

# INJURY PREVENTION IN THE TRAINING OF TRIPLE JUMP ATHLETES



ORIGINAL ARTICLE  
ARTIGO ORIGINAL  
ARTÍCULO ORIGINAL

PREVENÇÃO DE LESÕES NO TREINAMENTO DE ESPORTISTAS DE SALTO TRIPLO

PREVENCIÓN DE LESIONES EN EL ENTRENAMIENTO DE ATLETAS DE TRIPLE SALTO

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## ABSTRACT

**Introduction:** The triple jump technique is one of the techniques of the most difficult sport in athletics, requiring extremely high physical qualities such as muscular strength, explosive power, and coordination capacity of athletes. Training its young practitioners should prioritize the specific teaching of sports techniques and the prevention of injuries intrinsic to the sport. **Objective:** Promote preventive interventions in training young triple jump athletes. **Methods:** The research method was used with interviews with athletes, coaches, and specialists. A statistical analysis was performed to identify the most relevant injuries in the sport. A protocol of preventive activities to be added to the athletes' training was elaborated through the data obtained. **Results:** A survey of young triple jumpers in sports schools in some cities in Province A found that there were 62 junior triple jumpers, of which 48 had injuries, the injury rate was 77.4%, and the injury rate of junior triple jumpers was relatively high, mainly in the knee. After analyzing the factors that cause sports injuries, it is shown that by rationalizing the training plan for the triple jump and the scientific content of training, athletes gradually increase their adaptability and self-protective ability to the influence of external factors, mastering the methods of prevention and rehabilitation of sports injuries of the knee. **Conclusion:** The preventive interventions presented allow triple jump athletes to maintain their best competitive state and create competitive results at the professional level. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

**Keywords:** Sports; Physical Education and Training; Sports Injuries.

## RESUMO

**Introdução:** A técnica do salto triplo é uma das técnicas esportivas mais difíceis do atletismo, requerendo qualidades físicas extremamente elevadas como força muscular, poder explosivo e capacidade de coordenação dos atletas. O treinamento de seus jovens praticantes deve priorizar tanto o ensino específico das técnicas esportivas quanto a prevenção de lesões intrínsecas do esporte. **Objetivo:** Fomentar intervenções preventivas no treinamento de jovens atletas praticantes de salto triplo. **Métodos:** Utilizou-se o método de pesquisa com entrevistas entre atletas, treinadores e especialistas. Uma análise estatística foi elaborada para levantar as lesões mais relevantes ao esporte. Através dos dados obtidos, foi elaborado um protocolo de atividades preventivas a serem adicionadas no treinamento dos esportistas. **Resultados:** Uma pesquisa com jovens saltadores triplos em escolas esportivas de algumas cidades da Província A constatou que havia 62 saltadores triplos juniores, dos quais 48 tinham lesões, a taxa de lesões era de 77,4%, e a taxa de lesões dos saltadores triplos juniores era relativamente alta, principalmente no joelho. Após analisar os fatores que causam lesões esportivas, mostra-se que, racionalizando o plano de treinamento do salto triplo e o conteúdo científico do treinamento, os atletas aumentam gradualmente sua adaptabilidade e capacidade de auto-proteção à influência de fatores externos, dominando os métodos de prevenção e reabilitação das lesões esportivas do joelho. **Conclusão:** As intervenções preventivas apresentadas permitem que os atletas do salto triplo mantenham seu melhor estado competitivo e criem resultados de competição a nível profissional. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

**Descritores:** Esportes; Educação Física e Treinamento; Lesões Esportivas.

## RESUMEN

**Introducción:** La técnica del triple salto es una de las técnicas deportivas más difíciles del atletismo, ya que requiere cualidades físicas muy elevadas como la fuerza muscular, la potencia explosiva y la capacidad de coordinación de los atletas. La formación de sus jóvenes practicantes debe priorizar tanto la enseñanza específica de las técnicas deportivas como la prevención de las lesiones intrínsecas del deporte. **Objetivo:** Promover intervenciones preventivas en el entrenamiento de jóvenes atletas de triple salto. **Métodos:** Se utilizó el método de investigación con entrevistas a atletas, entrenadores y especialistas. Se elaboró un análisis estadístico para identificar las lesiones más relevantes en el deporte. A través de los datos obtenidos, se elaboró un protocolo de actividades preventivas a añadir en el entrenamiento de los deportistas. **Resultados:** Una encuesta realizada a jóvenes saltadores de triple en escuelas deportivas de algunas ciudades de la provincia A reveló que había 62 saltadores de triple junior, de los cuales 48 tenían lesiones, la tasa de lesiones era del 77,4%, y la tasa de lesiones de los saltadores de triple junior era relativamente alta, principalmente en la rodilla. Después de analizar los factores que causan las lesiones deportivas, se demuestra que al racionalizar el plan de entrenamiento del triple salto y el contenido científico del entrenamiento,



los atletas aumentan gradualmente su capacidad de adaptación y autoprotección a la influencia de los factores externos, dominando los métodos de prevención y rehabilitación de las lesiones deportivas de rodilla. Conclusión: Las intervenciones preventivas presentadas permiten a los atletas de triple salto mantener su mejor estado competitivo y crear resultados de competición a nivel profesional. **Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.**

**Descriptores:** Deportes; Educación y Entrenamiento Físico; Lesiones en Deportes.

DOI: [http://dx.doi.org/10.1590/1517-8692202329012022\\_0622](http://dx.doi.org/10.1590/1517-8692202329012022_0622)

Article received on 10/31/2022 accepted on 11/30/2022

## INTRODUCTION

The triple jump technique is one of the most difficult sports techniques to master in track and field, it requires extremely high physical qualities such as absolute strength, explosive power and coordination ability of athletes. Due to the limited scope of enrollment in ordinary colleges and universities, most track and field athletes do not have long-term professional training experience, lack of good training habits, if the teacher's training arrangements are slightly careless, it is very easy to cause sports injuries to athletes during triple jump training. Triple jump is a complex non-periodic, typical strength and speed sports.<sup>1</sup> A complete action consists of five parts: Run-up, one-legged jump, one step jump, one jump and landing. In addition to requiring athletes to master correct complex technical movements, athletes should have good explosive power, speed, balance and agility. The more complex the sports, the higher the requirements for the athletes and the more likely to cause injuries. While grasping the training tasks of teenage triple jumpers, how to effectively reduce and prevent sports injuries has become a difficult problem for coaches and scientific researchers, scientific training, reduce injury, injury prevention is also a requirement to maintain a high level of competence in provincial triple jumpers.<sup>2</sup>

## METHOD

### Research object

In this study, the knee sports injuries of youth triple jumpers from some sports schools in province A were taken as the research object, a survey was carried out on the youth triple jumpers of provincial sports schools in A province, B city sports schools, C city sports schools, D city sports schools, and F city sports schools (2 schools).<sup>3</sup>

### Research methods

#### Interview survey

**Athlete Interviews:** In order to write an authentic and scientific paper, from September 2019 to January 2020, I personally trained with the team in a sports school in F City as an assistant coach, get the most realistic training and injury status information for young athletes. The other 5 sports schools used the process of distributing questionnaires, communicating verbally with athletes directly for more information, understanding the real injury status of athletes makes this study more rigorous.<sup>4</sup>

**Interviews with coaches and experts:** According to the needs of the research, we visited the triple jump coaches and sports injury experts of some sports schools in A province. The purpose of visiting coaches is to test the consistency of the information collated by the survey with the real situation and obtain more real information. The purpose of visiting sports injury experts is to comprehensively and scientifically understand the theoretical knowledge of sports injuries. Provide valuable information and suggestions for the author's writing.<sup>5</sup>

#### Mathematical statistics method

According to the recovered questionnaires and interview records, SPSS18.0 was used to establish a database for the obtained data. Based

on the needs of this research, WPS table 2019 or SPSS18.0 software was used to analyze the data, including statistical methods such as descriptive analysis and weight analysis.<sup>6</sup>

### Ethical Compliance

Research experiments conducted in this article with animals or humans were approved by the Ethical Committee and responsible authorities of Gannan Healthcare Vocational College and Ganzhou Teachers College following all guidelines, regulations, legal, and ethical standards as required for humans or animals.

## RESULTS

### The incidence of knee sports injuries and related factors in adolescent triple jumpers

Triple jump athletes generally start to enter sports schools at the age of 12, most of the elite athletes have experience in basic training in sports schools. However, the occurrence of knee sports injuries has also caused the loss of some outstanding talents, when communicating with the coaches of sports schools in various cities, most of them also talked about such cases, therefore, it is also very concerned about the problem of sports injuries in the knee area. In order to investigate the basic situation of sports injuries in the knees of juvenile triple jumpers, the first thing to do is to study the injury incidence of triple jumpers in these sports schools.

The incidence of sports injuries in the knee area refers to the rate of sports injuries of athletes during competition or training, injured as a percentage of the total. In order to understand the current incidence of knee sports injuries among adolescent triple jumpers, the author conducted a specific survey on track and field triple jump athletes from 6 sports schools in 4 cities, the incidence of knee sports injuries among athletes is shown in Table 1.

It can be seen from Table 1 that, there were 36 boys, of which 28 had injuries, and the injury rate was 77.8%. There were 26 girls, 20 of whom had been injured, and the injury rate was 77%. There was little difference in the incidence of injuries between men and women. A total of 48 male and female surnames were injured, 14 of whom had no injuries, and the injury rate was 77.4%. At present, the injury rate of juvenile triple jumpers is relatively high, which needs to be paid great attention by coaches.

In addition, according to the survey results, it is found that the sports level of athletes is directly related to the training years, the sports level of athletes who have been training for more than 3 years has increased significantly, not only that, there is a close relationship between knee sports injuries and sports grades, the specific investigation is shown in Table 2.<sup>7</sup>

**Table 1.** Survey on the incidence of knee sports injuries among triple jumpers.

Gender	Has there been any damage		Total	Percentage
	Have	No		
Male	28	8	36	77.8
Female	20	6	26	77
Total	48	14	62	77.4

**Table 2.** Analysis of the relationship between the incidence of knee sports injuries and sports grades in triple jumpers.

Whether the athlete has suffered a sports injury	Sport class								Total
	Level 2 and below		Secondary		Level 1		Level 1 and above		
	Male	Female	Male	Female	Male	Female	Male	Female	
Damaged	11,68.7	8,66.7	14,87.5	11,84.6	3,75	1,100	0	0	48,77.4
No damage	5,31.3	4,33.3	2,12.5	2,15.4	1,25	0	0	0	14,22.6
Total	16	12	16	13	4	1	0	0	62

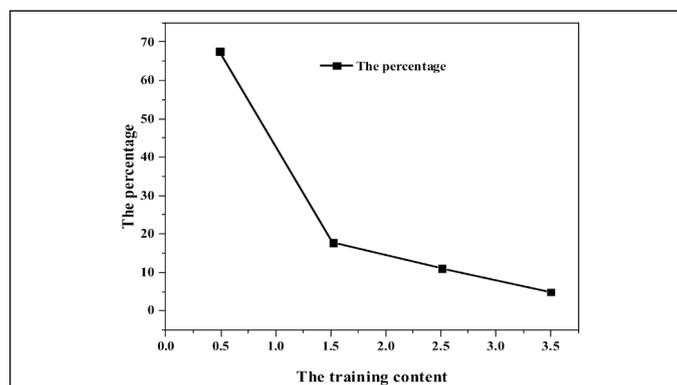
It can be seen from Table 2 that among the 62 juvenile triple jumpers surveyed, only 14 had no injuries, while 48 had injuries, and the injury rate was as high as 77.4%. Among these injured athletes, the incidence of sports injuries in the knee area varies with the level of exercise. The table shows that there are 28 male and female athletes below the second level, 19 of whom have been injured, and the injury rate is 67.9%; 11 boys had injuries, accounting for 68.7% of the total number of boys below the second level, and 8 girls had injuries, accounting for 66.7% of the total number of girls below the second level. Among the 25 second-level athletes who had injuries, 4 did not have sports injuries to the knees, and the injury rate was 86.2%; 14 boys were injured, accounting for 87.5% of the total number of boys at the second level; 11 girls were injured, accounting for 84.6% of the total number of girls at the second level. At the first level, 4 athletes had injuries, and 1 had no sports injuries, and the incidence of sports injuries was 80%. As can be seen from Figure 1, athletes are most likely to be injured during technical training. 33 people have been injured, with an injury rate of 68.8%, 8 people have been injured during speed training, 5 people were injured during the competition, and 2 athletes were injured in other training.

**Influencing factors of sports training for sports injuries of the knee**

Through the analysis of the characteristics of the project and the summary of the injuries and diseases in the daily training, the influencing factors are formed into detailed data in the form of investigation, and the obtained data are organized. From the data in Table 3 of the obtained influencing factors, it can be seen that all athletes are prone to knee sports injuries due to the huge pressure they bear in sports, long-term general training content is combined with specific training content. In addition, from the analysis of the athlete's own physical quality and ability, the limitations of their own conditions lead to blind imitation and wrong technical force methods during the practice process, which is also an important factor in causing sports injuries to the knee.<sup>8</sup>

**DISCUSSION**

During the rehabilitation of the track and field triple jump athletes after knee sports injuries, it is of great significance to the athlete's continued training time control and the athlete's safety protection work, continuing to perform a normal training program after short-term recovery can easily transform an athlete's acute sports injury into a chronic disease, the formation of compensatory knee sports injury is not only a test for future rehabilitation work, but also shortens the sports life of athletes. Therefore, the formulation of a reasonable rehabilitation training plan and the exercise of effective rehabilitation methods can better restore and improve the athletic ability of the knee of the track and field triple jumper.<sup>9,10</sup>



**Figure 1.** Analysis of the relationship between the incidence of knee sports injuries and training content.

**Table 3.** Factors causing sports injuries in the knee of triple jumpers.

Influencing factors	Number of people	The proportion
Unreasonable adjustment of training time and recovery measures	12	100
Excessive pressure on the knee after completing the technical movement	12	100
Training Intensity Sessions Overloaded	10	83.3
Decreased levels of physical fatigue	7	58.3
Irregular stride and take-off technical movements	5	41.7
Lack of strength in small muscle groups in the knee area	3	25
Continuous practice and competition with knee injuries	3	25
Game cold and game heat during practice or competition	2	16.7
Affected by adverse psychological factors	2	16.7
Inadequate preparation before exercise	0	0

**CONCLUSION**

The author studies human tissue injury and triple jump rehabilitation training in track and field sports. The author uses the survey method and mathematical statistics method. Research methods include interviews with athletes, coaches and experts. Adolescent triple jump injuries are related to training level and training content. Due to the nature of the triple jump, athletes' knees have a higher risk of sports injuries during training and competition. On the basis of analyzing the factors that cause sports injuries, it is important to put forward the triple jump training program, the optimization of scientific training content, the ability of athletes to adapt to external factors, the ability of self-defense, and the prevention of knee sports injuries. Rehabilitation can keep triple jumpers in their best condition and achieve better results.

All authors declare no potential conflict of interest related to this article

**AUTHORS' CONTRIBUTIONS:** Each author made significant individual contributions to this manuscript. Suqin Cao: writing and data analysis; Hui Wang: article review and intellectual concept of the article.

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