CORE STRENGTH TRAINING INFLUENCES BASKETBALL PLAYERS' BODY

A INFLUÊNCIA DO TREINAMENTO DE FORÇA DO CORE NO CORPO DE JOGADORES DE BASQUETE

LA INFLUENCIA DEL ENTRENAMIENTO DE LA FUERZA CENTRAL EN EL CUERPO DE LOS JUGADORES DE BALONCESTO

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ABSTRACT

Introduction: Modern basketball is very competitive and enjoyable; it combines several factors. Basketball requires specific physical characteristics such as high stature, which raises the position of the center of gravity, making the stability angle smaller. This compromises stability, especially in sudden speed and direction changes, because it requires a large base opening. The core musculature is intimately involved with body balance; however, there is a lack of studies verifying the impact of specific training of this region on balance in basketball athletes. Objective: To explore the influence of core strengthening on the physical fitness of college basketball players. Methods: 12 college basketball players were selected and randomly divided into a control group and an experimental group. The experimental group performed core strengthening training, while the control group practiced traditional strength training. After six weeks, physical fitness and basic skills were compared between the groups. Data were statistically treated and discussed confronting the literature. Results: Basketball players in the experimental group obtained higher fast dribbling passes and shots than before the experiment (P<0.05), there was no statistically significant difference in several indicators in the control group (P>0.05); Basketball players in the experimental group had higher fast dribbling passes and shots than the control group (P<0.05), there was no statistically significant difference in approach height between the experimental group and the control group (P>0.05). Conclusion: Core strengthening training can improve the physical fitness of college basketball players. ***Evidence level II; Therapeutic Studies - Investigating the results.***

Keywords: Resistance Training; Basketball; Exercise.

RESUMO

Introdução: O basquete moderno é muito competitivo e prazeroso, é uma combinação de vários fatores. O basquetebol exige características físicas específicas como a alta estatura, que eleva a posição do centro de gravidade, tornando o ângulo de estabilidade menor. Isso compromete a estabilidade, principalmente nas mudanças repentinas de velocidade e direção pois exige grande abertura de base. A musculatura do core está intimamente envolvida com o equilíbrio corporal, entretanto faltam estudos verificando o impacto do treino específico dessa região no equilíbrio em atletas de basquetebol. Objetivo: Explorar a influência do fortalecimento do core na aptidão física dos jogadores universitários de basquete. Métodos: 12 universitários jogadores de basquete foram selecionados e aleatoriamente divididos em grupo controle e grupo experimental. O experimental realizou treino fortalecimento do core, enquanto o controle praticava treinamento de força tradicional. Após seis semanas, comparou-se a aptidão física e habilidades básicas entre os grupos. Os dados foram tratados estatisticamente e discutidos confrontando a literatura. Resultados: Os jogadores de basquete do grupo experimental obtiveram maiores passes rápidos de drible e arremessos do que antes do experimento (P<0,05), não houve diferença estatisticamente significativa em vários indicadores no grupo controle (P>0,05); Os jogadores de basquete do grupo experimental apresentaram maiores passes e arremessos de drible rápido do que o grupo controle (P<0,05), não houve diferença estatisticamente significativa na altura de aproximação entre o grupo experimental e o grupo controle (P>0,05). Conclusão: O treino de fortalecimento do core pode melhorar a aptidão física de jogadores universitários de basquete. ***Nível de evidência II; Estudos terapêuticos - Investigação de resultados.***

Descritores: Treinamento de Força; Basquetebol; Exercício Físico.

RESUMEN

Introducción: El baloncesto moderno es muy competitivo y divertido, es una combinación de varios factores. El baloncesto exige características físicas específicas como la alta estatura, que eleva la posición del centro de gravedad, haciendo que el ángulo de estabilidad sea menor. Esto compromete la estabilidad, sobre todo en los cambios bruscos de velocidad y dirección, porque exige una gran apertura de la base. Los músculos del core están íntimamente implicados con el equilibrio corporal, sin embargo, faltan estudios que verifiquen el impacto del entrenamiento específico de esta región sobre el equilibrio en los deportistas de baloncesto. Objetivo: Explorar la influencia del fortalecimiento del núcleo en la aptitud física de los jugadores universitarios de baloncesto. Métodos: Se seleccionaron 12 jugadores de baloncesto universitario y se dividieron aleatoriamente en un grupo de control y un grupo experimental. Los

experimentales realizaron un entrenamiento de fortalecimiento del núcleo, mientras que los de control practicaron un entrenamiento de fuerza tradicional. Después de 6 semanas, se comparó la aptitud física y las habilidades básicas entre los grupos. Los datos fueron tratados estadísticamente y discutidos confrontándolos con la literatura. Resultados: Los jugadores de baloncesto del grupo experimental obtuvieron pases y tiros rápidos más altos que antes del experimento (P<0,05), no hubo diferencias estadísticamente significativas en varios indicadores en el grupo de control (P>0,05); Los jugadores de baloncesto del grupo experimental tuvieron pases y tiros rápidos más altos que el grupo de control (P<0,05), no hubo diferencias estadísticamente significativas en la altura de aproximación entre el grupo experimental y el grupo de control (P>0,05). Conclusión: El entrenamiento de fortalecimiento del núcleo puede mejorar la condición física de los jugadores de baloncesto universitarios. ***Nivel de evidencia II; Estudios terapéuticos - Investigación de resultados.***

Descriptores: *Entrenamiento de Fuerza; Baloncesto; Ejercicio Físico.*

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INTRODUCTION

Modern basketball is very competitive and enjoyable, it is a combination of various factors. Nowadays, basketball is widely used in colleges and universities in Changchun, and the level of competition has improved greatly and the speed of improvement is fast. In order to keep up with the times, keep up with the innovation and development of basketball, continuous pursuit to explore the new development stage of basketball.[1] Master effective training methods and skills, it is of great significance for workers and athletes engaged in basketball. The outstanding feature of basketball players' physical shape is their tall stature, the position of the center of gravity is high, the stability angle is small, and the stability is poor, when there is a sudden change in speed and direction, correspondingly, the higher the degree of stability of the trunk part of the body is required.[2] Lira A once proposed, life lies in the right amount of exercise, life lies in the right amount of exercise, come choose the exercise that suits you. This is the basic view of physical fitness, use the amount of exercise to enhance one's own body functions, and make adjustments in due course, maintain the best condition of the body, thereby gaining health.[3] MA Rodríguez-Pérez and others mentioned, physical fitness refers to the ability of the body to exert its own functions and the ability to adapt to the environment, as well as their own health status, ability to complete work tasks, you can enjoy your leisure time and the ability to deal with emergencies at any time, etc, and it is closely related to it.[4]

METHOD

Selection of research objects

Select 12 members of a university's men's basketball team as experimental subjects, the 12 team members were randomly divided into an experimental group and a control group, since these 12 team members belong to classmate age students, and the difference in the number of years of enrollment between each other is relatively small, therefore, there is no significant difference in age. At the same time, the 12 players did not have any sports injuries during the core strength training, and there is no significant difference in the physical fitness test of the 12 players before the experiment. At the same time, in order to ensure the authenticity and validity of the experiment, the 12 team members did not receive any notice or hint about the experiment before or during the experiment, it is carried out in a completely natural state.[5]

Research methods

Core strength training mainly includes freehand training and equipment training. (1) Freehand training: Bend and cross your knees, lie on your side, prop up your hips and knees, lie on your back with both ends, supine side bends, prone two-point support, side-lying bends and straighten up, etc.; (2) Equipment training: Lie on your back and hold the ball on both ends, lie on your side with elbow support and hold dumbbells, push up the arms and bend the legs to receive the Swiss ball, etc., the training moves from shallow to deep, from easy to difficult, carried out in groups, strictly control exercise load and exercise time, and maintain a 12-week training period.[6]

The content of traditional strength training mainly includes: (1) Push--ups, push-up leg lifts, and push-ups from both ends; (2) Sit-ups, supine leg lifts, and both ends of the supine; (3) Barbell bench press, barbell deadlift, neck lift barbell, neck lift barbell, barbell squat, barbell squat; (4) Pull-ups and so on. Work in groups, train reasonably, and train for 6 weeks.

Statistical methods

Use SPSS20.0 software for statistical analysis, quantitative data is expressed in the form of i±s, paired t test was used to compare the means of paired design data, the mean comparison of independent sample data adopts two independent sample t test, data that does not meet the t-test conditions are compared using rank-sum test. P<0.05 indicates that the difference is statistically significant.

RESULTS

Comparison of the basic data of the two groups of basketball players before the experiment

Before the experiment, collect and organize the basic data of the basketball players in the experimental group and the control group, provide a basis for later analysis of experimental results. From the results in Table 1, it can be seen that there is no statistically significant difference in age, height, weight, approach height, full-court dribble layup and shooting between the experimental group and the control group (P>0.05), it shows that there is no statistical difference between the basic data of the experimental group and the control group before starting the experiment.[7]

Comparison of physical fitness and basic skills of the two groups of basketball players before and after the experiment

By comparing the two groups of basketball players before and after the experiment, the run-up touch, fast dribble layups, shots and other

Table 1. Comparison of the basic data of the two groups of basketball players before the experiment.

	Test group (n=6)	Control group (n=6)	t	p
Age	20.5±1.33	20.8±0.86	1.300	0.201
Height	176.8±2.68	175.6±2.65	0.965	0.340
Weight	69.4±4.55	71.5±3.23	0.678	0.852
Run up	2.75±1.54	2.47±1.88	0.049	0.899
Dribble layup	37.5±1.33	37.2±1.88	0.836	0.408
Shot	6.7±1.33	8.5±1.67	1.184	0.255

indicators found that, in the experimental group, the difference in physical fitness of basketball players before and after the experiment was statistically significant (P<0.05), after the experiment, the basketball players' fast dribble layups and shots were higher than before the experiment; In the control group, there was no statistically significant difference in the physical fitness of basketball players before and after the experiment (P>0.05), there is no difference between the basketball players' indicators after the experiment and before the experiment (Figure 1). It shows that core strength training can improve the basic skills of men's basketball players, such as fast dribbling, layups and shooting, but the effect on approach height is not obvious (Figure 2).

Comparison of the physical fitness and basic skills of the two groups of basketball players after the experiment

By comparing the indicators of the two groups of basketball players, such as approach height, fast dribble and layup, and shooting, we found that after the experiment, the difference between the basketball players in the experimental group and the basketball players in the control group in fast dribble layups and shots, all are statistically significant (P<0.05), the basketball players in the experimental group had higher approach strokes and shots than the basketball players in the control group; However, there was no statistically significant difference in approach height between the basketball players in the experimental group and the basketball players in the control group (P>0.05), there is no difference in approach height between the basketball players in the experimental group and the basketball players in the control group (Table 2).[8] It shows that core strength training can improve the basic skills of basketball players such as fast dribbling, layup and shooting, however, the improvement effect on the advanced physical fitness of running-up and touch is not obvious (Figures 3 and 4).

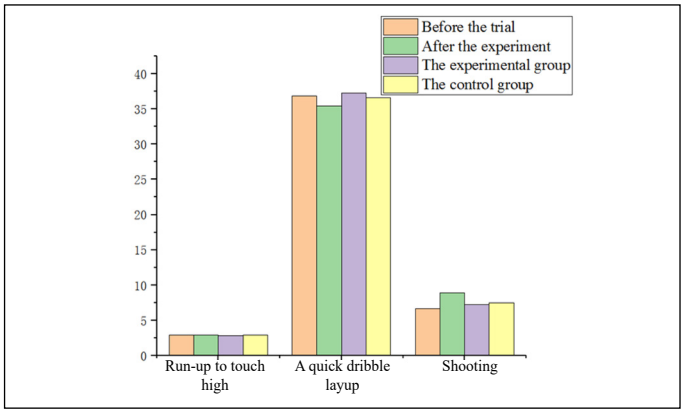

Figure 1. Comparison of physical fitness and basic skills of the two groups of basketball players before and after the experiment.

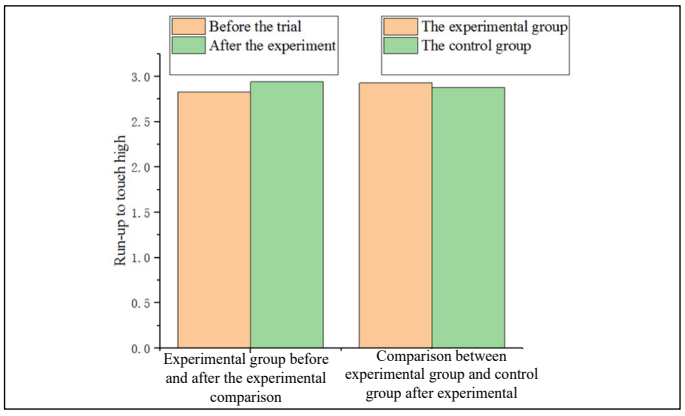

Figure 2. Comparison of basic techniques before and after the run-up and touch-up experiment.

Table 2. Comparison of the physical fitness and basic skills of the two groups of basketball players after the experiment.

	Test group (n=6)	Control group (n=6)	t	p
Run up	2.78±1.42	2.58±1.75	0.105	0.917
Dribble layup	34.8±1.89	36.8±1.78	2.364	0.023
Shot	8.9±1.78	8.3±1.42	4.195	0.001

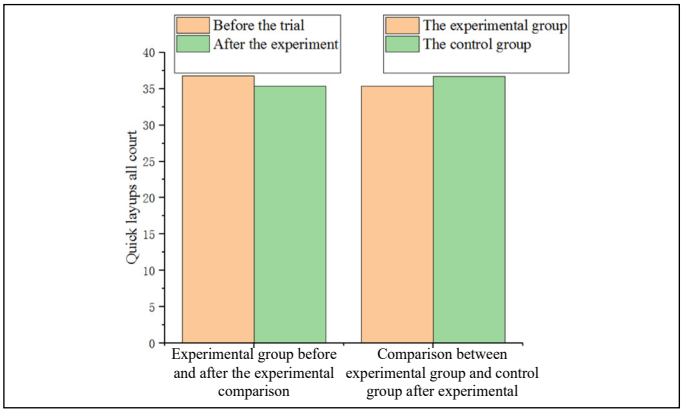

Figure 3. Comparison of basic skills before and after the full court fast dribble layup experiment.

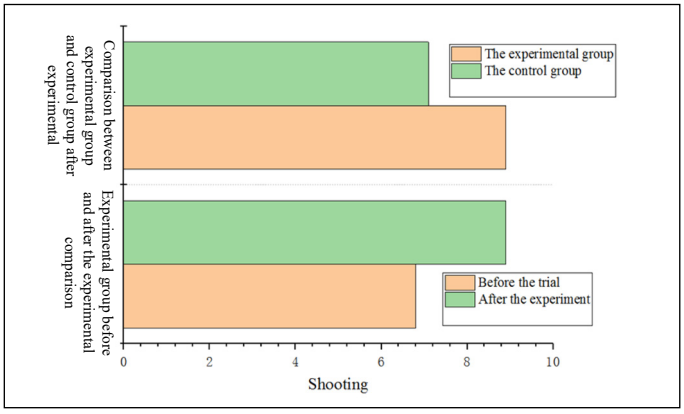

Figure 4. Comparison of basic skills before and after shooting experiment.

DISCUSSION

Basketball is a comprehensive sport, there are many requirements for physical fitness, including physical flexibility, flexibility and explosive power. Traditional sports training has been unable to meet the development of modern science and technology, and the new requirements for the physical fitness and basic sports abilities of college students, especially the training of basic physical fitness. Compared with traditional training methods, core strength training is more scientific, more diverse and innovative.[9] Related research shows that, core strength training can improve the coordination, balance, flexibility and other physical qualities of basketball players, improve the technical level and physical fitness of athletes. However, the traditional training method has a wide range of training and is not enough for physical training, can not carry out targeted training on the physical fitness and basic skills of basketball players, and the improvement effect is slow. The results of this study confirm that, core strength training is added to the physical fitness and basic technical training of college male basketball players, can make up for the single training effect of traditional training methods, it improves the overall quality of athletes' physical coordination and flexibility, and enhances the basic skills of basketball mobilization, such as dribbling speed and shooting.[10] Foreign scholars engaged in related research proposed, core strength training has limited improvement in certain physical fitness of basketball players in a short period of time,

this physical fitness index can only be improved after a certain period of training, and the longer the training duration, the more obvious the effect of training. This research shows that, core strength training failed to improve the approach height of basketball players, it shows that core strength is difficult to improve physical fitness in a short time, which is consistent with the results of related research.

CONCLUSION

After core strength training, the gap between the completion time of the athlete's core strength training action and that before the training is reduced; Similarly, after 6 weeks of training, the performance of core strength training exercises has improved significantly more than traditional exercises. After core strength training, the growth rate of athletes' conventional strength is generally greater than that of traditional strength training athletes. Core strength training exercises can significantly improve the waist, abdominal muscles and leg muscles, in addition, the coordination and balance of the athletes can be well exercised during training, therefore, sit-ups to examine the strength of the waist and abdomen, significant improvement can be obtained in the high-touch test that examines the jumping ability and waist and abdomen strength, as well as the speed quality, coordination, and balance of the circle running.

The author declare no potential conflict of interest related to this article

AUTHORS' CONTRIBUTIONS: The author made significant contributions to this manuscript. HL: writing and performing surgeries; data analysis and performing surgeries; article review and intellectual concept of the article.

REFERENCES

1. Hermassi S, Laudner K, Schwesig R. The Effects of Circuit Strength Training on the Development of Physical Fitness and Performance-Related Variables in Handball Players. Journal of Human Kinetics. 2020;71(1):191-203.
2. Skrypnik D, Bogdański P, Skrypnik K, Mądry E, Karolkiewicz J, Szulińska M et al. Influence of endurance and endurance–strength training on mineral status in women with abdominal obesity: a randomized trial. Medicine. 2019;98(12):e14909.
3. Lira AF, Oliveira RF, Dionisio-Da-Silva W, Barbosa de Moura GJ. Influence of the edge-core gradient on the scorpion assemblage (Arachnida, Scorpiones) in a Brazilian Atlantic forest. International Journal of Tropical Insect Science. 2021;41(1):447-54.
4. Rodríguez-Pérez MA, Mateo-March M, Sánchez-Muñoz C, Artero EG. Influence of fitness improvement on performance level in international elite young road-race motorcyclists. Science & Sports. 2019;34(1):e45-52.
5. Lai Z, Lee S, Chen Y, Wang L. Comparison of whole-body vibration training and quadriceps strength training on physical function and neuromuscular function of individuals with knee osteoarthritis: A randomised clinical trial. Journal of Exercise Science & Fitness. 2021;19(3):150-7.
6. Barzideh A, Marzolini S, Danells C, Jagroop D, Huntley AH, Inness EL et al. Effect of reactive balance training on physical fitness poststroke: study protocol for a randomised non-inferiority trial. BMJ Open. 2020;10(6):e035740.
7. Silva H, Neto GR, Vasconcelos W, Pereira-Neto EA, Gomes da Silva JC, Bittar ST et al. Revista Brasileira de Medicina do Esporte. 2020;26(6):542-6.
8. Stoickov V, Ilic MD, Stoickov M, Tasic I, Stoicov I, Saric S et al. The Influence of Exercise Training on Arterial Blood Pressure, Qt Dispersion, Cholesterol and Physical Exercise Capacity in Patience After Coronary Artery Bypass Graft Surgery. Journal of Hypertension. 2019;37:e121-2.
9. Teixeira J, Monteiro LF, Silvestre R, Beckert J, Massuça LM. Age-related influence on physical fitness and individual on-duty task performance of Portuguese male non-elite police officers. Biology of Sport. 2019;36(2):163-70.
10. Sansone P, Gasperi L, Tessitore A, Gomez MA. Training load, recovery and game performance in semi-professional male basketball: influence of individual characteristics and contextual factors. Biology of Sport. 2021;38(2):207-17.