EFFECTS OF BEACH TRAINING ON STRENGTH IN BASKETBALL PLAYERS

EFEITOS DO TREINAMENTO NA PRAIA SOBRE A FORÇA DOS JOGADORES DE BASQUETE

EFECTOS DEL ENTRENAMIENTO EN LA PLAYA SOBRE LA FUERZA DE LOS JUGADORES DE BALONCESTO

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Qiang Zhang[1]
(Physical Education Professional)
Feng Miao[1]
(Physical Education Professional)

1. Cangzhou Normal University, Department of Sports, Cangzhou, Hebei, China.

Correspondence:
Feng Miao
Cangzhou, Hebei, China. 061001.
lalawu861@126.com

ABSTRACT

Introduction: The characteristics of basketball require excellent players with athletic abilities such as high explosive strength for the instantaneous jump up, flexible movements and quick changes of direction, and accurate passing and shooting. These characteristics can also be found in beach games, and it is believed that the practice of these games can benefit the practice of basketball. Objective: Explore the effect of beach training on the physical fitness of basketball players. Methods: Through a randomized controlled trial, 24 basketball players were selected to analyze the explosive power of the lower extremity in the 40m sprint race and in the vertical jump, two representative indicators of the explosive power of the lower limbs. The group teaching experiment was conducted for 17 weeks, five times a week. Results: The comparison in the statistical test of the 40m sprint, and the vertical jump before and after the experiment proves that, compared with the traditional practice of basketball, the practice of beach games has a beneficial effect on improving the explosive power of the lower limbs. Conclusion: Beach sports training has benefits for basketball practice; the characteristics on the beach basketball court and the playing characteristics of the athletes determined this. ***Level of evidence II; Therapeutic studies - investigation of treatment outcomes.***

Keywords: Sports; Basketball; Physical Education and Training.

RESUMO

Introdução: As características do basquetebol exigem excelentes jogadores com habilidades atléticas como alta força explosiva para o salto instantâneo para cima, movimentos flexíveis e mudanças rápidas de direção, além de passes e tiros precisos. Essas são características que também podem ser encontradas nos jogos de praia e acredita-se que a prática desses jogos possa trazer algum benefício para a prática do basquetebol. Objetivo: Explorar o efeito do treinamento na praia sobre a aptidão física dos jogadores de basquetebol. Métodos: Através de um estudo randomizado controlado, foram selecionados 24 jogadores de basquetebol para analisar o poder explosivo da extremidade inferior no sprint de corrida de 40m e no salto vertical, dois indicadores representativos do poder explosivo dos membros inferiores, foram selecionados. O experimento de ensino em grupo foi realizado durante 17 semanas, cinco vezes por semana. Resultados: A comparação no teste estatístico dos 40m de sprint e do salto vertical antes e depois do experimento prova que, comparado com a prática tradicional do basquetebol, a prática dos jogos de praia tem um efeito benéfico na melhoria da potência explosiva dos membros inferiores. Conclusão: O treinamento com esporte de praia traz benefícios para a prática do basquetebol, isto foi determinado pelas características na quadra de basquetebol de praia e pelas características de jogabilidade dos esportistas. ***Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.***

***Descritores*:** *Esportes; Basquetebol; Educação Física e Treinamento.*

RESUMEN

Introducción: Las características del baloncesto exigen jugadores excelentes con habilidades atléticas como una gran fuerza explosiva para el salto instantáneo, movimientos flexibles y rápidos cambios de dirección, así como pases y tiros precisos. Son características que también se pueden encontrar en los juegos de playa y se cree que la práctica de estos juegos puede aportar algún beneficio a la práctica del baloncesto. Objetivo: Explorar el efecto del entrenamiento en la playa sobre la aptitud física de los jugadores de baloncesto. Métodos: Mediante un ensayo controlado aleatorio, se seleccionaron 24 jugadores de baloncesto para analizar la potencia explosiva de la extremidad inferior en la carrera de velocidad de 40 metros y en el salto vertical, dos indicadores representativos de la potencia explosiva de las extremidades inferiores. El experimento de enseñanza en grupo se llevó a cabo durante 17 semanas, cinco veces por semana. Resultados: La comparación en la prueba estadística del sprint de 40 metros y del salto vertical antes y después del experimento demuestra que, en comparación con la práctica tradicional del baloncesto, la práctica de los juegos de playa tiene un efecto beneficioso en la mejora de la potencia explosiva de los miembros inferiores. Conclusión: El entrenamiento deportivo en la playa aporta beneficios a la práctica del baloncesto, esto fue determinado por las características en la cancha de baloncesto en la playa y las características de jugabilidad de los atletas. ***Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.***

***Descriptores*:** *Deportes; Baloncesto; Educación y Entrenamiento Físico.*

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INTRODUCTION

The characteristics of basketball and the game require excellent basketball players to have explosive athletic abilities such as instant upward jumping, flexible movement and direction change, fast passing and precise shooting. In the explosive training of basketball players, in addition to traditional resistance training (Resistancet Raining), there are also various rapid explosive weightlifting training, such as snatch, high clean, squat, etc. -metrictRaining).[1] these training methods have been verified to have a positive impact on the development of muscle power. Rapid stretch compound training is considered to be the reason for the rapid rise and dominance of Eastern European countries in track and field in the early 1970s.[2] Gaudet, L, in his master's thesis, conducted an 8-week training intervention on 16 professional badminton players and found that in the standing long jump, vertical jump reaching height, standing triple jump, single-leg jump and lateral long jump these five explosive power index tests, the effect of fast-stretching compound training is more significant than that of weight-bearing resistance training.[3] And through the comparison of the two special badminton footwork tests before and after the experiment, the two sides touch the line and the four corners touch, it is found that the rapid expansion and contraction compound training is more effective than the weight-bearing resistance training in improving the speed of the badminton special footwork. In his master's thesis, Luh, A conducted 12-week fast-stretching compound training for students in two general courses of physical education, and found that rapid-stretching compound training had an effect on the standing triple jump, 20-meter timed, which affected the special quality of the stand-up long jump. Single-legged jump, single-legged deep and long jump, these performances have improved significantly. Moreover, the effect of fast-stretching compound training on improving the special quality of physical education students in the long jump and reaching the standard is more significant.[4] Li, W conducted training intervention on 40 male volleyball players 3 times a week for 12 weeks, and found that fast-stretching compound training combined with resistance training can effectively develop the lower body explosive power of athletes.[5] Dagmara Iwańska conducted training interventions on SCBA players from Shandong Institute of Physical Education in her master's thesis research, and found that both resistance training and fast-stretching compound training could improve and improve lower body explosive power, fast dribble layup and "T" return run have more significant improvement effects.[6]

METHOD

Research object

There are 24 special students of men's basketball in the Department of Physical Education, the specific situation is shown in Table 1.

Experimental method

A randomized controlled experimental study was adopted, and 24 subjects were randomly divided into an experimental group and a control group, with 12 people in each group, the experimental period was 17 weeks, 5 times a week.

Table 1. Athletes' age, height, weight and training years.

Item	Control group	N	Experiment group	N	T	Pvalue
Average age	18.5±0.3	12	18.6±0.3	12	0.4	0.7
Average height	177.2±1.2	12	178.0±1.3	12	0.5	0.7
Average weight	69.7±2.6	12	70.1±2.0	12	0.1	0.9
Average training years	6.3±0.5	12	7.4±0.5	12	1.6	0.1

The training grounds of the experimental group and the control group were beach courts and regular basketball courts, respectively, where they conducted beach basketball training and traditional basketball training, 5 times a week, for a total of 17 weeks. The training time and hours are exactly the same, and the training content is the same, including various basic basketball skills and tactics exercises, teaching competitions, and physical fitness exercises. Strictly control other influencing factors.[7]

40m sprint running, vertical jumping in situ and touching height were selected, and the research subjects were tested before and after the experiment, and the test methods and standards were the same. Use Excel 2000 to count all the data before and after the experiment, and conduct preliminary processing. Using the statistical software SPss11.5, the data between the experimental group, the control group, and the experimental group before and after the teaching experiment were independently t-tested, and at the same time, it was tested whether there was a significant difference (significant level $P<0.05$).[8]

Ethical Compliance

Research experiments conducted in this article with animals or humans were approved by the Ethical Committee and responsible authorities of Cangzhou Normal University following all guidelines, regulations, legal, and ethical standards as required for humans or animals.

RESULTS

Comparison of lower extremity explosive power before and after the experiment in the same group

It can be seen from Table 2 that the scores of the two test indicators of the experimental group before the experiment were 5.65±0.09s and 271.9±1.cm, respectively, while the scores of the two indicators after the experiment were 5.5±0.1s and 275.9±1.4cm, respectively, from the performance point of view, the scores of the two indicators have improved, through the t test, the P values are 0.02 and 0.03 respectively, which shows that there is a significant difference in the scores of the two indicators in this group before and after the experiment, indicating that beach basketball practice can indeed Effectively improve the explosive power of lower limbs.

It can be seen from Table 3 that before and after the experiment, the 40m sprint running scores of the control group were 5.7±0.1s and 5.6±0.05s, respectively, and the in-situ vertical jumping scores were 270.8±1.8cm and 272.8±1.9cm, respectively, from the data point of view, it has also improved, after the t test, the P values are 0.05 and 0.04, respectively, which shows that traditional basketball exercises can also improve the lower body explosive power of the practitioners.

Comparison of lower extremity explosive power between the experimental group and the control group before and after the experiment

It can be seen from Table 4 that before the group teaching experiment, the 40m sprint running scores of the control group and the

Table 2. Comparison of lower extremity explosive power in the experimental group before and after the experiment.

Item	Pre-trst	Post-test	N	T	Pvalue
40m sprint (s)	5.7±0.1	5.5±0.1	12	2.9	0.02
In situ vertical jump and touch height (cm)	271.9±1.6	275.9±1.4	12	-0.3	0.03

Table 3. Comparison of lower extremity explosive power in the control group before and after the experiment.

Item	Pre-trst	Post-test	N	T	Pvalue
40m sprint (s)	5.7±0.1	5.6±0.1	12	2.9	0.05
In situ vertical jump and touch height (cm)	270.8±1.8	272.8±1.9	12	-0.3	0.04

Table 4. Comparison of lower extremity explosive power between the experimental group and the control group before and after the test.

Before experiment						
Item	**Control group**	**N**	**Experiment group**	**N**	**T**	**Pvalue**
40m sprint (s)	5.7±0.1	12	5.7±0.1	12	0.4	0.8
In situ vertical jump and touch height (cm)	270.8±1.8	12	271.9±1.6	12	-1.2	0.5
After the experiment						
Item	**Control group**	**N**	**Experiment group**	**N**	**T**	**Pvalue**
40m sprint (s)	5.6±0.1	12	5.5±0.1	12	4.0	0.01
In situ vertical jump and touch height (cm)	272.8±1.9	12	275.9±1.4	12	-2.2	0.04

experimental group were 5.70±0.09s and 5.65±0.09s, respectively, with a P value of 0.76 (greater than 0.05), there is no significant difference between the two groups, indicating that there is no significant difference in the scores between the two groups. Before the experiment, the scores of the vertical jump in place were 270.78±1.83cm and 271.90±1.57cm, respectively, and the P value was 0.45 (greater than 0.05), there was also no significant difference between the two groups, indicating that there was no significant difference in the level of lower extremity explosive power between the two groups of subjects before the experiment.

It can be seen from Tables 2 and 3 that after 17 weeks of training, the performance of the two groups of subjects has improved. So, which training method has more obvious effect? To this end, a t-test was carried out on the 40m sprint running and in-situ vertical jumping scores of the two groups of subjects after the experimen, after the test, the two indexes of the experimental group were better than those of the control group, and the P values were 0.01 and 0.04, which indicated that after 17 weeks of training subjects, the level of lower extremity explosive power was improved, and compared with that of the control group, it is said that beach basketball exercises have a more significant effect on the development of lower extremity explosive power.

DISCUSSION

In a beach basketball game, the surface of the court is sandy, and the buffering force is large, athletes have to run on the court for nearly 40 minutes, and they also need to complete various technical movements with and without the ball, the consumption is very large. Athletes running and jumping on the beach basketball court will definitely consume more energy, and also achieve better training effects.[9] Therefore, the agility of athletes is particularly important. Athletes must quickly, accurately and coordinately change the spatial position and direction of body movement under various complex transformation conditions, and can easily and coordinately move in combination with the direction of the ball, reasonable use of change of direction and the connection of movements to maintain the balance of the body. In the whole game, can continue to move quickly and complete the ball in the run. Adaptability, explosiveness and durability are the special characteristics of the speed of beach basketball. Athletes must have fast reaction speed, starting speed, fast and accurate movement speed and explosive force development speed, and these speeds are required to be lasting without exhaustion.[10] In terms of strength and quality, athletes need to have the comprehensive strength shown by the coordination of all sports links, it is the basis of athletes' special abilities and depends on the development level of muscle strength in various parts of the body, it needs overall strength training to improve. In view of the requirements for physical fitness and the special competition environment, in order to enable athletes to reasonably control their body balance on 30-40cm thick sand, give full play to human athletic ability, and successfully complete technical and tactical coordination, it is necessary to emphasize targeted adaptation to sand. physical fitness training. Therefore, a better understanding and understanding of beach basketball and beach practice methods can play an auxiliary role in traditional basketball training.

CONCLUSION

Systematic and reasonable traditional basketball practice and beach basketball practice can improve the lower body explosive power of practitioners to a certain extent. After 17 weeks of training, the comparison and statistical test of 40m sprint running and vertical jumping in place before and after the experiment proved that compared with traditional basketball exercises, beach basketball practitioners had better lower body explosive power.

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

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REFERENCES

1. Pelzer T, Schmidt M, Jaitner T, Pfeiffer M. External training load and the effects on training response following three different training sessions in young elite beach volleyball players. Int J Sports Sci Coach. 2020;15(5-6):717-27.
2. Ribeiro LDC, Figueiredo LS. Relative Age Effects and team performance among elite beach handball athletes. J Phys Educ Sport. 2020;20(6):3354-60.
3. Luh A. Grounternehmen und Betriebssport in Deutschland vom Kaiserreich bis in die Gegenwart. Ein (zu) wenig beachtetes sozial- und sporthistorisches Phnomen. Stadion (Cologne, Germany). 2020;44(2):300-37.
4. Li W, Xiong Z, Ding Y, Cao Z, Wang Z. Lower Limb Model Based Inertial Indoor Pedestrian Navigation System for Walking and Running. IEEE Access. 2021;9:42059-70.
5. Iwańska D, Tabor P, Grabowska O, Mastalerz A. The Symmetry of Fatigue of Lower Limb Muscles in 400 m Run Based on Electromyography Signals. Symmetry. 2021;13(9):1698.
6. Daneshjoo A, Raeisi S. Effect of Eight Weeks Plyometric Training on Some Kinematic Parameters, Horizontal Jumping Power, Agility, and Body Composition in Elite Parkour Athletes. J Sports Biomech. 2020;6(1):54-65.
7. Cook H, Reilly CC, Rafferty GF. A home-based lower limb-specific resistance training programme for patients with COPD: an explorative feasibility study. ERJ Open Res. 2019;5(2):00126-2018.
8. Hagiwara Y, Yabe Y, Sekiguchi T, Momma H, Tsuchiya M, Kanazawa K, et al. Upper Extremity Pain Is Associated with Lower Back Pain among Young Basketball Players: A Cross-Sectional Study. Tohoku J Exp Med. 2020;250(2):79-85.
9. Brini S, Ouerghi N, Bouassida A. Small sided games vs repeated sprint training effects on agility in fasting basketball players. RBME. 2020;26(3):248-52.