EFFECTS OF BODY POSTURE TRAINING ON AEROBIC PERFORMANCE

EFEITOS DO TREINAMENTO DE POSTURA CORPORAL SOBRE O DESEMPENHO AERÓBICO

EFECTOS DEL ENTRENAMIENTO DE LA POSTURA CORPORAL EN EL RENDIMIENTO AERÓBICO

Original Article
Artigo Original
Artículo Original

Liyuan Xie[1]
(Physical Education Professional)

1. Ningbo Polytechnic, P.E. Education, Ningbo, Zhejiang, China.

Correspondence:
Liyuan Xie
Ningbo, Zhejiang, China. 315000.
2014055@nbpt.edu.cn

ABSTRACT

Introduction: The intensity of daily training increases with the development of aerobics, presenting a series of requirements for students' body posture and sports performance. Objective: Study the effect of postural training on the performance of university students practicing aerobics. Methods: The experiment lasted nine weeks, performed three times a week. The control group was trained according to traditional aerobics teaching, while the experimental group was introduced to practice dance movements based on aerobics training to strengthen postural teaching. Results: The total performance score of the experimental group before the experiment was 70.32 points, which rose to 80.19 points, representing an increase of 12.30%; the initial performance score of the control group was 68.13 points, rising to 75.32 points, an increase of 9.54%. Conclusion: Body posture training can optimize students' physical fitness and flexibility, improving their artistic expression skills and aerobic expression scores, and should be promoted. ***Level of evidence II; Therapeutic studies - investigation of treatment outcomes.***

Keywords: Postural Balance; Physical Fitness; Physical Education and Training.

RESUMO

Introdução: A intensidade do treinamento diário aumenta com o desenvolvimento da aeróbica, apresentando uma série de exigências para a postura corporal e o desempenho esportivo dos alunos. Objetivo: Estudar o efeito do treinamento postural sobre o desempenho dos estudantes universitários praticantes de aeróbica. Métodos: O experimento durou 9 semanas, realizado três vezes por semana. O grupo controle foi treinado de acordo com o ensino tradicional da aeróbica, enquanto que ao grupo experimental foi introduzida a prática de movimentos de dança baseados no treinamento da aeróbica para fortalecer o ensino postural. Resultados: A pontuação total de desempenho do grupo experimental antes do experimento foi de 70,32 pontos, que se elevou para 80,19 pontos, representando um aumento de 12,30%; a pontuação no desempenho inicial do grupo controle foi de 68,13 pontos, elevando-se para 75,32 pontos, um aumento de 9,54%. Conclusão: O treinamento da postura corporal pode otimizar a aptidão física e a flexibilidade dos estudantes, melhorando as suas capacidades de expressão artística e a pontuação da expressão aeróbica, devendo ser promovido. ***Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.***

Descritores: *Equilíbrio Postural; Aptidão Física; Educação Física e Treinamento.*

RESUMEN

Introducción: La intensidad del entrenamiento diario aumenta con el desarrollo del aeróbic, presentando una serie de exigencias para la postura corporal y el rendimiento deportivo de los alumnos. Objetivo: Estudiar el efecto del entrenamiento postural en el rendimiento de estudiantes universitarios que practican aeróbic. Métodos: El experimento duró 9 semanas y se realizó tres veces por semana. Al grupo de control se le entrenó según la enseñanza tradicional de aeróbic, mientras que al grupo experimental se le introdujo la práctica de movimientos de danza basados en el entrenamiento de aeróbic para reforzar la enseñanza postural. Resultados: La puntuación total de rendimiento del grupo experimental antes del experimento fue de 70,32 puntos, que ascendió a 80,19 puntos, lo que representa un aumento del 12,30%; la puntuación inicial de rendimiento del grupo de control fue de 68,13 puntos, que ascendió a 75,32 puntos, lo que representa un aumento del 9,54%. Conclusión: El entrenamiento de la postura corporal puede optimizar la aptitud física y la flexibilidad de los alumnos, mejorando sus habilidades de expresión artística y sus puntuaciones de expresión aeróbica, debiendo ser promovido. ***Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.***

Descriptores: *Equilibrio Postural; Aptitud Física; Educación y Entrenamiento Físico.*

DOI: http://dx.doi.org/10.1590/1517-8692202329012022_0743 Article received on 11/30/2022 accepted on 12/14/2022

INTRODUCTION

Aerobics is a sport in which the whole body is involved in performance. Body movements are the basis for aerobics, and aerobics projects account for a very high proportion of aerobic exercise.[1] Aerobics has a certain influence in China. The difficulty of the event can be adjusted according to the age of the participants. Therefore, aerobics is an inclusive sport.[2] Secondly, since there are no special requirements for the venue, the specific types of aerobics can be adjusted according to the site conditions. Long term aerobics projects can help students shape their bodies, cultivate good posture, and enhance their physical quality.[3] And it can cultivate students' tenacious will quality in this critical life stage of university. Help students maintain a healthy state by improving their physical function, coordination and stability. And aerobics is more helpful for students suffering from obesity.[4] Long time aerobics can help students with obesity problems to speed up fat burning. It has the effect of slimming and shaping. Since the development of aerobics, there have been traditional physical fitness events developed into competitive sports. With the development of aerobics, the intensity of daily training also increases, which puts forward certain requirements for students' body posture and sports performance.[5] Therefore, through the analysis of the students' body posture, the training methods of sports expressiveness suitable for aerobics can effectively help the development of aerobics courses in colleges and universities, and provide powerful help for students to participate in aerobics.[6] In order to study the effect of body posture training on the improvement of college students' performance in aerobics, this paper selects a freshman aerobics major in a university to train them in body posture, and analyzes the results.[7]

METHOD

Selection and grouping of aerobics experimenters

After defining the experimental scheme, 20 researchers were selected for random sampling, and they were divided into 10 experimental groups and 10 control groups. The study and all the participants were reviewed and approved by Ethics Committee of Ningbo Polytechnic (NO.NBPLT20PT102). The basic information is shown in Table 1, with little difference between them.

Experimental implementation plan

The experiment lasted for 9 weeks, with three training sessions per week. Among them, the control group followed the traditional aerobics movement training, and the experimental group introduced dance based on the aerobics movement training. Through in-depth study of the competitive status of excellent athletes, and with the influence of dance teaching, students' quality in body posture was improved.

Before the beginning of the experiment and after 9 weeks of training, the experimental group and the control group were measured, including the basic physical indicators, the flexibility indicators of athletes, and the scores of movement performance and total scores, to analyze the teaching effects of the two methods.

Table 1. Basic information of the experimental group and the control group.

Experiment group No	Age	Height	Weight	Control group No	Age	Height	Weight
1	18.29	172.58	71.26	1	18.94	176.70	61.86
2	18.27	165.38	63.74	2	18.58	168.10	58.10
3	19.96	168.08	56.38	3	19.54	173.61	71.30
4	19.65	176.65	56.60	4	19.49	168.64	59.18
5	19.29	168.43	61.94	5	19.53	170.68	63.65
6	20.25	176.17	69.21	6	19.03	166.53	71.82
7	18.78	172.78	62.40	7	18.18	171.40	57.61
8	20.16	168.60	68.86	8	20.25	168.77	61.44
9	18.77	168.28	66.83	9	18.63	175.30	64.17
10	19.78	166.55	57.89	10	18.61	166.19	62.81

RESULTS

Effect of body posture training on physical fitness of aerobics students

Aerobics seems to be light, but it actually takes a lot of physical strength. Therefore, if students want to give people a light posture when performing aerobics and improve their expressiveness, they must strengthen the optimization of their own physical ability. Five indicators, including one minute push up, 30 seconds standing and lying up, one minute two head up, one minute sit up and one minute rope skipping, were selected as the criteria for judging physical fitness. The specific conditions before and after the experiment are shown in Table 2.

The number of push ups in the experimental group was (26.20 ± 12.9835) one minute before the experiment, and increased to (34.55 ± 12.4508) after the experiment, an increase of 24.1792%, significantly higher than 8.9179% in the control group; The times of standing and lying in the experimental group were (16.69 ± 2.2957) times 30 seconds before the experiment, and increased to (17.57 ± 2.1284) times after the experiment, an increase of 5.0261%, higher than 4.7094% in the control group; The number of starts at both ends of the experimental group was (16.89 ± 4.8648) times one minute before the experiment, and increased to (21.99 ± 5.4711) times after the experiment, an increase of 23.1607%, significantly higher than 5.1221% in the control group; The number of sit ups in the experimental group was (38.25 ± 8.6769) times in the first minute before the experiment, and increased to (43.19 ± 5.4146) times after the experiment, an increase of 11.4444%, significantly higher than 3.9334% in the control group; The number of rope skipping in the experimental group was (149.36 ± 14.4233) times in the first minute before the experiment, and increased to (163.20 ± 8.5110) times after the experiment, an increase of 8.4802%, significantly higher than -1.5340% in the control group.

The flexibility of aerobics is the key to reaching the standard of aerobics movement. If the body is not flexible enough, it will make the movement stiff and show no aesthetic feeling of aerobics. Therefore, five indicators, including right vertical fork, left vertical fork, cross fork, sitting forward bend and shoulder turn, are selected as the criteria for judging the flexibility of aerobics special students. The specific data statistics and changes before and after the experiment are shown in Table 3.

Table 2. The Influence of Body Posture Training on the Physical Ability Index of Students Majoring in Aerobics.

Experiment group No	Before experiment	After experiment	Rate of change
One minute push ups	26.20±12.9835	34.55±12.4508	24.1792%
30 second standing and lying support	16.69±2.2957	17.57±2.1284	5.0261%
From both ends in a minute	16.89±4.8648	21.99±5.4711	23.1607%
One minute sit ups	38.25±8.6769	43.19±5.4146	11.4444%
One minute jump rope	149.36±14.4233	163.20±8.5110	8.4802%
Control group No	**Before experiment**	**After experiment**	**Rate of change**
One minute push ups	25.80±12.2306	28.33±13.0755	8.9179%
30 second standing and lying support	16.26±2.0053	17.06±2.1057	4.7094%
From both ends in a minute	17.12±3.9336	18.05±5.1583	5.1221%
One minute sit ups	38.93±4.6184	40.52±5.9168	3.9334%
One minute jump rope	149.56±16.3181	147.30±17.7542	-1.5340%

Table 3. The Influence of Body Posture Training on the Flexibility Index of Students Majoring in Aerobics.

Experiment group No	Before experiment	After experiment	Rate of change
Right longitudinal fork	18.17±7.5675	10.15±5.3910	78.9436%
Left longitudinal fork	21.65±9.2145	13.08±6.8825	65.4739%
Transverse fork	28.72±9.5804	19.07±6.1609	50.6148%
Sitting forward flexion	9.43±5.0933	14.04±3.7669	32.8087%
Shoulder turner	44.37±12.4551	52.30±14.4253	17.8786%
Control group No	**Before experiment**	**After experiment**	**Rate of change**
Right longitudinal fork	18.86±10.3466	16.77±10.2535	11.0966%
Left longitudinal fork	21.62±9.9640	17.83±10.5378	17.5397%
Transverse fork	29.70±9.2820	24.68±8.8380	16.8785%
Sitting forward flexion	9.35±4.5485	11.99±5.7461	22.0075%
Shoulder turner	51.18±13.1776	51.18±15.6650	0.0059%

The height of the right crotch of the experimental group was (18.17 ± 7.5675) cm before the experiment, and decreased to (10.15 ± 5.3910) cm after the experiment, optimizing 78.9436%, significantly higher than 11.0966% of the control group; The height of the left crotch of the experimental group was (21.65 ± 9.2145) cm before the experiment, and decreased to (13.08 ± 6.8825) cm after the experiment, optimizing 65.4739%, significantly higher than 17.5397% of the control group; The crotch height of the experimental group was (28.72 ± 9.5804) cm before the experiment, and decreased to (19.07 ± 6.1609) cm after the experiment, which was 50.6148% optimized, significantly higher than 16.8785% of the control group; In the experimental group, the forward bending distance of the sitting body before the experiment was (9.43 ± 5.0933) cm, and after the experiment, it was raised to (14.04 ± 3.7669) cm, which was 32.8087% optimized, higher than 22.0075% in the control group; The rotation angle of the shoulder in the experimental group was (44.37 ± 12.4551) ° before the experiment, which was improved to (52.30 ± 14.4253) ° after the experiment, which was 17.8786% optimized, significantly higher than 0.0059% in the control group.

It can be seen from the comparison within the group that the existing aerobics movement skill training in the control group can provide a good optimization effect on flexibility, but the difference is very significant compared with the experimental group, which shows that the existing aerobics movement skill is not as good as the content of dance training in flexibility. Therefore, the introduction of dance art body posture training into aerobics movement training can greatly enhance the flexibility of special students.

The influence of body posture training on the movement performance of aerobics students

Aerobics is the combination of art and sports, and the composition of strength and beauty. Therefore, action performance is a key point of aerobics scoring. The article refers to the scoring standard of aerobics, and selects six indicators for scoring, including musical rhythm, facial expression, norm, strength, range and posture. The specific score changes are shown in Table 4.

The score of music rhythm sense in the experimental group before the experiment was (2.49 ± 0.8061) points, and after the experiment, it rose to (3.75 ± 0.8344) points, which increased by 33.6020%, higher than 20.6288% in the control group; The score of facial expression in the experimental group was (1.78 ± 0.4816) points before the experiment, and it rose to (2.35 ± 0.5813) points after the experiment, an increase of 24.3687%, significantly higher than 5.6642% in the control group; The standard score of the experimental group before the experiment was (2.61 ± 0.7958) points, which was increased to (3.57 ± 0.5093) points after the experiment, 26.9585% higher than the control group's 23.5137%; The score of strength in the experimental group before the experiment was (2.28 ± 0.6258) points, which rose to (3.53 ± 0.9817) points after the experiment, 35.2914% higher than the control group's 19.0861%; The score of the experimental group in terms of amplitude before the experiment was (2.28 ± 0.5390) points, which rose to (2.88 ± 0.6902) points after the experiment, 20.8033% higher than the control group's 13.8676%; The score of posture in the experimental group before the experiment was (2.53 ± 0.7469) points, and it rose to (3.51 ± 0.9888) points after the experiment, an increase of 27.8784%, significantly higher than 14.7975% in the control group.

Finally, the changes in performance scores of aerobics students are compared and analyzed, as shown in Table 5. The total performance score of the experimental group before the experiment was (70.32 ± 7.4688) points, which rose to (80.19 ± 5.4902) points after the experiment, an increase of 12.3078%; The total performance score of the control group before the experiment was (68.13 ± 6.8167) points, which rose to (75.32 ± 5.0801) points after the experiment, an increase of 9.5466%. It can be seen from this that the control group has significantly improved the performance, but there is still a certain gap compared with the experimental group, which proves the advantages of introducing dance teaching body posture training into aerobics special training.

DISCUSSION

Since the aerobics project exhibition, the aerobics body posture training is the core training content of the aerobics project. The high-level aerobics competition is developing towards a more difficult and artistic direction. All technical movements can be completed on the basis of stability. The high degree of action completion can reflect the aesthetic appreciation value. The second is the cultivation of temperament. The expression of temperament is based on the comprehensive consideration of external temperament and internal temperament. Temperament can directly reflect a person's mental outlook. Different temperament can have different artistic expression in aerobics. Through daily posture training, students' temperament can be cultivated imperceptibly. What is outstanding is the cultivation of students' personality, which can make the artistry more prominent and improve the artistic level of the project by expressing beauty in elegant temperament. In the process of posture training, quality attribute training is indispensable. The purpose of improving physical fitness is to improve students' physical functions, and ensure that students can have good physical fitness as

Table 4. The influence of body posture training on the performance of aerobics students.

Experiment group No	Before experiment	After experiment	Rate of change
Musical rhythm	2.49±0.8061	3.75±0.8344	33.6020%
Facial expression	1.78±0.4816	2.35±0.5813	24.3687%
Standard	2.61±0.7958	3.57±0.5093	26.9585%
Intensity	2.28±0.6258	3.53±0.9817	35.2914%
Range	2.28±0.5390	2.88±0.6902	20.8033%
Attitude	2.53±0.7469	3.51±0.9888	27.8784%
Control group No	**Before experiment**	**After experiment**	**Rate of change**
Musical rhythm	2.56±0.9304	3.23±0.8263	20.6288%
Facial expression	1.78±0.4816	1.88±0.4597	5.6642%
Standard	2.60±0.8284	3.39±0.6186	23.5137%
Intensity	2.44±0.6116	3.02±0.7405	19.0861%
Range	2.25±0.5122	2.61±0.6534	13.8676%
Attitude	2.39±0.7900	2.81±0.7588	14.7975%

Table 5. The influence of body posture training on the performance of aerobics students.

Experiment group No	Before experiment	After experiment	Rate of change
Performance score	70.32±7.4688	80.19±5.4902	12.3078%
Control group No	Before experiment	After experiment	Rate of change
Performance score	68.13±6.8167	75.32±5.0801	9.5466%

the basis for complete performance of technical actions. In the aerobics competition, the posture of each part of the body is a factor that directly affects the final result of the competition. Therefore, in the daily training link, we should ask ourselves to have enough movement completion, and good body posture cannot be rushed to success. Through accumulated training, the beauty of posture is gradually formed. In the training process, strengthen the training of these body control. Difficult technical movements usually require their own control to reach a certain standard. The training of body control can ensure students to complete the whole set of movements with high standards. The last is to improve the project level by improving the basic physical quality. Basic physical fitness refers to a series of sports attributes such as strength, speed, endurance, physical strength, flexibility and flexibility. In view of these sports attributes, it is an important part of cultivating one's own posture to carry out targeted strengthening training in combination with one's own weak links.

CONCLUSION

There is such a misunderstanding in the teaching and training of aerobics, which simply regards aerobics as a sport and only pays attention to the standard of action in the process of sports, but ignores the expression of action and the presentation of the overall atmosphere. Therefore, this paper combines the body posture training of dance teaching with the existing aerobics expressive force training to design the body posture training of aerobics, And it is applied in the aerobics teaching of a university. The research results show that body posture training can better optimize students' physical fitness and flexibility, improve their artistic expression ability, and ultimately improve the score of aerobics expression, so it is worth promoting.

The author 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. Liyuan Xie: writing and execution.

REFERENCES

1. Yan M. Research on the arrangement and visual design of aerobics under the new situation. Int Core J Eng. 2019;5(9):170-3.
2. Zaletel P, Gabrilo G, Perić M. The training effects of dance aerobics: A review with an emphasis on the perspectives of investigations. Coll Antropol. 2013;37(2):125-30.
3. Douris PC, McDonald B, Vespi F, Kelley NC, Herman L. Comparison between Nintendo Wii Fit aerobics and traditional aerobic exercise in sedentary young adults. J Strength Cond Res. 2012;26(4):1052-7.
4. Rokka S, Mavridis G, Kouli O. The impact of exercise intensity on mood state of participants in dance aerobics programs. Stud Phys Cult Tour. 2010;17(3):241-5.
5. Héroux M, Janssen I, Lee D, Sui X, Hebert JR, Blair SN. Clustering of unhealthy behaviors in the aerobics center longitudinal study. Prev Sci. 2012;13(2):183-95.
6. Bryukhanova NA, Bulgakova OV, Mokrova TI, Bogashchenko YA. Determination of possibilities of the use of high-intensive trainings facilities on lessons health aerobics. Physical Education of Students. 2013;17(2):25-9.
7. Haffer H, Popovic S, Martin F, Hardt S, Winkler T, Damm P. In vivo loading on the hip joint in patients with total hip replacement performing gymnastics and aerobics exercises. Sci Rep. 2021;11(1):13395.