

ANALYSIS OF CAUSES AND PREVENTION OF ANKLE INJURIES IN COLLEGE BASKETBALL



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ANÁLISE DAS CAUSAS E PREVENÇÃO CONTRA LESÕES NO TORNOZELO NO BASQUETEBOL UNIVERSITÁRIO

ANÁLISIS DE LAS CAUSAS Y LA PREVENCIÓN DE LAS LESIONES DE TOBILLO EN EL BALONCESTO UNIVERSITARIO

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ABSTRACT

Introduction: Basketball is a combative sport, very popular among college students. However, it requires many periods of running, interspersed with emergency breaks, tackling, and other actions prone to ankle injuries. **Objective:** Investigate the causes of ankle joint injuries in college basketball, raising countermeasures to prevent these sports injuries. **Methods:** 413 college students who regularly participate in basketball games at 10 colleges and universities were selected as research objects. The causes of ankle joint injuries in the process of this sport were investigated through questionnaires, and the main causes of injuries were analyzed using statistical methods. **Results:** The causes of ankle joint injuries in college basketball include subjective and objective factors. Subjective factors include inadequate psychological preparation, warm-up exercise, cushioning, and excessive exercise, among others listed; objective factors mainly contemplate local injury and accidental injury. **Conclusion:** The participation of college students in basketball is beneficial to improve their physical health, requiring effective measures to prevent possible ankle injuries, both related to subjective and objective aspects. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

Keywords: Basketball; Ankle Injuries; Causal Mediation Analysis.

RESUMO

Introdução: o basquetebol é uma modalidade esportiva combativa, muito popular entre os universitários. No entanto, necessita de muitos períodos de corrida, intercalados por pausas emergenciais, enfrentamentos e outras ações propensas a lesões no tornozelo. **Objetivo:** Investigar as causas de lesões nas articulações do tornozelo no basquetebol universitário, levantando contramedidas para prevenir essas lesões desportivas. **Métodos:** O total de 413 estudantes universitários que participam regularmente em jogos de basquetebol em 10 faculdades e universidades foram selecionados como objetos de pesquisa. As causas das lesões nas articulações do tornozelo no processo desse esporte foram investigadas através de questionários, sendo analisadas as principais causas das lesões através de métodos estatísticos. **Resultados:** as causas das lesões nas articulações do tornozelo dentro do basquetebol universitário incluem principalmente fatores subjetivos e objetivos. Os fatores subjetivos incluem a preparação psicológica inadequada, o exercício de aquecimento inadequado, o amortecimento inadequado, o exercício excessivo, entre outros listados; os fatores objetivos contemplam principalmente a lesão local e a lesão acidental. **Conclusão:** A participação dos estudantes universitários no basquetebol é benéfica para melhorar a sua saúde física, requerendo medidas eficazes para prevenir possíveis lesões no tornozelo, tanto as relacionadas aos aspectos subjetivos como objetivos. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores: Basquetebol; Traumatismos do Tornozelo; Análise de Mediação Causal.

RESUMEN

Introducción: El baloncesto es una modalidad deportiva combativa, muy popular entre los estudiantes universitarios. Sin embargo, requiere muchos períodos de carrera, intercalados con pausas de emergencia, enfrentamientos y otras acciones propensas a las lesiones de tobillo. **Objetivo:** Investigar las causas de las lesiones de la articulación del tobillo en el baloncesto universitario, planteando contramedidas para prevenir estas lesiones deportivas. **Métodos:** Se seleccionaron como objeto de investigación un total de 413 estudiantes universitarios que participaban regularmente en partidos de baloncesto en 10 colegios y universidades. Las causas de las lesiones de la articulación del tobillo en el proceso de este deporte se investigaron mediante cuestionarios, y las principales causas de las lesiones se analizaron mediante métodos estadísticos. **Resultados:** Las causas de las lesiones de la articulación del tobillo en el baloncesto universitario incluyen principalmente factores subjetivos y objetivos. Los factores subjetivos incluyen una preparación psicológica inadecuada, un ejercicio de calentamiento inadecuado, una amortiguación inadecuada, un ejercicio excesivo, entre otros enumerados; los factores objetivos contemplan principalmente la lesión local y la lesión accidental. **Conclusión:** La participación de los estudiantes universitarios en el baloncesto es beneficiosa para mejorar su salud física, requiriendo medidas eficaces para prevenir posibles lesiones de tobillo, tanto las relacionadas con aspectos subjetivos como objetivos. **Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.**

Descriptor: Baloncesto; Traumatismos del Tobillo; Análisis de Mediación Causal.



INTRODUCTION

As one of the most popular sports in the world, basketball is deeply loved by the masses. It is a tense, intense and antagonistic sport that integrates physical quality, skills and intelligence and directly contacts the body.¹ Its technical movements include basic skills such as running, jumping and throwing. It must complete various technical movements in the fierce offensive and defensive confrontation. It is a fast changing movement. Basketball is intense in confrontation and high in intensity. Accordingly, in basketball teaching and training, the probability of sports injury of students is relatively high.² After long-term observation in teaching and training, it is found that ankle injury is one of the common sports injuries with a very high probability. Basketball is a combination of collective strength, brain power, skills, tactics and other factors. It has been widely welcomed since its birth. However, it will consume too much physical energy and energy of the human body in sports confrontation, and it has strong aggressiveness and antagonism. Therefore, it is inevitable that some injuries will occur to both sides of the confrontation. Ankle injury is the main form of injury. Bruise, pain and swelling caused by ankle joint injury not only affect students' training, but also bring inconvenience to students' life.³ Ankle injury is very common in basketball. If it is not handled properly in the early stage, it will seriously affect the training of students and may cause serious sequelae. Therefore, further study on the causes of ankle joint sports injury will not only accelerate the process of treatment and better prevent sports injury, improve teaching and training conditions and methods, and improve sports performance and exercise effect.⁴ Many students have suffered from ankle injury in basketball teaching and training. Some students even suffer from ankle injury many times and repeatedly, which affects the normal and efficient development of basketball teaching and training activities and affects the enthusiasm of students for basketball.⁵ This paper studies the cause analysis and prevention of ankle joint injury in college basketball, which is of great significance.

METHODS AND RESULTS

The study is Purely observational studies which no need to registry ID of ICMJE, and all the participants were reviewed and approved by Ethics Committee of Sanmenxia Polytechnic College, China (NO. 20210223)

A total of 413 college students who regularly participate in basketball sports in 10 colleges and universities were taken as the research objects. The investigation was conducted to investigate the causes of ankle joint injury in the process of basketball sports, and the main causes of ankle joint injury in college basketball sports were analyzed with statistical methods.⁶ The subjects surveyed have trained for about 3 years on average. The survey form adopted this time is questionnaire survey, in which the content of the survey is relatively large, including the part of the injury and the cause of the injury. In addition, it also includes the degree of the injury and the consequences of each person's injury. Of the 413 students surveyed, 276 had suffered ankle joint injuries, accounting for 66.83% of the total number of students surveyed. That is to say, more than half of the students have experienced ankle injury in basketball teaching and training.⁷ Therefore, the incidence of ankle injury in college basketball teaching and training is quite high. The incidence of ankle joint injury in college basketball teaching and training is shown in Figure 1.

For the number of injuries of these athletes, if they are injured in the same place for many times, it will be recorded as 1. Times. If the athletes are injured in different places for many times, it will be recorded as many times. The degree of injury of athletes is mainly divided into 3 levels, which are severe, moderate and mild.⁸ In addition, in the questionnaire, we also need to make statistics on the causes of athletes' injuries, and then analyze the results of the questionnaire. In addition, in the investigation

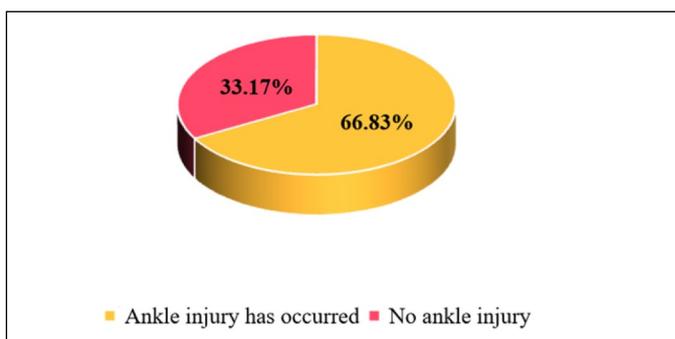


Figure 1. Incidence of ankle joint injury in college basketball teaching and training.

and statistics on the incidence of ankle joint injury in college basketball teaching and training, it was also found that although 276 students had suffered ankle joint injury, the total number of ankle joint injuries of these 276 students was as high as 315 times, with an average of 1.14 times.⁹ This situation shows that the ankle joint injury in college basketball teaching and training is highly frequent. Among the ankle joint injuries occurred, 178 times were external ankle ligament injuries, which accounted for more than 1/2 of the total number. There were 83 times of osteoarthritis, accounting for about 20% of the total number. In addition, there were 31 times of internal ankle ligament injuries and 46 times of tibiofibular avulsion fracture.¹⁰ According to the results of the questionnaire, among the injured athletes, 294 injuries were mild injuries, accounting for 71%, followed by moderate injuries, accounting for about 18%, and the rest were severe injuries.

Causes of ankle joint injury in college basketball

Subjective factors

Before starting sports, students need to do appropriate warm-up exercises to buffer their bodies, so that all organs and nervous systems have a certain sense of movement, so that they can play a role in the field of competition. Lack of preparation activities or non-standard preparation activities are one of the important causes of injury.¹¹ The preparation activity is not only to improve the muscle temperature, but also to improve the excitability of the central nervous system, strengthen the activity of various organ systems, promote the human body to change from relatively static to tense active state as soon as possible, overcome the functional inertia of various tissues and organs of the human body, make the human body change from static state to active state, and maximize the efficiency of the functions of various organ systems. Students' lack of preparation before sports may lead to weak coordination and control ability of the body and inflexible extension of the limbs, which may easily lead to body imbalance, unstable center of gravity and ankle sprain in an emergency. Warm up is an important process that must be carried out before all strenuous confrontational sports. If the basketball game is directly started without warm-up, it will make it difficult for the body to enter the exercise state at the first time, and the excitation function controlled by the nervous system will not play its role, and affect the viscosity of ligaments, muscles and viscera. At this time, the flexibility of ligaments and muscles will not be in the best state, and the flexibility of joints will not meet the basic requirements. Before the basketball training or competition, if the students do not do the preparatory activities or the preparatory activities are not sufficient, the excitability of the nervous system and the functions of the internal organs will not be fully mobilized, the viscosity of the muscles and ligaments will not be effectively reduced, the extensiveness of the muscles and ligaments will not reach the best state, and the joint flexibility will be insufficient, resulting in uncoordinated technical actions.

The basis of students' physical quality is uneven, leaving an opportunity for the occurrence of ankle injury. Through the observation and testing of students in the long-term teaching and training, it is found that the physical quality of students is not only good and bad, but also many students with poor physical quality. Among the ten players in basketball, there are certain differences in physical strength and physical quality among the players, which is also one of the main reasons for ankle injury of some players with weak physical strength and poor physical quality. There are also some athletes with insufficient foot stamping flexibility, upper body strength and lower limb strength. They do not have the physical quality to do some technical actions, but they must violate the body principle and exceed the body function to do this action, which will cause ankle injury. For example, many students have insufficient strength of lower limbs and weak muscle strength of ankle joints. The stability of the corresponding ankle joint of the students with the above-mentioned situation is often poor, so when they participate in basketball teaching and training activities, they are prone to ankle joint injury. Many basketball players play basketball out of their personal interests, and they also do some training in their daily life. However, due to the lack of guidance from professional basketball coaches, their training arrangements are extremely unreasonable, and there are also some defects in technology, which will lead to irregular activities of their body organs and tissues, which will lead to more ankle injuries. In addition, there will also be problems such as excessive pursuit of training results, random training plans, blind training, etc. these problems will make the athletes' skills not standardized, resulting in their inability to cooperate with other players in the basketball game, and ankle injuries in unexpected cases. The application of technology is based on the structure of the human body and must follow the characteristics of rules, so you can get more results with less effort. Incorrect exercise will ignore the role of the body in sports and lead to muscle tension and ankle injury.

Objective factors

On the basketball court, there are not only accidental injuries, but also injuries caused by malicious collisions of opponents. For some amateurs, the desire to win is too strong. For some purposes, such as strenuous exercise or excessive interference, malicious damage may occur. These factors increase the possibility of injury. In addition, the site is too hard, uneven, too slippery, and the equipment is not suitable, which can also cause joint injury, strain, periosteal injury, Achilles tendon pain and other injuries.

Prevention of ankle joint injury in college basketball

Strengthen the physical quality training of students, especially the muscle strength training of ankle joint. Through the strengthening of physical quality training, the foundation of students' physical quality should be consolidated, and the uneven situation of students' physical quality should be gradually improved. In daily life, we should consciously change our own living habits and formulate scientific and reasonable training plans, such as training plans for physical fitness and physical quality, such as step jumping, frog jumping, quantitative constant speed running, and constantly improving the intensity of variable speed running. This has a very obvious effect on the improvement of personal physical fitness and physical quality. We should also pay special attention to strengthening the muscle strength training of the ankle joint, promote the improvement of joint stability through the improvement of the muscle strength of the ankle joint, and then reduce the possibility of ankle joint injury in college basketball teaching and training. It is worth mentioning that this is a long-term project, which requires constant persistence. Only in this way can athletes imperceptibly improve their physical quality and achieve a large-scale improvement of physical strength, so that their physical

functions can gradually adapt to the high-intensity sports of basketball, and avoid the greater pressure on the ankle joints due to lack of physical strength in the basketball competition, so that they can be protected to a certain extent. The college basketball match is shown in Figure 2.

In the process of basketball teaching and training in Colleges and universities, teachers and coaches should pay attention to the technical movements of students at any time. Once the students have nonstandard, nonstandard and wrong technical movements, they should correct them in a timely manner so as to avoid the students from forming wrong movement stereotypes. Athletes who like basketball should also pay attention to the standardization of basketball technical actions in their daily life. They can learn how to display the professional forms of various actions by watching videos or learning from teachers of professional institutions, so as to compare their own relevant actions and correct their wrong behaviors in time. In this way, the situation of ankle joint injury caused by technical action level problems is gradually reduced, and finally the effect of preventing ankle joint injury is achieved.

When carrying out basketball teaching and training in Colleges and universities, teachers should pay attention to explaining basic sports safety knowledge to students, and analyze the characteristics, causes and self-protection skills of various types of ankle joint injuries, so as to improve students' safety awareness and let students understand the harm of ankle joint injuries. It is not difficult to see that sports injuries may still occur in sports. However, most people think that ankle sprains should be cured for two days, which is not the case. Proper rest is necessary, but it is not the whole treatment. Patients without proper and good treatment are 3-4 times more likely to suffer ankle joint injury than those with treatment. For patients with initial injury in the acute phase, if the injury does not involve the ligament tissue, as long as they are treated conservatively and follow the principles of rest, ice dressing, pressure bandaging and lifting the affected limb, they can obtain satisfactory results. At the same time, we should not engage in things beyond our ability.

CONCLUSIONS

Basketball is famous for its rapid movement and fierce competition. With the continuous improvement of the basketball level, the competition is also increasing, resulting in more and more injuries. In all aspects of injuries of basketball players, ankle joint injuries account for a large proportion, which has a great impact on the sports career of basketball players. This requires that athletes can analyze the causes of ankle joint injuries in an all-round way, so as to carry out comprehensive prevention in future basketball games and avoid major damage to themselves. The ankle joint is one of the joints that are easy to be injured in our basketball sports. In normal training, the practitioner should strengthen the practice of all aspects of the body



Figure 1. College basketball match.

and strengthen the overall quality of the body. At the same time, we should pay attention to the ankle joint, that is, we should prepare for activities before sports to avoid fatigue sports. If there is any injury, we should treat it in time to prevent serious injury and repeated injury. In this way, we can better protect ourselves and improve our health. Schools should strengthen the education of College Students'

self-protection consciousness, reduce and avoid sports injuries, and strengthen college students' attention to ankle injury, so that they can fully understand the harm of ankle injury to their bodies.

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