INFLUENCE OF SQUARE DANCING ON MOTOR FUNCTION OF MIDDLE-AGED AND ELDERLY WOMEN

INFLUÊNCIA DA DANÇA DE QUADRILHA NA FUNÇÃO MOTORA DE MULHERES DE MEIA-IDADE E IDOSAS

INFLUENCIA DEL BAILE DE CUADRILLA EN LA FUNCIÓN MOTORA DE MUJERES DE MEDIANA EDAD Y DE EDAD AVANZADA

Original Article
Artigo Original
Artículo Original

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ABSTRACT

Introduction: The quality of life of middle-aged and elderly women is affected by the physiological effects of aging on the locomotor system; moderate aerobic exercise is one of the practices that can delay these deleterious effects. Square dancing has functional characteristics of aerobic exercise, but there are still no studies on its effects on motor function in middle-aged and elderly women who practice it regularly. Objective: Explore the long-duration square dance exercises' effect on motor function in middle-aged and elderly women. Methods: 45 middle-aged and elderly women, divided into experimental and control groups, participated. The experimental group (n=25) performed square dancing exercises of 90 minutes four times a week for six months. Indicators of physical function, vital capacities, and motor function indices were collected. Results: After exercise, improved grip strength of the middle-aged women in the square dance group and the 1-minute sessions was observed; in particular, the mean value of the selection response reduced from 516.20±83.87 before exercise to 440.28±58.07, a very significant difference. Conclusion: Long-term square dance exercise has a particular effect on improving the cardiopulmonary function of middle-aged and elderly women and significantly improved motor function. ***Evidence Level II; Therapeutic Studies - Investigating the result.***

Keywords: Square Dance; Women's Health; Physical Functional Performance.

RESUMO

Introdução: A qualidade de vida das mulheres de meia idade e idosas são afetadas pelos efeitos fisiológicos do envelhecimento no sistema locomotor; o exercício aeróbico moderado é comprovadamente uma das práticas que pode retardar esses efeitos deletérios. A dança de quadrilha tem características funcionais de exercício aeróbico, porém ainda não há estudos sobre seus efeitos sobre a função motora em mulheres de meia-idade e idosas que a praticam regularmente. Objetivo: Explorar o efeito dos exercícios de dança de quadrilha de longa duração sobre a função motora nas mulheres de meia-idade e idosas. Métodos: 45 mulheres de meia-idade e idosas, divididas em grupo experimental e controle, participaram do experimento. As mulheres do grupo experimental (n=25) realizaram exercícios de dança de quadrilha de 90 minutos, 4 vezes por semana durante 6 meses. Foram coletados indicadores de função física, capacidades vitais e índices de função motora. Resultados: Após o exercício, a força de preensão das mulheres de meia-idade no grupo de dança de quadrilha e as sessões de 1 minuto foram significativamente melhoradas, em particular, o valor médio da resposta de seleção foi reduzido de 516,20±83,87 antes do exercício para 440,28±58,07, houve uma diferença muito significativa. Conclusão: O exercício de dança de quadrilha de longo prazo tem um certo efeito na melhoria da função cardiopulmonar de mulheres de meia-idade e idosas, sua função motora foi significativamente melhorada. ***Nível de evidência II; Estudos Terapêuticos - Investigação de Resultados.***

Descritores: *Dança de quadrilha; Saúde da Mulher; Desempenho Físico Funcional.*

RESUMEN

Introducción: La calidad de vida de las mujeres de mediana y avanzada edad se ve afectada por los efectos fisiológicos del envejecimiento sobre el aparato locomotor; el ejercicio aeróbico moderado es una de las prácticas que pueden retrasar estos efectos deletéreos. El baile de cuadrilla tiene características funcionales de ejercicio aeróbico, sin embargo, aún no hay estudios sobre sus efectos en la función motora en mujeres de mediana edad y ancianas que lo practican regularmente. Objetivo: Explorar el efecto de los ejercicios de baile de cuadrilla de larga duración sobre la función motora en mujeres de mediana y avanzada edad. Métodos: 45 mujeres de mediana y avanzada edad, divididas en grupos experimental y de control, participaron en el experimento. Las mujeres del grupo experimental (n=25) realizaron ejercicios de baile de cuadrilla de 90 minutos, 4 veces por semana durante 6 meses. Se recogieron indicadores de función física, capacidades vitales e índices de función motora. Resultados: Después del ejercicio, la fuerza de agarre de las mujeres de mediana edad del grupo de baile de cuadrilla y de las sesiones de 1 minuto mejoró significativamente, en particular, el valor medio de la respuesta de selección se redujo de 516,20±83,87 antes del ejercicio a 440,28±58,07, lo que supuso una diferencia muy significativa. Conclusión: El ejercicio del baile de cuadrilla a largo plazo tiene un cierto efecto en la mejora de la función cardiopulmonar de las mujeres de mediana edad y de las ancianas, y su función motora mejoró significativamente. ***Nivel de evidencia II; Estudios terapéuticos - Investigación de resultados.***

Descriptores: *Cuadrilla; Salud de la Mujer; Rendimiento Físico Funcional.*

DOI: http://dx.doi.org/10.1590/1517-8692202228062022_0027 Article received on 01/06/2022 accepted on 02/18/2022

INTRODUCTION

The health and quality of life of middle-aged and elderly people are affected by many factors, moderate aerobic exercise is one of the factors that affect the health and quality of life of middle-aged and elderly people.[1] As we all know, as middle-aged and elderly people grow older, the condition of its bones and muscles is also much worse than before.[2] How to increase bone and muscle health has become a common problem faced by middle-aged and elderly people. According to research: Appropriate exercise not only has a good effect on strengthening the bones and muscles, at the same time, the flexibility and elasticity of body joints are also greatly improved, compared with middle-aged and elderly people who often participate in physical exercise, there are big differences in all aspects of the body, regular exercise can effectively enhance the flexibility of the body, prevent the relaxation of ligaments, slow down muscle atrophy, increase the secretion of synovial fluid in the joint capsule, it has a preventive effect on the joint diseases of middle-aged and elderly people.[3] In response to this research, Yoshida Y et al. said that square dance is a combination of fitness and body in sports and art, a group fitness dance activity that is accompanied by beautiful rhythm music and carried out in spacious places such as squares, it is the perfect fusion of sports and art in dance.[4]

METHOD

Research objects

This research takes middle-aged and elderly women as the research object, it is planned to recruit 45 middle-aged and elderly female volunteers aged 45-65 as experimental subjects, the experimenters were all persons with sound limbs and no major diseases. Divided into two groups: experimental group and control group, 25 people in the experimental group received 2 weeks of square dance training, there are professionals to guide you during the exercise, demonstrate correct actions and correct wrong actions.[5] Exercise 4 times a week for 2 hours each time, (15min of warm-up activity, 90min of continuous training for exercise, 15min of tidying up and relaxation), 20 people in the control group, do not exercise, maintain the original state of life. Perform regular square dance exercises for the experimental group for 6 months, select the relevant motor function indexes, and test the body function before and after the experiment, study the influence of square dance exercise on the exercise function of middle-aged and elderly women.[6]

Test indicators and methods

1. Physical function indicators: Heart rate (HR), blood pressure (BP), step test, vital capacity (VC), and maximum ventilation (MVV) at rest.
• Heart rate measuring instrument at rest: stopwatch.
• Blood pressure measuring instruments at rest: Mercury sphygmomanometer, stethoscope, cuff.
• Vital capacity, maximum ventilation measuring instrument: Spirolabll color portable pulmonary function meter.
2. Movement function index: Grip strength, reaction time, stand on one foot with eyes closed, bend forward in sitting position, sit-ups.
• Grip strength measuring instrument: Grip strength meter.
• Standing on one foot with eyes closed. Measuring instrument: stopwatch.
• Seated forward bending measuring instrument: sitting forward bending instrument.

Mathematical Statistics

The data obtained after this experiment is calculated with SPSS17.0 software, the results are expressed as mean±standard deviation ($\bar{x} \pm s$). The data of the same group before and after the experiment were analyzed by paired-sample t test, the independent sample t test is used for the comparison between groups, taking P<0.05 as the difference has a significant level.

RESULTS

Changes in physical function of middle-aged and elderly women before and after the experiment

As can be seen from Table 1, after 6 months of square dancing exercises, before and after the experiment in the square dance group, the quiet heart rate and systolic blood pressure of the subjects decreased slightly but not significantly, there is a small increase in diastolic blood pressure, are within the normal range; Vital capacity, maximum ventilation, and step test after the experiment were significantly increased compared with those before the test, and there was a very significant difference (P<0.01). The heart rate of the control group increased after the experiment, which was significantly different from that before the experiment (P<0.01); Vital capacity and maximum ventilation have decreased, there is a very significant difference from before the experiment. After exercise, the square dance group compared with the control group, the heart rate is significantly reduced, the vital capacity and the maximum ventilation are significantly increased, there are very significant differences, there is no significant change in other indicators.[7]

As can be seen from Figure 1, after 6 months of exercise, the heart rate, systolic blood pressure, and diastolic blood pressure in the square dance group decreased compared with 6 months ago, the rate of decrease is: Diastolic blood pressure> systolic blood pressure> heart rate, vital capacity, maximum ventilation, and step test have been significantly improved, the improvement range is: Vital capacity>maximum ventilation>step test. The heart rate, systolic blood pressure, diastolic blood pressure, and step test of the control group increased compared with 6 months ago, the range of change is: Heart rate>diastolic blood pressure>step test>systolic blood pressure, vital capacity and maximum ventilation have decreased, the rate of decrease is: Vital capacity>maximum ventilation.

Table 1. Comparison of physical functions of middle-aged and elderly women before and after the experiment.

	Before the experiment		After the experiment	
	Control group	Test group	Control group	Test group
Heart rate	67.25±3.61	64.20±7.00	69.90±3.03	643.60±4.69
Systolic blood pressure	125.25±11.81	123±11.17	127.40±16.00	122.52±18.81
Diastolic blood pressure	73.35±4.13	78.64±7.48	75.40±5.49	76.92±8.05
Vital capacity	2443.5±418.02	2349±316.29	2300.0±370.4	2676.2±440.48
Maximum ventilation	72.37±5.00	71.13±10.31	69.30±2.64	75.83±11.0
Step experiment	58.75±14.07	60.88±6.03	58.10±13.30	64.40±7.07

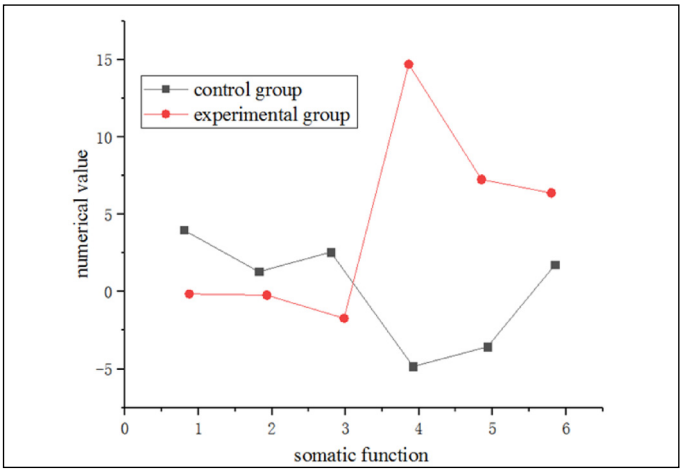

Figure 1. Comparison of the physical function changes of the two groups of subjects before and after the experiment.

Changes in exercise function of middle-aged and elderly women before and after the experiment

As can be seen from Table 2, the grip strength of middle-aged women in the square dance group and the 1-min sit-ups were significantly improved, in particular, the average value of the selection response was shortened from 516.20±83.87 before exercise to 440.28±58.07, there was a very significant difference (P<0.01). Sitting forward bending, back hook with left and right hands, and standing on one foot with closed eyes are improved to a certain extent, but there is no significant difference. After the experiment, the square dance group was compared with the control group. Lifting strength, 1min sit-ups and sitting body forward bending increased, and the choice reaction time shortened significantly (P<0.01), the back hooks of both hands have changed but not much, and other indicators have no obvious changes.[8]

As can be seen from Figure 2, in the square dance group, sit-ups for 1 min, sitting forward bending, back hooks with both hands, and standing with closed eyes on one foot improved greatly, the improvement range is: Standing on one foot with closed eyes> sit-ups> back hook with both hands (right)> sitting forward bending> back hook with both hands (left)> grip strength; The reaction time is significantly shortened. In the control group, 6 months later, 1 minute sit-ups, both hands and back hooks (left) with closed eyes and one foot standing all had a significant decrease, the decline in sitting body forward bend is small, and other indicators have a small increase.

DISCUSSION

The influence of square dance exercise on the body function of middle-aged and elderly women

As people grow older, various functions of the respiratory system have decreased, by the age of 70, vital capacity will decrease by 40%-50%, the arterial wall gradually hardens, which leads to a decrease in the elasticity of the blood vessel wall, increased risk of cardiovascular disease.[9] The contractility of the ventilator is weakened, maximum ventilation decreases, decreased breathing function. The step test index is an important indicator reflecting the cardiovascular function of the human body, the greater the step test index value, it means that the higher the function of the cardiovascular system, and vice versa. Conducted regular square dance exercises for middle-aged and elderly women for 6 months, vital capacity, maximum ventilation, step test, etc. were significantly improved than before the experiment, showing a very significant difference. It may be because square dancing is a regular aerobic exercise, after a certain period of exercise, can enhance the strength of the respiratory muscles, increase the elasticity of the lungs, which in turn increases the oxygen uptake, helps improve the body's metabolism, improve the ventilation function of the lungs and the functional level of the cardiovascular system. Similarly, after 6 months of square dancing exercises, heart rate, systolic blood pressure, and diastolic blood pressure all showed significant trends, and compared with the control group, there is a significant improvement. Basically consistent, it can be inferred that long-term square dance exercises have a certain effect on improving the cardiopulmonary function of middle-aged and elderly women.[10]

Table 2. Comparison of physical fitness of middle-aged and elderly women before and after the experiment.

	Before the experiment		After the experiment	
	Control group	Test group	Control group	Test group
Grip	20.32±4.17	6.99±5.11	20.57±4.25	28.06±5.06
Sit-ups	8.0±6.71	10.88±5.79	7.35±6.03	15.80±5.40
Sitting forward bending	9.19±6.05	15.0±5.74	9.05±6.13	14.36±5.75
Reaction time	611.25±96.75	515.2±83.77	622.25±95.78	440.0±58.0
Back hook with both hands (left)	-3.0±7.68	0.063±6.28	-3.60±7.70	0.88±6.62
Back hook with both hands (right)	1.83±5.04	3.46±5.23	1.85±5.18	4.0±4.1
Stand on one foot with eyes closed	9.26±8.73	10.58±13.68	9.0±8.55	14.76±14.61

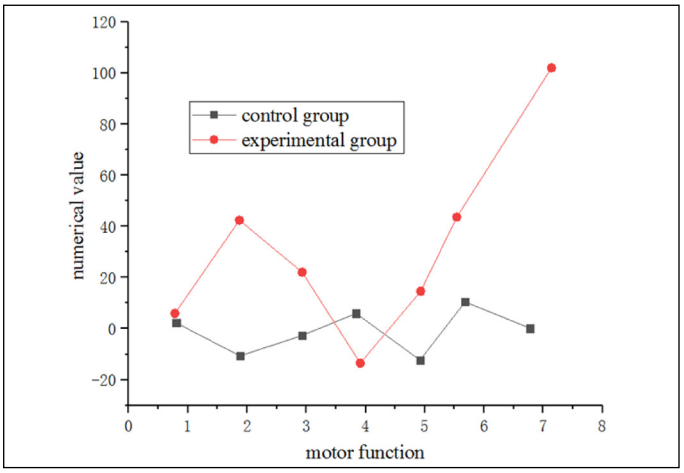

Figure 2. Comparison of the range of changes in motor function of the two groups of subjects before and after the experiment.

CONCLUSION

Put forward the research on the effect of long-term square dance exercise on the exercise function of middle-aged and elderly women, the test results show that long-term square dance exercise has a certain effect on improving the cardiopulmonary function of middle-aged and elderly women. After a long period of regular exercise, the grip strength has improved, the strength of the waist and abdomen has also been improved, muscle strength has also been strengthened to a certain extent. Improve the motor function of middle-aged and elderly women.

ACKNOWLEDGMENT

Soft Science project of Science and Technology Department of Sichuan Province, research on sports dance performance and training concept Innovation. Project no.: 2019JDR0063.

The author declare no potential conflict of interest related to this article

AUTHORS' CONTRIBUTIONS: The author made significant contributions to this manuscript. YJ: writing and performing surgeries, data analysis and performing surgeries, article review and intellectual concept of the article.

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