

IMPACTS OF PHYSICAL COORDINATION TRAINING ON SPEED IN SHORT TRACK SPEED SKATING



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IMPACTOS DO TREINAMENTO DE COORDENAÇÃO FÍSICA SOBRE A VELOCIDADE NA PATINAÇÃO DE VELOCIDADE EM PISTA CURTA

EFFECTOS DEL ENTRENAMIENTO DE LA COORDINACIÓN FÍSICA SOBRE LA VELOCIDAD EN EL PATINAJE DE VELOCIDAD EN PISTA CORTA

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ABSTRACT

Introduction: Although the development time of short-track speed skating in China is relatively short, with the joint efforts of many athletes and coaches, the special technical level can be comparable with that of European and American countries. **Objective:** Verify the impacts of physical coordination training on speed in short track speed skating. **Methods:** Athletes from the provincial skating team were randomly selected and distributed into control and experimental groups to apply the training method on physical coordination in short track speed skating. **Results:** The average body fat rate of the skaters in the control group was 15.24%, the average body fat rate in the control group was 15.20%, and the T value of the experimental group and control group was 1.00, $P = 0.374 < 0.05$. **Conclusion:** Because they are special equipment, the turn resistance training device and the air resistance parachute played an important role in improving the special fitness of Chinese short track speed skaters. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

Keywords: Training; Exercise; Skating; Exercise.

RESUMO

Introdução: Embora o tempo de desenvolvimento da patinação em pista curta na China seja relativamente curto, com os esforços conjuntos de muitos atletas e treinadores, o nível técnico especial pode ser comparável com o dos países europeus e americanos. **Objetivo:** Verificar os impactos do treinamento de coordenação física sobre a velocidade na patinação de velocidade em pista curta. **Métodos:** Atletas da equipe de patinação provincial foram aleatoriamente selecionados e distribuídos em grupos controle e experimental para aplicar o método de treinamento na coordenação física de patinação de velocidade em pista curta. **Resultados:** A taxa média de gordura corporal dos patinadores no grupo controle foi 15,24%, a taxa média de gordura corporal no grupo de controle foi 15,20%, e o valor de T do grupo experimental e do grupo de controle foi 1,00, $P = 0,374 < 0,05$. **Conclusão:** Por serem equipamentos especiais, o dispositivo de treinamento de resistência à curva e o paraquedas de resistência ao ar desempenharam um papel importante na melhoria da aptidão física especial dos patinadores chineses de velocidade em pista curta. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores: Treinamento Físico; Patinação; Exercício Físico.

RESUMEN

Introducción: Aunque el tiempo de desarrollo del patinaje de velocidad en pista corta en China es relativamente corto, con el esfuerzo conjunto de muchos atletas y entrenadores, el nivel técnico especial puede ser comparable al de los países europeos y americanos. **Objetivo:** Verificar los impactos del entrenamiento de la coordinación física sobre la velocidad en el patinaje de velocidad en pista corta. **Métodos:** Se seleccionaron aleatoriamente atletas del equipo provincial de patinaje y se distribuyeron en grupos de control y experimentales para aplicar el método de entrenamiento de la coordinación física en el patinaje de velocidad en pista corta. **Resultados:** El índice medio de grasa corporal de los patinadores del grupo de control fue del 15,24%, el índice medio de grasa corporal del grupo de control fue del 15,20%, y el valor T del grupo experimental y del grupo de control fue de 1,00, $P = 0,374 < 0,05$. **Conclusión:** Debido a que son equipos especiales, el dispositivo de entrenamiento de resistencia en curva y el paraquedas de resistencia al aire desempeñaron un papel importante en la mejora de la aptitud física especial de los patinadores de velocidad de pista corta chinos. **Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.**

Descritores: Entrenamiento Físico; Patinación; Ejercicio Físico.



INTRODUCTION

Since the short track speed skating project was introduced into China in 1981, it has achieved leapfrog development in China, especially in the north of China. With the rapid development of China's economy and the improvement of people's living standards, short track speed skating has been widely valued and popularized. At the same time, the middle and short track speed skaters also achieved excellent results in the Winter Olympic Games and the world championships.¹ Speed skating is the foundation of athletes' endurance training, and it is a long-term short track training to improve athletes' physical coordination ability. It's not that you can improve your endurance in a short time. The physical coordination ability training of all sports events has something in common, but the project characteristics are different, and the detailed training of physical coordination ability training is different. Moreover, in 2006, the International Skating Federation revised the competition rules of short track speed skating, requiring short track speed skaters to complete two 500 meter competitions in one day with an interval of 10-20 minutes.² The new competition rules put forward new requirements for the training of physical coordination ability of short track speed skaters. Only by applying reasonable training methods, can short track speed skaters quickly recover their physical fitness and metabolize the residual high lactic acid in the body within 10-20 minutes. Only in this way can we ensure that our athletes can achieve good results in the Winter Olympic Games and the world championships.³

METHOD

Research object

The body coordination ability of young speed skaters was studied. The subjects were 29 male short track speed skaters from the provincial short track speed skating youth team. See Table 1 for the basic information of the subjects.

Experimental method

The experimental period from May 4, 2019 to November 4, 2020 is six months. The duration of each training course (the total training time of both groups is 60-120min), the load heart rate of each training course (150-160 times / min), and the training course is arranged every week (6 times).

Thirty athletes were randomly divided into two groups.⁴ The experimental group was trained with other countries' short track speed skating body coordination ability training methods, and the control group was trained with China's traditional body coordination ability training methods.⁵ The two groups were followed up for 6 months. The working time of each training session was 60-120 minutes, and the heart rate of each training session was 165-175 times per minute.

The whole process and index test of the experiment were jointly implemented and monitored by myself and the coach of the provincial short track speed skating youth team.⁶ Under the strict requirements on the training quality of the experimental objects, 30 athletes of the short track speed skating youth team were randomly divided into two groups. The two groups used different training methods of physical coordination ability, and the experiment was carried out under the condition of equal training time, training load and training rules.

Table 1. Subject Basic Information Sheet.

	Experience group		Control group		t	p
	M	SD	M	SD		
Height (CM)	181.5	3.0	182.4	3.7	0.59	0.45
Age	17.8	3.4	19.2	3.4	0.4	0.61
Weight	77.6	5.3	75.1	4.3	0.47	0.58

Data Analysis

In this paper, spss17.0 statistical analysis is used to convert the five index data before and after the experiment into statistical tables for comparative analysis between and within groups. It provides a theoretical basis for the practicality and effectiveness of this paper.⁷

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

RESULTS

Before the experiment, 30 male athletes of short track speed skating youth team were selected, of which 15 short track speed skaters were randomly selected as group D and the other 15 short track speed skaters as group E. Test the indicators reflecting the level of physical coordination ability of the subjects. The test results are shown in Table 2 below.

It can be seen from the data in Table 2 that before the experiment, the average value of maximum oxygen uptake of short track speed skaters in group D was 56.8 LML / min.kg, the average value of short track speed skaters in Group E was 56.85 ml / min.kg, and the T value of groups D and E was -0.38, P = 0.974 > 0.05. These data show that there is no significant difference between group D and group E in the maximum oxygen uptake of short track speed skaters before the experiment.⁸

It can be seen from the data in Table 3 that before the experiment, the average value of 500m performance of short track speed skaters in group D was 45.35 seconds, the average value of 500m performance in Group E was 45.51 seconds, and the T value of groups D and E was -0.574, P = 0.586 > 0.05. These data show that before the experiment, there is no significant difference between group D and group E in the 500 meter running performance of short track speed skaters.⁹

It can be seen from the data in Figure 1 that after the experiment, the average value of the maximum oxygen uptake of short track speed skaters in group D is 63.44m/min.kg, the average value of the maximum sound oxygen uptake of short track speed skaters in Group E is 57.24ml/min.kg, and the T value of groups D and E is 6.351, P = 0.001 < 0.05. These data show that there are significant differences in the maximum oxygen uptake of short track speed skaters in group D and group E after the experiment. At the same time, the above data prove that the training methods of Short Track Speed Skaters' physical coordination ability in other countries are conducive to improving the maximum oxygen uptake level of short track speed skaters in China.

DISCUSSION

The physical requirements of competitive sports for athletes are much higher than ordinary people. In addition to mastering movement skills, an excellent athlete also needs to have strong physical quality. Even if he is physically and mentally tired in the process of competition, he can still burst out amazing endurance and speed at the critical moment. For short track speed skating, special physical training is particularly important.

Table 2. Comparison of maximum oxygen uptake of short track speed skaters in group D and group E before the experiment (n = 15).

	Experience group	Standard deviation	Control group	Standard deviation	t	p
Maximum oxygen uptake (ml/min.kg)	56.17	1.6007	55.63	1.7532	-0.36	0.857

Table 3. Comparison of 500m performance between group D and group e short track speed skaters before the experiment (n = 15).

	Experience group	Standard deviation	Control group	Standard deviation	t	p
500 meter run (second)	44.34	0.3846	44.16	0.4265	-0.564	0.563

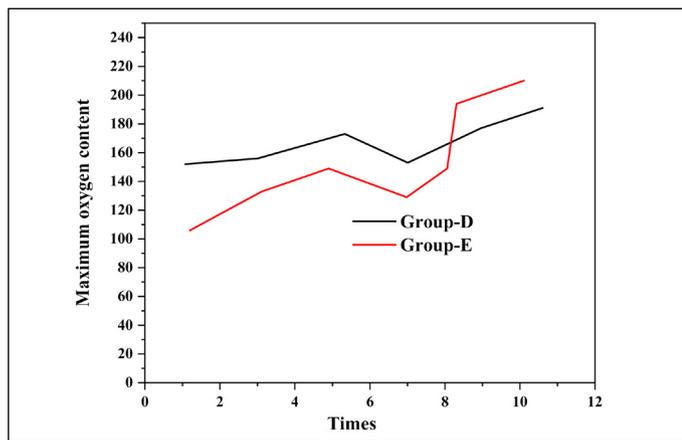


Figure 1. Maximum oxygen uptake in groups D and E.

Short track speed skating is a short-range event, that is to say, athletes should basically maintain the state of high-speed sliding in the whole process, which is a great challenge to athletes' physical fitness. Therefore, it is urgent to carry out special physical fitness training for young short track speed skaters.¹⁰ According to the formation mechanism of short track speed skating special physical fitness, it is necessary to carry out overload physical fitness training for athletes according to national competition standards in daily training, so as to help them break through and improve on the basis of their original physical fitness. Due to the particularity of short track speed skating, when carrying out special physical training for athletes, we also need to use certain auxiliary tools to expand various resistance by using the sports structure of instruments, so as to promote athletes to gradually break through their limits in continuous training. At present, the common physical training instruments in short track speed skating mainly include short track speed skating curve strength trainer and ice sliding resistance umbrella. The emergence of the two training instruments improves the conditions of special physical training, innovates the training mode, injects fresh blood into physical training, and enables short track speed skaters to make a breakthrough in their physical fitness in a short time and deeply tap their potential.

Coaches in the physical training of short track speed skaters can not blindly follow the traditional training mode. They should follow the

needs of the times, constantly change the training concept, and timely reform and improve the bad training methods and methods, so as to cultivate the athletes' interest in physical training and better tap their physical potential. In order to fully mobilize the athletes' interest and enthusiasm in physical training and training, coaches should give full encouragement and support in the process of their training, so that he can accept the next physical training challenges with more confidence. At the same time, in the training process, we should also give full play to the subjective initiative of athletes, so that they can really enjoy the fun and role of physical training from the heart. For athletes with better performance, they can demonstrate for other athletes. On the one hand, they can affirm the training results of athletes. On the other hand, we can find their shortcomings and improve them in time, so as to promote the physical progress and improvement of athletes. In the training process, coaches can not only follow their personal wishes and ignore the ideas of athletes. They should listen to their suggestions in time, improve the training scheme, and promote the improvement of physical training quality through mutual learning and improvement, so that each athlete can have strong physical quality.¹¹

CONCLUSION

Special body coordination is the ability to complete the corresponding short track speed skating technical actions and coordinate with teammates through their own operation and overall linkage within the body. Improving the special physical coordination ability of short track speed skaters, especially young short track speed skaters, can not only help to improve their own physical qualities, but also strengthen the accurate cooperation between the players in the field, so as to complete the competition tasks with better quality. At the same time, the special physical coordination training is more novel and effective for high school students' short track speed skaters, which can stimulate their potential enthusiasm and ability for short track speed skaters. If it is combined with the traditional training methods, it is bound to achieve twice the result with half the effort in the training of young short track speed skaters.

All authors declare no potential conflict of interest related to this article

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