PHYSICAL CAPACITY OF BASKETBALL PLAYERS IN RESISTANCE TRAINING

CAPACIDADE FÍSICA DE JOGADORES DE BASQUETE AO TREINAMENTO RESISTIDO

CAPACIDAD FÍSICA DE JUGADORES DE BALONCESTO AL ENTRENAMIENTO DE RESISTENCIA

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Li Chun[1]
(Physical Education Professional)
Wang Jiechun[1]
(Physical Education Professional)

1. Anhui Normal University, Physical Education College, Wuhu, Anhui, China.

Correspondence:
Wang Jiechun
Wuhu, Anhui, China. 241000.
wjc231102@163.com

ABSTRACT

Introduction: Coaches' focus on young athletes is to understand the critical period of their physical and mental development, educating sports and personal skills while expanding their awareness of teamwork. Objective: Study the effect of resistance training on the physical fitness of young basketball players. Methods: 20 high school students with outstanding sports skills were selected as volunteers for this research. According to the random sampling method, 20 athletes were divided into the experimental and control group. The experiment lasted 6 weeks, consisting of three weekly resistance training sessions. Only the experimental group used elastic bands, while the control group performed the same movement as the experimental group without resistance. Results: The test results of the experimental group were expressive, proving that resistance training can achieve a beneficial effect on players. Conclusion: Allying resistance training to basketball exercise protocol can optimize basal fitness and focused fitness indicators in young basketball players, helping to achieve better practical results. ***Level of evidence II; Therapeutic studies - investigating treatment outcomes.***

Keywords: Endurance Training; Basketball; Physical Conditioning, Human.

RESUMO

Introdução: O foco dos treinadores nos jovens atletas consiste em compreender o período crítico de seu desenvolvimento físico e mental, educando as capacidades esportivas e pessoais enquanto expandem sua consciência de trabalho em equipe. Objetivo: Estudar o efeito do treinamento resistido sobre a aptidão física dos jovens jogadores de basquetebol. Métodos: 20 estudantes do ensino médio com destaque em suas habilidades esportivas foram selecionados como voluntários para essa pesquisa. De acordo com o método de amostragem aleatória, 20 atletas foram divididos no grupo experimental e controle. O experimento durou 6 semanas, consistindo em três treinamentos de resistência semanais. Somente o grupo experimental usou faixas elásticas, enquanto o grupo controle apenas realizou o mesmo movimento do grupo experimental sem resistência. Resultados: Os resultados dos testes do grupo experimental foram expressivos, comprovando que o treinamento resistido pode alcançar um efeito benéfico aos jogadores. Conclusão: Aliar o treinamento resistido ao protocolo de exercícios do basquetebol pode otimizar os indicadores de aptidão física basal e aptidão física focada nos jovens jogadores de basquetebol, auxiliando a conquista de melhores resultados práticos. ***Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.***

Descritores: *Treino de Resistência; Basquetebol; Condicionamento Físico Humano.*

RESUMEN

Introducción: El enfoque de los entrenadores hacia los jóvenes deportistas consiste en comprender el período crítico de su desarrollo físico y mental, educando las habilidades deportivas y personales al tiempo que se amplía su conciencia de trabajo en equipo. Objetivo: Estudiar el efecto del entrenamiento de resistencia en la aptitud física de jóvenes jugadores de baloncesto. Métodos: Para esta investigación se seleccionaron como voluntarios 20 estudiantes de secundaria con habilidades deportivas destacadas. Según el método de muestreo aleatorio, 20 atletas fueron divididos en el grupo experimental y el de control. El experimento duró 6 semanas y consistió en tres sesiones semanales de entrenamiento de resistencia. Sólo el grupo experimental utilizó bandas elásticas, mientras que el grupo de control se limitó a realizar el mismo movimiento que el grupo experimental sin resistencia. Resultados: Los resultados de las pruebas del grupo experimental fueron expresivos, demostrando que el entrenamiento de resistencia puede lograr un efecto beneficioso en los jugadores. Conclusión: Aliar el entrenamiento de resistencia al protocolo de ejercicios de baloncesto puede optimizar los indicadores de aptitud física basal y la aptitud física focalizada en jóvenes jugadores de baloncesto, ayudando a la consecución de mejores resultados prácticos. ***Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.***

Descriptores: *Entrenamiento de Resistencia; Baloncesto; Acondicionamiento Físico Humano.*

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INTRODUCTION

Basketball is an aerobic sport with strong team cooperation and strong competition intensity. And the main characteristics of the project are long duration, frequent physical confrontation and diverse tactical changes. Therefore, athletes need to have sufficient physical strength. Since the development of basketball, various sports events have played a very positive role in the development of the project.[1] It has attracted many young people to join. Some young people decided to take the professional sports path and participate in more professional training, which greatly improved their competitive level and state. Moreover, the training of young basketball players provides direct resources for the national basketball talents.[2] Therefore, great attention should be paid to the training of young athletes. Through daily training, improve the abilities of young basketball players in an all-round way. There is still an obvious gap between the development of basketball in China and that of a strong basketball country. All aspects of youth training are not mature. Therefore, we should deeply study the core contents of various special training for teenagers.[3] As teenagers are in the growth and development period, they are young, with strong project plasticity, high talent potential and strong knowledge understanding. Adolescent stage is the key period for qualitative change of project ability and the best period for improving project understanding and technical ability. In the process of basketball, there will be frequent physical confrontations, which have higher requirements on the resistance ability and physical fitness of teenagers.[4] Therefore, in the training of young basketball players, we should make good use of the advantages of the high efficiency period of young basketball players. Strengthen the training of young basketball players in the resistance link, improve the physical fitness of young basketball players, and improve the ability of young basketball players.[5] Feedback can be obtained in the competition to reduce the gap with the opponent. Through daily high-intensity training to maintain the competitiveness of young basketball players and extend their future career.

METHOD

As shown in Table 1, 20 athletes were randomly divided into the experimental group and the control group. The study and all the participants were reviewed and approved by Ethics Committee of Anhui Normal University (NO.19AHNUSR63).

The experiment lasted for 6 weeks, and resistance training was conducted three times a week. The experimental group used elastic bands, and the control group did not use elastic bands for training on the same basis as the experimental group. Except for the variable of whether the two groups of athletes use elastic bands, all other training duration, training actions and related indicators are consistent.

As for the basic physical fitness index, the number of push ups and the number of sit ups were selected as the observation indexes in the aspect of strength related basic physical fitness; In terms of physical ability related to explosive force, the distance of three-level frog jump and the height of two feet jump were selected as observation indexes; In the aspect of speed related basic physical ability, the time of turning back and the time of running around the pole were selected as observation indexes; In terms of basic physical ability related to flexibility, the forward flexion distance of sitting body was selected as the observation index; In terms of endurance related basic physical ability, 1500m running time was selected as the observation index.

Table 1. Basic information of the experimental group and the control group.

Group	Age	Height	Weight
Control group	16.08±0.705	189.26±3.515	82.63±12.591
test group	16.63±1.129	188.05±6.820	83.66±9.963
P value	0.3137	0.5047	0.8887

After determining the observation indicators, the athletes were collected before and after the experiment, and the data were analyzed using Excel software and SPSS software. The obtained data were sorted out to facilitate the follow-up comparative study.

RESULTS

Effect of resistance training on improving basic physical ability of young basketball players

Basic physical ability is the foundation of all sports activities. All sports activities are completed under the combination and evolution of basic physical fitness. Basic physical fitness is divided into five aspects related to strength, explosive power, speed, flexibility and endurance. Corresponding indicators are selected for analysis. The specific results are shown in Table 2.

In terms of strength related basic physical ability, the initial data of the number of push ups in the experimental group was 37.03 ± 7.324, and after six weeks of experiment, it increased to 55.15 ± 5.857; The initial data of the number of push ups in the control group was 38.60 ± 8.065, which increased to 53.37 ± 6.076 after six weeks of experiment; The initial data of the number of sit ups in the experimental group was 47.10 ± 5.873, which increased to 68.69 ± 3.856 after six weeks of experiment; The initial data of the number of sit ups in the control group was 46.42 ± 4.972, which increased to 67.14 ± 4.268 after six weeks of experiment. It can be seen that after the relevant 6-week training, the strength related physical ability of the experimental group and the control group has been improved. Although the improvement range of the experimental group is higher than that of the control group, there is little difference between them, which indicates that resistance training is slightly better than the existing physical training methods in terms of strength quality and physical fitness improvement.

In terms of physical ability related to explosive force, the initial data of the three-level frog jump distance of the experimental group was 7.86 ± 0.487, and after six weeks of experiment, it was increased to 8.23 ± 0.720; The initial data of the three-stage frog jump distance in the control group was 7.94 ± 0.294, and after six weeks of experiment, it increased to 8.13 ± 0.478; In the experimental group, the initial data of the jumping height of both feet was 64.32 ± 10.324, which increased to 71.68 ± 9.246 after six weeks of experiment; The initial data of the jumping height of both feet in the control group was 62.84 ± 10.589. After six weeks of experiment, it increased to 66.42 ± 9.699. This shows that basketball training can improve the physical indexes related to explosive power, and the addition of resistance training makes the index optimization better.

Table 2. Effect of resistance training on improving basic physical ability of young basketball players.

Project	Group	Before	After	P
Push ups	test group	37.03±7.324	55.15±5.857	0.0059
	Control group	38.60±8.065	53.37±6.076	0.0355
Sit-ups	test group	47.10±5.873	68.69±3.856	0.0020
	Control group	46.42±4.972	67.14±4.268	0.0152
Siter	test group	12.77±6.472	13.67±7.011	0.0366
	Control group	12.61±7.110	13.01±5.175	0.2410
Third -class frog jet	test group	7.86±0.487	8.23±0.720	0.0338
	Control group	7.94±0.294	8.13±0.478	0.0660
High feet jump high	test group	64.32±10.324	71.68±9.246	0.0040
	Control group	62.84±10.589	66.42±9.699	0.0416
Turn around	test group	13.51±1.380	12.71±1.544	0.4543
	Control group	13.37±1.306	12.77±1.802	0.4921
Run around	test group	18.26±1.613	17.03±1.306	0.0079
	Control group	17.77±1.638	16.73±1.948	0.0386
1500m running	test group	5.30±0.365	5.17±0.278	0.8462
	Control group	5.37±0.355	5.19±0.325	0.7717

In terms of speed related basic physical ability, the initial data of turn back running time in the experimental group was 13.51 ± 1.380, which was shortened to 12.71 ± 1.544 after six weeks of experiment; The initial data of turn back running time in the control group was 13.37 ± 1.306, which was shortened to 12.77 ± 1.802 after six weeks of experiment; The initial data of the experimental group was 18.26 ± 1.613, which was shortened to 17.03 ± 1.306 after six weeks of experiment; The initial data of the control group when running around the rod was 17.77 ± 1.638, which was shortened to 16.73 ± 1.948 after six weeks of experiment. It can be seen that the speed improvement of the experimental group is higher than that of the control group, and both methods can effectively improve the basic indicators related to speed.

In terms of the basic physical ability related to flexibility, the initial data of the forward flexion distance of the sitting body in the experimental group was 12.77 ± 6.472, and after six weeks of experiment, it increased to 13.67 ± 7.011; The initial data of the forward flexion distance of the sitting body in the control group was 12.61 ± 7.110. After six weeks of experiment, it increased to 13.01 ± 5.175. It can be seen that the optimization range of the experimental group is higher than that of the control group after adding resistance training.

In terms of endurance related basic physical ability, the initial data of 1500m running time in the experimental group was 5.30 ± 0.365, which was shortened by 5.17 ± 0.278 after six weeks of experiment; The initial data of 1500m running time in the control group was 5.37 ± 0.355, which was shortened by 5.19 ± 0.325 after six weeks of experiment. From the data analysis, it can be seen that resistance training can better strengthen the endurance of users, so as to obtain better initiative in the basketball field.

Effect of resistance training on the improvement of special physical ability of young basketball players

For young basketball players, the goal of all training is to improve sports performance. Therefore, the effect of special physical fitness improvement of basketball players is a very important link. In this regard, the specific summary is also carried out in two aspects: the special physical fitness of single basketball and the special physical fitness of team basketball, as shown in Table 3.

It can be seen from this that the increase of resistance training, compared with ordinary basketball training, has a strong improvement in personal strength, and the passing distance and recommended time have been better optimized, better than the control group. Resistance training can effectively increase the cooperation strength between teams, but compared with the current two person cooperation, the optimization range is significantly higher than three person cooperation, which indicates that the existing training methods need to carry out a greater range of team cooperation training to obtain better team benefits.

DISCUSSION

Through the professional resistance training, the athletes can intuitively feel all abilities, and the daily resistance training will benefit the athletes' sports ability and technical level. Especially the special basketball skills and functional sports ability of athletes. In the resistance training, the lower limb strength of the athletes has been gradually improved.

Table 3. Effect of resistance training on special physical ability of young basketball players.

Project	Group	Before	After	P
Passing distance	test group	11.23±1.485	11.95±1.578	0.0069
	Control group	11.11±1.324	11.57±1.043	0.4556
3/4 basketball court holding the ball to advance	test group	4.26±0.248	3.97±0.386	0.0208
	Control group	4.42±0.344	4.31±0.319	0.6606
15m × 2 Polo the ball to advance	test group	7.13±0.426	6.72±0.486	0.0010
	Control group	7.41±0.476	7.19±0.812	0.3866
Quick short pass from the two	test group	13.58±0.913	12.85±0.814	0.0000
	Control group	14.05±0.406	13.72±0.396	0.8891
Three people fast break promotion	test group	15.79±0.365	15.21±0.284	0.0387
	Control group	16.22±0.478	15.74±0.425	0.4333

Among them, the running and jumping training content in the training can effectively enhance the muscle volume and muscle coordination of the lower limbs and core strength areas of the athletes. Due to the intense competition in modern basketball matches, there are a lot of antagonistic actions in training and competitions. Therefore, in the daily resistance training, the training intensity can be increased according to the requirements of the competition, and the feedback information can be given to the coaches in time according to the daily training experience. According to the feedback information, coaches analyze the data report of athletes' muscle fitness, and take the data as the basis for the formulation of training plans. Improve the training content of young basketball players. Different training methods can be adopted, such as push ups, pull ups and weight-bearing training. Strengthen the resistance ability of young basketball players in different latitudes such as horizontal and vertical. Daily resistance training can also reduce the injury risk of young basketball players. When the athletes have excellent physical resistance ability, they can accumulate on-site emergency treatment experience through training. In the course of competition, after fierce physical confrontation, it can effectively disperse the movement resistance, maintain the stability of the body, and it is necessary to reduce the risk of injury. Even in the event of injury, it can effectively reduce the degree of injury. Indirectly extending the professional life of athletes.

CONCLUSION

For young athletes, how to grasp the critical period of their physical and mental development and comprehensively cultivate their personal sports ability and team cooperation consciousness are the focus of coaches. Through the research of this paper, it can be seen that adding resistance training on the basis of existing basketball training can better optimize the data indicators of basic physical fitness and special physical fitness of young basketball players, so as to obtain better results on the basketball court.

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