

# CHARACTERISTICS AND PREVENTION OF SPORTS INJURIES IN ADOLESCENT SOCCER



ORIGINAL ARTICLE  
ARTIGO ORIGINAL  
ARTÍCULO ORIGINAL

CARACTERÍSTICAS E PREVENÇÃO DE LESÕES ESPORTIVAS NO FUTEBOL ADOLESCENTE

CARACTERÍSTICAS Y PREVENCIÓN DE LESIONES DEPORTIVAS EN EL FÚTBOL ADOLESCENTE

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## ABSTRACT

**Introduction:** This year is the year of the soccer World Cup. With the adult team unable to participate in the World Cup, society's attention has turned to college soccer. However, as a highly aggressive sport, soccer will inevitably cause various sports injuries. **Objective:** Investigate the causes and characteristics of sports injuries of young school soccer players in some areas of China, and propose measures to prevent and control sports injuries. **Methods:** A total of 1024 adolescents aged 6 to 17 years were research volunteers; the causes and characteristics of sports injuries of these young college soccer players were investigated through field investigation, questionnaire survey, expert interview, and mathematical analysis. **Results:** The results of the survey show that 73.2% (750 people) of the respondents have suffered sports injuries, among which the common injuries in elementary school (6-12 years old) are knee and upper limb joints, and the common injuries in middle school (12-17 years old) are mainly ankle and knee joints, with the same characteristics as adult players. The degree of injury in different segments is the same, with mild injuries being the most common, followed by moderate and severe. As the learning period increased, the mild injuries decreased significantly, while the moderate and severe injuries showed an increasing trend. Most injuries occurred in the summer, with the injury rate during training significantly higher than during competition. The causes of injuries are different in different age groups. **Conclusion:** Young school soccer players are prone to sports injuries in the sporting process, and specific preventive measures are needed to prevent these injuries from causing adverse effects on young players. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

**Keywords:** Teenagers; Football; Athletic Injuries.

## RESUMO

**Introdução:** Este ano é o ano da Copa do Mundo de futebol. Com o time adulto impossibilitado de participar da Copa do Mundo, a atenção da sociedade voltou-se para o futebol universitário. Entretanto, o futebol, como um esporte altamente agressivo, inevitavelmente causará várias lesões esportivas. **Objetivo:** Investigar as causas e características das lesões esportivas de jovens jogadores de futebol escolar em algumas áreas da China, propondo medidas de prevenção e controle das lesões esportivas. **Métodos:** Um total de 1024 adolescentes entre 6 e 17 anos foram voluntários de pesquisa, as causas e características das lesões esportivas desses jovens jogadores de futebol universitário foram investigadas por meio de investigação de campo, pesquisa de questionário, entrevista com especialistas e análise matemática. **Resultados:** Os resultados da pesquisa mostram que 73,2% (750 pessoas) dos entrevistados sofreram lesões esportivas, entre as quais as lesões comuns na escola primária (6-12 anos de idade) são as articulações do joelho e membros superiores, e as lesões comuns na escola média (12-17 anos de idade) são principalmente as articulações do tornozelo e joelhos, com as mesmas características dos jogadores adultos. O grau de lesão em diferentes segmentos é o mesmo, sendo as lesões leves as mais comuns, seguidas de moderadas e severas. Com o aumento do período de aprendizagem, as lesões leves diminuíram significativamente, enquanto as moderadas e severas mostraram uma tendência crescente. A maioria das lesões ocorreu no verão, sendo a taxa de lesões durante o treinamento significativamente maior do que durante a competição. As causas das lesões são diferentes em diferentes faixas etárias. **Conclusão:** Os jovens jogadores de futebol escolar são propensos a lesões esportivas no processo esportivo, sendo necessárias as medidas preventivas específicas para evitar que essas lesões causem os efeitos adversos nos jovens jogadores. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

**Descritores:** Jovens; Futebol; Lesões do Esporte.

## RESUMEN

**Introducción:** Este año es el año del Mundial de Fútbol. Ante la imposibilidad de que la selección adulta participe en el Mundial, la atención de la sociedad se ha dirigido al fútbol universitario. Sin embargo, el fútbol, como deporte altamente agresivo, provocará inevitablemente diversas lesiones deportivas. **Objetivo:** Investigar las causas y características de las lesiones deportivas de los jóvenes futbolistas escolares en algunas zonas de China, proponiendo medidas para prevenir y controlar las lesiones deportivas. **Métodos:** Un total de 1024 adolescentes de entre 6 y 17 años fueron voluntarios de la investigación, se investigaron las causas y características de las lesiones deportivas de estos jóvenes futbolistas universitarios mediante una investigación de campo, una encuesta con cuestionario, una entrevista con



expertos y un análisis matemático. Resultados: Los resultados de la investigación muestran que el 73,2% (750 personas) de los encuestados han sufrido lesiones deportivas, entre las cuales las lesiones comunes en la escuela primaria (6-12 años) son las articulaciones de la rodilla y del miembro superior, y las lesiones comunes en la escuela media (12-17 años) son principalmente las articulaciones del tobillo y de la rodilla, con las mismas características que los jugadores adultos. El grado de lesión en los distintos segmentos es el mismo, siendo las lesiones leves las más comunes, seguidas de las moderadas y las graves. Con el aumento del periodo de aprendizaje, las lesiones leves disminuyeron significativamente, mientras que las lesiones moderadas y graves mostraron una tendencia al alza. La mayoría de las lesiones se produjeron en verano, y el índice de lesiones durante el entrenamiento fue significativamente mayor que durante la competición. Las causas de las lesiones son diferentes en los distintos grupos de edad. Conclusión: Los jóvenes futbolistas escolares son propensos a sufrir lesiones deportivas en el proceso deportivo, y se necesitan medidas preventivas específicas para evitar que estas lesiones causen efectos adversos en los jóvenes jugadores.

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

**Descriptor:** Jóvenes; Fútbol; Lesiones en Deportes.

DOI: [http://dx.doi.org/10.1590/1517-8692202329012022\\_0491](http://dx.doi.org/10.1590/1517-8692202329012022_0491)

Article received on 09/05/2022 accepted on 10/24/2022

## INTRODUCTION

With the continuous development of competitive sports technology and increasingly fierce competition, the incidence of sports injuries is increasing. Statistics show that football is one of the sports with the highest incidence of injuries.<sup>1</sup> Teenagers are at the peak of their youth development, and the excitement process of nervous system is dominant, which is characterized by liveliness, high desire for sports and strong risk. Football is a highly competitive sport. If you want to achieve an ideal ranking in a formal football match, you need athletes to receive a lot of physical and technical training in daily training, which will easily lead to injuries in training. Modern football is characterized by intense confrontation, large amount of exercise, high intensity, long duration, high energy consumption, rapid development of technical and tactical level, and the requirement of being able to attack and defend. It is easy to cause sports injuries due to subjective or objective factors, and it is one of the sports with the highest incidence of trauma.<sup>2-3</sup>

Through a sample survey of schools where campus football is carried out, this study studies the present situation, causes and characteristics of injuries of young athletes aged 6-17 in some areas of China, and puts forward constructive countermeasures. The damage is analyzed in all aspects, and the detailed research is expected to provide valuable information for this part of the research area.

### Overview of sports injuries

Sports refer to all kinds of injuries that occur in the course of sports. Its occurrence is closely related to sports training, sports technology, sports events, sports environment and equipment, etc. It mainly occurs in the human body's sports system, but also includes injuries of blood vessels and nervous system. It belongs to the category of orthopedics in Chinese medicine and is one of the important contents of sports medicine.<sup>4</sup> Sports injury can not only prevent athletes with high training level from participating in training or competition, but also cause serious disability or loss of life, and it can also affect people's psychology and hinder the normal development of sports.

According to the tissue structure of injury, it can be divided into skin injury, bursa injury, muscle and tendon injury, joint and bone injury, nerve injury and so on. The most common definition of sports injury in football is that athletes can't play or train normally because of the doctor's treatment and anatomical diagnosis. According to the survey data, football is one of the sports events with the highest injury rate. Through the analysis of previous research results, it can be seen that in football sports injuries, athletes' injuries are mainly concentrated in the lower limbs due to the factors of the project, and the injuries of the lower

limbs are mostly acute soft tissue injuries. Researchers found that among the more than 1,000 games investigated, there were 1,200 injuries in the games, and these injuries mainly concentrated in the lower limbs, accounting for 73% of the total injuries.<sup>5-6</sup> From the statistical data, we can easily see that the injuries of campus football players mainly focus on soft tissue injuries.

Football is one of the sports with high incidence of injuries, because many technical actions in football, such as shooting hard, tackling the ball on the ground and passing the ball, need the coordination of body muscles and various parts. It is found that the main causes of football players' injuries are insufficient training level, human factors and objective factors. Moreover, the incidence of football sports injuries is on the rise, which should be highly valued by athletes and coaches.<sup>7</sup> The researcher investigated the sports injuries of 370 athletes from 18 women's football teams, and statistically concluded that there were 35 cases of knee joint injuries including medial ligament injuries, accounting for 26%, 32 cases of meniscus injuries, accounting for 24%, 21 cases of cruciate ligament injuries, accounting for 16.5%, followed by patellar strain.<sup>8</sup> It can be seen that meniscus injury and medial and lateral collateral ligament injury are common in knee joint injuries, which attract the attention of athletes and coaches.<sup>9</sup>

Most researchers at home and abroad have conducted a relatively complete research on football and its participants' injuries. Through a large number of analyses, it is found that the average level of coaches is not high, and injuries are not taken seriously. At the same time, the medical level inside the campus is low, which leads to the fact that the wounded can't be treated in time and effectively. Schools also need to promote the cultivation of young football reserve talents according to the actual situation, improve their cultivation environment to the maximum extent within the allowable funds, improve the quality of lawns, hire professionals to conduct irregular spot checks and regular renovations, and close the venue in time in case of partial damage, maintain it, and cultivate the quality of professionals.

## RESEARCH METHOD

### Research objects

This paper focuses on the young campus football players in some areas of China. According to the demand, because both sexes are men, the data samples are divided into two groups: middle school and primary school according to age.

### Literature data method

In the course of this study, a large number of relevant materials have been collected, including medical knowledge about the principle

of football injury, early repair and later rehabilitation, research on intervention methods of athletes' mental diseases, and the relationship between training intensity and efficiency. In a comprehensive way, these contents have been relatively perfect in previous studies. This article has summarized, summarized and condensed some valuable materials throughout this article.

### Expert interview method

According to the needs of research, visit the head coaches and sports medicine experts of youth campus football teams in some areas of China. They listened to the opinions and suggestions of this research and provided some theoretical ideas for the research.

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 Xinxiang Vocational and Technical College, China (NO. 2021028)

### Questionnaire survey method

A questionnaire survey was conducted on the sports injuries of young campus football players. The questionnaire was distributed online, and the subjects filled it out and immediately took it back. In this study, 1,369 questionnaires were distributed, and 1,224 were recovered, with a recovery rate of 89.4% and 1,024 valid questionnaires, with an effective rate of 74.8%.

### Mathematical statistics

Excel and SPSS software are used to make statistics and analysis of the obtained data.

## RESULT

### Characteristics of sports injuries of juvenile football players on campus

In terms of the injury ratio of male football players in primary and secondary schools, the injury rate in primary schools is 30.05%, and that in secondary schools is 69.95%. This shows that the injury rate of young male athletes aged 12-17 in campus football is high.

73.2%(750 people) of the respondents had sports injuries, among which the common injuries in primary school age (6-12 years old) were knee joints and upper limbs, and the common injuries in middle school age (12-17 years old) were mainly ankle joints and knees, which had the same characteristics as those of adult football players.

The degree of sports injury is divided into acute injury and chronic injury according to the course of injury; According to the severity of injury, it can be divided into mild injury, moderate injury and severe injury. The survey results show. (Figure 1)

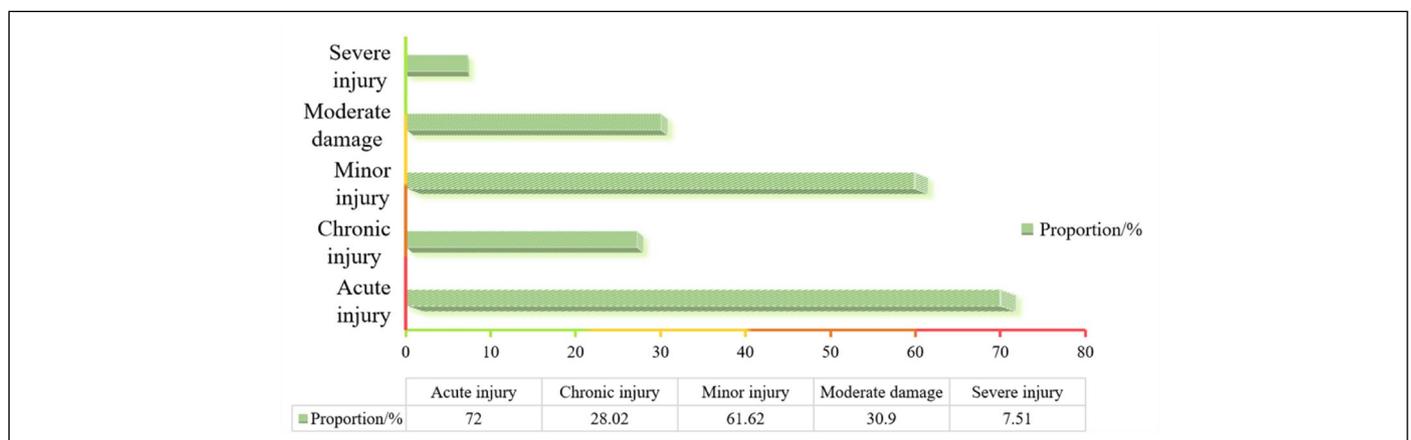


Figure 1. Degree distribution of sports injury.

Among the 1024 football players with injuries, 737 are acute injuries and 287 are chronic injuries. The incidence of acute injury is 72.0%, and that of chronic injury is 28.02%. Among the 1024 football players with injuries, 631 were mild injuries, accounting for 61.62%; 316 cases (30.9%) were moderately injured; Seventy-seven patients were severely injured, accounting for 7.51%. It can be seen that the injuries of football players are mostly acute injuries in the course of disease, and the severity of injuries is mostly mild injuries and moderate injuries.

The degree of football injury in different segments is the same, with mild injuries being the most, followed by moderate and severe injuries. With the increase of learning period, mild injuries decreased significantly, while moderate and severe injuries showed an increasing trend.

Most of the injuries occurred in summer, and the injury rate during training was significantly higher than that during competition. The causes of injury are different in different age groups. The distribution in sports season is shown in Figure 2.

Spring and summer are the seasons with high frequency of injuries, which account for more than 80%, while the lowest frequency is only 11.59% in winter. At this time, we can judge whether the difference of physical function is caused by the different external temperatures in different seasons, thus determining the occurrence of injuries. It is more unsuitable for sports than the other three seasons, so there are more sports injuries in summer and autumn.

### Causes of sports injuries of young football players on campus

The special physical qualities of football on campus mainly include strength, speed, endurance, coordination, sensitivity, flexibility and so on. Strength is the foundation of all other qualities, and it is also the most important foundation to prevent sports injuries. Statistical data of athletes' sports injury factors show that: Among the sports injuries caused by physical fitness, 24.17% are caused by poor endurance and 43.63%

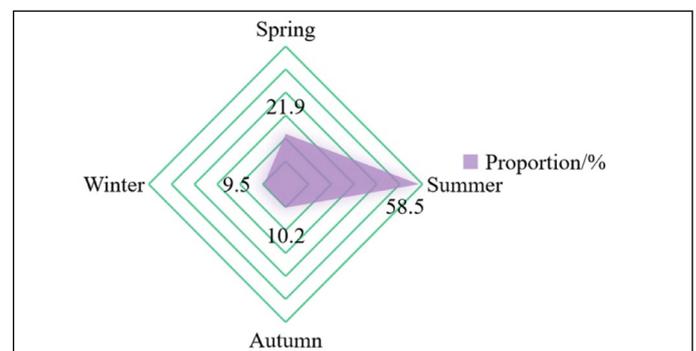


Figure 2. Seasonal distribution of sports injuries.

are caused by poor strength. This is enough to prove that coaches don't pay enough attention to the training of strength quality, which leads to the increase of the probability of sports injuries.

Incorrect technical essentials refer to the injury of body tissues caused by athletes' technical shortcomings and mistakes, which violate the characteristics of human body structure, the activity rules of various organs and systems, and the mechanical principles during sports. Incorrect technical essentials are important factors leading to sports injuries. According to the statistical data in the questionnaire of injury causes of young campus football players, sports injuries caused by incorrect technical essentials account for 12.36% of the total injury factors. During training, there are often muscle tension, improper exertion, uncoordinated contraction of active muscles and antagonistic muscles, and sometimes redundant movements occur, resulting in sports injuries.

In the growth and development stage of primary school students, muscle moisture is more, the contents of protein, sugar and inorganic salts are less, and there are more hoof-binding tissues among muscle fibers, so the muscles are softer and looser, and the muscle contraction strength is poor. The weight and volume of the heart are also smaller than those of adults. Because the growth of pupils' hearts has not yet been completed, long-term intense practice will overload the hearts. At the same time, it is similar in the course of the competition. With the progress of the schedule, the mood changes at any time, and the unstable heart will have a negative impact on the players themselves to a great extent. Excessive nervousness, anxiety and excitement may cause negative psychology at any time due to their poor level of play, and some extreme actions are more likely to make them hurt. It is found that among 663 athletes' total injuries, the site factor accounts for the largest proportion of injuries (35%). Secondly, physical fatigue (7%); Old wounds are not healed (5%); Insufficient muscle strength (4%).

## Countermeasures to prevent sports injuries of young football players

### Establish a scientific training system

The level of technical level varies with the degree of injury. With the increase of technical level, there is a process of injury reduction, that is, in the early stage of training, the automatic training system in sports training is strictly followed, and the coordination between movement technology and physical fitness is constantly broken in. This is a good way to reduce injury.<sup>10</sup> Therefore, in the process of training, it is necessary to explain the basic theoretical knowledge and basic movement techniques of football to football players, so that they can master the important and difficult points of some technical movements. In the process of training, they should constantly strengthen the practice of professional technical movements, requiring athletes to make their movements accurate, stable and standardized, thus effectively reducing the occurrence of sports injuries.

## Improve the physical quality of football players in an all-round way

Football is a sport that tests athletes' physical fitness and skill strategy. Therefore, teachers should not only attach importance to imparting strategic skills, but also appropriately improve the physical training intensity of young athletes in the process of daily football training. Athletes have to complete the technical movements in quick start and timely stop, so it is very easy to cause sports injuries in some technical movements because of the athletes' physical fitness level. Therefore, some world-class football teams attach great importance to the improvement of athletes' physical fitness.<sup>11</sup>

## Strengthen injury prevention education and treat injury accidents correctly

Coaches should guide each athlete to learn self-protection before training, self-protection during training, self-relaxation after training and self-first aid after injury. Every athlete should learn to deal with the relationship between study, training and rest. Constantly improve teachers' professional ability, stabilize and improve relevant policies, focus on the development of physical education in primary and secondary schools and students' physical and mental health, and make it truly a strong driving force for the occurrence of amateur sports in primary and secondary schools. We should deal with and treat our existing injuries in time to strengthen the functional recovery after injuries. Rational allocation of treatment equipment and methods to achieve early prevention and treatment. It is suggested to pay attention to the rehabilitation training in the later stage of injury, and conditional rehabilitation equipment or unarmed functional training exercises can be used to restore the motor function of the affected part.

## CONCLUSION

In terms of the injury ratio of male football players in primary and secondary schools, the injury rate in primary schools is 30.05%, and that in secondary schools is 69.95%. This shows that the injury rate of young male athletes aged 12-17 in campus football is high. The degree of football injury in different segments is the same, with mild injuries being the most, followed by moderate and severe injuries. Among the 1024 football players with injuries, 737 are acute injuries and 287 are chronic injuries. The incidence of acute injury is 72.0%, and that of chronic injury is 28.02%. Football is a highly competitive sport. If you want to achieve an ideal ranking in a formal football match, you need athletes to receive a lot of physical and technical training in daily training, which will easily lead to injuries in training. Teachers should be clear about the characteristics and causes of physical injuries of football players in sports, and appropriately improve the physical training of young athletes. Teenagers' injuries are not only football injuries, but also the healthy development of teenagers' body and mind.

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

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**AUTHORS' CONTRIBUTIONS:** The author made significant contributions to this manuscript. Yang Xi: writing and performing surgeries; data analysis and performing surgeries; article review and intellectual concept of the article.

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