RESEARCH ON CORE STRENGTH TRAINING FOR VOLLEYBALL PLAYERS

PESQUISA SOBRE O TREINAMENTO DO CORE DOS JOGADORES DE VOLEIBOL

INVESTIGACIÓN SOBRE EL ENTRENAMIENTO DEL CORE DE LOS JUGADORES DE VOLEIBOL

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ABSTRACT

Introduction: Modern exercise physiology theory states that abdominal core muscle strength plays a very important role in the completion of athletes' motor skills; the specific performance is to stabilize the athlete's center of gravity, the source of explosion and power transmission beyond his center of control. Objective: Verify the effect of an experimental training methods on the muscular strength of the abdominal core in volleyball athletes. Methods: 24 athletes were divided into an experimental group and a control group, in order to ensure that the baseline indicators of the two groups before the experiment did not show significant comparison, using independent sample t-test and paired sample t-test. Results: The average number of sit-ups of the two groups of students was 58.15 and 70.52n, respectively, the five baseline indicators of stability of the two groups were all significant, and the strength training methods in the experimental group were better than those in the control group. Conclusion: The presented experimental method helps to improve the success rate in athlete's jump. The core strength training methods used in the experimental group in jumping were superior to the traditional training methods used in the control group. ***Level of Evidence II; Therapeutic studies - investigation of treatment outcomes.***

Keywords: Volleyball; Strength training; Abdominal Core.

RESUMO

Introdução: A moderna teoria da fisiologia do exercício afirma que a força muscular do core desempenha um papel muito importante na conclusão das habilidades motoras dos atletas; o desempenho específico é estabilizar o centro de gravidade do atleta, a fonte de explosão e transmissão de potência além do seu centro de controle. Objetivo: Verificar o efeito dos métodos de um treinamento experimental sobre a força muscular do core em atletas de voleibol. Métodos: 24 atletas foram divididos em grupo experimental e grupo de controle, a fim de garantir que os indicadores basais dos dois grupos antes do experimento não apresentassem comparação significativa, usando teste t de amostra independente e teste t de amostra pareada. Resultados: O número médio de sit-ups dos dois grupos de estudantes foi de 58,15 e 70,52n, respectivamente, os cinco indicadores básicos de estabilidade dos dois grupos foram todos significativos, e os métodos de treinamento da força no grupo experimental foram melhores do que os do grupo controle. Conclusão: O método experimental apresentada ajuda a melhorar a taxa de sucesso no salto do atleta. Os métodos de treinamento da força do core usados no grupo experimental em salto foram superiores aos métodos tradicionais de treinamento usados no grupo de controle. ***Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.***

***Descritores*:** Voleibol; Treinamento de Força; Centro Abdominal.

RESUMEN

Introducción: La teoría moderna de la fisiología del ejercicio afirma que la fuerza muscular del core desempeña un papel muy importante en la realización de las habilidades motrices de los atletas; la actuación específica consiste en estabilizar el centro de gravedad del atleta, la fuente de explosión y la transmisión de potencia más allá de su centro de control. Objetivo: Verificar el efecto de los métodos de un entrenamiento experimental sobre la fuerza muscular del core en atletas de voleibol. Métodos: 24 atletas fueron divididos en un grupo experimental y un grupo de control, con el fin de garantizar que los indicadores basales de los dos grupos antes del experimento no mostraran una comparación significativa, utilizando la prueba t de muestras independientes y la prueba t de muestras emparejadas. Resultados: El número medio de sentadillas de los dos grupos de estudiantes fue de 58,15 y 70,52n, respectivamente, los cinco indicadores de estabilidad de referencia de los dos grupos fueron todos significativos, y los métodos de entrenamiento de fuerza del grupo experimental fueron mejores que los del grupo de control. Conclusión: El método experimental presentado ayuda a mejorar la tasa de éxito en el salto del atleta. Los métodos de entrenamiento del core utilizados en el grupo experimental en los saltos fueron superiores a los métodos de entrenamiento tradicionales utilizados en el grupo de control. ***Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.***

***Descriptores*:** *Voleibol; Entrenamiento de fuerza; Núcleo Abdominal.*

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INTRODUCTION

Modern core strength training theory states that: Muscle strength in the core area of the body plays a very important role in the completion of athletes' motor skills, the specific performance is to stabilize the center of gravity of the athlete, the source of power excitation and transmission, and the center of power control.[1] This shows, core strength plays an important role in an athlete's technical performance. Athlete Volleyball players are the reserve force of the country's future competitive sports volleyball talents, the athlete stage is also a critical period for the development of physical fitness, whether the training is scientific or not in this stage determines their future development direction.[2] However, for a long time, most coaches in China tend to be eager to achieve success in physical fitness training for athletes, or the training concept is too traditional, resulting in unscientific physical fitness training, it has seriously affected the success rate of China's competitive sports reserve talents. Through the core strength training theory, this article seeks to develop the best physical fitness training mode for athletes' volleyball players' special quality to conduct experiments, in order to provide valuable reference for athletes' volleyball training.[3]

METHOD

Research objects

The research object is male players of the youth volleyball team of the Volleyball Management Center.

Research methods

Documentation Law

By arranging and analyzing the literature and materials, I have mastered the research and analysis of core strength on technical movements in volleyball, focusing on the concept of core strength and the theoretical basis of training such as analysis of jump serve movements, training methods and stability factors.[4]

Experimental method

Measurement method of independent variable means training

According to the physical requirements of different methods of core strength training for jumping serve, a unified load method is adopted, a. Swiss ball upside down; b. Throwing a medicine ball on one foot; c. Throwing a medicine ball on the balance pad; d. Lifting the barbell with one leg; e. Lifting the barbell on the balance pad; f. The Swiss ball is on the back and the hip is raised; g. The ball is thrown after kneeling on one knee and supporting the head; h. The medicine ball is thrown after kneeling on the head; i. The three-point support of the supine shoulder press the ball to support the weighted object to bend the arm up; j. The experimental group requires that the number of repetitions of each group of training methods is 15-20 times, the number of exercise groups is 2-4 groups, the rest time between groups is 3-5 minutes, the interval time between movements is 60-90 seconds, and the load intensity is 60-75 %.

Measurement

Measurement methods: When making measurements, the use of the velocimeter must maintain a good stability, narrow the measurement range and be consistent with the direction of movement of the ball, in order to obtain accurate data and accuracy.[5] Therefore, the specified requirements for the measurement of the ball's movement landing point and angle are as follows: The measuring person stands 2-3m behind the center of the end line of the volleyball court, facing the net and the testers. Waiting for the operator to hold the tester to measure the speed, the tester prepares to serve.

Mathematical Statistics

In the data analysis, the author mainly used software such as EXCEL2013 and SPSS20.0, firstly used EXCEL2013 for simple data processing, and then used SPSS20.0 to analyze the data before and after the experiment.[6]

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

RESULTS

Before the experiment, the physical fitness indicators of the experimental group and the control group were subjected to independent sample T test, the test results showed that, there was no significant difference in the indicators of physical fitness between the two groups of athletes (P>0.05), therefore, it can be defined from a statistical degree that there is no significant difference in the physical fitness indicators between the experimental group and the control group before the experiment. (Figure 1)

From the statistics it can be seen that: The number of prone and back-extensions in the experimental group was 38.77, while that in the control group was 37.95, and the conditions were basically the same. The average number of sit-ups in both the experimental group and the control group is about 46.65, it is concluded that the number of sit-ups in the two groups is the same, before the experiment, the average vertical jumps of both feet of the two groups of students were 52.36 and 52.82 cm, respectively, the average approach height of the two groups of students before the experiment was 3.1526 and 3.1654 m, and the 30-meter sprint time was about 4.44s, in the table, there is no significant comparison between the two groups of vertical jumps, approach heights, and 30-meter sprints, indicating that the physical fitness indicators are consistent.[7]

Before the experiment, the core stability index of the jump serve technique of the athletes in the experimental group and the control group was independently sampled T-test, there was no significant difference in the core stability of the jump serve technique between the two groups of athletes (P>0.05). From a statistical point of view, it can be proved that the core stability of the jump serve technique of the two groups before the experiment is basically the same.[8] The statistical results are shown in Figure 2.

After the experiment, the core stability index of the jump serve technique of the athletes in the experimental group and the control group was subjected to an independent sample T test, and it was found that, there was a significant difference in the core stability index of the jump serve technique between the two groups of athletes (P<0.05). The results indicated that after the experiment, there was a significant contrast in the core stability index of the jump serve technique of the two groups of athletes. The statistical results are shown in Figure3.

From the statistics it can be seen that: The number of left and right bridges in the experimental group was 81.02s, while that in the control

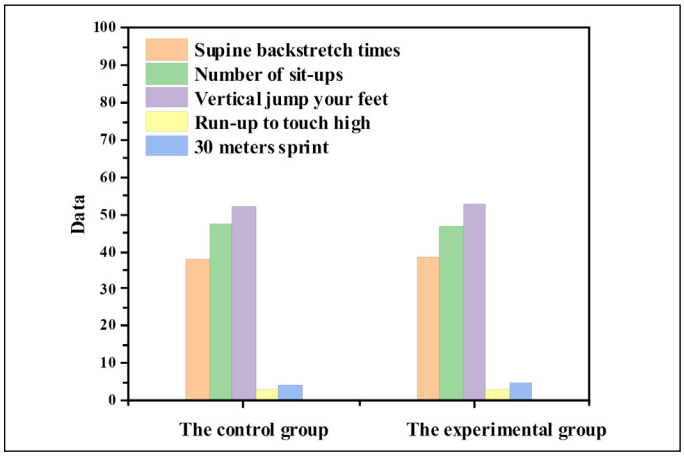

Figure 1. Statistical results of physical fitness indicators of athletes before the experiment.

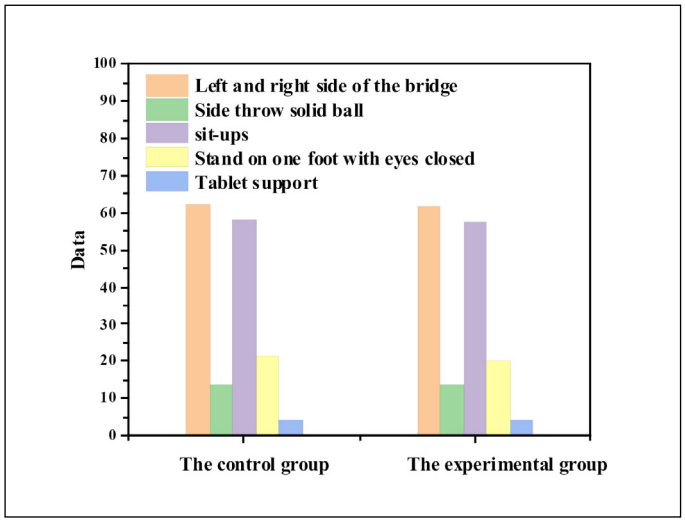

Figure 2. The statistical results of the core stability index of the two groups of athletes before the experiment.

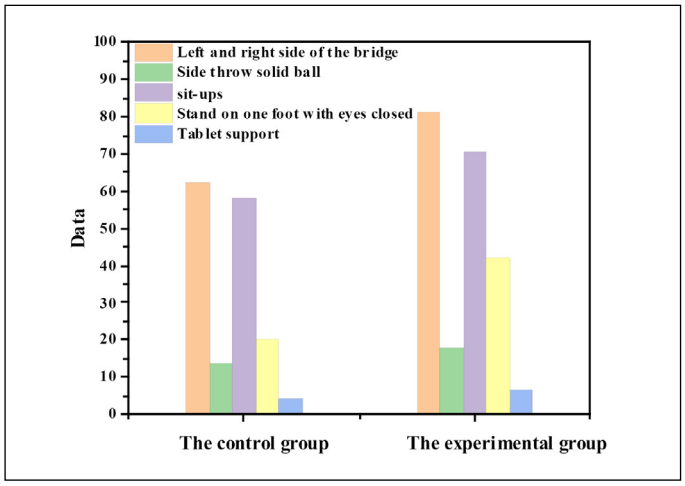

Figure 3. Statistical results of core stability indexes of the two groups of athletes after the experiment.

group was 62.21, with a big difference. Before the experiment, the speed of jumping serve of the athletes in the experimental group and the control group was tested by an independent sample T test, and it was found that (P>0.05), there was no significant difference between the two groups of players in the jump service hitting speed index (P>0.05). From a statistical point of view, it can be proved that the hitting speeds of the two groups before the experiment are basically the same.[9] The statistical results are shown in Table 1.

Before the experiment, the data test values of the jump service hitting speed of the two groups of athletes were subjected to an independent sample T test to obtain, statistics on the hitting speed of the two groups of players for jumping serve, the P value is 0.361 (P>0.05), it shows that before the experiment, the index of the hitting speed of the jump service of the athletes in the experimental group and the control group is not significant.

Before and after the experiment, the paired sample t-test was performed on the jump service hitting speed of the athletes in the control group, there was a significant difference in the speed index of the jump service of the control players (P<0.05, P>0.01). From a statistical point of view, it can be proved that there is a certain difference in the hitting speed of the jump service between the two groups before the experiment, but there is no big difference. The statistical results are shown in Table 2.

Table 1. Statistical results of jump serving speed of athletes in the two groups before the experiment.

Indicators	Speed of jump service	P value
The control group	35.46±1.42	0.361
The experimental group	37.42±2.13	

Table 2. Statistical results of jump serving speed of athletes in the control group before and after the experiment.

Indicators	Speed of jump service	P value
The control group	34.63±1.42	0.331
The experimental group	43.74±2.13	

The test value of the jump service hitting speed data before and after the experiment in the control group was subjected to a paired sample T test to obtain, before and after the experiment, the athletes in the control group jumped serve and hit the ball, the traditional core strength training method has a certain improvement effect on the hitting speed of the jump serve, which shows that the traditional strength training method is not completely ineffective. It shows that this index before and after the experiment of athletes has a certain contrast effect, but there is no strong significant difference.

DISCUSSION

Through the statistical analysis of the experiment, it shows that the training content adopted by the two groups in this experiment is beneficial to a certain extent to improve the success rate of jump service and the ability to hit the ball, this makes the experimental and control groups of athletes have a certain improvement in the success rate of jumping serve. Here are a few things to keep in mind when doing core strength training: In physical training in different training cycles, the arrangement of core strength should conform to the characteristics of core training at different stages. Therefore, when formulating a training plan, it should be scientifically and reasonably designed according to the needs and objectives of the athletes and the time schedule, in order to increase the complementarity between core strength training and traditional strength training, the strength of the core area is increased, and the mechanism of action to effectively activate the core strength, make the most of your new training methods.[10]

CONCLUSION

According to the independent variable selected in the experiment, that is, the index of core strength of jump service is suitable, and its training method can improve the ability of men to hit the ball with strong jump service; The index for evaluating the training effect of the training method in the experiment is reasonable, and it can be shown that the experimental index enhances the effect of the jump serve training. The experimental group used the jump serve training method for training, the three aspects of the core stability quality index, hitting speed and the success rate of the jump serve were better than the conventional training methods adopted by the control group.

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