EFFECTS OF FUNCTIONAL TRAINING ON PROPRIOCEPTION IN SPORT ATHLETES

EFEITOS DO TREINAMENTO FUNCIONAL NA PROPRIOCEPÇÃO FÍSICA DE ATLETAS ESPORTIVOS

EFECTOS DEL ENTRENAMIENTO FUNCIONAL EN LA PROPIOCEPCIÓN FÍSICA DE LOS DEPORTISTAS

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ABSTRACT

Introduction: Physical training is a well-known training method in competitive sports. However, in the majority of the physical training classes, the focus is still on the traditional exercises of physical conditioning as strength, speed, resistance, etc., directed for young athletes that are in the growth and development phase, without a literary base to assure actual effectiveness in the load increases for the athletic performance facing the risks in the athletes' physical proprioception. Objective: Explores the effect of functional training on the physical sensibility of sports athletes. Methods: The data collection method is used in the daily training of six notable athletes in a district sports school: judo, martial arts, wrestling, tennis team, swimming team, and table tennis team, adding the functional training protocol in body movement. Results: The average performance of the groups before and after the experiment was collected and confronted, the difference test was performed, and the test result found P>0.05. The athletes in the experimental group not only improved the footwork speed and physical coordination, the movement speed of the footwork and the speed of the connection between movements increased significantly in the sixth week, reflecting more excellent stability and motor coordination in the movements. Proprioception is one of the essential sports qualities of the human body; it is directly related to physical qualities such as speed and strength and is also closely related to the different neural pathways. Conclusion: Functional training can improve athletes' physical flexibility and motor coordination; it can also stimulate body proprioceptors, increase athletes' confidence, and make training more efficient and effective. ***Evidence level II; Therapeutic Studies - Investigating the results.***

Keywords: Training; Athletes; Proprioception.

RESUMO

Introdução: O treinamento físico é um método de treinamento bastante conhecido em esportes competitivos. Porém, na maioria das aulas de treinamento físico, o foco ainda está nos exercícios tradicionais de condicionamento físico como força, velocidade, resistência, etc., voltados para jovens atletas que estão em fase de crescimento e desenvolvimento, sem embasamento literário para assegurar uma real eficácia nos aumentos de carga para o desempenho atlético frente aos riscos na propriocepção física dos atletas. Objetivo: Explorar o efeito do treinamento funcional na sensibilidade física de atletas esportivos. Métodos: O método de coleta de dados é utilizado no treinamento diário de seis diferentes atletas especiais em uma escola de esportes distrital: judô, artes marciais, luta livre, equipe de tênis, equipe de natação e equipe de tênis de mesa, agregando o protocolo de treino funcional em movimento corporal. Resultados: O desempenho médio dos grupos antes e depois do experimento foram coletados e confrontados, o teste de diferença foi realizado, sendo o resultado do teste encontrado P>0,05. Os atletas do grupo experimental não apenas melhoraram a velocidade de trabalho com os pés e a coordenação física, a velocidade do movimento do trabalho com os pés e a velocidade da conexão entre os movimentos aumentaram significativamente na sexta semana, refletindo maior estabilidade e coordenação motora nos movimentos. A propriocepção é uma das qualidades esportivas essenciais do corpo humano, não está apenas diretamente relacionada às qualidades físicas, como velocidade e força, mas também está intimamente relacionada as diferentes vias neurais. Conclusão: O treinamento funcional pode melhorar a flexibilidade física e a coordenação motora dos atletas; também pode estimular os proprioceptores corporais, aumentar a confiança dos atletas e tornar o treinamento mais eficiente e eficaz. ***Nível de evidência II; Estudos terapêuticos - Investigação de resultados.***

Descritores: *Treinamento; Atletas; Propriocepção.*

RESUMEN

Introducción: El entrenamiento físico es un método de entrenamiento muy conocido en los deportes de competición. Sin embargo, en la mayoría de las clases de entrenamiento físico, el enfoque sigue siendo los ejercicios tradicionales de acondicionamiento físico como fuerza, velocidad, resistencia, etc., dirigidos para jóvenes atletas que están en fase de crecimiento y desarrollo, sin base literaria para asegurar una eficacia real en los aumentos de carga para el rendimiento atlético frente a los riesgos en la propiocepción física de los atletas. Objetivo: Explorar el efecto del entrenamiento funcional en la sensibilidad física de los deportistas. Métodos: El método de recogida de datos se utiliza en el entrenamiento diario de seis atletas especiales diferentes en una escuela deportiva distrital: judo, artes marciales, lucha, equipo de tenis, equipo de natación y equipo de tenis de mesa, añadiendo el protocolo

de entrenamiento funcional en el movimiento corporal. Resultados: Se recogió el rendimiento medio de los grupos antes y después del experimento y se confrontó, se realizó la prueba de la diferencia y el resultado de la prueba fue P>0,05. Los atletas del grupo experimental no sólo mejoraron la velocidad del trabajo de pies y la coordinación física, sino que la velocidad del movimiento de pies y la velocidad de la conexión entre los movimientos aumentaron significativamente en la sexta semana, lo que refleja una mayor estabilidad y coordinación motora en los movimientos. La propiocepción es una de las cualidades deportivas esenciales del cuerpo humano, no sólo está directamente relacionada con cualidades físicas como la velocidad y la fuerza, sino que también está estrechamente relacionada con las diferentes vías neuronales. Conclusión: El entrenamiento funcional puede mejorar la flexibilidad física y la coordinación motora de los atletas; también puede estimular los propioceptores corporales, aumentar la confianza de los atletas y hacer que el entrenamiento sea más eficiente y eficaz. ***Nivel de evidencia II; Estudios terapéuticos - Investigación de resultados.***

Descriptores: *Entrenamiento; Atletas; Propiocepción.*

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INTRODUCTION

Physical training is a well-known training method in competitive sports, it is also an important part of sports training, has become an important method recognized at home and abroad to improve athletes' special athletic ability, it is valued by more and more coaches. Most sports teams incorporate physical fitness training into their athletes' daily training content,arrange at least one physical fitness class every week, in order to improve the athlete's special quality.[1] However, in most physical training classes, the focus of training is still on traditional physical fitness exercises such as strength, speed, endurance, etc, facing young athletes who are in the growth and development period, although a larger training load can improve the athletic water armor of young athletes, but invisibly caused the fatigue of the athlete's body, lead to the emergence of injuries.[2] Wakahara T mentioned that in the training of competitive athletes, mass training is essential, however, different training methods have different effects. Functional training is an innovative training method and section, it can improve the disadvantages of traditional mass training. [3,4]

METHOD

Research objects

Take the three different special athletes of Judo, Wushu and Wrestling in a sports school for sports athletes in a certain district as an example, research on the influence of physical motor function training on athletes' training.

Research methods

The literature data method is based on research needs, by reading books and searching the Internet, collect relevant literature data, through China Knowledge Network, China Journals Network, and China Master and Doctoral Dissertation Database, use keywords such as "functional training" to search for documents related to this research, understand the research status and provide a solid theoretical foundation and basis for the research.[5]

The data collection method is adopted in the daily training of judo, martial arts, and wrestling young athletes in a sports school in a certain district, add body movement function training content, three months later, physical fitness tests were conducted on 6 different athletes in judo, martial arts, wrestling, tennis, table tennis, and swimming, and compare and analyze the test results.

Mathematical Statistics

The statistical software used in this text is Excl and spss22.0, all the data collected in the research and the data obtained in the test are processed through these two tools. To ensure the scientificity of the experiment, perform a T experiment on the differences before and after the experiment, the statistical significance is generally set at 0.05.[6]

RESULTS

Analysis of the total scores of all athletes

A total of 50 athletes participated in the test, the test content includes sitting forward bending, standing long jump, throwing solid balls to the left and right, 30m sprint, hexagonal jump. By summarizing the test results of all athletes, the analysis is shown in Table 1.

As can be seen from Table 1, among the athletes participating in the test, there are 35 male athletes and 15 female athletes. Among male athletes, the highest score is 54 points, and the lowest score is 12 points; Among the female athletes, the highest score is 48 points and the lowest score is 18 points. Men averaged 35.11 points, and women averaged 30.38 points.

Analysis of individual test scores of different items

Seated forward bending through the analysis of the test content results of sitting forward bending of athletes in different sports, perform functional training to get Figure 1.

Table 1. Total scores of all male and female athletes.

	Number of people	Max	Minimum	Average value	Standard deviation
Man	35	54	12	35.11	8.99
Women	15	26	48	30.38	9.21

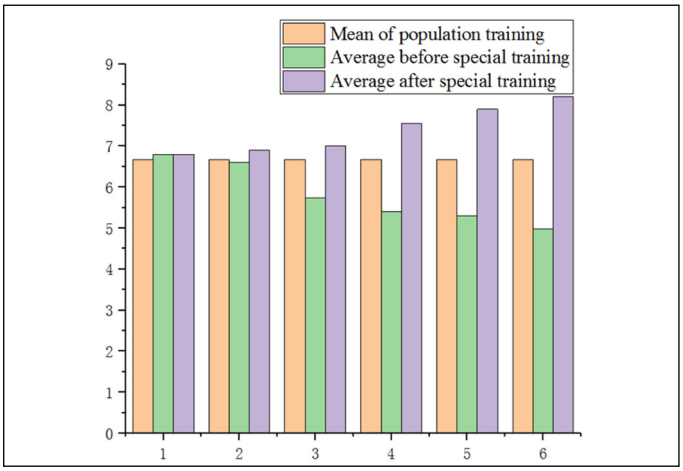

Figure 1. Special training test analysis of wrestling team, tennis team and table tennis team.

In one of the sitting forward bending test, the average value of judo, martial arts, and swimming juvenile athletes is higher than the overall average, the average value of wrestling, tennis, and table tennis players is lower than the overall level. The sitting forward bending test reflects the athlete's flexibility, training flexibility will be significantly developed and improved, therefore, wrestling teams, tennis teams, and table tennis teams should pay more attention to the flexibility of their players in their daily training, improve the special performance under the premise of ensuring the overall development of the team members' various qualities.[7] The results of functional training and Figure 1 show:

Standing long jump through the analysis of the results of the standing long jump test content of athletes in different sports, perform functional training to get Figure 2.

Standing long jump test. Among the events, the average value of judo, martial arts, wrestling, and table tennis special young athletes is higher than the overall average, the average value of tennis and swimming players is lower than the overall level. The standing long jump test reflects the athlete's lower limb strength and explosive power, therefore, tennis and swimming teams should pay more attention to the lower limb strength and explosive force training of their players in their daily training, improve the special performance under the premise of ensuring the overall development of the team members' various qualities. The results of the functional training test and Figure 2 show:

Left-throwing a solid ball through the analysis of the test results of the left-throwing solid ball of different athletes, perform functional training to get Figure 3.

Throw a solid ball on the left, the average of judo, wrestling, and tennis-specialized juvenile athletes is higher than the overall average, the average values of martial arts, swimming, and table tennis players are lower than the overall level. The left-throwing solid ball test reflects the strength and explosiveness of the player's left upper limb, therefore, the martial arts, swimming, and table tennis teams should inject more into the left upper limb strength and explosive force training of the players in their daily training, on the premise of the comprehensive development of the various qualities of the Baowang team members, improve the special performance.[8] The results of functional training and Figure 3 show:

Right tossing a solid ball through the analysis of the test content results of the right tossing of a solid ball for athletes in different sports, perform functional training to get Figure 4.

Throw a solid ball on the right, the average value of judo, wrestling, and tennis-specialized young athletes is higher than the overall average, the average values of martial arts, swimming, and table tennis players are lower than the overall level. The right-throwing solid ball test reflects the strength and explosiveness of the player's upper right limb, therefore, the martial arts, swimming, and table tennis teams should pay more attention to the players' right upper limb strength and explosive force training in their daily training, improve the special performance under the premise of ensuring the overall development of the team members' various qualities. The results of functional training and Figure 4 show:

30m running through the analysis of the results of the 30m running test for different athletes, perform functional training to get Figure 5. In a 30-meter run, the average value of young athletes in martial arts, tennis, and table tennis is higher than the overall average, the average value of

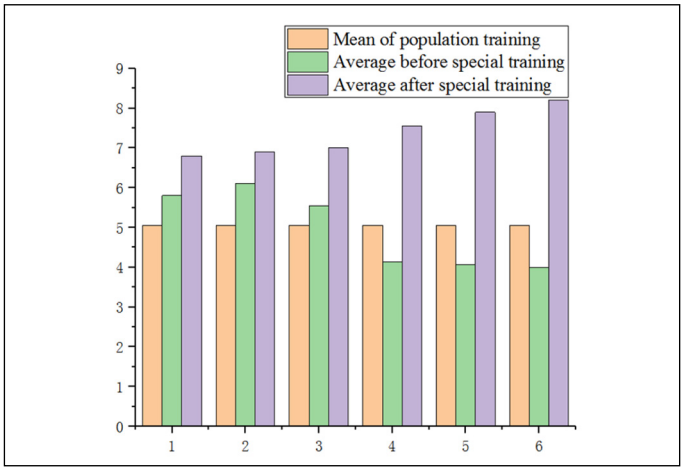

Figure 2. Tennis and swimming team special training test analysis.

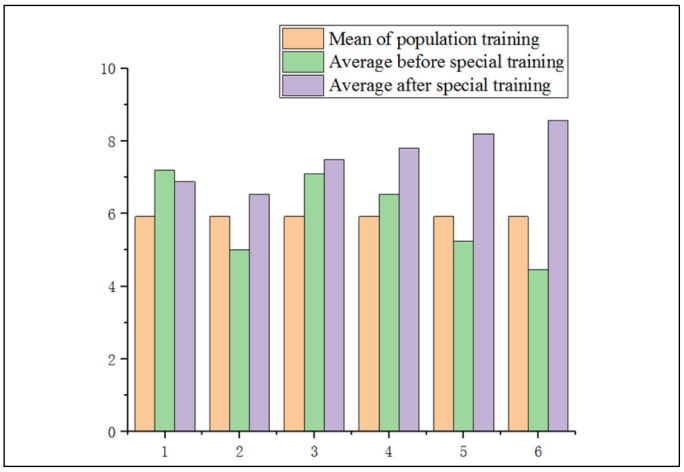

Figure 3. Special training test analysis of martial arts, swimming, and table tennis teams.

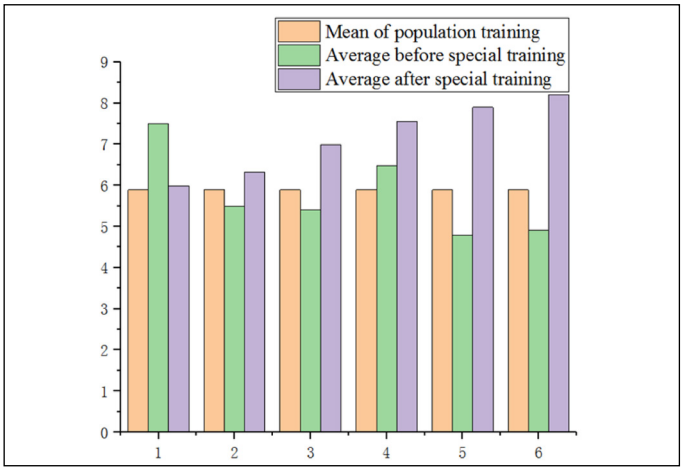

Figure 4. Special training test analysis of martial arts, swimming, and table tennis teams.

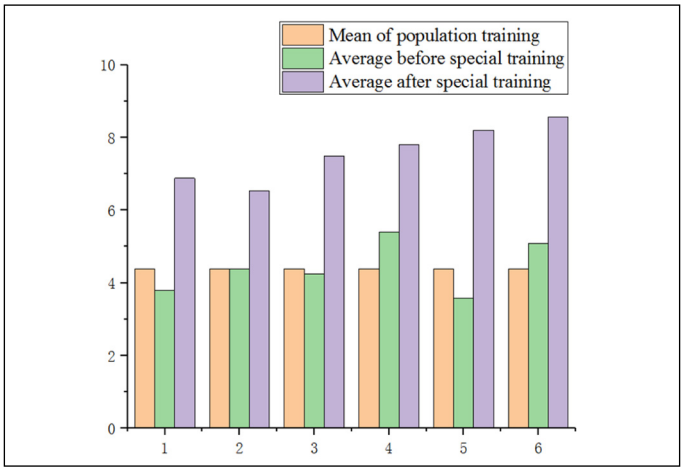

Figure 5. Special training test analysis for judo, wrestling, and swimming teams.

judo, wrestling, and swimming players is lower than the overall level. The 30m running test reflects the speed indicators of the players, therefore, judo, wrestling, and swimming teams should pay more attention to the speed index training of their players in their daily training, improve the special performance under the premise of ensuring the overall development of the team members' various qualities. The results of functional training and Figure 5 show:

Hexagonal jump through the analysis of the results of the test content of different athletes' hexagonal jump, perform functional training to get Figure 6.

The hexagonal jump test reflects the sensitivity index of the players, therefore, wrestling, tennis, and swimming teams should pay more attention to the sensitivity index training of their players in their daily training, improve the special performance under the premise of ensuring the overall development of the team members. The results of functional training and Figure 6 show:

DISCUSSION

After the experiment, the experimental group and the control group are compared and analyzed, calculate the average of the two groups after training, according to the before and after comparison and the difference detection, it was found that the experimental group and the control group had $P<0.05$ before the experiment, there is a significant difference, it shows that the footwork movement speed of the experimental group has been improved after functional training. Functional training is a practical training method that can attract the attention of athletes, during training, athletes in the experimental group not only improved their footwork speed and physical coordination, the speed of footwork movement and the speed of connection between movements have increased significantly in the sixth week, the footwork is more stable, and the footwork and movement connection are more coordinated. Sensitivity is one of the important sports qualities of the human body, it is not only directly related to physical qualities such as speed and strength, and it is also closely related to nerve types.[9] Only with better sensitivity, in order to make better use of athletic ability in training, improve the level of exercise. Functional training is an important means of developing agility, it carries out innovation and consolidation based on the skills that students have acquired, break through the original movement consciousness and body sensation, subjectively make changes in body movements. Put functional training into basic footwork training, perform functional training once or twice a week, and combine various footwork with soft ladders, on the one hand, it helps to improve the concentration of athletes, increase the concentration time of athletes in competitions or courses, on the other hand, the exercise of foot movement enhances the flexibility and coordination of the athlete's body.[10]

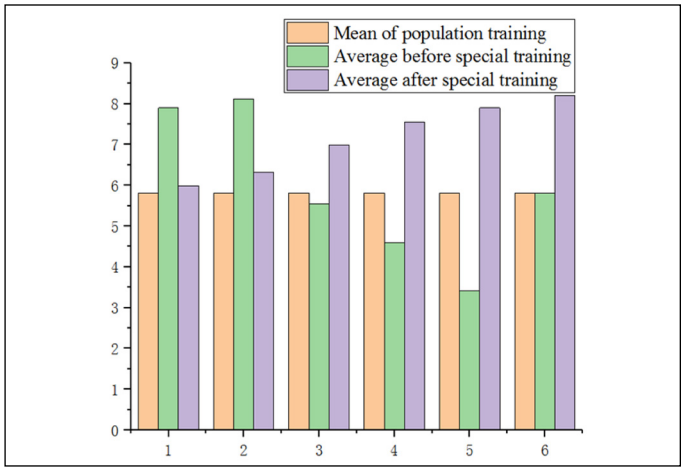

Figure 6. Special training test analysis of wrestling, tennis, and swimming teams.

CONCLUSION

Although different projects have different requirements for physical fitness, for example, judo and wrestling events have higher requirements for core strength and stability than other events, but in combination for a detailed comparative analysis, join the program of physical motor function training, the overall performance is better than that of the projects that have not joined the physical exercise function training. It can be seen that physical exercise function training is of great help to athletes' training.

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

AUTHORS' CONTRIBUTIONS: Each author made significant individual contributions to this manuscript. PJ: writing and performing surgeries; MZ: data analysis and performing surgeries, article review and intellectual concept of the article.

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