise is required. The risk coefficient of static exercise and slow exercise is low, similar to some Taijiquan and horse stance, which can make students show enough perseverance. As we all know, the basis of general exercise is physical fitness, and the movement in the process of aerobics should have a certain range, so when performing aerobics, we must show strength and speed, and be able to combine a series of movements. In order to develop our physical quality, we must adhere to it when practicing, and do not shrink because of fatigue, so that our physical quality can be greatly improved. In the process of aerobics teaching, aesthetic education is also very important. It will make the educated form a very standard and scientific aesthetic concept, and will make the educated create the ability of beauty. Aesthetic education has a lot of space in aerobics teaching, so we should use aerobics education to cultivate students' aesthetic concepts and aesthetic ability.

CONCLUSION

Through the measurement and comparative analysis of various balance ability indicators and ability improvement indicators of college

students in the control group of the experimental group, it can be seen that after the balance ability training, the data change of college students' left foot support ability and right foot support ability is more obvious, and the improvement effect of aerobics ability is more significant. Therefore, it is very necessary to increase the balance ability training in the process of college students' aerobics training, which can effectively improve the teaching effect of aerobics and enable students to better understand and absorb the knowledge and actions of aerobics, so as to further improve the performance of college students' aerobics.

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