REGULAR STRENGTH TRAINING EFFECT ON KUNG FU ATHLETES INJURIES REDUCTION

EFEITO DO TREINAMENTO REGULAR DE FORÇA NA REDUÇÃO DAS LESÕES ESPORTIVAS EM ATLETAS DE KUNG FU

EFECTO DEL ENTRENAMIENTO DE FUERZA REGULAR EN LA REDUCCIÓN DE LESIONES DEPORTIVAS EN ATLETAS DE KUNG FU

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ABSTRACT

Introduction: As the competitive level of martial arts keeps improving, the requirements for athletes' skills are also getting more elevated. Against this background, implementing preventive protocols for sports practice injuries is necessary. Regular strength training is a practice that aims to prevent injuries, but the approach in Kung Fu practitioners is still empirical. Objective: Explore the effect of regular strength training on Kung Fu athletes' exercise injury. Methods: 40 athletes with similar ages and grades are randomly grouped into control and experimental groups. While the control group practiced regular training, strength training lasting 90 minutes was implemented three times a week for five months in the experimental group. Physical test results have been analyzed before and after the experiment. Results: After a detailed analysis of the quality and ability data, the indicators are significantly different. Although the athletes in the control group also improved to varying degrees, they are not as good as those in the experimental group. Conclusion: Regular strength training has a positive impact on reducing exercise injury in martial arts athletes and helps improve the athletic level of athletes. After much regular strength training, the quality and ability of the athletes were significantly improved. ***Evidence Level II; Therapeutic Studies - Investigating the result.***

Keywords: Resistance Training; Martial Arts; Athletic Injuries.

RESUMO

Introdução: Com a melhora contínua do nível competitivo das artes marciais, os requisitos para as habilidades dos atletas também estão ficando cada vez mais altos. Nesse contexto, surge a necessidade de implementar protocolos preventivos para lesões ocasionadas durante a prática esportiva. Treinamentos regulares de força são práticas que visam a prevenção de lesões, porém a abordagem em praticantes de Kung Fu ainda é empírica. Objetivo: Explorar o efeito do treinamento regular de força para reduzir a lesão de exercício nos atletas de Kung Fu. Métodos: 40 esportistas com idades e notas semelhantes são agrupados aleatoriamente em grupos controle e experimental. Enquanto o grupo controle praticava os treinamentos regulares, no grupo experimental foi implementado o treino de força com duração de 90 minutos, três vezes por semana por cinco meses. Resultados de testes físicos foram analisados antes e depois do experimento. Resultados: Após a análise especial dos dados de qualidade e habilidade, os indicadores são significativamente diferentes. Embora os atletas do grupo de controle também tenham melhorado em graus variados, eles não são tão bons quanto os do grupo experimental. Conclusão: O treinamento regular de força tem um impacto positivo na redução da lesão de exercício dos atletas de artes marciais e ajuda a melhorar o nível esportivo dos atletas. Depois de muito treinamento regular de força, a qualidade e habilidade dos esportistas foram significativamente aprimoradas. ***Nível de evidência II; Estudos Terapêuticos - Investigação de Resultados.***

Descritores: *Treinamento de Força; Artes Marciais; Traumatismos em Atletas.*

RESUMEN

Introducción: Con la continua mejora del nivel competitivo de las artes marciales, los requisitos para las habilidades de los atletas también son cada vez más altos. En este contexto, surge la necesidad de implementar protocolos preventivos para las lesiones causadas durante la práctica deportiva. El entrenamiento de fuerza regular es una práctica destinada a la prevención de lesiones, pero el enfoque en los practicantes de Kung Fu sigue siendo empírico. Objetivo: Explorar el efecto del entrenamiento de fuerza regular para reducir las lesiones por ejercicio en los atletas de Kung Fu. Métodos: 40 atletas de edad y grado similares se agrupan aleatoriamente en grupos de control y experimental. Mientras que el grupo de control practicó el entrenamiento habitual, en el grupo experimental se implementó un entrenamiento de fuerza de 90 minutos de duración tres veces por semana durante cinco meses. Los resultados de las pruebas físicas se analizaron antes y después del experimento. Resultados: Tras un análisis especial de los datos de calidad y capacidad, los indicadores son significativamente diferentes. Aunque los atletas del grupo de control también mejoraron en diversos grados, no son tan buenos como los del grupo experimental. Conclusión:

El entrenamiento de fuerza regular tiene un impacto positivo en la reducción de las lesiones por ejercicio en los atletas de artes marciales y ayuda a mejorar el nivel deportivo de los atletas. Tras un entrenamiento de fuerza muy regular, la calidad y la capacidad de los atletas mejoraron significativamente. ***Nivel de evidencia II; Estudios terapéuticos - Investigación de resultados.***

Descriptores: *Entrenamiento de Fuerza; Artes Marciales; Traumatismos en Atletas.*

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INTRODUCTION

With the continuous improvement of the level of martial arts competition, the requirements for the various abilities of the athletes are also getting higher and higher. The injuries of martial arts athletes are more common and serious, and the causes of injuries are also complex and diverse.[1] In order to ensure the smooth progress of training and competition, it is imperative to find a more efficient training method to reduce athletes' exercise injury. Regular strength training plays a positive role in guiding the scientific training of martial arts and has great practical value.[2] The movements of martial arts routines are complex and changeable, at the same time, it has both ups and downs, flashing and moving, and it is necessary to complete the action quickly, it also needs to have beautiful movements, and through regular strength training, can well improve the stability, balance and coordination of athletes. Can well improve the stability, balance and coordination of athletes.[3] Athletes in the basic training stage are in the period of puberty, which is a sensitive period for the development of various qualities and abilities, at the same time, it is in the period of laying the foundation for various special abilities, seize this golden period to intervene in physical fitness for athletes, can play a multiplier effect with half the effort.[4-5] The regular strength training solves the basic problems of various physical training, it is not waist and abdomen strength training in the traditional sense, it does not require high-intensity strength training for support, but by improving the small muscle groups deep in our torso, pelvis, and core area, in order to stabilize the center of gravity, maintain balance, and conduct force. At the same time, regular strength training can also solve the more prominent problems in the competition of high-level athletes, for example, when completing difficult moves, the improvement of body control ability, stability and balance ability when landing, etc. The basic training stage is a period to lay the foundation for the high-level stage, and it is also a period to reserve energy for the high-level training stage, if you can seize this period and use regular strength training to train athletes, balance the ability of various indicators of athletes, so that athletes can smoothly enter high-level sports teams, not only can it reduce the workload of high-level sports teams for athletes' physical training, more importantly, it has a long-term significance for the sustainable development of athletes.[6] In response to this research question, Mastnak et al. believe that core stability refers to the stable posture that controls the muscles of the pelvis and trunk during exercise, create a fulcrum for the movement of the upper and lower limbs, and coordinate the exertion of the upper and lower limbs to optimize the generation, transmission and control of power.[7]

METHOD

Experimental subjects

1. Taking 40 male athletes from a martial arts team in a province as experimental subjects, divide into an experimental group (20 people) and a control group (20 people). The basic situation is shown in Table 1.

Table 1. Basic situation of experimental subjects.

Group	N/person	Age	Height/cm	Weight/kg	Training years/year
Test group	20	18±5	170±5	60±10	9±3
Control group	20	18±5	170±5	60±10	9±3

Experimental design

1. Experimental group

Regular strength training sessions are conducted three times a week, each training session is 90 minutes. Training should adhere to the principle of gradual and orderly progress, and gradually increase the difficulty of the action. The training content includes single-person exercises without equipment, exercises with the aid of equipment, compound exercises, and tests of special qualities and special techniques.[8]

2. Control group

Using traditional training methods, focusing on technical training, combined with some general quality training, such as speed exercises (30 meters, 100 meters, back and forth running), strength and explosive power exercises (barbell, leapfrog, steps), flexibility exercises (pull ligament, lower fork, pull leg), endurance exercises (3000 meters), etc., and test special qualities and special skills.

Experimental method

Experimental group (increased regular strength training group): A total of five months, three regular strength training sessions per week (Tuesday, Thursday, Saturday), 90 minutes per training session; Regular strength training should adhere to the principle of gradual and orderly progress, gradually increase the difficulty of the action, and run through some general quality training in the training. Control group (traditional training method): Using traditional training methods, focusing on technical training, combined with general quality training, the quality part of each special technical class is arranged for 20 minutes. General quality training includes speed exercises (30 meters, 100 meters, downhill, etc.), strength and explosive power exercises (barbell, leapfrog, steps, etc.), endurance exercises (400 meters, 3000 meters), flexibility exercises (shoulder, waist, hip, ankle, etc.), flexible exercises (round-trip running, stand-up support).[9]

RESULTS

Comparative analysis of special quality ability

After the experiment, the difference between the experimental group and the control group in the second-level jump test results

After five months of group experiments, although the test scores of the athletes in the experimental group and the control group have improved, however, the horizontal differences between the experimental group and the control group are compared, as shown in Figure 1, the two-level jump test results of the experimental group and the control group are significantly different, it proves that the athletes in the experimental group have undergone a lot of quality strength training, its second-level jump ability is significantly better than that of the control group athletes using traditional training methods, it shows that qualitative strength training can significantly help the improvement of second-level jump performance.[10]

After the experiment, the experimental group and the control group dangling legs test results comparison

After five months of group experiments, although the test scores of the athletes in the experimental group and the control group have improved, however, the horizontal differences between the experimental group and the control group are compared, as shown in Table 2, there is a highly significant difference between the dangling leg lift test results of the experimental group and the control group, it proves that the athletes in the experimental group have undergone a lot of regular strength training, its ability to drape and raise legs is significantly better than that of the control group athletes who use traditional training methods, it shows that regular strength training has a significant help in improving the performance of hanging legs .

After the experiment, the difference between the experimental group and the control group "8" test results

After five months of group experiments, although the test scores of the athletes in the experimental group and the control group have improved, however, the horizontal differences between the experimental group and the control group are compared, as shown in Table 3, there are significant differences between the experimental group and the control group in the "8" running test results, it proves that the athletes in the experimental group have undergone a lot of regular strength training, the "8" running ability is significantly better than the control group athletes using traditional training methods, which shows that regular strength training can significantly help the improvement of "8" running performance.

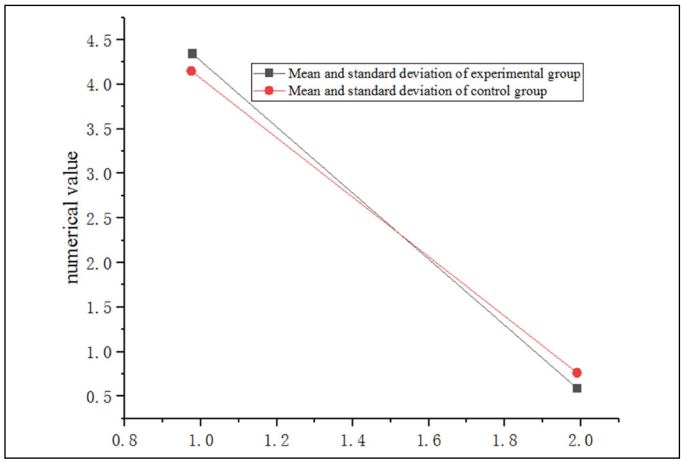

Figure 1. List of t-test results of the secondary jump test data of the experimental group and the control group after the experiment.

Table 2. Comparison of the test results of the experimental group and the control group after the experiment.

Group	N	Mean	Standard deviation	t
Standard deviation	20	9.55	2.12	4.45
Control group	20	6.80	1.88	

Table 3. Comparison of the test results of the "8" run between the experimental group and the control group after the experiment.

Group	N	Mean	Standard deviation	t
Standard deviation	20	15.88	0.51	-2.45
Control group	20	16.20	0.38	

DISCUSSION

After the data analysis of the special quality and ability, there are significant differences in all the indicators, the athletes in the experimental group have undergone a lot of regular strength training, its special quality ability has been significantly improved, although the athletes in the control group also improved to varying degrees, but obviously not as much progress as the experimental group athletes. Among them, the second-level jump reflects the explosive power of the athlete's lower limbs and the reaction force. After a lot of regular strength training, athletes are stronger because of their core areas, it is more coordinated with the transmission of the limbs, and the effort is more economical, the reaction is more rapid, so the progress will be more prominent. In martial arts training, there are many jumping, coordinated exertion of upper and lower limbs, and continuous exertion, the requirements for explosive power are very high, and regular strength exercises, can strengthen the synergy of the whole body, can significantly improve explosive power and reaction effort, it has a very high auxiliary effect on martial arts training. The hanging leg raise reflects the athlete's trunk and hip flexion ability. Regular strength training focuses on the stability and control of the trunk, iliopsoas muscles, and thigh muscles, after a certain amount of practice, the athlete's hip flexion ability will definitely improve a lot. The improvement of this ability, when we swing our legs and jump into the air, stabilizing the torso, increasing the speed of swinging legs, improving the difficulty completion ability and completion quality have a significant impact. The "8" running is the ability to reflect the athlete's starting, changing direction, and re-acceleration after changing the direction, which is related to speed and agility. After athletes undergo a lot of regular strength training, their pelvis becomes more stable, the torso can be controlled better, the force is more coordinated, changing direction, shifting speed and turning and accelerating can be done better, it can significantly improve the athlete's speed and flexibility. And the influence of these qualities on martial arts athletes is also obvious, as we all know, the movements of martial arts routines are more complex and changeable, there must be ups and downs, flashes and shifts, it also needs to be flexible, fast and powerful, therefore, improving regular strength training has a prominent effect on martial arts routine training.

CONCLUSION

The strength training of martial arts athletes has its particularity, arrangements should be made dialectically according to the physical and psychological characteristics of athletes. It is necessary to consider the physiological stages of athletes' growth and development, it is also necessary to consider its psychological endurance for long-term, regular, and boring strength load training. Therefore, regular strength training reduces sports injuries, improve the stability of the core of the body, stimulate deep muscles and nerves, and integrate the characteristics of strength, flexibility, and coordination training, it is a useful supplement to traditional strength training.

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

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