

IMPACTS OF FUNCTIONAL TRAINING ON COLLEGE STUDENTS' PHYSICAL CAPACITY IMPROVEMENT



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IMPACTOS DO TREINAMENTO FUNCIONAL SOBRE O APRIMORAMENTO DA CAPACIDADE FÍSICA DOS ESTUDANTES UNIVERSITÁRIOS

IMPACTOS DEL ENTRENAMIENTO FUNCIONAL EN LA MEJORA DE LA CAPACIDAD FÍSICA DE LOS ESTUDIANTES UNIVERSITARIOS

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ABSTRACT

Introduction: The physical health of college students in China is deficient. Efforts to improve the physical health of college students have become the focus of the national education department and the work of colleges and universities. **Objective:** Analyze the impacts of functional training on college students' physical fitness. **Methods:** 180 college students were randomly selected into an experimental and control group. The experimental group received functional training, while the control group received no intervention. Mathematical statistics were used to compare and analyze the students' fitness assessment indicators before and after the experiment. **Results:** After functional exercise, the test data of various physical fitness of the experimental group of college students found the existing elements ($P < 0.05$). **Conclusion:** The functional physical training method improves the physical quality of college students. Functional training has a clear positive impact on physical fitness. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

Keywords: Physical Conditioning, Human; Sports; Exercise Test.

RESUMO

Introdução: A saúde física dos estudantes universitários na China é deficitária. Os esforços para melhorar a saúde física dos estudantes universitários se tornaram o foco do departamento de educação nacional e o trabalho das próprias faculdades e universidades. **Objetivo:** Analisar os impactos do treinamento funcional sobre a aptidão física dos estudantes universitários. **Métodos:** Foram selecionados aleatoriamente 180 estudantes universitários para serem divididos em um grupo experimental e outro de controle. O grupo experimental recebeu treinamento funcional, enquanto o grupo de controle não recebeu intervenção. Foram utilizadas estatísticas matemáticas para comparar e analisar os indicadores de avaliação da aptidão física dos estudantes antes e depois do experimento. **Resultados:** Após o exercício funcional, os dados de teste de várias aptidões físicas do grupo experimental de estudantes universitários constataram a existência de determinada melhora ($P < 0,05$). **Conclusão:** O método de treinamento físico funcional aperfeiçoa a qualidade física dos estudantes universitários. O treinamento funcional tem claro impacto positivo sobre a aptidão física. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores: Condicionamento Físico Humano; Esportes; Teste de Esforço.

RESUMEN

Introducción: La salud física de los estudiantes universitarios en China es deficiente. Los esfuerzos por mejorar la salud física de los estudiantes universitarios se han convertido en el centro de atención del departamento nacional de educación y del trabajo de los propios colegios y universidades. **Objetivo:** Analizar el impacto del entrenamiento funcional en la condición física de los estudiantes universitarios. **Métodos:** Se seleccionaron al azar 180 estudiantes universitarios para dividirlos en un grupo experimental y otro de control. El grupo experimental recibió entrenamiento funcional, mientras que el grupo de control no recibió ninguna intervención. Se utilizaron estadísticas matemáticas para comparar y analizar los indicadores de evaluación de la aptitud física de los alumnos antes y después del experimento. **Resultados:** Tras el ejercicio funcional, los datos de las pruebas de diversas aptitudes físicas del grupo experimental de estudiantes universitarios constataron la existencia de cierta mejora ($P < 0,05$). **Conclusión:** El método de entrenamiento físico funcional mejora la calidad física de los estudiantes universitarios. El entrenamiento funcional tiene un claro impacto positivo en la condición física. **Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.**

Descriptor: Acondicionamiento Físico Humano; Deportes; Prueba de Esfuerzo.



INTRODUCTION

The physical health of college students in China is not optimistic. According to relevant data, students' physical fitness has shown a downward trend for more than 20 consecutive years. Excessive obesity, weak strength, and slow movement speed.¹ The problem of increased myopia and decreased endurance is also becoming more prominent. In recent years, efforts to improve the physical health of college students have become the focus of the national education department and the work of colleges and universities themselves. Functional physical training is a kind of teaching concept that emphasizes the foundation and is relatively novel. We can apply it to professional sports. This can promote the progress of athletes' competitive performance.² We can also give full play to our advantages in the usual physical training of college students. This will better solve the above two research difficulties.

METHOD

Research object

This article randomly selects 180 students from 4 classes in colleges and universities as the research objects.³ Among them, there are 94 boys and 86 girls. Two classes are the experimental group (90 persons), and two are the control group (90 persons).

Experimental design

Students in the experimental group use the concepts and forms of functional physical training to complete the learning content. Among them, the focus is on the following parts. The control group was conducted traditionally. The experimental group made appropriate adjustments in the following training.

One is the preliminary preparations.⁴ The content includes T-shaped and Y-shaped exercises, lateral lunge exercises, lunge squats, and open-close jump exercises. Each action is completed in two eight beats, respectively.

The second is the core part. We incorporate targeted training content based on different quality goals. In terms of speed, four different directions of front, back, left, and right feet are quickly alternated training. Several different elastic belts are used to assist running in situ, forward, and backward. At the same time, college students also need to perform high-leg raising and acceleration running, small step running and acceleration running, etc. In terms of endurance, it includes several forms of intermittent running, such as 400m×2, 200m×4, 100m×6, etc. Each physical training is based on one form, and the three forms are carried out in cycles.⁵ Different training forms are adopted according to the situation in terms of strength. Such as flexion of the hips, climbing push-ups, side bridges, push-up bridges, one-foot or two-foot jump steps, etc. In terms of flexibility, it can include parallel running, T-shaped running, skipping rope, etc. In terms of flexibility, various static or dynamic stretching methods are required.

The third is the relaxation part after training. The control group used traditional physical education methods to complete.⁶ The experimental group took jogging, warm-up exercises, and joint stretching, depending on the difference in the front core part.

Research methods

This experiment focused on experimental methods, statistical methods, and literature methods. In sports training, the physiological variables of athletes are functions that change with time.⁷ Suppose y represents each physiological random variable. x represents the time-independent variable, and the unit is minutes. $\{A_i, i = 0, 1, \dots, 10\}$ is the parameter to be estimated, namely the undetermined regression coefficient. ε is a random error term, which is usually unpredictable. Its generalized polynomial model can be expressed as

$$y = \sum_{i=0}^4 A_i x^i + \sum_{i=1}^2 A_i + 4x^{-i} + A_7 x^{1/2} + A_8 x^{-1/2} + A_9 e^{-x} + A_{10} \lg x + \varepsilon \quad (1)$$

The fitting principle is the criterion that the sum of squares of the fitting residuals is the smallest. $\sum_{i=1}^n v_i^2 \Rightarrow \min$ where v is the residual value. The physiological variables of athletes have a relationship that changes with the heart rate (*HR*). Assume that y represents each physiological random variable. x represents the heart rate (*HR*) independent variable [8]. The unit is times/minute. $\{A_i, i = 0, 1, \dots, 10; a_k, b_k, k = 1, 2\}$ is the parameter to be estimated. ε is a random error term, which is usually unpredictable. Its generalized polynomial model can be expressed as

$$y = \sum_{i=0}^4 A_i x^i + \sum_{i=1}^2 A_i + 4x^{-i} + A_7 x^{1/2} + A_8 x^{-1/2} + A_9 e^{-x} + A_{10} \lg x + \sum_{k=1}^2 [a_k \cos(kwx) + b_k \sin(kws)] + \varepsilon \quad (2)$$

The fitting principle is that the sum of squares of fitting residuals is the minimum criterion. $\sum_{i=1}^n v_i^2 \Rightarrow \min$ where v is the residual value.

There is no need for a code of ethics for this type of study.

RESULTS

After a period of different forms of training, the experimental group and the control group achieved a significant difference in performance. (Table 1) There is no significant difference in the scores of the two groups of students in 100m(s), 1000m/800m(min), standing long jump (m), and round-trip running (s). This shows that the two groups of students have similar physical fitness before the experiment. However, there are differences in students' physical fitness during the specific experimental operation. This is because of the difference in training concepts and training methods. The author also added functional action screening tasks for the experimental and control groups.⁹ We asked two groups of students to perform six functional screenings of squats, front and rear split squats, and shoulder flexibility. Student performance is divided into different levels. After a period of functional physical training in the experimental group, the proportion of people who completed the action without pain was significantly better than that of the control group.

The comparative analysis of the physical fitness experiment mainly compares physical fitness before and after the experiment. The scores of a group of students who took functional physical training improved significantly in 100m(s), 1000m/800m(min), standing long jump (m), and round-trip running (s). Although the students in the control group have made some progress after taking regular training, the degree of progress is not as good as the former. This result can fully explain two problems.¹⁰ First of all, functional physical training and traditional physical training can positively impact the physical fitness of students. Secondly, the two

Table 1. Comparison of physical fitness between the experimental and control groups before and after the experiment.

Index content	gender	Test group		Control group	
		Before the experiment	After the experiment	Before the experiment	After the experiment
100m(s)	male	15	14.1	15.1	14.7
	Female	17.3	16.4	17.3	14.5
100m/800m(min)	male	4.38	4.04	4.38	4.17
	Female	4.48	4.16	4.48	4.18
Standing long jump (m)	male	2.05	2.37	2.04	2.32
	Female	1.78	1.82	1.78	1.87
Round trip (s)	male	30	27	28	28
	Female	36	32	35	33

training methods still show a certain difference. The functional physical training form designed according to the actual situation is more likely to make students interested in participation.

DISCUSSION

Innovative functional physical training concepts and methods

The form of functional physical training greatly affects the development of college students' physical fitness.¹¹ Therefore, introducing it into the training program can adjust for students of different genders and levels. This ensures the optimization of the training effect. Functional training comes from the root of rehabilitation training in the medical industry. So we can clarify its particularity in the modern physical training system. It emphasizes the objective evaluation of sports participants' body systems in the context of big data analysis. In this way, the action training mode can simultaneously train multiple body parts and functions under different loads and different stimulation conditions.

Combination of functional physical training and professional teaching

We recommend that the training content and process be combined with the student's major. In this way, different majors correspond to different training content.¹² At the same time, functional physical training no longer exists in isolation. The purpose of this is to ensure that functional physical training has a more effective physical health promotion effect on college students.

Majors with heavier body load requirements, such as mechanical operation majors, can clarify that they have higher requirements in terms of endurance and balance. Students must ensure their attention, upper limb coordination, and lower limb endurance.¹³ The training content available for this purpose includes the following items. Dumbbell exercises, gymnastics, heavy object throwing, solid balls, etc. The professional requirements related to the assembly of objects focus on the coordination and accuracy of the limbs. At the same time, they require a faster movement speed.

For this reason, functional physical training should be tilted towards heavy object throwing. So they can also coordinate with 30-meter or

50-meter acceleration runs and various types of basketball dribbling and passing. Design and drawing majors should have greater accuracy of limbs, finger flexibility, and concentration.¹⁴ Therefore, the available functional physical training content includes shooting exercises and prone posture. If the students' major is related to fieldwork, then there will be higher requirements for their limbs' strength, sensitivity, and flexibility. Therefore, gymnastics, long jump, and climbing are more suitable when performing functional physical training.

Functional physical training in colleges and universities can more effectively promote students' overall physical fitness. Therefore, college physical education teachers must pay full attention to the possibility of its integration into normal sports teaching. Allow students to fully exercise all aspects of their physical qualities and reaction abilities during class.¹⁵ Integrating functional physical training into sports guidance is a question that all teachers should seriously consider. Teachers need to adopt targeted training and guidance programs according to different majors' differences and even individual students. This satisfies student requirements. Only this way can provide students better master relevant knowledge and skills under effective physical training methods.

CONCLUSION

Functional physical training has a positive effect on the experimental group of students. This method makes the improvement effect of physical fitness better than the control group. Secondly, the student's physical fitness in the control group improved significantly. Therefore, the role of traditional training methods cannot be easily denied. The third analysis from the perspective of gender comparison found that whether it is the experimental group or the control group, the male group is often better than the female group.

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