

FUNCTIONAL EXERCISE CAPACITY IN SEDENTARY COLLEGE STUDENTS

CAPACIDADE DE EXERCÍCIO FÍSICO FUNCIONAL EM ESTUDANTES UNIVERSITÁRIOS SEDENTÁRIOS

CAPACIDAD DE EJERCICIO FÍSICO FUNCIONAL EN ESTUDIANTES UNIVERSITARIOS SEDENTARIOS



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ABSTRACT

Introduction: The functional training method has been widely adopted as core training by national and foreign sports teams, due to the good results achieved in improving physical fitness and sports skills. **Objective:** Explore the effect of physical function training on exercise capacity in sedentary college students. **Methods:** Volunteer students randomly assigned to experimental and control groups were selected from 120 non-sport majors. Before the formal experiment, the physical indicators of the two groups of college students were measured and recorded. After the experiment, the physical indicators of the two groups of college students were measured and recorded again, and these data were statistically analyzed and discussed. **Results:** After 12 weeks of training under the prescribed intervention protocol, the test scores of the two groups of subjects in functional movement screening were elevated. It is concluded that there is no significant difference between traditional physical training and functional training on height, weight and body mass index of sedentary college students. **Conclusion:** Functional training can improve the physical quality of college students, improve their ability to exercise and play an active role in preventing sports injuries, representing no statistical difference for those who practice it sporadically. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

Keywords: Exercise; Physical Functional Performance; Sports Injuries; Body Mass Index.

RESUMO

Introdução: O método de treinamento funcional tem sido vastamente adotado como treinamento principal por equipes esportivas nacionais e estrangeiras, devido aos bons resultados alcançados na melhoria da aptidão física e das habilidades esportivas. **Contudo,** ainda há lacunas sobre a sua intervenção em estudantes sedentários. **Objetivo:** Explorar o efeito do treinamento da função física na capacidade de exercício físico em estudantes universitários sedentários. **Métodos:** Foram selecionados entre 120 disciplinas não esportivas, alunos voluntários designados aleatoriamente para grupos experimental e controle. Antes do experimento formal, os indicadores físicos dos dois grupos de estudantes universitários foram mensurados e registrados. Após o experimento, os indicadores físicos dos dois grupos de estudantes universitários foram medidos e registrados novamente, sendo esses dados analisados estatisticamente e discutidos. **Resultados:** Após 12 semanas de treinamento sob o protocolo de intervenção prescrito, os resultados dos testes dos dois grupos de sujeitos em triagem de movimento funcional foram elevados. **Conclui-se** que não há diferença significativa entre o treinamento físico tradicional e o treinamento funcional sobre a altura, peso e índice de massa corporal dos estudantes universitários sedentários. **Conclusão:** O treinamento funcional pode melhorar a qualidade física dos estudantes universitários, melhorar sua capacidade de exercício físico e desempenhar um papel ativo na prevenção de lesões esportivas, não representando diferenças estatísticas para aqueles que o praticam esporadicamente. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores: Exercício Físico; Desempenho Físico Funcional; Lesões Esportivas; Índice de Massa Corporal.

RESUMEN

Introducción: El método de entrenamiento funcional ha sido ampliamente adoptado como entrenamiento principal por equipos deportivos nacionales y extranjeros, debido a los buenos resultados obtenidos en la mejora de la forma física y las habilidades deportivas. **Sin embargo,** aún existen lagunas sobre su intervención en estudiantes sedentarios. **Objetivo:** Explorar el efecto del entrenamiento de la función física sobre la capacidad de ejercicio en estudiantes universitarios sedentarios. **Métodos:** Se seleccionaron estudiantes voluntarios asignados aleatoriamente a los grupos experimental y de control entre 120 sujetos no deportistas. Antes del experimento formal, se midieron y registraron los indicadores físicos de los dos grupos de estudiantes universitarios. Tras el experimento, se volvieron a medir y registrar los indicadores físicos de los dos grupos de universitarios, y estos datos se analizaron y discutieron estadísticamente. **Resultados:** Tras 12 semanas de entrenamiento según el protocolo de intervención prescrito, las puntuaciones de los dos grupos de sujetos en las pruebas de detección de movimientos funcionales fueron elevadas. **Se concluye** que no hay diferencias significativas entre el entrenamiento físico tradicional y el entrenamiento funcional sobre la altura, el peso y el índice de masa corporal de los estudiantes universitarios sedentarios. **Conclusión:** El entrenamiento funcional puede mejorar la calidad física de los estudiantes universitarios, mejorar su capacidad de



Descriptores: Ejercicio Físico; Rendimiento Físico Funcional; Lesiones en Deportes; Índice de Masa Corporal.

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INTRODUCTION

As the backbone of the future development of the motherland, college students' physical condition is directly related to the future development of the motherland. However, as far as the physical quality of college students in the early stage is concerned, this is not only a problem that needs to be solved urgently in the society, but also a certain danger to the development of countless students, families and society in China. In order to develop their own physical quality and enhance their physical ability, we need to carry out sports activities. At the same time, we need to select some training methods, and the selected training methods must be scientific and effective training methods, which will be effective.¹ At present, there is a method that is outstanding in training methods and functions, that is, physical functional training. In the early 1990s, the United States first put forward a new concept of physical fitness training, that is, functional training. Later, more and more scholars began to explore the content. In the field of physical rehabilitation, functional training was first used to enable patients to recover as soon as possible and recover better after surgery, and then gradually applied to professional sports.² Generally speaking, physical function training is not achieved overnight, it is a gradual development process from low to high.³

At present, most of the training methods used in school sports training are single traditional physical training methods. Compared with traditional training, physical functional training is diversified.⁴ It is based on traditional training, and then combines general and specific physical qualities. Most of the training methods are used to train with bare hands or simple equipment, This can not only reduce the problems caused by the site restrictions, but also reduce the large cost of purchasing equipment.⁵ Of course, the training efficiency will also be effectively improved. Therefore, we can summarize some of the best methods in physical functional training, form a set of optimization methods that have a greater impact on improving college students' physique, and then apply them to sports classes, Help improve college students' test scores and improve their physique through targeted training.

Relevant concepts and research

Physical functional training

The term "body functional training" has changed from an unfamiliar one to a well understood one. However, experts and scholars hold different views on the concept of body functional training, and there is no exact definition so far. However, the general idea expressed is consistent, and the author explained it in this study as follows: body functional training is to use comprehensive training to further improve the whole sports system of the human body, so as to give full play to the competitive level, further improve the physical quality, and significantly improve the sports performance.

A practical study of physical functional training

The field of rehabilitation is the first field involved in training under physical function to help athletes recover better. Later, it is more used as a means and method in training to improve sports performance through training. Body functional training reflects many unique characteristics and effects of its own. It makes training more perfect. It can not only

enhance the general quality, but also enhance the competitive level. It can make athletes' bodies more comprehensive development, so it can also improve sports performance to varying degrees. The research on physical functional training is still at the initial stage, and its aspects are not very wide, mainly involving the research on competitive sports. However, the research on mass fitness and school sports is still less. The research has proved that physical functional training can not only achieve excellent results in the field of competitive sports, but also has feasible value and significance in public fitness and school sports. In the field of mass fitness, the elderly are the center of research, mainly focusing on the elderly and their balance. In addition, there are few studies conducted by other groups in the field of mass fitness. According to the relevant review in this field, there are few researches on the physical functional training of students in the school field, especially on the physical fitness of college students.

Index selection and scheme design

Selection of healthy fitness test indicators

The physical function training items selected in this study are based on relevant videos, papers, journals, etc. in the Physical Function Training Sports Manual compiled by the National Physical Training Center of the General Administration of Sport of China.⁷ See Table 1 for specific training contents. The main teaching method of the experimental group is to prepare for and practice at the end of the physical education class. The main methods adopted are demonstration and explanation. As for the key actions, I hope that this means can enable students to effectively and deeply understand, and correct the mistakes in the training process in a timely manner.

Research Methods

The control experiment method is to do the control group first, and then observe and analyze the difference between the two groups.⁶ If the results show that the experimental effect is better than the control group, then the methods that can be implemented are effective. 120 non sports majors were selected and divided into experimental group and control group. Before the formal experiment, the physical indicators of the two groups of college students were measured and recorded. T test was used to ensure that there was no significant difference between the two groups' physical indicators and FMS test scores. On this basis, the experimental group carried out physical function training, while

Table 1. Intervention content and training arrangement of physical function training (part).

Weeks	action	Number of groups	Amount
Week 1-6	Walk with high legs	3	20m
	Heel to hip after walking	3	20m
	Walk with high leg lift	3	20m
	Side step squat	3	20m
Week 7-12	Cradle hold leg	3	20m
	High leg run	3	20m
	Sidestep jump	3	20m
	Quadruplegic walking	3	20m
	Double leg hip bridge	3	60s

the control group carried out traditional physical training, which lasted for 12 weeks. After the experiment, the physical indicators of the two groups of college students were measured and recorded to verify the effect of physical functional training.

Empirical analysis

Physical functional training has its own advantages. This study focuses on the improvement of physical exercise ability of non sports major college students, and plays an active role in preventing students from sports injuries. The study is Purely observational studies which no need to registry ID of ICMJE, and all the participants were reviewed and approved by Ethics Committee of Xiang Yang polytechnic, China (NO. 2021027)

Purpose and object of the experiment

After two different methods of training, the students in the experimental group and the control group can improve their sports performance, enhance their physical fitness, and develop their sports ability. More importantly, the training effect of the experimental group using the body functional training method is higher than that of the control group. The use of the body functional training method can better improve the physical fitness of students, In addition, the use of physical functional training methods can also provide some teaching practice methods for physical education teaching, so that students can also take physical exercise after class to strengthen their physique.

Through sorting out the physical fitness test data of 2019 freshmen in a college, 60 ordinary college students of non sports majors who met the requirements were selected and divided into two groups, 30 in each group (21 men and 9 women). The basic physical conditions of the two groups of students are shown in Table 2. The experimental group received physical function training intervention twice a week for 12 weeks. The control group received normal physical education teaching. The physical fitness of 60 students was evaluated before and after the class.

Experimental results and analysis

The differences in age, height and weight between the experimental group and the control group before the experimental intervention are shown in Table 2. The data confirmed that there was no significant difference in age, height and weight of the selected subjects before the intervention. Five items, standing long jump, sit ups, sitting forward bending, 50m and 800m, were selected to evaluate the physical quality of students. The differences between the two groups of students before and after the experimental intervention are shown in Figure 1.

According to the comprehensive experimental results, there was no significant difference in the physical fitness between the control group and the experimental group before the experimental intervention. Through 12 weeks of physical function training, both male and female students' physical quality improved significantly. Among them, standing long jump, pull up and sit ups representing strength quality and sitting forward bending representing flexibility quality are significantly different. In contrast, although there is no significant difference between the 50 meter race representing speed quality and the 1000 meter race and 800 meter race representing endurance quality, the results have improved.

Strength refers to the ability of the whole body or a certain part of the body when it contracts and relaxes.⁸ It is an important factor

Table 2. Age, height and weight of experimental group and control group before experimental intervention.

Test index	Experience group	Control group	P
Year	18.33±0.59	18.13±0.56	0.19
Height	174.66±8.41	170.67±8.17	0.07
Weight	65.6±12.75	70.2±19.17	0.28

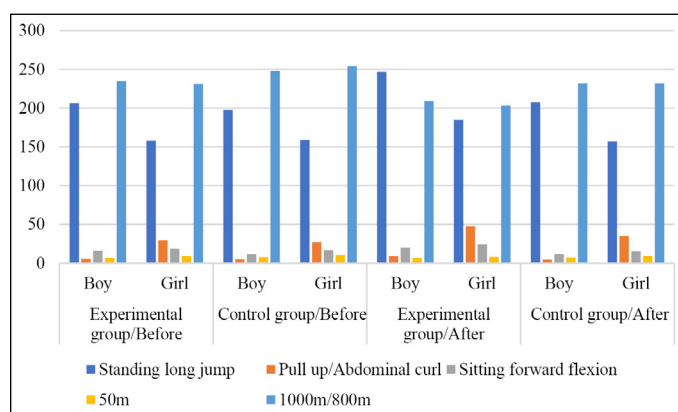


Figure 1. Results before and after the control experiment.

in the growth of muscle endurance and running speed, and also helps to develop sensitivity. Flexibility refers to the range of motion of each joint of the human body, the elasticity and extensibility of the tissues around the joint (ligaments, tendons, muscles, skin and other tissues crossing the joint), and the ability to increase the range of motion during human movement. It is of great significance in mastering sports techniques, preventing the hunch and possibility of injury, maintaining the elasticity and explosive force of muscles, maintaining body posture, etc. Flexibility depends not only on the structural characteristics, but also on the functional state of the nervous system controlling skeletal muscle. Therefore, in combination with the characteristics of strength and flexibility, the physical function training plan is formulated with reference to the Physical Function Training Sports Manual. The main purpose is to strengthen the muscle strength of the leg and the core muscle group, as well as the flexibility of the joints and ligaments of the lower limb. Through training, students can improve their muscle strength and better control their bodies, thus improving their long jump and sit ups. However, there is no training program for upper limbs. Therefore, we speculate that the improvement of the pull up performance of the boys in the experimental group is mainly due to the growth of the core strength, but also because the boys in the control group did not spontaneously carry out the relevant strength training, leading to the decline of the strength quality. In general, the plan has a great effect on improving students' strength and flexibility.

Speed refers to the number of actions completed in a unit time or the ability of the body to move quickly.⁹ It can reflect the functional state of the human central nervous system and the regulatory function of nerves and muscles, as well as other qualities of the human body. Endurance refers to the ability of the human body to perform muscle activities for a long time, also known as anti fatigue ability. Endurance quality reflects the comprehensive situation of muscle endurance, cardiorespiratory endurance and systemic endurance. It is closely related to the improvement of muscle tissue function, cardiorespiratory system function and other basic system functions of the body.

Through the teaching intervention of 12 weeks of physical function training, students' speed and endurance quality can be improved to a certain extent whether they receive sports intervention training or not. It can be speculated that college students can improve their physical fitness by seriously participating in physical education courses. In the control group, although the lower limb strength training was carried out during the exercise intervention, the training intensity was low, which could not significantly increase the strength of the legs and the flexibility of the joints. To sum up, the 12 week exercise intervention can improve the physical fitness of college students to varying degrees.

CONCLUSIONS

Physical function training has a great effect on the improvement of college students' physical health. After 12 weeks of physical function training, the physical quality of 60 college students in the experimental group and the control group has improved. The physical quality of 30 students in the experimental group has significantly improved compared with the performance of 30 students in the control group, especially the strength quality, flexibility quality and sensitivity quality. In the 50 meter and 100 meter events, which reflect students' speed quality and endurance quality, although the scores of the two groups of students have improved, the results are not significant. According to the test results before the experiment, the physical function training intervention plan formulated according to the results was conducted for 12 weeks of intervention training. The data analysis results after the intervention

showed that the personalized physical function training intervention had a significant effect on improving college students' physical health quality, and could become an effective exercise method in college students' physical education classes.

Physical function training can improve and strengthen students' physical function. It is suggested that it be included in school physical education as a means to exercise students' physical ability. While paying attention to strength quality and flexibility quality training, we should also strengthen the training of cardiorespiratory function, and appropriately add aerobic exercise, such as jogging. Group training can be carried out in more detail, and more targeted training plans can be developed for different problems of students.

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