

# INJURY PREVENTION FOR YOGA PRACTICING COLLEGE STUDENTS



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PREVENÇÃO DE LESÕES PARA ESTUDANTES UNIVERSITÁRIOS PRATICANTES DE IOGA

PREVENCIÓN DE LESIONES EN ESTUDIANTES UNIVERSITARIOS PRACTICANTES DE YOGA

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## ABSTRACT

**Introduction:** The research shows that most yoga students consider it a low-intensity and low-risk training, evidencing the lack of awareness related to prevention and safety methods, two causal factors of sports injuries. Added to this danger is the scarce literature scientifically reporting the prevention methods for college students practicing this activity. **Objective:** Study the prevention of injuries during yoga practice by college students, exploring the risk management of this activity. **Methods:** Patients admitted to a hospital, yoga practitioners, were volunteers in a questionnaire to raise the main injuries and their causes. Data such as time of practice, frequency, and recurrence of injuries were also cataloged. A preventive protocol was elaborated based on the data of the collected accidents and tested with another 50 volunteers divided equally into control and experimental groups. The control group received no interventions. The experimental group added 10 minutes of warm-up and stretching based on the elaborated protocol. Interventions were three times weekly for eight weeks. Risk mitigation data and FMS tests were collected and compared. **Results:** The total FMS test score in the experimental group increased from 12.5 to 16.2, with a significant impact. The total FMS test score of college students in the control group before the experiment was 12.5 to 14.3. **Conclusion:** Adding warm-up exercises combined with preparation activities by stretching and basic yoga movements before the start of activities can help athletes' physical condition and reduce the occurrence of sports injuries. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

**Keywords:** Yoga; Prevention and Mitigation; Injuries, Sports.

## RESUMO

**Introdução:** As pesquisas mostram que a maioria dos estudantes praticantes de ioga a considera um treinamento de baixa intensidade e baixo risco, evidenciando a falta de consciência relacionada à prevenção e métodos de segurança, dois fatores causais de lesões esportivas. Soma-se a essa periculosidade a escassa literatura relatando cientificamente os métodos de prevenção aos estudantes universitários praticantes dessa atividade. **Objetivo:** Estudar a prevenção de lesões durante a prática do exercício de ioga pelos estudantes universitários, explorando a gestão de riscos dessa atividade. **Métodos:** Pacientes internados em um hospital, praticantes de ioga, foram voluntários em um questionário para levantar as principais lesões e suas causas. Dados como tempo de prática, frequência e reincidências de lesões também foram catalogadas. Um protocolo preventivo foi elaborado com base nos dados dos acidentes coletados e experimentado com outros 50 voluntários divididos igualmente em grupo controle e experimental. O grupo de controle não recebeu intervenções. O grupo experimental acrescentou 10 minutos de aquecimento e alongamento com base no protocolo elaborado. As intervenções foram de 3 vezes semanais, por 8 semanas. Dados de mitigação de riscos e teste FMS foram coletados e comparados. **Resultados:** A pontuação total do teste FMS no grupo experimental aumentou de 12,5 para 16,2, com impacto significativo. A pontuação total do teste FMS de estudantes universitários do grupo de controle antes do experimento foi de 12,5 para 14,3. **Conclusão:** A adição de exercícios de aquecimento combinados com atividades de preparação por alongamento e movimentos básicos de ioga antes do início das atividades pode auxiliar na condição física dos atletas e reduzir a ocorrência de lesões esportivas. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

**Descritores:** ioga; Prevenção e Atenuação; Lesões Esportivas.

## RESUMEN

**Introducción:** Las investigaciones muestran que la mayoría de los estudiantes que practican yoga lo consideran un entrenamiento de baja intensidad y bajo riesgo, lo que evidencia la falta de concienciación relacionada con los métodos de prevención y seguridad, dos factores causales de las lesiones deportivas. A este peligro se suma la escasa literatura que informe científicamente sobre los métodos de prevención para los universitarios que practican esta actividad. **Objetivo:** Estudiar la prevención de lesiones durante la práctica del ejercicio de yoga por los estudiantes universitarios, explorando la gestión de riesgos de esta actividad. **Métodos:** Los pacientes ingresados en un hospital, practicantes de yoga, fueron voluntarios en un cuestionario para plantear las principales lesiones y sus causas. También se catalogaron datos como el tiempo de práctica, la frecuencia y la recurrencia de las lesiones. Se elaboró un protocolo preventivo basado en los datos de los accidentes recogidos y se experimentó con otros 50 voluntarios divididos a partes iguales en grupo de control y grupo experimental. El grupo de control no recibió ninguna intervención. El grupo



experimental añadió 10 minutos de calentamiento y estiramientos basados en el protocolo elaborado. Las intervenciones se realizaron 3 veces por semana durante 8 semanas. Se recopilaron y compararon los datos de mitigación de riesgos y la prueba FMS. Resultados: La puntuación total de la prueba FMS en el grupo experimental aumentó de 12,5 a 16,2, con un impacto significativo. La puntuación total en la prueba FMS de los estudiantes universitarios del grupo de control antes del experimento era de 12,5 a 14,3. Conclusión: La adición de ejercicios de calentamiento combinados con actividades de preparación mediante estiramientos y movimientos básicos de yoga antes del inicio de las actividades puede ayudar a la condición física de los deportistas y reducir la aparición de lesiones deportivas.

**Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.**

**Descriptores:** Yoga; Prevención y Atenuación; Lesiones en Deportes.

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## INTRODUCTION

The developed modern life has brought some side effects to college students. For example, long-term sitting will lead to stiffness of muscles or joints, which is not conducive to the healthy growth of college students. Yoga can balance body and mind and regulate body posture.<sup>1</sup> Since it was introduced into China, it has been gradually welcomed by the people. It has been combined with Chinese traditional sports in many years of development, and gradually derived a yoga movement suitable for Chinese people.<sup>2</sup> These sports methods are also popular in universities, and many college students, especially college girls, will participate. The increasing popularity of yoga has led many universities to introduce yoga as an elective course of physical education.<sup>3</sup> However, yoga also has some problems. Research shows that most yoga learners regard yoga as a low-intensity and low-risk exercise training, so they lack the awareness of safety prevention.<sup>4</sup> Even beginners dare to try some complicated movements when doing yoga, which is easy to cause sports injuries. The research results show that many college students have the problem of yoga sports injuries, including but not limited to joint sprains, muscle strains and joint bruises.<sup>5</sup> These sports injuries affect the health of college students and discourage their enthusiasm for sports. Therefore, it is necessary to strengthen the sports risk management in the process of college students' yoga sports according to the actual situation of college students, combined with sports injury prevention strategies.<sup>6</sup>

## METHOD

### Investigation on yoga exercise and injury of college students

In order to clarify the necessity of research and better collect the needs of risk management in yoga, the first part of the article adopts the interview method and questionnaire survey method. The study and all the participants were reviewed and approved by Ethics Committee of Nanjing University of Science and Technology Zijin College (NO.21N-JUST-ZJ076). First of all, interview and exchange with the yoga course instructor in the gym around a college yoga club and the PE teacher who teaches yoga courses in the school, and ask the college students about their willingness to do yoga, the frequency of exercise, the main types of learning and the types of sports injuries, so as to have a more systematic understanding of the research on efficient yoga. Then, using the method of questionnaire survey, we distributed a questionnaire to the people who had yoga injuries in a university hospital and invited them to answer it. The main contents include the frequency of yoga exercises, the main types of learning and the specific conditions of sports injuries. A total of 70 questionnaires were distributed to obtain 68 questionnaires, including 66 valid ones. Excel software was used to collate and analyze the data and draw relevant pictures for the convenience of later research.

### Preventive strategies for college students during yoga

Research object: In the previous research, we visited college yoga clubs, yoga classes in surrounding gyms and yoga courses in schools.

During the interview, we communicated with students from these yoga loving clubs, and collected some students who love yoga, but have poor yoga foundation and are prone to sports injuries. We collected volunteers from them. Totally 50 athletes were collected and divided into the experimental group and the control group according to the form of random sampling. Each group had 25 athletes. The basic sports conditions, height and weight and other factors were almost the same, thus reducing the interference of unrelated variables to the experiment and ensuring the strictness of the experimental results.

Experiment method: The article adopts the method of controlled experiment. The control group does not intervene according to the existing yoga training method. The experimental group adds 10 minutes of warm-up and stretching training on the basis of the existing yoga training. Its content is to add some yoga actions on the basis of the traditional warm-up to make it more suitable for the characteristics of sports. The whole experiment lasted for 8 weeks, and yoga training was carried out three times a week. Except for different warm-up preparation activities, the other yoga training movements and yoga training load duration were almost the same between the experimental group and the control group, so as to avoid interference from unrelated factors.

Data test, Zero indicates that the specified action cannot be completed completely; One point indicates that some of the prescribed actions can be completed, but there are still many non-standard or inconsistent actions; A score of two indicates that the relevant actions can be basically completed, but there are some non-standard actions; Three points indicate that the specified test action can be completed smoothly and smoothly, and the action standard of the whole test process. Before and after the experiment, FMS tests were conducted on the experimental group and the control group respectively, and the actions were scored according to the actual test situation of volunteers, and the data were collated.

## RESULTS

### College Students' Yoga and Injuries

From the survey, it can be seen that the current college students have a high enthusiasm for yoga, and the reasons are also obvious. Yoga can adjust body posture well, and has the effect of weight loss and fitness. Compared with running and other sports, yoga has a relatively small amount of exercise, and there is no panting phenomenon during the exercise. Therefore, it is popular with many college students who do not want to exercise in a large scale; Secondly, the impact of the COVID-19 has kept schools closed or isolated from students at home from time to time. In order to prevent crowds from gathering, many stadiums are closed, which compresses students' sports space. Yoga has little demand for venues, and often only needs a yoga mat. Therefore, many students have signed up for yoga training classes to learn some introductory and basic knowledge, It is convenient for home exercise when isolation occurs, so college yoga is very popular among college students.

As shown in Figure 1, the current frequency of college students' yoga exercise is 3 to 4 times a week, accounting for 46.97%, followed by 1 to 2 times a week, accounting for 33.33%. This is corresponding to the current curriculum arrangement and life needs of college students. Many college students have general education courses or lectures in the evening, unable to participate every day, and actively carry out yoga teaching in their spare time. To maintain a relatively good exercise frequency, some college students who do not have heavy schoolwork or have certain pursuit of weight loss and shaping will choose to increase the exercise frequency to achieve better results.

As shown in Figure 2, the current types of college students' yoga activities are different. Different yoga teachers and studios have different teaching habits and different teaching focuses. From the figure, it can be seen that the highest proportion is yoga posture teaching, accounting for 62.12%, while the rest is breathing method teaching, meditation teaching, etc., which accounts for a low proportion. This shows that what is popular among college students at present is the stretching and relaxing functions of yoga on the body. There are also some college students who prefer some more complex yoga movements due to the influence of We Media and official account, so yoga movement teaching has become the main type of current learning, and this kind of movement teaching will also have a certain impact on sports injuries.

As shown in Figure 3, the main types of sports injuries in the process of yoga for college students. It can be seen from Figure 3 that yoga sports injuries are related to some complex yoga movements. For example, overload stretching is easy to cause muscle strain, which is also the most frequent injury, accounting for 53.03%. Secondly, 22.73% of them suffer from joint pain and make noises, which is also related to overloaded exercise. College students have not exercised for a long time. If they rush to do some complicated yoga movements, they will easily lead to overloaded operation of muscles and joints. In a short time, they will easily lead to muscle strain and joint damage, and in a long time, overload will cause wear and tear of joints.

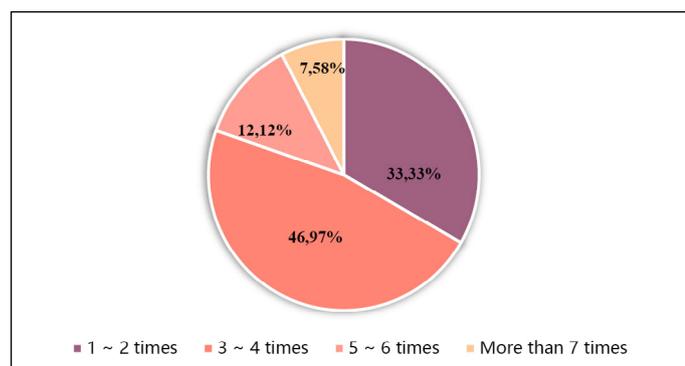


Figure 1. College students' yoga exercise frequency.

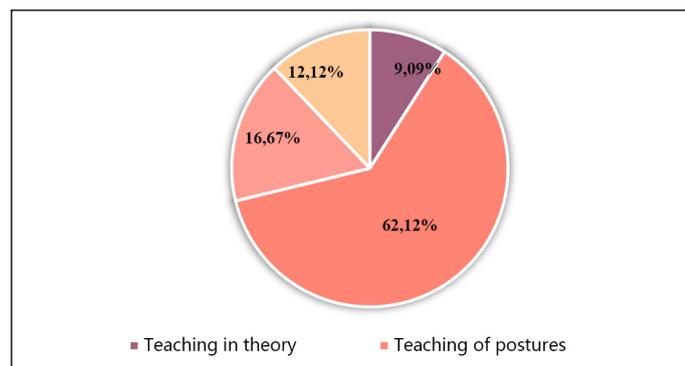


Figure 2. Types of Yoga Learning for College Students.

## Risk Mitigation of College Students' Yoga

In view of the various risks in the current college students' yoga, we chose the warm-up stretching training as a strategy to prevent sports injuries and test the FMS results.

Table 1 shows the test results of college students in the experimental group before and after the intervention. It can be seen that the total score has increased from (12.510 ± 2.201) to (16.282 ± 1.448), with a very significant change. This shows that serious stretching before yoga training can greatly relax joints and muscles, make muscles adapt to current changes, and prevent sports injuries caused by excessive load during yoga.

## DISCUSSION

### Problems in college students' yoga

Through the current work experience of yoga teaching in colleges and universities, we can see that students have the following problems in the process of yoga exercise:

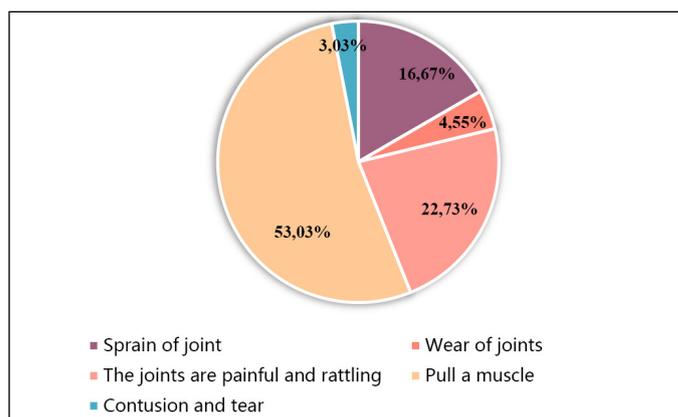


Figure 3. Types of Sports Injuries in the Process of Yoga for College Students.

Table 1. FMS test of college students in experimental group before and after intervention training.

Project	Before experiment	After experiment	t value	P value
Total score	12.510±2.201	16.282±1.448	-17.8385	0.0000
Squat	1.926±0.738	2.340±0.464	-4.8452	0.0000
Hurdle step	1.464±0.672	2.536±0.501	-13.0438	0.0000
Front and back split squat	1.407±0.557	2.346±0.481	-12.4462	0.0000
Shoulder flexibility	1.916±0.708	2.431±0.499	-5.8049	0.0000
Active straight knee lifting	2.123±0.678	2.764±0.458	-6.4268	0.0000
Torso stability push up	1.602±0.533	1.935±0.414	-3.6694	0.0010
Rotational stability	1.926±0.219	2.025±0.689	-1.4285	0.1596

Table 2. FMS test of college students in the control group before and after intervention training.

Project	Before experiment	After experiment	t value	P value
Total score	12.579±2.044	14.307±1.225	-5.7201	0.0000
Squat	1.955±0.688	2.118±0.622	-2.3772	0.0231
Hurdle step	1.376±0.632	2.017±0.865	-4.2668	0.0000
Front and back split squat	1.436±0.557	1.765±0.732	-2.9035	0.0050
Shoulder flexibility	1.985±0.688	2.289±0.589	-2.8689	0.0059
Active straight knee lifting	2.044±0.599	2.521±0.693	-4.9180	0.0000
Torso stability push up	1.651±0.514	1.734±0.504	-1.4357	0.1614
Rotational stability	1.906±0.259	1.975±0.223	-0.9976	0.3222

1. Lack of systematic teaching. With the development of various We media networks, yoga, as an activity that is easily pursued by young people, has occupied an important position in these We media. Many fitness bloggers and yoga coaches have set up We media accounts and released some teaching videos of yoga on We media. These teaching videos are more suitable for yoga lovers with a certain foundation to train and teach, It is not suitable for beginners without sports foundation. But at present, many beginners do not have a good understanding of yoga. They think that it is OK to practice with videos and tutorials. This makes many beginners lack the necessary common sense and systematic teaching of yoga. They often only learn yoga movements and do not have a thorough grasp of its principles. When they perform some complex movements, they are prone to strain, sprain and other problems.

2. The risk of yoga is not well understood. Many students' recognition of sports injuries still stays in the fierce sports such as basketball and football, and they think that yoga will not cause sports injuries in a small area. Therefore, when conducting yoga training, they will omit the warm-up exercises and directly start to conduct complex sports training. Many yoga teachers do not pay enough attention to the preparation activities. Even if students are perfunctory in the preparation activities, Teachers will not pay too much attention to yoga training, but directly carry out yoga training, which makes many students lack the necessary warm-up preparation activities, muscles and joints do not stretch, and it is easy to have strain, sprain and other sports injuries due to some complex movements in the process of yoga.

### **Risk management measures for college students' yoga**

In view of various situations in the current college students' yoga, the author proposes the following sports risk management measures:

First of all, we should strengthen the publicity of yoga knowledge. College students choose yoga as a form of exercise, which has a good effect on improving their own physique. However, the current problem of insufficient understanding of yoga is also the main cause of sports injuries. Therefore, college teachers should strengthen the publicity of theoretical knowledge of yoga, such as the biological basis of yoga, the origin and development of yoga, As well as the matters needing attention

in yoga, etc., through online video courses or learning lectures to promote to college students' We Media followers and yoga communities, so that students can have a scientific and systematic understanding of the advantages and precautions of yoga, and reduce the sports injuries caused by their random practice.

Secondly, it is necessary to conduct standardized research on the yoga clubs in the school and the surrounding yoga gyms and studios. The yoga clubs in the school can employ PE teachers for guidance, or employ PE students with relevant certificates to explain, standardize yoga teaching, and prevent sports injuries caused by blind training. As for the yoga institutions outside the school, we should cooperate with the market supervision department. Professional yoga teachers should check the surrounding yoga institutions, review the sports environment and teachers' qualifications, determine the "white list" of yoga institutions around the school, give students a standardized guidance when choosing yoga institutions, and prevent sports injuries caused to students by non professional yoga institutions.

### **CONCLUSION**

Yoga seems calm, with little risk and range of exercise, but it can actually consume a lot of calories, which has a good effect on weight loss and fitness shaping. It can also improve the joint and muscle status of sedentary college students, and has very low requirements for sports venues, so it is popular on college campuses. However, the hidden sports risks of yoga are unknown, which can easily cause some damage to the health of college students. Therefore, this paper puts forward the problems of college students' yoga through investigation and research, and discusses the impact of pre exercise warm-up preparation activities on the safety risks of yoga through a controlled experiment. The research results show that, Before starting exercise, add yoga warm-up exercises combining stretching preparation activities and simple yoga movements, which can well regulate the physical condition of athletes and reduce the occurrence of sports injuries, so it is worth promoting.

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The author declare no potential conflict of interest related to this article

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**AUTHORS' CONTRIBUTIONS:** The author has completed the writing of the article or the critical review of its knowledge content. This paper can be used as the final draft of the manuscript. Every author has made an important contribution to this manuscript. Xie Huihui: writing and execution.

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