EFFECT OF GYMNASTICS TRAINING ON PHYSICAL PERFORMANCE IN MIDDLE-AGED AND ELDERLY DANCERS

EFEITO DO TREINO DE GINÁSTICA SOBRE O DESEMPENHO FÍSICO EM DANÇARINOS DE MEIA IDADE E IDOSOS

EFECTO DEL ENTRENAMIENTO GIMNÁSTICO EN EL RENDIMIENTO FÍSICO DE BAILARINES DE MEDIANA Y AVANZADA EDAD

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ABSTRACT

Introduction: Ballroom dancing has become popular as an exercise method that encompasses many benefits in the social aspect. However, some middle-aged and elderly dancers have suffered from injuries and other problems from dancing. The comprehensive understanding of gymnastic training to solve this problem has not yet been raised, without which no adequate means of prevention can be outlined. Objective: Study the effect of balanced aerobic training on the physical fitness of middle-aged and elderly ballroom dance practitioners. Methods: A study was conducted with 50 volunteers practicing ballroom dancing, middle-aged and elderly, divided into experimental and control groups. According to the community square dance protocol, the control group performed the dance for one hour daily. The experimental group also used the same period and technique, introducing balanced aerobic exercises. Fitness and performance data were collected before and after the intervention, analyzed, and presented statistically. Results: In the experimental group, the growth rate of the grip strength index was 28.70%, the lumbar strength index was 32.27%, the time rate in the orthostatic position was 6.28%, and the sitting forward flexion index was 6.69%. Conclusion: Compared to traditional community sports, balanced aerobics inserted into ballroom dance training showed an improvement effect on the physical and sports fitness of middle-aged and elderly women, and may also prevent the adverse effects of aging on activities of daily living, and its implementation is valid. ***Level of evidence II; Therapeutic studies - investigation of treatment outcomes.***

Keywords: Gymnastics; Dancing; Physical Fitness; Elderly.

RESUMO

Introdução: A dança de salão popularizou-se como um método de exercício físico que abrange muitos benefícios no aspecto social. Contudo, alguns dançarinos de meia idade e idosos têm sofrido com lesões e outros problemas decorrentes da dança. A compreensão abrangente do treino com ginástica para a solução desse problema ainda não foi levantada, sem a qual não se pode traçar meios adequados de prevenção. Objetivo: Estudar o efeito do treinamento aeróbico balanceado sobre a aptidão física de praticantes de dança de salão de meia-idade e idosos. Métodos: Foi elaborado um estudo com 50 voluntários praticantes de dança de salão, de meia idade e idosos, divididos em grupos experimental e controle. O grupo de controle realizou a dança durante uma hora diária, de acordo com o protocolo de dança da praça comunitária. O grupo experimental também utilizou o mesmo período e técnica, introduzindo exercícios aeróbicos balanceados. Os dados de aptidão física e desempenho foram coletados antes e após a intervenção, analisados e apresentados estatisticamente. Resultados: No grupo experimental, a taxa de crescimento do índice de força de preensão foi de 28,70%, o índice de força lombar foi de 32,27%, a taxa de tempo em posição ortostática foi de 6,28%, e o índice de flexão sentado para frente foi de 6,69%. Conclusão: Em comparação com os esportes comunitários tradicionais, a aeróbica equilibrada inserida no treino de dança de salão apresentou um efeito de melhoria na aptidão física e esportiva das mulheres de meia-idade e idosas, podendo prevenir também os efeitos adversos do envelhecimento sobre as atividades de vida diária, sendo válida a sua implementação. ***Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.***

Descritores: *Ginástica; Dança; Aptidão Física; Idosos.*

RESUMEN

Introducción: Los bailes de salón se han popularizado como método de ejercicio físico que encierra muchos beneficios en el aspecto social. Sin embargo, algunos bailarines de mediana y avanzada edad han sufrido lesiones y otros problemas derivados del baile. Aún no se ha planteado un conocimiento exhaustivo del entrenamiento gimnástico para resolver este problema, sin el cual no se pueden esbozar medios adecuados de prevención. Objetivo: Estudiar el efecto del entrenamiento aeróbico equilibrado en la forma física de los practicantes de bailes de salón de mediana y avanzada edad. Métodos: Se desarrolló un estudio con 50 voluntarios practicantes de bailes de salón, de mediana y avanzada edad, divididos en grupos experimental y control. El grupo de control realizó el baile durante una hora diaria, según el protocolo de baile de salón de la comunidad. El grupo experimental utilizó el mismo período y la misma

técnica, introduciendo ejercicios aeróbicos equilibrados. Se recogieron datos sobre la forma física y el rendimiento antes y después de la intervención, y se analizaron y presentaron estadísticamente. Resultados: En el grupo experimental, el índice de crecimiento del índice de fuerza de prensión fue del 28,70%, el índice de fuerza lumbar fue del 32,27%, el índice de tiempo en posición ortostática fue del 6,28% y el índice de flexión hacia delante sentado fue del 6,69%. Conclusión: En comparación con los deportes comunitarios tradicionales, los ejercicios aeróbicos equilibrados insertados en el entrenamiento de bailes de salón mostraron un efecto de mejora en la forma física y deportiva de las mujeres de mediana edad y ancianas, y también pueden prevenir los efectos adversos del envejecimiento en las actividades de la vida diaria, y su aplicación es válida. ***Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.***

Descriptores: *Gimnasia; Baile; Aptitud Física; Ancianos.*

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INTRODUCTION

Square dance is a common type of community fitness in China, which is often formed spontaneously by some middle-aged and old women.[1] Square dance is adapted on the basis of some music with strong sense of rhythm, introducing some dance movements, which is both a fitness exercise and a social activity. Although this activity can delight the body and mind, improve the neighborhood relationship between dancers, and play a certain social role, it also has many negative effects.[2] In recent years, the negative effects of square dance have emerged one after another, such as the problem of high power sound disturbing people, the problem of seizing the sports ground, and the problem of conflicts between young people and middle-aged and old people, which shows that there are some inappropriate aspects in the current sports form.[3] This article has carried on the research to these situations, thought that the current square dance movement has certain benefits to the athletes themselves, but also has many problems. For example, some square dance movements are not professional enough, and they are learned from music videos.[4] Although these movements look beautiful, they have certain security risks and are not suitable for middle-aged and elderly people. Secondly, the disturbance of square dancing cannot be ignored. In the long run, although the dancers themselves have been trained, they will bring bad consequences to the physical and mental health of others and the neighborhood relations, which is also an uncivilized behavior.[5] Therefore, the existing square dance activities need to be improved to achieve the goal of strengthening the body and not disturbing the people.[6] Under the guidance of this goal, this paper improved the existing square dance movement, introduced the concept of balanced aerobics, improved some empty and beautiful movements with little effect, chose a more suitable exercise mode for middle-aged and elderly women, and put forward his own suggestions on the optimization of the existing square dance movement.[7]

METHOD

Selection of research objects

The author visited the residential square of a community in the evening, interviewed the active leader of the square dance group, and collected and sorted out the current situation of square dance and the main square dance movements in the current research area. The study and all the participants were reviewed and approved by Ethics Committee of Fuyang Preschool Teachers College (NO.FYPTCF105). During the survey, we communicated with square dance enthusiasts and proposed the need to recruit volunteers.

Through the collection of volunteers, 60 middle-aged and elderly women were recruited, and 50 volunteers were selected, excluding some volunteers with good sports literacy or poor sports ability. According to the form of random sampling, they were divided into experimental group and control group, 25 in each group. From the intra group comparison and inter group comparison, it can be seen that the 50 volunteers selected have little difference in age, physical fitness and other aspects, which can minimize the interference of irrelevant variables on the experimental results and ensure the effectiveness of the experiment.

Experimental design and result analysis

The experiment was conducted in the form of setting up a control group. According to the existing rules of square dance in the community, the control group performed square dance with the square dance group for one hour every night. The experimental group was in the same time, different places for the same length of balanced aerobics. In order to ensure the accuracy of the experimental results, the experimental group and the control group did not communicate during the exercise, so as to avoid psychological pressure on the members of the control group and interference with the final test results,

RESULTS

The influence of balanced aerobics training on the physical fitness of middle-aged and elderly athletes in the community

The body of middle-aged and old women gradually weakens in many aspects, which is shown in the physical quality, that is, the waist hip ratio increases, the BMI index increases, the body fat rate and fat content gradually increases, the blood pressure increases, the quiet heart rate increases, the vital capacity decreases, and so on. On the macro level, the middle-aged and elderly women are gradually obese, with hyperlipidemia, hypertension and other diseases, and cardiovascular and cerebrovascular diseases. Therefore, this section studies the improvement of the physical fitness of middle-aged and elderly women by balanced aerobics and square dance.

Table 1 shows the sorting of physical fitness of middle-aged and elderly athletes in the community before the experiment. It can be seen from the table that there is no significant difference between the experimental group and the control group in waist hip ratio, BMI index, body fat rate, internal fat rate, systolic blood pressure, diastolic blood pressure, quiet heart rate, and vital capacity indicators (P>0.05), indicating

Table 1. Arrangement of physical fitness of middle-aged and elderly athletes in the community before the experiment.

Index	Experience group	Control group	P
Waist hip ratio	0.827±0.0496	0.825±0.0398	0.4893
BMI index	23.157±1.9974	22.732±2.1153	0.4087
Body fat percentage	33.473±2.0140	32.387±2.3924	0.5644
Internal fat percentage	5.599±1.7177	6.238±1.3627	0.4775
Systolic pressure	120.654±3.3116	120.041±3.5754	0.2766
Diastolic pressure	84.806±3.3855	86.222±3.1691	0.3908
Quiet heart rate	71.805±2.9009	71.119±3.0584	0.2622
Vital capacity	2532.065±303.2826	2573.935±317.0831	0.5961

that there is no significant difference, so as to reduce the interference of unrelated variables on the experimental results before the experiment.

In the experimental group, the waist hip ratio index became 0.800 ± 0.0596, the BMI index became 22.784 ± 1.8875, the body fat rate index became 32.778 ± 2.5373, the internal fat rate index became 5.589 ± 1.9175, the systolic pressure index became 118.963 ± 4.2433, the diastolic pressure index became 78.290 ± 4.4741, the quiet heart rate index became 70.606 ± 2.6693, and the vital capacity index became 2799.952 ± 257.0239.

In the control group, the waist hip ratio index became 0.830 ± 0.0497, the BMI index became 22.762 ± 1.9239, the body fat rate index became 32.347 ± 2.4122, the internal fat rate index became 6.340 ± 1.5119, the systolic pressure index became 119.941 ± 3.4738, the diastolic pressure index became 84.006 ± 2.8532, the quiet heart rate index became 70.920 ± 2.9673, and the vital capacity index became 2573.530 ± 300.9494. From the comparison within the group, it can be seen that both the balanced aerobics and the traditional square dance can optimize the physical quality of middle-aged and elderly female athletes, and achieve the goal of reducing blood pressure and heart rate, regulating body fat rate, and improving body shape.

Before and after the experiment, the reduction rate of waist hip ratio, BMI index, body fat rate, internal fat rate, systolic blood pressure, diastolic blood pressure, resting heart rate, vital capacity in the experimental group was 3.261%, 1.609%, 2.076%, 0.177%, 1.401%, 7.683%, 1.669%, 10.580%, respectively. In the control group, the increase rate of waist hip ratio index was 0.613%, the increase rate of BMI index was 0.134%, the decrease rate of body fat rate index was 0.123%, the increase rate of internal fat rate index was 1.623%, the decrease rate of systolic pressure index was 0.083%, the decrease rate of diastolic pressure index was 2.570%, the decrease rate of quiet heart rate index was 0.280%, and the decrease rate of vital capacity index was 0.016%.

The influence of balanced aerobics training on the sports quality of middle-aged and elderly athletes in the community

For the middle-aged and elderly, many daily sports are full of risks. If a fall occurs, it is easy to cause a variety of complications, even life threatening when serious. Therefore, many places have added fall prevention facilities for middle-aged and elderly people, and many intelligent electronic products also have fall alarm functions. From the point of view of kinematics, the most fundamental reason for many middle-aged and old athletes to fall is their sports quality. With the increase of age, the sports quality gradually declined, and the stability, flexibility and muscle strength of the body declined, which led to accidents in life. Therefore, this section studies the sports quality of middle-aged and old athletes.

It can be seen from the table that there is no significant difference between the experimental group and the control group in grip strength, waist back strength, standing time of one foot, and sitting forward bending indicators (P>0.05), indicating that there is no significant difference, so as to reduce the interference of unrelated variables on the experimental results before the experiment.

In the experimental group, the grip strength index changed to 28.597 ± 8.3449, the waist back strength index changed to 75.654 ± 14.8004, the standing time index of one foot changed to 8.688 ± 4.0089, and the sitting forward bending index changed to 12.290 ± 7.3160.

In the control group, the grip strength index changed to 23.489 ± 2.7729, the waist back strength index changed to 60.104 ± 15.1842, the standing time index of one foot changed to 8.296 ± 4.2129, and the sitting forward bending index changed to 12.084 ± 7.2214. From the comparison within the group, it can be seen that the balanced aerobics can effectively optimize the various sports qualities of the athletes, but the square dance has a poor optimization effect on the sports quality, and all aspects of the athletes still show a decline.

Before and after the experiment, the growth rate of the grip strength index in the experimental group was 28.704%, the growth rate of the waist back strength index was 32.277%, the growth rate of the single leg standing length index was 6.287%, and the reduction rate of the sitting forward bending index was 6.698%. In the control group, the reduction rate of grip strength index was 1.572%, the reduction rate of back strength index was 0.802%, the reduction rate of single leg standing length index was 1.604%, and the reduction rate of sitting forward bending index was 12.598%.

Table 2. Changes of physical fitness of middle-aged and elderly athletes in the community after the experiment.

Index	Experience group	Control group	P
Waist hip ratio	0.800±0.0596	0.830±0.0497	0.0402
BMI index	22.784±1.8875	22.762±1.9239	0.0293
Body fat percentage	32.778±2.5373	32.347±2.4122	0.0281
Internal fat percentage	5.589±1.9175	6.340±1.5119	0.0076
Systolic pressure	118.963±4.2433	119.941±3.4738	0.0464
Diastolic pressure	78.290±4.4741	84.006±2.8532	0.0302
Quiet heart rate	70.606±2.6693	70.920±2.9673	0.0267
Vital capacity	2799.952±257.0239	2573.530±300.9494	0.0555

Table 3. Comparison of the change rate of physical fitness of middle-aged and elderly athletes in the community before and after the experiment.

Index	Experience group	Control group	Experience group-Control group
Waist hip ratio	-3.261%	0.613%	-3.874%
BMI index	-1.609%	0.134%	-1.743%
Body fat percentage	-2.076%	-0.123%	-1.953%
Internal fat percentage	-0.177%	1.623%	1.801%
Systolic pressure	-1.401%	-0.083%	-1.318%
Diastolic pressure	-7.683%	-2.570%	-5.113%
Quiet heart rate	-1.669%	-0.280%	-1.389%
Vital capacity	10.580%	-0.016%	10.596%

Table 4. Sorting out the sports quality of middle-aged and old athletes in the community before the experiment.

Index	Experience group	Control group	P
Grip	22.219±4.4760	23.864±2.8962	0.5916
Back strength	57.194±24.2751	60.590±19.7965	0.3155
Length of standing on one leg	8.175±4.2044	8.431±4.1169	0.3104
Sitting forward flexion	13.173±6.5170	13.826±6.1270	0.5100

Table 5. Changes of sports quality of middle-aged and elderly athletes in the community after the experiment.

Index	Experience group	Control group	P
Grip	28.597±8.3449	23.489±2.7729	0.0182
Back strength	75.654±14.8004	60.104±15.1842	0.0579
Length of standing on one leg	8.688±4.0089	8.296±4.2129	0.0166
Sitting forward flexion	12.290±7.3160	12.084±7.2214	0.0080

Table 6. Comparison of the change rate of sports quality of middle-aged and elderly athletes in the community before and after the experiment.

Index	Experience group	Control group	Experience group-Control group
Grip	28.704%	-1.572%	30.275%
Back strength	32.277%	-0.802%	33.079%
Length of standing on one leg	6.287%	-1.604%	7.891%
Sitting forward flexion	-6.698%	-12.598%	5.901%

DISCUSSION

From this study, we can see that although the community square dance is lack of professionalism, and the effect on improving the sports quality is not obvious, it is still better for middle-aged and elderly women to improve their physique than not exercising. Therefore, this type of sports is worth improving, optimizing and advocating. In view of the sharp contradiction of the current square dance, the author believes that the following aspects can be improved:

Improve the movement of square dance

Many of the existing square dance movements have a weak sense of rhythm. If you want to achieve the sense of rhythm of the movement, you need to use music with a strong sense of rhythm and turn up the volume, which has caused the problem of disturbing people. Therefore, it is necessary to improve the square dance movement, introduce the related content of balanced aerobics, select the movement with stronger rhythm, reduce the dependence on music, and thus alleviate the problem of square dance music disturbing people.

Distributed music playing

The square dance has a large number of people. Some organizers prevent the peripheral people from playing too loud music, which will also interfere with the dancers' own hearing system. Therefore, it can be played in a decentralized way. Multiple audio devices can be arranged in a decentralized manner. Each audio device can only accompany the surrounding people, thus reducing the problem of excessive sound.

Community responsible units should actively guide

The property management and neighborhood committee should bear their own responsibilities, such as adjusting the sports time of square dance, changing the main sports time from night to day, so as to prevent square dance music from affecting office workers who need to rest. As for the site problem, reconstruction can be carried out to reduce the interference of sunlight on the site in the daytime by planting trees or building greenhouses. In midsummer, indoor venues can also be arranged to facilitate square dancing.

CONCLUSION

At present, square dance is very popular in the community, but this popular sport has limitations on the improvement of the physical fitness of middle-aged and elderly women. Although many movements learned from the MV have good ornamental value, they cannot provide more help to the sports quality of middle-aged and elderly people. Therefore, this paper introduces the concept of balanced aerobics into square dance and combines it with square dance. The research results show that, compared with traditional community sports, balanced aerobics has a better effect on improving the physical and sports quality of middle-aged and elderly women, can effectively combat the adverse effects of aging on physical functions, not only adjust the physical and mental health of athletes, but also prevent a variety of sports risks, which is worth promoting in community sports.

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