

# Common Injuries and Healthcare in College Basketball Sports

Liyun Wang, Yulin Normal University, China

Qingbin Sun, Yulin Normal University, China\*

## ABSTRACT

College students often experience sports injuries on the basketball court due to their lack of understanding of their own situation and poor self-protection awareness. This article takes college students in the Chengdu Chongqing region as the research object, analyzes the causes of basketball sports injuries among college students through questionnaire survey, and proposes rehabilitation methods and preventive measures for sports injuries. The research results indicate that the main reasons for athlete injuries include improper preparation activities, technical errors, excessive load, poor physical fitness. To reduce the occurrence of injuries, it is necessary to do good warm-up training and enhance the flexibility of joints and ligaments. During physical rehabilitation training, it is necessary to focus on controlling the training intensity and establishing a phased recovery plan. Ultrasound can be used to accelerate the recovery speed of athletes' injuries. The research results provide theoretical data support for preventing basketball injuries among college students.

## KEYWORDS

Basketball, College Students, Healthcare, Rehabilitation, Sports Injuries

## INTRODUCTION

With the in-depth integration of physical education in schools and physical exercise for all people, people's love for various sports has been continuously improved (Zuckerman et al.,2018). China's scientific and technological progress and the pace of life have accelerated, material and spiritual civilization have continued to develop, and basketball has gradually become the most involved sport, loved by more people (Zhao, 2022). Basketball is a high-intensity sport that combines skill, body, and intelligence and emphasizes physical confrontation (Clifton et al.,2018). At the same time, basketball sports often occur in different degrees of sports injuries due to the lack of technical skills, large range of movements, different styles and ball styles, and a weak sense of self-protection (Starkey, 2000). Therefore, studying the causes of injuries in basketball and proposing effective methods to prevent sports injuries is beneficial for enhancing the enthusiasm of the general public to participate in basketball (Foss et al.,2014).

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\*Corresponding Author

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There have been certain research results on the occurrence of sports injuries in basketball. Some researchers have investigated the causes of sports injuries that ordinary high school students are prone to during basketball training classes (Hammig & Bensema, 2007). Basketball can help improve the physical and mental health development of high school students and improve their physical fitness (Lempke et al.,2021). During the teacher's teaching process, students often experience injuries during training classes due to the non-standard use of teaching equipment, lack of self-protection awareness, and non-standard movements (MacKnight & Sridhar, 2020). Therefore, by continuously improving students' awareness of self-protection, strengthening self-protection, establishing standard and scientific training methods, and doing a good job in the daily maintenance of teaching equipment, sports injuries can be significantly reduced. Some researchers have conducted research on the body parts that are prone to injury in basketball (Goldstein & Wee 2011). I believe that basketball is deeply loved and has a high level of participation. In sports, high antagonism and intensity lead to sports injuries that athletes are prone to (Darrow et al.,2009). In response to the most common sports injuries and their locations, it is necessary to take effective measures in advance, propose effective prevention and treatment methods, continuously improve the fun basketball brings to people, and truly improve their physical fitness and athletic ability (Trojian et al.,2013). Some researchers analyze the injury characteristics and mechanisms of athletes in basketball through anatomy and have concluded that varying degrees of sports injuries have occurred in basketball, including training. At the same time, basketball is divided into guard, sub position, small forward, power forward, and center. The injury probability and position of players in different positions are different. The injured parts mainly include the head, shoulder, hand, elbow, foot, leg, and trunk, with the knee and ankle joints having the highest frequency and probability of injury (Garrrick & Requa, 1988). This is mainly due to objective factors such as athletes' own skills and intensity of events, as well as subjective factors such as inadequate physical fitness, sports skills, and self-protection awareness, as well as non-standard habits, which cause sports injuries. Some researchers have analyzed the situation of basketball sports injuries and believe that due to the lack of understanding of their physical condition, poor self-protection and protection awareness, and lack of proficiency in professional skills, basketball players often experience sports injuries of different parts and varying degrees. The knee joint is the most common, prone, and frequently injured area. Mild injuries can seriously affect training and game performance. It is difficult for severely injured individuals to recover to their pre-injury level of exercise through the best treatment techniques, and even more so, it can affect their daily lives. Some researchers conducted a questionnaire survey of basketball players to analyze the frequency, degree, and causes of knee joint injuries among college students during daily training and competition in basketball. Propose to improve athletes' physical fitness, protective awareness, and tactical arrangements, and prevent injury risks by taking effective knee joint protection measures. Some researchers have focused on the injuries caused by basketball training and sports among students in vocational colleges and physical education colleges (Makovicka et al.,2019). Through on-site questionnaire surveys and data statistical analysis, it has been found that the main reasons for student injuries are insufficient self-protection measures, insufficient warm-up preparations in the early stages of sports, slippery ground conditions, and physical conditions at the time (Zhang, 2022). Corresponding preventive measures have been proposed based on these reasons. Some researchers conducted a questionnaire survey on sports injuries among basketball players majoring in sports in universities. Statistical analysis shows that the number of people with finger injuries is the highest, reaching 30%, followed by 25% for the ankle joint, followed by the knee joint, wrist, and lower back. The main reasons for these injuries are insufficient preparation activities accounting for 35% and violations of rules accounting for 26% (Othman et al.,2019). Some researchers have studied the competitions of university basketball departments and colleges, and have calculated that when sports losses occur, the main reasons for athletes are insufficient warm-up activities in the early stages, as well as their own physiological and technical reasons (Parisien et al.,2021). Therefore, it is proposed to improve playing skills and physical fitness and prepare for warm-up and relaxation training, in order to minimize and avoid sports injuries as much as possible.

Basketball has become the most participated sport and is deeply loved by college students (Clifton et al.,2018). It has the characteristics of high-intensity exercise and strong antagonism. Athletes are prone to sports injuries due to various reasons in the intense competition for ball rights and scores, which affects their enthusiasm for participating in sports activities (Kasitinon et al.,2018). This article takes college students in the Chengdu Chongqing region as the research object, conducts a questionnaire survey on the situation of basketball sports injuries among college students, analyzes the causes of basketball sports injuries among college students, summarizes the types of sports injuries that often occur, and proposes targeted rehabilitation and health care methods for sports injuries and preventive measures. The research aims to provide theoretical data support for preventing basketball injuries among college students and guide the sustainable and healthy development of basketball in universities. This study helps to improve the self-protection awareness of college basketball players and reduce and avoid the risk of sports injuries. At the same time, it can also provide scientific guidance and basis for coaches and managers, promoting the sustainable and healthy development of basketball in universities. In addition, this study also has certain theoretical and practical significance for enhancing the enthusiasm of the public to participate in basketball, improving people's physical fitness and athletic ability, and promoting national fitness and sports culture.

## EXPERIMENTAL METHODS

### Subjects of Study

This article takes basketball sports among college students in the Chengdu Chongqing region as the research object, selects basketball courses from 10 universities, and designs a questionnaire on basketball sports injuries among college students (Borowski et al.,2008). A total of 900 questionnaires were distributed, and 885 valid responses were collected, with a recovery rate of 98.3%, including 626 males and 259 females. The students are mainly sophomores aged 19-21. Table 1 provides statistics on injuries in basketball classes for college students. Figure 1 shows the injury rate of male and female students in basketball classes.

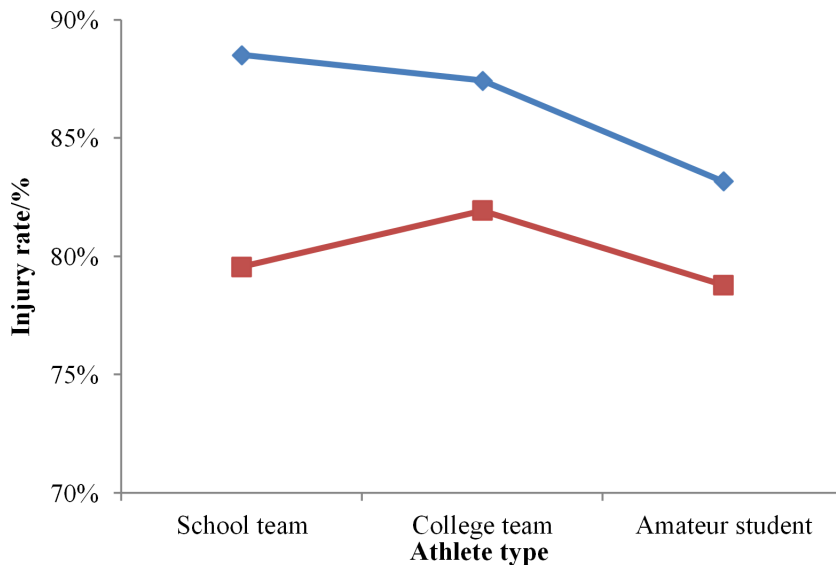
### Statistics on Basketball Sports Injuries

Through a survey questionnaire, it was found that the location of injuries among college students in basketball classes is mainly related to the characteristics of basketball itself (Mateos Conde et al.,2022; McGuine et al.,2000). According to the degree of sports injury of college students, this paper divides it into mild, moderate and severe injuries. Mild injuries mainly manifest as sprains, minor abrasions, and bumps (Middleton et al.,2020). After the injury, it does not affect continued exercise, nor does it affect the complete loss of future athletic ability, nor does it affect future sports activities and exercise (Baquie & Brukner, 1997). Moderate injuries are commonly muscle strains and tendon sprains, which can affect normal exercise and training (Fletcher et al.,2014). It is necessary to stop and rest for a period

Table 1. Injuries in college students' basketball classes

Athlete Type	Male Students			Female Students		
	Number of People Surveyed	Number of Injured People	Injury Rate/%	Number of People Surveyed	Number of Injured People	Injury Rate/%
School team	122	108	88.52%	44	35	79.55%
College team	183	160	87.43%	83	68	81.93%
Amateur student	321	267	83.18%	132	104	78.79%
Sum	626	535	85.46%	259	207	79.92%

Figure 1. Injury rate in basketball classes for male and female students



of time before returning to a normal state. Severe injuries mainly include fractures, bone fractures, visceral damage, joint dislocation, etc. These types of injuries must be immediately hospitalized and require long-term rehabilitation and rehabilitation to carry out normal activities and exercise (Pasanen et al.,2017). In order to better understand the severity of injuries and the length of rehabilitation period, sports injuries are further divided into acute and chronic injuries. Acute injury mainly refers to one-time direct or indirect external force caused by injury, general symptoms appear rapidly, and the recovery time is short. Chronic injury mainly refers to the injury caused by long-lasting force and impaired physical function of a certain part of the body, and its onset period is relatively slow, the recuperation period is long and the disease is repeated, such as common arthritis, lumbar muscle strain, etc. Table 2 shows the statistics of injury types in basketball classes college students, and Figure 2 shows the statistics of the number of people with different injury types. As can be seen from Table 2 and Figure 2, acute injuries such as joint sprains and muscle strains occur most often in basketball.

The climate, venue conditions, and athlete psychological state of different seasons may all affect the incidence of sports injuries. Therefore, in this paper, the statistics of injuries in college basketball classes in different seasons in 2021 are selected. Table 3 shows the occurrence of injuries in college basketball classes in different seasons, and Figure 3 shows the injuries of college basketball classes in different seasons. It can be seen from Table 3 and Figure 3 that the probability of injury in spring sports is low, and the occurrence of injury in winter is the most obvious. This may be related to factors such as cold weather in the autumn and winter seasons, reduced flexibility and flexibility of the human body, and inconvenient activities due to heavy clothing.

Table 2. Statistics of injury types in basketball classes of college students

Nature of Injury	Acute Injury			Chronic Injury		
	Joint Sprains	Muscle Strain	Fracture Dislocation	Patal Strain	Lumbar Muscle Strain	Bone Hyperplasia
Number of injuries/people	128	100	5	21	28	4

Figure 2. Number of people with different injury types

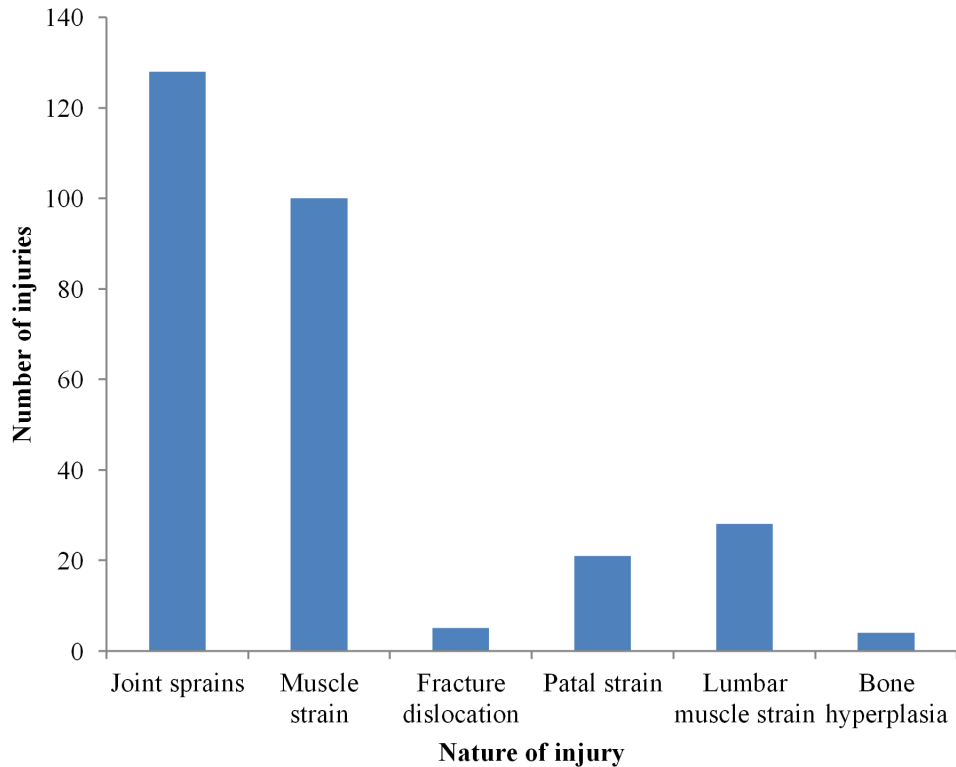


Table 3. Occurrence of injuries in basketball classes of college students in different seasons

Season	Spring	Summer	Autumn	Winter
Number	31	51	76	121
Percentage (%)	11.11%	18.28%	27.24%	43.37%

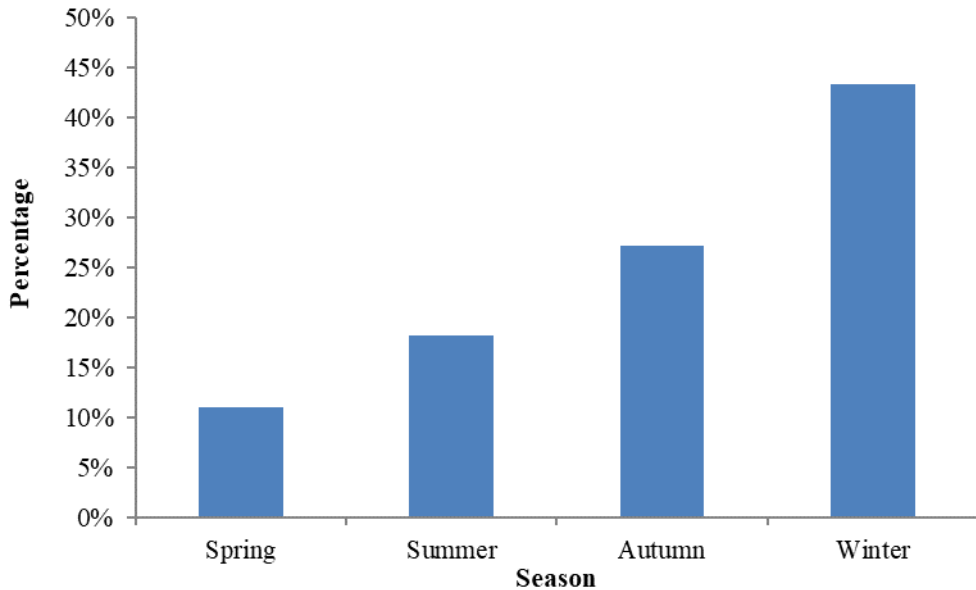
From Table 3, it can be seen that there is a certain correlation between college basketball class injuries and seasons. Therefore, attention should be paid to preventing seasonal sports injuries. To participate in sports in spring, one should pay attention to overcoming spring difficulties and make sufficient preparations. Pay attention to heatstroke prevention during summer sports, do not participate in exercise in the sun, and strengthen the supplementation of water and salt. In autumn, it is important to wear more clothes at the beginning of exercise and wipe off sweat in a timely manner after exercise. Do not or as little as possible inhale through the mouth during exercise, and breathe through the nose more to avoid cold air irritating the throat. In winter, it is important to prepare well for activities to avoid injuries and illnesses to various parts of the body. After exercise, it is necessary to strengthen the ability to keep warm and replenish.

## EXPERIMENTAL RESULTS

### Causes of Sports Injuries

There are many reasons for sports injuries in basketball sports class college students, through a questionnaire survey of 230 college students who have been injured. Table 4 and Figure 4 give the

Figure 3. Injuries in basketball classes of college students in different seasons



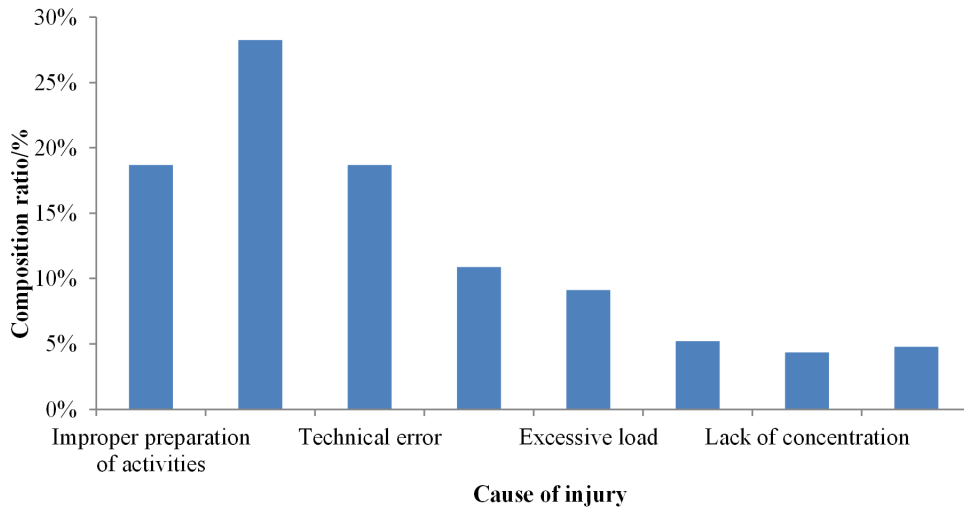
causes of sports injuries of college students who often participate in basketball, and it can be seen that the main causes of injuries include improper preparation activities, violation of rules, technical errors, poor venues, excessive load, poor physical fitness, lack of concentration, etc. Improved preparation and technical errors specifically refer to athletes who are not fully prepared for warm-up and lack proper technical execution. Rule violations, technical errors and insufficient preparation before exercise are the main causes of activity injuries.

As a sport that attaches importance to movement speed, basketball needs confrontation, grasp the timing of shooting, and is highly competitive, which requires the lower limb activities of basketball players to be at high intensity for a long time, especially the knee joint exercise is flexible. When grabbing boards and steals in basketball, it is necessary to stretch and bend many times, and bounce to a higher height with the lower limb. In the fiercely competitive environment of basketball courts,

Table 4. Causes of sports injuries among college students who regularly participate in basketball

Cause of Injury	Number of Injuries	Composition Ratio/%
Improper preparation of activities	43	18.70%
Violation of rules	65	28.26%
Technical error	43	18.70%
Poor grounds	25	10.87%
Excessive load	21	9.13%
Poor physical fitness	12	5.22%
Lack of concentration	10	4.35%
other	11	4.78%
Sum	230	100.00%

Figure 4. Causes of sports injuries among college students who regularly participate in basketball



athletes may need to engage in physical confrontations, fast dribbling, sudden stops, jumps or breakthroughs, rapid withdrawals, sudden landings after dunks, etc. in a short period of time, which can cause significant knee joint damage. Long term local high-intensity stress can easily lead to strain and injury of the knee joint. At the same time, when athletes stop and dunk at high speed or pick up rebounds, if the power is not used properly, the body's center of gravity will shift, and the cushioning will not be in place when landing, which is very easy to cause unstable joint support and ligament strain. If the action is fiercer and more intense, there may be tendon tears or leg fractures.

With the rapid development of basketball technology, the difficulty of dribbling in basketball is also constantly increasing. The frequency of use of shoulder, elbow, wrist, and finger and toe joints will also increase, greatly increasing the injury rate of these joints. Especially when fighting for rebounds in the air, various parts of the upper limbs are stretched out vigorously, which can easily cause shoulder and elbow joint ligament injuries.

During basketball, when athletes experience injuries, acute injuries are generally the main form. Most of it is due to insufficient warm-up before the activity and inadequate exercise movements. At the same time, during conversations with students, it was learned that college students do not attach great importance to minor injuries. When there is unbearable pain and inability to exercise, it is only taken care of, often missing the best opportunity for injury diagnosis and treatment, and sometimes causing great negative effects on athletes. At the same time, ordinary college students have insufficient understanding of injuries and lack self-protection awareness of their physical harm. Therefore, it is necessary for school physical education teachers to emphasize the importance of correctly handling sports injuries to college students, teaching different methods of correctly handling injuries, and emphasizing rehabilitation, recuperation, and training.

At present, based on the emergency response ability of athletes, the best way to deal with injuries on site is to minimize the degree of injury and not cause secondary injuries. Adopt different emergency response methods for different injuries. For joint injuries, it is necessary to protect the injured area through splints or other fixation measures. For routine sprains and pulls, emergency treatment methods such as ice compress, pressure bandage, and lifting the injured limb can be used to stimulate the body through load stimulation. At the same time, it takes more than 24 hours to remove the pressure bandage on the injured area, apply trauma medicine to promote blood circulation, and eliminate congestion or swelling on the body.

## **Injury Treatment and Prevention Methods**

For acute injuries in athletes, the first thing to do is to stop bleeding as soon as possible, remove the blood remaining in the body, eliminate the blood remaining in soft tissues such as internal cells, eliminate stasis and swelling as soon as possible. You can also apply some commonly used hemostatic drugs or ice with cold water to accelerate the contraction of capillaries and achieve the hemostatic effect. After timely medication and bandaging, it is also necessary to raise the injured site higher than the height of the heart to prevent blood from concentrating on the injured part, and heat compresses. Massage and other actions should be stopped at this time.

According to the severity of the injury, check for joint dislocation in the injured department. If there is a dislocation, quickly reposition the joint and massage the surrounding tissues. If there is a serious fracture or dislocation of the ligament, the injured position must be fixed as soon as possible and the injured athlete must be sent to a professional hospital for treatment. Through proper injury management, the bandage should be loosened one or two days before the recovery period, and moderate massage should be carried out to restore blood circulation as soon as possible and accelerate the improvement of the injured area.

In order to minimize the occurrence of injuries, athletes should prepare for warm-up training before activities. Especially before the formal competition, it is necessary to warm up the ankle, knee, and waist to enhance joint and ligament flexibility and coordination. By warming up and preparing, move the joints of various parts of the body, stretch the muscles of the body, and maintain a flexible state of joints and muscles.

Enhance personal self-protection awareness. College students should attach great importance to the education of sports techniques, standards, and protection, and cultivate the concept of preventing injuries. From the perspective of thinking and action, it is necessary to carry out systematic and planned daily sports activities. At the same time, schools can also popularize college students' sports injury-related knowledge through various forms of safety education, and realize the importance of injury prevention. Strengthen the protection of vulnerable areas according to personal daily exercise habits. In order to avoid damage to fingers and wrist joints, it is necessary to strengthen joint movement in daily life, improve its ability to adapt to a certain intensity and prevent repeated injuries to the knee joint. Simultaneously enhancing the strength of the quadriceps can also effectively prevent ankle injuries.

## **Injury Rehabilitation Methods**

When basketball players experience sports injuries during activities, adopting certain recovery training can help them quickly engage in new training and activities. If daily training is stopped due to injury, the physical fitness of athletes will also be affected to a certain extent. When conducting physical rehabilitation training, attention should be paid to controlling the training intensity, maintaining a certain training intensity for the uninjured parts, gradually increasing the training intensity for the injured department, conducting appropriate functional training for joints and muscles, and conducting professional medical personnel management for injured athletes.

After an athlete's physical function is damaged, daily training and intensity must be forced to pause. Planned rehabilitation training should be developed to provide effective recovery management. When the injured area is healing, guide athletes to carry out effective rehabilitation training to restore motor function, and according to the training rhythm of each recovery stage, try to recover it as much as possible before the injury. Joint injuries mainly rely on flexibility training for recovery. According to different recovery training methods, static stretching exercises are used to alleviate muscle and joint fatigue, achieving a soothing treatment for the surrounding joint ligaments and muscles. In order to restore muscle strength, after static stretching, gradually increase the training load on the injured area according to the recovery situation. After the doctor determines that the muscle shape has basically recovered, the focus of recovery will be on endurance training. When muscle strength returns to normal, specialized training can be conducted to adjust muscle strength.



For frequent ankle joint injuries, the degree of injury needs to be determined first. And based on the doctor's diagnosis, a detailed rehabilitation plan will be developed according to the level of injury. At the same time, the pressure bandage must be removed for more than 24 hours, and appropriate mild exercise can only be performed after 48 hours. According to the degree of injury at the injury site, use internal and external rotations, and single- or double-foot jumps to restore ligament and muscle damage. If the exercise effect is good, increase the exercise load appropriately and strengthen the intensity of rehabilitation training. Ultrasound and other technologies enable effective adhesion of damaged tissues, accelerating the recovery speed of athletes' injuries.

## **CONCLUSION**

This article uses a questionnaire survey method to select basketball courses from 10 universities to conduct a survey on college students' basketball sports injuries. Research has found that the location of injuries among college students is mainly related to the characteristics of basketball itself. At the same time, the probability of injury during spring sports is relatively low, and the occurrence of injury in winter is the most obvious.

Different emergency response methods are adopted for different injuries. Acute sports injuries should be stopped as soon as possible to eliminate blood stasis and swelling, and the injured department should be checked for joint dislocation. To reduce the occurrence of injuries, prepare for warm-up exercises before activities to maintain a flexible state of joints and muscles. When conducting physical rehabilitation training, maintain a certain level of training intensity for the uninjured area, gradually increase the training intensity for the injured department, and conduct appropriate functional training for joints and muscles. Frequent ankle injuries require a phased recovery plan. Ultrasound and other techniques can be used to accelerate the recovery speed of athletes' injuries. Through the research in this article, we can have a more comprehensive and in-depth understanding of the causes, common parts, and treatment methods of basketball sports injuries among college students. At the same time, we have proposed some effective rehabilitation methods and preventive measures to reduce the risk of injury for college students in basketball, enhance personal self-protection awareness, and provide useful reference and guidance for campus physical education. The contribution of this article lies in providing theoretical data support for preventing basketball injuries among college students and providing actionable suggestions for relevant practices.

## **DATA AVAILABILITY**

The figures and tables used to support the findings of this study are included in the article.

## **CONFLICTS OF INTEREST**

The authors declare that they have no conflicts of interest.

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