PHYSICAL EXERCISES IN THE REHABILITATION OF SPORTS INJURIES IN THE ELDERLY

EXERCÍCIOS FÍSICOS NA REABILITAÇÃO DE LESÕES ESPORTIVAS EM IDOSOS

EJERCICIOS FÍSICOS EN LA REHABILITACIÓN DE LESIONES DEPORTIVAS EN ANCIANOS

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Jing Gao[1]
(Physical Education Professional)

1. Yanshan University, Physical Education College, Qinghuangdao, Hebei, China.

Correspondence:
Jing Gao
Qinghuangdao, Hebei, China.
066000.
mariehoney@ysu.edu.cn

ABSTRACT

Introduction: According to the background of the healthy aging population and national fitness care, rapid development has begun in national sports in China. This development is the result of current research on the current scenario. Objective: Study the effects of exercise on the rehabilitation of middle-aged and elderly people with sports injuries. Methods: Twenty individuals were recruited for the experiment; the experimental group received the rehabilitation exercise protocol three times a week for four weeks, while the control group maintained the original lifestyle with no exercise or vigorous exercise. Results: It was found that there was no significant difference in height, weight, and body fat percentage after the aerobic exercise intervention training protocol (P>0.05), but there was a significant difference in BMI between the experimental group and the control group after the intervention training period (P<0.05). The VAS score of the experimental group before and after training decreased from 5.49 to 0.90, showing a significant effect, indicating a significant difference between the experimental group before and after training (P<0.05). Conclusion: The research shows that exercise positively affects the prevention and rehabilitation of sports injuries. The results obtained can help groups in national fitness. ***Level of evidence II; Therapeutic studies - investigation of treatment outcomes.***

Keywords: Athletic Injuries; Physical Fitness; Exercise Therapy; Elderly.

RESUMO

Introdução: Segundo o contexto do envelhecimento saudável da população e dos cuidados da condição física nacional, iniciou-se um rápido desenvolvimento nos esportes nacionais chineses. Esse desenvolvimento é fruto de pesquisas atuais sobre o cenário atual. Objetivo: Estudar os efeitos do exercício físico na reabilitação de pessoas de meia-idade e idosas com lesões ocasionadas pelo esporte. Métodos: Foram recrutados 20 indivíduos para o experimento, o grupo experimental recebeu o protocolo com exercício de reabilitação 3 vezes por semana durante 4 semanas, enquanto o grupo de controle manteve o estilo de vida original sem exercícios ou com exercícios vigorosos. Resultados: Verificou-se que não houve diferença significativa em altura, peso e percentual de gordura corporal após o protocolo de treinamento de intervenção aeróbica de exercício (P>0,05); porém houve diferença significativa no IMC entre o grupo experimental e o grupo controle após o período de treinamento de intervenção (P<0,05). O escore VAS do grupo experimental antes e depois do treinamento diminuiu de 5,49 para 0,90, apresentando um efeito significativo, indicando que houve uma diferença significativa entre o grupo experimental antes e depois do treinamento (P<0,05). Conclusão: A pesquisa mostra que o exercício tem um efeito positivo na prevenção e na reabilitação de lesões esportivas. Os resultados obtidos podem ajudar grupos em aptidão física nacional. ***Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.***

***Descritores*:** *Traumatismos em Atletas; Aptidão Física; Terapia por Exercício; Idosos.*

RESUMEN

Introducción: De acuerdo con el trasfondo del envejecimiento saludable de la población y el cuidado de la forma física nacional, se ha iniciado un rápido desarrollo del deporte nacional chino. Este desarrollo es el resultado de la investigación en curso sobre el escenario actual. Objetivo: Estudiar los efectos del ejercicio en la rehabilitación de personas de mediana y avanzada edad con lesiones deportivas. Métodos: Veinte individuos fueron reclutados para el experimento, el grupo experimental recibió el protocolo con ejercicio de rehabilitación 3 veces por semana durante 4 semanas, mientras que el grupo de control mantuvo el estilo de vida original sin ejercicio o con ejercicio vigoroso. Resultados: Se observó que no había diferencias significativas en la estatura, el peso y el porcentaje de grasa corporal tras el protocolo de entrenamiento de intervención con ejercicio aeróbico (P>0,05); sin embargo, sí había diferencias significativas en el IMC entre el grupo experimental y el grupo de control tras el periodo de entrenamiento de intervención (P<0,05). La puntuación VAS del grupo experimental antes y después del entrenamiento disminuyó de 5,49 a 0,90, mostrando un efecto significativo, lo que indica que hubo una diferencia significativa entre el grupo experimental antes y después del entrenamiento (P<0,05). Conclusión: La investigación demuestra que el ejercicio tiene un efecto positivo en la prevención y rehabilitación de las lesiones deportivas. Los resultados obtenidos pueden ayudar a los grupos en la preparación física nacional. ***Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.***

***Descriptores*:** *Traumatismos en Atletas; Aptitud Física; Terapia por Ejercicio; Ancianos.*

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INTRODUCTION

In order to solve the problem of aging, WHO puts forward the concept of healthy aging, that is, the middle-aged and elderly people need to constantly improve their physical and mental health and develop good social adaptability.[1] The China Aging office implemented the research on the national strategy for coping with aging, and defined the strategies of "development oriented, safety oriented, health-oriented, participation driven and harmonious needs". In the context of the healthy aging strategy, the outline of the national fitness plan issued by the State Council puts forward that "sports for the middle-aged and the elderly promote the health of the middle-aged and the elderly". That is, the middle-aged and the elderly need to pay attention to sports, so as to further maintain physical and mental health. It can be said that as an important step to actively deal with the aging of the population, fitness for the middle-aged and the elderly has ushered in a new era of development opportunities. Nowadays, more and more middle-aged and elderly people begin to participate in sports and fitness, and related sports are becoming more and more abundant.[2] However, physical exercise is a double-edged sword for the middle-aged and elderly. On the one hand, the middle-aged and elderly can improve their physical health through fitness exercise, so as to deal with the risk of disease and reduce the pressure of family and society. On the other hand, due to the decline of physical resistance of middle-aged and elderly people, it is easy to cause sports injury. Once sports injury occurs, it cannot be effectively handled and faced due to lack of relevant knowledge, so the injury will deteriorate rapidly.[3] The middle-aged and elderly people are limited by lack of physical fitness, lack of sports knowledge and skills, and lack of professional sports coaches to correct wrong sports habits, which is easy to lead to unnecessary sports injuries and difficult to achieve the expected sports goals. The duality of exercise will not only improve the health level of middle-aged and elderly people, but also bring exercise-related damage. How to help the middle-aged and elderly exercise safely, reduce sports injury as much as possible and prevent injury is a hot issue to be solved urgently. Based on this point, this paper studies a set of national sports rehabilitation aerobics, and analyzes its impact on the overall fitness injury of the middle-aged and elderly.

METHOD

Research approach

This paper studies the rehabilitation of sports injury in national fitness. Using literature and experimental methods, this paper analyzes the impact of national sports rehabilitation Aerobics on comprehensive fitness injury of middle-aged and elderly people. The study and all the participants were reviewed and approved by Ethics Committee of Yanshan University(NO. YSUIT2019S-056). After obtaining the data, we use mathematical statistics to determine that national sports rehabilitation aerobics has a positive effect on the recovery of comprehensive fitness injury in the middle-aged and elderly. We hope this conclusion can help people participating in national fitness.

Conceptual design

Literature method: Recent papers and academic articles on sports rehabilitation, physical rehabilitation training and sports injury rehabilitation methods are obtained through CNKI, Wanfang database and a university library. Based on the effective research results of predecessors, relevant research is collected, sorted, summarized, summarized and analyzed. From the perspective of sports injury rehabilitation training and based on scientific training theory, rehabilitation training methods for fitness sports injury of middle-aged and elderly people are designed, As the main research method and the basic theory of understanding and solving problems.

Experimental method: Main subjects: according to the survey, the middle-aged and elderly people account for the largest proportion of national fitness injury, and their physical health is worse than that of young people. Therefore, if aerobics is effective for the middle-aged and the elderly, it may be more effective for the young. All researchers in this paper selected the middle-aged and elderly population, that is, the age range is 45-70 years old, and recruited on a voluntary basis. It does not include the middle-aged and elderly people with contraindicated movement disorders. The experiment requires the subjects not to participate in other sports and vigorous physical activities during the experiment. A total of 21 subjects were recruited, including 17 women and 4 men. According to the screening, 20 subjects were left and divided into experimental group and control group. The number of people in both groups was 10, and they were composed of 8 women and 2 men. The experimental group received rehabilitation exercises three times a week for four weeks, while the control group continued its original lifestyle without exercise and vigorous physical activity.

National sports rehabilitation Aerobics: This paper is based on the thirteen forms of Tai Chi. Its basic body shape is head upright, straight neck, top of the hundred meetings, current vision, jaw slightly retracted, including chest, back, abdomen, buttocks, legs slightly bent, toes bent, and hands naturally drooping; The mode of breathing (inspiratory) is abdominal breathing. The inspiratory time is equal to the expiratory time, and the inspiratory times are equal to the expiratory times. There is no obvious gap between them; The expression of ideas is the present vision, looking for images, objects and characters that can comfort the body and mind, and ensuring that they can be presented in front of their own eyes and continue to exist from beginning to end; The reference actions are: limitless pile, lifting pile, opening and closing pile, rolling pile, holding the sky with both hands, holding the sky with one arm, rhinoceros looking at the moon, moving bow and shooting carving, regulating the spleen and stomach, rolling back the humerus, wild horse dividing mane and high exploring horse, embracing knee bend step and up step seven stars, cloud hand single whip, oblique flying style and white crane shining wings, holding clothes and pushing Huashan Mountain, downward potential and independence of golden rooster, holding bird tail, etc.

Experimental test method: Analog visual scale (VAS). This method is the most common clinical evaluation method. The use scene is to evaluate the intensity and change degree of pain. This method is often used to evaluate the pain relief to evaluate the treatment effect. This method uses the numerical evaluation method (NRS) to describe the specific intensity (value) of pain. There are 11 grades in total. If the score is 0, it means no pain; if the score is 10, it means the pain is extremely severe. The stronger the pain, the higher the score.

Test tools include: German kardiomedmedmed700 series elliptical machine, upper limb power meter, treadmill, comfortable bicycle, etc.

Mathematical statistics

SPSS 25.0 statistical software is selected to process the data. The measured data are expressed by mean standard deviation. Paired sample test is used to analyze the training effect before and after training, and independent sample test is used to analyze the difference before and after training. Gender and training time. Difference, $P < 0.05$ means the difference is statistically significant, $P < 0.01$ means the difference is statistically significant.

RESULTS

Comparison of body composition before and after rehabilitation training of National Sports Aerobics

BMI and body fat ratio are common indicators to evaluate human fat, obesity and health status. These two body shape indicators are also applicable to the evaluation of middle-aged and elderly people. As the middle-aged and elderly people are susceptible to cardiovascular disease and diabetes, their BMI value is positively correlated with body fat index. It is also necessary to strictly control the fat content to reduce the risk of obesity related diseases.

Table 1 shows the body shape index test values of the middle-aged and elderly in the experimental group and the control group after the aerobic intervention training of national rehabilitation Aerobics:

Table 1 shows that after the completion of the national exercise rehabilitation aerobics experiment, compared with the middle-aged and elderly people in the control group, the middle-aged and elderly people in the experimental group have no significant difference in height, weight and body fat rate after the intervention training period ($P > 0.05$), and the BMI index between the experimental group and the control group has significant difference after the intervention training ($P < 0.05$).

The stability of systolic and diastolic blood pressure is the guarantee of normal blood circulation in the body. The normal and stable state of systolic and diastolic blood pressure is affected by many factors, so that the human body can stably and normally metabolize. If the blood pressure is too low or too high, it will affect the body. If the blood pressure is seriously abnormal, it will even endanger human life. Hypertension is common in the elderly, and the mortality of complications in the elderly is usually high, indicating that normal and stable blood pressure plays an important role in the health of the elderly.

Before and after the national exercise rehabilitation aerobics intervention training, the physical function index test values of the middle-aged and elderly in the experimental group are shown in Table 2:

Table 3 shows the comparison of the average blood pressure and heart rate of the middle-aged and elderly in the control group before and after the experiment. It can be seen that the meditation rate of the middle-aged and elderly in the two groups has not been significantly improved before and after the national sports rehabilitation aerobics training ($P > 0.05$). After 4 weeks of national exercise rehabilitation aerobics training, the systolic and diastolic blood pressure of the middle-aged and elderly in the experimental group were significantly improved compared with those before intervention training ($P < 0.05$), and the degree of improvement of systolic blood pressure was very significant ($P < 0.01$). However, after intervention training, the systolic and diastolic blood pressure of the middle-aged and elderly in the control group did not improve significantly ($P > 0.05$).

Table 1. Comparison of the mean value of body shape between the experimental group and the control group.

---	Experience group		Control group		t	P
	N	x̄±s	N	x̄±s		
Height (m)	10	1.64±0.26	10	1.64±0.194	1.415	0.169
Weight (kg)	10	61.54±5.11	10	62.01±4.04	-0.739	0.472
BMI (kg / m2)	10	23.42±1.36	10	23.89±1.40	-2.473	0.017
Sensory fat ratio (%)	10	33.92±4.52	10	35.29±4.62	-1.179	0.250

Table 2. Comparison of mean blood pressure and heart rate of middle-aged and elderly people in the experimental group before and after the experiment.

---	Before experiment		After the experiment		t	P
	N	x̄±S	N	x̄±S		
Sealing pressure (MMHG)	30	131.53±18.64	30	119.41±7.17	5.27	0.000
Shuxo pressure (MMHG)	30	74.57±5.39	30	73.18±4.78	2.36	0.026
Heart rate (times)	30	71.71±7.21	30	71.24±6.58	1.18	0.25

Comparison of relevant indexes before and after rehabilitation training of National Sports Aerobics

Statistical analysis (Table 4): the VAS score of the experimental group before and after training ($t = 8.60$, $P = 0.00$), indicating that there was significant difference between the experimental group before and after training ($P < 0.05$); The VAS score of the control group before and after training ($t = 0.64$, $P = 0.55$), indicating that there was no significant difference between the control group before and after training ($P > 0.05$).

DISCUSSION

When formulating the national sports rehabilitation aerobics project suitable for the middle-aged and the elderly, it is necessary to consider the physical and mental characteristics of the middle-aged and the elderly, and design it according to their health level and their own purpose. First of all, it is necessary to arouse the interest and awareness of middle-aged and elderly people in rehabilitation training, so as to promote them to cooperate with rehabilitation work and develop good positive habits.[4] By designing scientific and effective rehabilitation exercise intervention training, we can effectively improve the physique and daily activity ability of the middle-aged and elderly.

Middle-aged and elderly comprehensive fitness exercise rehabilitation aerobics movement design should have characteristics

Because the physical health of the middle-aged and elderly people is in a downhill state, and their musculoskeletal and body system functions are worse than those of the young people, they are a special group. The results reflected in some experiments in this study can show that the weak muscle strength of the middle-aged and elderly people will lose the effect of some training items, and the action range needs to be adjusted. Therefore, this point should be paid attention to in the actual design of rehabilitation intervention training.

Due to the special physical characteristics of the middle-aged and elderly, the amount of exercise designed for intervention training should not be too large, and the technical movements must conform to their physical characteristics. The joints of middle-aged and elderly people will become less active due to their infrequent exercise, resulting in decreased

Table 3. Comparison of mean blood pressure and heart rate of middle-aged and elderly people in the control group before and after the experiment.

---	Before experiment		After the experiment		t	P
	N	x̄±S	N	x̄±S		
Sealing pressure (MMHG)	30	130.93±11.78	30	131.20±ll.59	-1.258	0.225
Shuxo pressure (MMHG)	30	80.53±6.87	30	80.37±7.04	0.374	0.721
Heart rate (times)	30	70.50±6.47	30	70.77±6.24	-1.200	0.247

Table 4. Comparative analysis of VAS scores before and after training cycle between the two groups ($x \pm s$).

Group	Before training	After training
Test group	5.49±1.61	0.90±0.94
Control group	6.23±0.76	5.38±2.91

muscle strength, hyperosteogeny, osteoporosis, etc., and decreased physical stability, thus increasing the risk of falls.[5] The physiological functions and body organs of the middle-aged and elderly people will also appear with age, such as the increase of body fat rate, the decrease of bone mineral density, vascular sclerosis and hypertension. Therefore, the design of rehabilitation training action must strictly compound the physical characteristics of the middle-aged and elderly people.[6]

CONCLUSION

With the development of society, the concept of national fitness has gradually entered people's hearts. Once the basic physiological needs are met, residents begin to seek to improve their overall health. In the context of population aging, healthy aging has become the only way to drive the rapid growth of national fitness activities. However, national fitness activities are a double-edged sword. While improving the physical quality of the middle-aged and elderly, they also have the risk of sports injury to a certain extent. Compared with young people, the sports injury of the middle-aged and elderly is more serious, and they lack injury protection system and rehabilitation training methods. Based on this point, this paper constructs a set of national fitness exercise rehabilitation aerobics to alleviate sports injury, hoping to be helpful to the prevention of national fitness sports injury.

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