

STUDY ON SPORTS INJURIES AND REHABILITATION IN BADMINTON PLAYERS



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ESTUDO SOBRE LESÕES ESPORTIVAS E REABILITAÇÃO EM JOGADORES DE BADMINTON

ESTUDIO SOBRE LESIONES DEPORTIVAS Y REHABILITACIÓN EN JUGADORES DE BÁDMINTON

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ABSTRACT

Introduction: Badminton has a wide audience and a large development market in China. Although it benefits the flexibility of sedentary workers by recruiting the whole body's musculature, it can also cause a harmful effect due to lack of preparation or intensity during matches. **Objective:** Study the methods of sports injury and rehabilitation of badminton players. **Methods:** 60 badminton players with low back injuries were randomly divided into experimental and control groups. The control group used the traditional method of recovery by manual techniques. An intervention with core stability training lasting 40 minutes three times a week for six weeks was added to the experimental group. **Results:** The degree of injury of badminton players is mostly mild, with some cases of moderate and severe injury. The combination of core strengthening associated with manual therapy rehabilitation and stretching can accelerate the muscular rehabilitation of the lumbar spine. **Conclusion:** In the rehabilitation process of badminton injuries, we should combine physical training with traditional rehabilitation techniques, increasing the effectiveness of sports rehabilitation. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

Keywords: Badminton; Sports Injuries; Rehabilitation Exercises.

RESUMO

Introdução: O badminton tem um público amplo e um grande mercado de desenvolvimento na China. Embora beneficie a flexibilidade de trabalhadores sedentários ao recrutar toda a musculatura corporal, ele também pode causar um efeito deletério devido a falhas na preparação ou intensidade durante os jogos. **Objetivo:** Estudar os métodos de lesão esportiva e reabilitação de jogadores de badminton. **Métodos:** 60 jogadores de badminton com lesão lombar foram divididos aleatoriamente em grupo experimental e grupo controle. O grupo controle utilizou o método tradicional de recuperação por técnicas manuais. Ao grupo experimental foi adicionada uma intervenção com treinamento de estabilidade do core com duração de 40 minutos, três vezes por semana, durante seis semanas. **Resultados:** O grau de lesão dos jogadores de badminton é majoritariamente leve, com alguns casos de lesão moderada e grave. A combinação do fortalecimento do core associada à reabilitação por terapia manual e alongamentos pode acelerar a reabilitação muscular da coluna lombar. **Conclusão:** No processo de reabilitação de lesões de badminton, devemos combinar o treinamento físico com as técnicas de reabilitação tradicionais, aumentando a eficácia da reabilitação esportiva. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores: Badminton; Lesões do Esporte; Exercício de Reabilitação.

RESUMEN

Introducción: El bádminton tiene un amplio público y un gran mercado de desarrollo en China. Aunque beneficia a la flexibilidad de los trabajadores sedentarios al reclutar toda la musculatura del cuerpo, también puede causar un efecto deletéreo debido a la falta de preparación o intensidad durante los partidos. **Objetivo:** Estudiar los métodos de lesión deportiva y rehabilitación de los jugadores de bádminton. **Métodos:** 60 jugadores de bádminton con lesión lumbar fueron divididos aleatoriamente en grupo experimental y grupo de control. El grupo de control utilizó el método tradicional de recuperación mediante técnicas manuales. Al grupo experimental se le añadió una intervención con entrenamiento de estabilidad del núcleo de 40 minutos, tres veces por semana, durante seis semanas. **Resultados:** El grado de lesión de los jugadores de bádminton es majoritariamente leve, con algunos casos de lesiones moderadas y graves. La combinación de fortalecimiento del core asociada a la rehabilitación de terapia manual y a los estiramientos puede acelerar la rehabilitación muscular de la columna lumbar. **Conclusión:** En el proceso de rehabilitación de las lesiones de bádminton, debemos combinar el entrenamiento físico con las técnicas de rehabilitación tradicionales, aumentando la eficacia de la rehabilitación deportiva. **Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.**

Descriptorios: Bádminton; Lesiones en Deportes; Ejercicios de Rehabilitación.



INTRODUCTION

Badminton not only has strong interest, but also can comprehensively train the whole body strength, including the core of upper limbs and lower limbs, so as to improve the flexibility of the body. It can also effectively alleviate the problems of shoulder and neck stiffness caused by long-time desk work. Therefore, it is widely loved by many people in contemporary times.¹ Badminton is also an advantageous project in China's Olympic Games. Therefore, badminton has a wide audience and a great development market in China, and has good research value. Although badminton can activate all parts of the body to a great extent, it will also have a certain impact on the body due to too intense exercise or insufficient preparation.² According to the literature, badminton sports injuries are widely distributed, such as ligament strain, patella injury, muscle strain and so on.³ According to the literature, badminton players often have different degrees of strain in the fourth year of training. Therefore, when training, we should have a sense of protection and carry out rehabilitation training for the parts prone to sports injury.⁴ After analyzing the current sports injury of athletes, the literature puts forward that for the sports injury of badminton athletes, we should pay attention to strengthening the training of wrist flexibility and hand strength, pay attention to footwork during sports, and bear more strength by thigh muscles, so as to reduce the pressure of knee joint.⁵ It is also proposed in the literature that for the problem of sports injury, massage can be used to relieve the muscles and joints of the whole body, so as to alleviate the strain caused by sports.⁶

In view of these situations, this paper first uses the way of questionnaire survey to analyze the parts and conditions of sports injury in badminton. Then, using the experimental method, 60 students in a university were trained in the rehabilitation of badminton sports injury, so as to explore the rehabilitation injury and sports injury prevention of badminton players, and explore the strategies of rehabilitation.

METHOD

In order to further study, the current Badminton Athletes' sports injury and related knowledge of rehabilitation, this paper first uses the literature research method, through various knowledge platforms such as Internet platform and offline library, and uses the electronic and paper materials provided to sort out and summarize the relevant key points, so as to lay a solid research foundation for this paper.

During the questionnaire survey, this paper consulted the respondents about the intention of relevant experiments, and the respondents signed up according to the principle of voluntariness. The study and all the participants were reviewed and approved by Ethics Committee of Shijiazhuang Posts and Telecommunications Technical College (NO. 20SJZPTTU-013). After screening, 60 badminton players with lumbar spine injury were selected as the research object of the experiment and randomly divided into experimental group and control group. The basic information is shown in Table 1.

After determining the research object and its injury, this paper adopts the experimental method of controlling variables. The control group adopts the traditional massage recovery method. On the basis of massage recovery, the experimental group increases the core stability training intervention, three times a week, 40 minutes each time. This experiment lasts for six weeks. In order to minimize the interference of

Table 1. Basic information of rehabilitation training research object.

Option	Experience group	Control group
Age (years old)	19.923±1.657	20.091±1.468
Height (CM)	177.728±8.408	178.195±6.835
Weight (kg)	62.626±8.982	64.522±7.326

human factors, the experimental group and the control group kept the same exercise and lifestyle as much as possible during the experiment.

In the measurement of experimental indexes, the activity of lumbar flexion, lumbar extension, lumbar left flexion and lumbar right flexion in the experimental group and the control group were measured before and after rehabilitation training, and the data were compared and analyzed. In order to explore the links of pain injury in the whole recovery process, vas fuzzy visual pain scale is selected, and the scores of 0 to 10 are given respectively according to the painless to the most painful, which is divided by athletes according to their actual situation. Organize the recorded data every week and draw the pain relief trend for the convenience of follow-up investigation and research.

RESULTS

Investigation on sports injury of badminton players

In this section, the sports injuries of badminton players in the study area are analyzed. In order to be more targeted, the survey objects of the questionnaire are badminton professional athletes who have a history of badminton injury. By sorting and analyzing the data over the years, questionnaires were sent to relevant personnel to analyze the degree and type of sports injury. The results are shown in Figure 1 and 2.

It can be seen from the results in Figure 1 that although there are relatively many sports injuries in badminton and they are widely distributed, they are relatively mild injuries, such as slight sprain, strain or joint dislocation. These injuries often do not bring too much interference to the daily life of athletes, and only need to go to the hospital for simple treatment. Some athletes choose not to go to the hospital and can recover by applying drugs for promoting blood circulation and removing blood stasis. Therefore, the degree of injury of badminton players is relatively light injury, but there are also some cases of moderate injury and severe

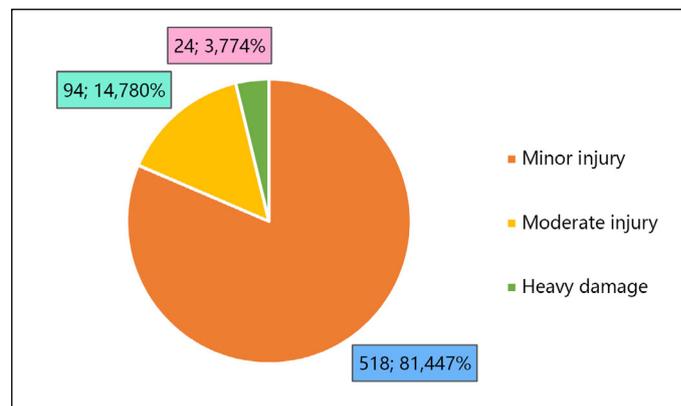


Figure 1. Degree of sports injury of badminton players.

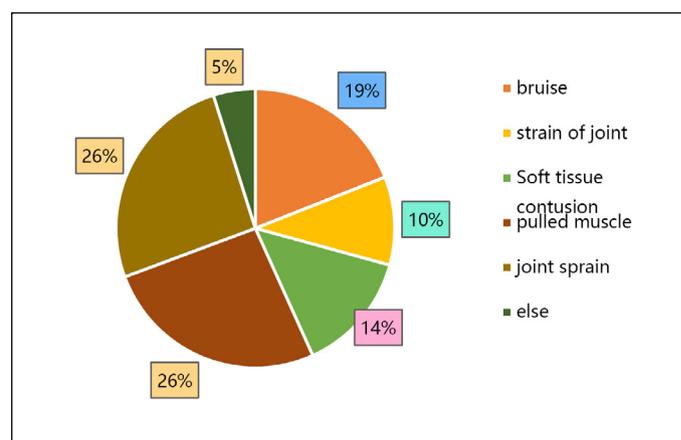


Figure 2. Types of sports injuries of badminton players.

injury. In case of the latter two, timely medical treatment and effective rehabilitation training must be carried out to prevent adverse effects on Athletes' sports skills or sports career due to contempt.

It can be seen from the results in Figure 2 that badminton is a sport with large range of limb movement. Therefore, it is inevitable to strain and sprain in the overall movement process, which are also the injury types with the highest proportion. In addition, certain abrasions and contusions will inevitably occur in the process of running and catching the ball. Therefore, these two injuries rank in the middle reaches. In addition, for some athletes with long training years, long-term training will produce certain continuous pressure on their joints, resulting in joint strain and other problems. Therefore, this is also a major type of athletes' sports injury. After fully understanding the degree and types of Badminton Athletes' sports injury, we can choose the starting point of research and carry out rehabilitation research.

Analysis on rehabilitation effect of badminton players' sports injury

Among the sports injury types of badminton players, waist injury will not only have a certain impact on the athletes' sports career, but also lead to many inconveniences in the athletes' daily life. Therefore, the rehabilitation training for lumbar spine has always been a major focus of badminton injury rehabilitation research. This paper discusses the rehabilitation effect of Badminton Athletes' sports injury by means of inter group control.

(Table 2) shows the range of motion of badminton players before and after rehabilitation training. It can be seen from Table 2 that the lumbar flexion of the experimental group changed from (86.626 ± 3.163) before training to (90.009 ± 1.178) after training, the lumbar extension changed from (26.573 ± 1.171) before training to (29.859 ± 1.388) after training, and the left lumbar flexion changed from (26.228 ± 1.856) before training to (29.273 ± 1.075) after training, The right lumbar flexion changed from (25.936 ± 1.827) before training to (30.036 ± 1.400) after training ($P < 0.01$), indicating that there was a very significant difference. In the control group, lumbar flexion changed from (86.806 ± 2.742) before training to (88.332 ± 1.178) after training, lumbar extension changed from (25.751 ± 1.241) before training to (28.652 ± 1.635) after training, lumbar left flexion changed from (26.278 ± 2.039) before training to (28.058 ± 1.587) after training, and lumbar right flexion changed from (25.936 ± 1.827) before training to (28.525 ± 1.717) after training, $P > 0.05$, indicating that there was no significant difference. It can be seen that choosing core strength training combined with traditional massage and stretching can exercise the muscles and joints of the lumbar spine more targeted, so as to make the activities of the lumbar spine more flexible.

As shown in Figure 3, the pain relief of Badminton Athletes' sports injury within six weeks is shown. It can be seen from Figure 3 that in week 0, that is, at the beginning of the experiment, there is little difference in

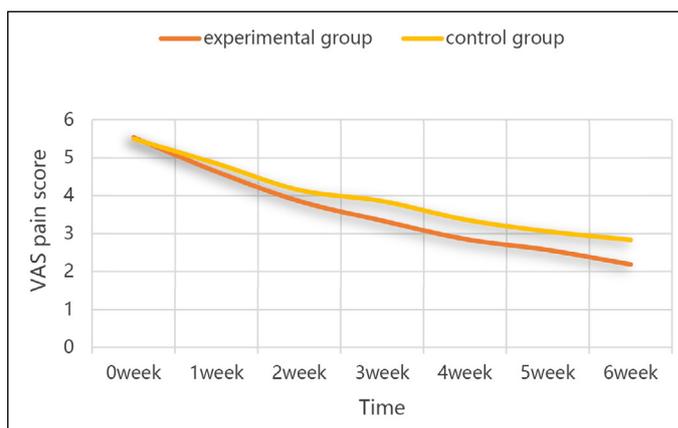


Figure 3. Relief of badminton players' sports injury pain rehabilitation.

the average value of injury between the two groups of athletes. Therefore, the comparison of experimental results is of more reference significance. As can be seen from the curve of the control group, it showed a process of first decreasing and then gradually flattening from 1 to 3 weeks, with a relatively obvious turning point in the third week, and then reducing the pain score at a relatively slow rate until the sixth week. From the curve of the experimental group, it can be seen that from the beginning of the experiment to the sixth week, the experimental group has always decreased gently at a relatively constant speed, and the decline rate of pain score is faster than that of the control group, and the decline range after six weeks is also significantly higher than that of the control group. It can be seen that choosing targeted core strength training combined with massage and stretching can provide a more effective way for the rehabilitation of athletes' sports injury and achieve the effect of more rapid pain relief.

DISCUSSION

Strengthening the cultivation of sports injury prevention consciousness

Badminton is an advantageous sport in China. Therefore, many badminton players have good sports skills, but because of their own advantages in badminton, many badminton players' awareness of sports injury prevention is not in place. For example, many athletes think they are very skilled in badminton, because in the process of sports, they may ignore the warm-up movement and start the relevant badminton movement after a few simple stretches, which can easily lead to the emergence of sports injuries. Some athletes are influenced by the dazzling videos on the Internet, such as "rice spoon playing table tennis", and also choose inappropriate equipment for the demonstration of sports skills, which also increases the probability of sports injury to some extent. Therefore, in the process of badminton, it is necessary to strengthen the cultivation of sports injury prevention awareness. Whether it is serious training or simple skill display, it is necessary to do sufficient warm-up activities, wear and use formal equipment, and keep focused at all times, so as to prevent sports injury caused by self contempt and indifference.

Reasonably arrange exercise load

Badminton is a competitive sport. Therefore, there is relatively fierce competition. Many athletes, out of a competitive psychology, tend to choose to increase the amount of training when their performance declines or is not ideal. However, for athletes themselves, the exercise load they bear is limited. If they blindly strengthen sports training, it will lead to muscle strain and joint injury in relevant joints, which is not conducive to the subsequent career development of athletes. Therefore, coaches should always pay attention to the psychological state of

Table 2. Analysis of mobility before and after rehabilitation training.

Option	Experience group			Control group		
	Before training	After training	p	Before training	After training	p
Lumbar forward flexion	86.626±3.163	90.009±1.178	<0.01	86.806±2.742	88.332±1.178	>0.05
Lumbar extension	26.573±1.171	29.859±1.388	<0.01	25.751±1.241	28.652±1.635	>0.05
Lumbar spine flexion	26.228±1.856	29.273±1.075	<0.01	26.278±2.039	28.058±1.587	>0.05
Lumbar spine right side flexion	25.936±1.827	30.036±1.400	<0.01	25.936±1.827	28.525±1.717	>0.05

athletes, adjust them in time, and scientifically match and design the sports load, so that the effect of sports exercise will not be low due to too small sports load, nor will it bring a series of interference to athletes due to too large sports load.

Construction of sports injury prevention system

In order to reduce athletes' sports injury as much as possible and improve the effect of rehabilitation training, we should also build a badminton sports injury prevention system, mainly including the following parts.

The first is the factors of the environmental module, including the construction of venue infrastructure, the construction of the underlying surface of the venue, the allocation of venue medical facilities and medical staff, etc. This is a module that needs to be maintained for a long time. The person in charge of colleges and universities or sports venues must design according to the actual situation and needs of badminton, so as to make the environment of the venue more suitable for badminton, and in case of sports injury, Professional medical staff can immediately give first aid and send them to hospital in time. The second is the prevention of coaches. In the process of sports training, coaches should always pay attention to the mental and physical state of athletes. Once athletes are out of strength, they should stop in time. If athletes are absent-minded, they should also remind them in time and prohibit them from continuing sports when necessary. The third is the rehabilitation training stage after sports injury. File the injured athletes, analyze their physical condition, and put forward corresponding adjustment suggestions.

Athletes should also complete the feedback of the recovery process of sports injury according to their own actual situation, so as to facilitate the discussion of relevant conditions by coaches and medical staff, and design a rehabilitation training scheme more suitable for themselves. Through the above strategies, we can effectively start from the athletes themselves, cut off the occurrence of sports injuries from the source, and reduce the frequency of sports injuries.

CONCLUSION

From the research of this paper, we can see that although badminton has many benefits, the sports injury brought by badminton cannot be underestimated. Therefore, in daily sports training, we should establish self-defense awareness and effectively avoid some situations that are prone to sports injury, so as to reduce the occurrence of sports injury as much as possible. In case of sports injury, it is necessary to deal with it in time and seek medical treatment quickly, so as to reduce the treatment time and delay the treatment as much as possible, so as to avoid the deterioration of sports injury. For patients with sports injury, it is not enough to only use the traditional massage and stretching method. It also needs to be combined with physical exercise. For the area where the injury problem occurs, combine physical training with rehabilitation training, and design corresponding actions for training, so as to make the effect of sports rehabilitation more remarkable.

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