

SPORTS YOGA BASED ON THE PREVENTION OF JOINT INJURIES



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IOGA ESPORTIVA BASEADA NA PREVENÇÃO DE LESÕES ARTICULARES

YOGA DEPORTIVO BASADO EN LA PREVENCIÓN DE LESIONES ARTICULARES

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ABSTRACT

Introduction: During sports, the athletes' joints bear a strong overload, causing joint injuries, which have a strong impact on the sports level and shorten the sports athletes' careers. **Objective:** Explore the preventive effect of yoga practice on joint injuries. **Methods:** In this study, an experimental protocol was tested. The experimental group adopted the yoga teaching method, and the control group adopted traditional massage. The interventions were performed three times a week, lasting one hour for a total of 6 months. The scores of the VAS and the Oswestry functional disorder index questionnaire were collected and compared, and the joint activity before and after the experiment was also collected and analyzed. **Results:** Both methods can effectively improve the overall joint condition and prevent joint injury, but the effect of the yoga teaching group was superior to the massage group. **Conclusion:** Compared to traditional massage, sport-oriented yoga training proved superior, better adapted to the actual situation of athletes, and more cost-effective. Further studies are recommended for its promotion. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

Keywords: Joint Diseases; Physical Education and Training; Yoga.

RESUMO

Introdução: Durante os esportes, as articulações dos atletas suportam uma forte sobrecarga, ocasionando lesões articulares, ocasionando um forte impacto no nível esportivo e abreviando a carreira dos atletas esportivos. **Objetivo:** Explorar o efeito preventivo da prática de ioga sobre as lesões articulares. **Métodos:** Neste trabalho, foi testado um protocolo experimental. O grupo experimental adotou o método de ensino de ioga, e o grupo de controle adotou a massagem tradicional. As intervenções foram realizadas três vezes por semana, com duração de uma hora num total de 6 meses. As pontuações do VAS e do questionário do índice de desordem funcional Oswestry foram coletadas e comparadas, e a atividade conjunta antes e depois do experimento também foi coletada e analisada. **Resultados:** Ambos os métodos podem efetivamente melhorar a condição articular geral e prevenir lesões articulares, porém o efeito do grupo de ensino de ioga demonstrou-se superior ao grupo de massagem. **Conclusão:** Em comparação com a massagem tradicional, o treinamento de ioga voltado para o esporte demonstrou-se superior, adaptando-se melhor à situação real dos atletas, além de ser mais econômico. **Recomenda-se maiores estudos para a sua promoção. Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores: Artropatias; Educação Física e Treinamento; ioga.

RESUMEN

Introducción: Durante la práctica deportiva, las articulaciones de los atletas soportan una fuerte sobrecarga, provocando lesiones articulares, causando un fuerte impacto en el nivel deportivo y acortando la carrera deportiva de los atletas. **Objetivo:** Explorar el efecto preventivo de la práctica del yoga en las lesiones articulares. **Métodos:** En este trabajo se ha probado un protocolo experimental. El grupo experimental adoptó el método de enseñanza del yoga, y el grupo de control adoptó el masaje tradicional. Las intervenciones se realizaron tres veces por semana, con una duración de una hora, durante un total de 6 meses. Se recogieron y compararon las puntuaciones del VAS y del cuestionario del índice de trastornos funcionales de Oswestry, y también se recogió y analizó la actividad articular antes y después del experimento. **Resultados:** Ambos métodos pueden mejorar eficazmente el estado general de las articulaciones y prevenir las lesiones articulares, pero el efecto del grupo de enseñanza de yoga demostró ser superior al del grupo de masaje. **Conclusión:** En comparación con el masaje tradicional, el entrenamiento de yoga orientado al deporte demostró ser superior, adaptándose mejor a la situación real de los atletas, además de ser más rentable. **Se recomienda realizar más estudios para su promoción. Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.**

Descriptorios: Artropatías; Educación y Entrenamiento Físico; Yoga.



INTRODUCTION

Sports training is a long-term and step-by-step activity. Coaches should not only pay attention to improving athletes' physical quality, sports skills, endurance and other factors, but also pay attention to preventing sports injuries.¹ Sports injuries can be divided into many types, which refer to various injuries occurring in the process of sports training. After the occurrence of sports injury, athletes will be affected in a certain period of time in the future, resulting in the decline of sports ability.² If the sports injury is not treated in time, it is easy to produce sequelae and affect the athletes' sports life. The joint is a very important part of human tissue, and it is the basis for human limbs and waist to complete large-scale activities.³ In the process of exercise, the cartilage of the joint is constantly squeezed and rubbed. If the athletes' exercise posture is incorrect or the exercise load exceeds the standard, it is easy to increase the degree of cartilage wear, and then affect the activities of the joint.⁴ In addition, joint related ligament injury is also a common type of joint injury. Ligaments mainly maintain the stability of joint activities. If ligament injury occurs, it is easy to cause instability and affect the athletes' sports level.⁵ Because the structure of the joint is relatively thorough, and human activities are highly dependent on the joint, doctors often do not recommend the method of operation for joint injury as a last resort, even if the effect of operation is not good. Therefore, conservative treatment and self-cultivation are often adopted for joint injuries, and it is difficult to recover to the original exercise level even after recovery.⁶ Joint injury is a great blow to sports athletes, which may lead to the decline of sports level at least, or the end of their career at this point.

METHOD

In this paper, 60 athletes, including 30 men and 30 women, were selected in a college physical education major. The study and all the participants were reviewed and approved by Ethics Committee of Tianjin Foreign Studies University (NO.2018TJFSU69). The selected objects met the following conditions:

① Have many years of sports training experience, and is a national level II or above athlete. ② Years of physical training has brought some discomfort to the joints, but after medical treatment, it shows that there is no serious joint injury. ③ Have good compliance, be able to follow the arrangement of researchers and complete relevant actions. ④ During the whole process of the experiment, it can be guaranteed not to take drugs, and not to carry out additional training or physical therapy. (Table 1)

This paper adopts the method of control experiment, in which the control group chooses the traditional massage physiotherapy recovery method, and the experimental group chooses the sports yoga teaching method. The experiment lasted for six weeks, and the relevant training was carried out three times a week, each time for one hour, that is, the experimental group carried out one hour of yoga training, while the control group carried out one hour of massage physiotherapy by physiotherapists.

Before the start of the experiment, 3 weeks after the start of the experiment, and 6 weeks after the start of the experiment, that is, at the end of the experiment, the VAS scores and Oswestry dysfunction index questionnaire (ODI) scores of the subjects were sorted out respectively to explore the efficacy in the whole process. Then, taking the waist as an example, the range of motion of the lumbar joints in all directions

Table 1. Basic information of subjects.

Group	Person	Male	Female	Age	BMI
Control group	30	15	15	22.2820±2.1591	22.1815±1.4565
Test group	30	15	15	22.3831±2.9542	22.0796±2.2626

was evaluated before the experiment. After the experiment, the relevant data were measured again, and the data before and after the experiment were compared.

RESULTS

Figure 1 shows the changes of VAS scores of the subjects during the experiment. It can be seen from the picture that the VAS scores of the two groups before the experiment are not different. In the third week, the VAS score of the experimental group was slightly higher than that of the control group, indicating that in the first half of the experiment, the effect of massage physiotherapy was better than yoga teaching. Then, around the 5th week, the two curves coincide. By the 6th week, the VAS score of the experimental group was significantly lower than that of the control group, and the VAS score of the experimental group decreased faster than that of the control group in the second half of the experiment and within 3~6 weeks, indicating that the teaching method of physical yoga was better than massage therapy in the second half of the experiment.

VAS score is the pain grade score, and the subjects can mark their own pain grade visually. Among them, 1-3 points refer to slight pain, 4-6 points refer to comparative pain, and 7-10 points refer to severe pain. It can be seen from Figure 1 that before the experiment, the pain degree of the two groups was above 3.5, indicating that they were in a state of moderate pain, which proved that there were some problems in the joints of the two groups at this time, but they had not yet reached the condition of serious injury. After the experiment, the data between 1 and 1.5 belong to mild pain, indicating that the joint pain of the two groups of subjects has been well relieved. This proves that for patients with mild joint injury, the use of yoga teaching can well adjust the joint condition and prevent the deterioration of joint injury without additional surgical treatment.

Figure 2 shows the score results of the Oswestry dysfunction index questionnaire (ODI). It can be seen from the picture that in the first half of the experiment, that is, in the process of 0~3 weeks, the score of the massage physiotherapy group decreased faster and with a higher

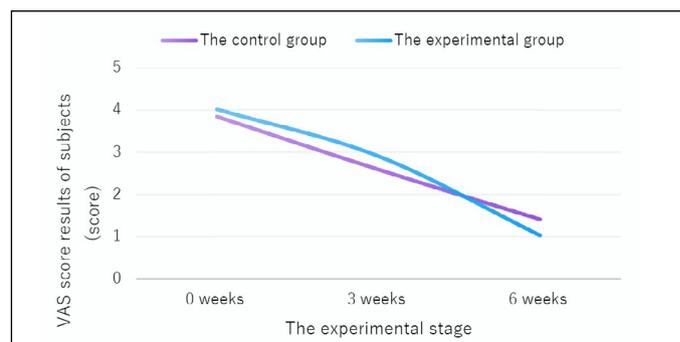


Figure 1. VAS score results of subjects (points).

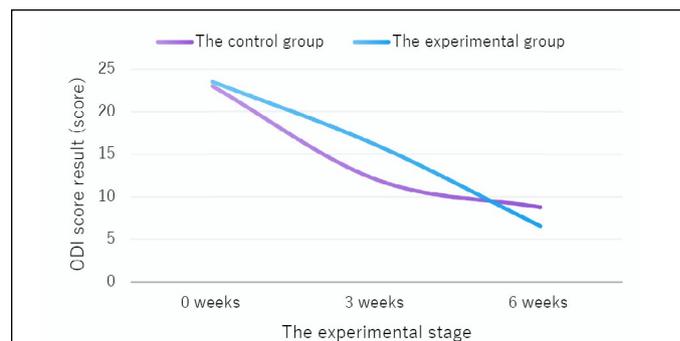


Figure 2. Score results of Oswestry dysfunction index questionnaire (ODI) of subjects (points).

range, which proves that the massage physiotherapy method is better than yoga teaching in the short term. However, through the research and analysis of the second half, it can be seen that within 3~6 weeks, the recovery rate of the yoga teaching group is much higher than that of the physiotherapy massage group, and its decline rate is higher than that of the physiotherapy massage group. It can be seen from the whole that the rate of physical therapy and massage group increased first and then slowed down, while the rate of yoga teaching group decreased slowly at a relatively consistent rate, and the decline rate of yoga teaching group was higher than that of massage and physical therapy group. By comparing the results, it can also be seen that at the beginning of the experiment, although the scores of the two groups were high, they were still in a relatively moderate state of discomfort, with joint pain and movement dysfunction, but they did not constitute serious joint injury. Yoga teaching can effectively improve this kind of joint strain and prevent joint injury.

Combined with the research results in Figure 1 and Figure 2, it can be seen that the current two curves show that the effect of the massage physiotherapy group in the first half of the experiment is better than that of the yoga teaching group, but the effect of the yoga teaching group in the second half is better than that of the massage physiotherapy group. The reasons are various. Massage physiotherapists are relatively professional and can provide the best medical services for subjects in the shortest time. However, yoga teaching requires a certain stage of learning and exploration. Subjects need to master yoga movements in the first few weeks and adjust them according to their actual needs. Therefore, in the first half of the time, the effect of yoga teaching is not as good as that of massage physiotherapy group. However, for the second half, the massage methods of the massage physiotherapy group are often unchanged or slightly adjusted, but there may be a certain disconnect with the actual needs of the athletes. At this time, the athletes in the yoga teaching group are becoming more and more proficient in yoga, have a more intuitive experience of joint stretching and movement, and can reasonably arrange their actions according to their actual needs at this time. Therefore, the effect of yoga teaching group is better than that of massage physiotherapy in the latter half of the stage. The specific teaching scheme is shown in Table 2.

Table 3 shows the evaluation results of the range of motion of the joints in all directions of the subject's lumbar spine. Through the comparative analysis between the experimental group and the control group, it can be seen that although the two groups have certain activity barriers before the intervention, they have little impact on daily life, and are still in the stage of joint injury prevention. After the experiment, either the traditional massage therapy or the yoga teaching method proposed in this paper can effectively improve the range of motion of the joints in all directions, so as to improve the joint condition and prevent joint injury. Through comparison, it can be seen that the experimental group, that is, the way of yoga teaching, has a better effect on the improvement of joint mobility.

Table 2. Physical Yoga Teaching Scheme.

Position	Action
Lumbago	Double right angle, double simple twist arm
Hip	Cradle pose, lizard pose
Shoulder	Standing Twist Forward
Thigh	Half frog, double pyramid, double phantom chair
Calf Ankle	Standing wrist extension
Forearm	Open shoulder sitting posture, phantom chair for two, spinal mobility for two
Wrist	Standing wrist extension

Table 3. Evaluation results of lumbar joint range of motion in all directions (%).

Option	Control group		Test Group	
	Before	After 6 weeks of intervention	Before	After 6 weeks of intervention
Premier	41.7049±7.6607	49.4915±8.2310	42.5866±5.7109	51.4045±5.6976
Extension	22.5476±2.2457	26.5997±2.7033	22.1609±3.9009	29.1446±0.9421
Left	24.8022±2.5063	29.3473±3.0336	24.4509±3.8055	36.0567±2.8198
Bent on the right side	24.8004±5.4578	31.6203±4.1817	24.2648±4.3417	35.8391±2.8362
Levse	29.3968±6.1365	39.4465±4.3819	28.9460±4.6617	41.7370±1.5281
Right rotation	32.7131±5.6779	39.5175±4.3252	33.0072±4.2190	42.5864±1.9003

DISCUSSION

Athletes are tired after high-intensity training. At this time, the muscles are in a tense state and can not be relaxed. Some external forces are still applied to the joints, leading to joint stiffness, and long-term tense muscles will also cause muscle damage. The joint is a precise structure composed of bones and muscles. Therefore, if the high-intensity training cannot be effectively restored, the balance and stability of the whole joint will be easily damaged, resulting in pain or sports injury. Through yoga teaching, an external force is applied to the tense muscle state to make it lengthen and fully relax. In addition to the active muscle, the antagonistic muscle is also effectively relaxed. By relaxing the muscle group and adjusting the joints, the joints can be effectively flexed and extended, so as to strengthen the control ability of the joints to the surrounding muscles and make the joints more flexible. Yoga can reduce the pain caused by the accumulation of blood lactic acid under fatigue or muscle strain. Therefore, long-term physical yoga can effectively alleviate body fatigue, improve joint flexibility, reduce joint pain, and prevent joint injury.

The psychological adjustment of athletes is also an essential part of teaching in the process of sports. If athletes always maintain a nervous psychology, it is easy to produce serious anxiety and psychological fatigue. In the face of serious competitions, on the contrary, it will lead to difficulty in concentrating, or insufficient play due to excessive tension. At least, it will lead to the decline of competitive level, or at least some sports operation errors due to tension, which will lead to sports injuries. Studies have shown that a large part of the factors in athletes' joint injuries are sports errors caused by athletes' excessive tension. Therefore, the use of yoga training to adjust the athletes' psychology can alleviate the athletes' excessive tension after sports training and achieve relaxation. Research shows that through yoga, soothing music and empty thinking, athletes can quickly enter the state of soul and body integration. In the music sound of yoga, we can adjust our own mechanism according to our own needs, stretch the muscles and joints, and relax the tense mood, so as to relieve the tense mood in the process of high-intensity sports training, and face the follow-up life with a more relaxed mood. In this way, athletes can quickly adjust their psychological emotions through warm-up before sports training, and face sports training and sports competition with a nervous and enthusiastic attitude. After sports training, they can adjust both physical fatigue and mental fatigue through yoga, so that athletes can maintain good psychological adjustment in training and life.

CONCLUSION

Combined with the problems of sports fatigue and joint injury of current athletes, this paper analyzes the current situation of physical therapy and massage, points out its disadvantages, and puts forward the relaxation method of yoga teaching according to its own work experience. The experimental results show that although the effect of this method is not as good as massage physiotherapy in the short term, in the long term, the method of sports yoga teaching can make athletes

better adjust the focus of relaxation according to their actual needs, so as to adjust the situation of joint injury. It also breaks the limitation of time and space. In view of the need to make an appointment in advance for massage physiotherapy, sports yoga teaching can enable athletes to relax anytime and anywhere when they are tired. Therefore, the timeliness of sports Yoga adjustment is also stronger. In addition, compared with

massage therapy, the cost of sports yoga teaching is low. It can reduce a lot of expenditure in the training process. It has good economic value and application effect, so it is worth promoting.

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